Appendix BB Bat Management Plan

Fast-Track Approvals Act 2024 Substantive Application

Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.: 880.016894.00001

19 August 2026

Bat Management Plan

Harmony Hinuera Solar Farm

Harmony Energy NZ #6 Limited

Level 10 The Shortland Centre, Tower 2,
55 Shortland Street,
Auckland

Prepared by:

SLR Consulting New Zealand

SLR Project No.:880.016894.00001

25 June 2026

Revision: 1.2

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0.2	20 November 2025	Jade Van der Zanden	Andrew Briggs	
0.3	23 March 2026	Kelly Hayhurst	Mike Jones – External review and sign off	Mike Jones – External review and sign off
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1.2	25 June 2026	Kelly Hayhurst	Mike Jones – External review and sign off	Mike Jones – External review and sign off

Basis of Report

This report has been prepared by SLR Consulting New Zealand Limited (SLR) on the instructions of Harmony Energy NZ #6 Limited (the Client), in accordance with the agreed scope of work. It is intended to support the Client's application under the Fast Track Approvals Act 2024 and may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application. While SLR has exercised due care in preparing this report, it does not accept liability for any use of the report beyond its intended purpose. Where information has been supplied by the Client or obtained from external sources, it has been assumed to be accurate unless otherwise stated.

Statement of Qualifications and Experience

Mike Jones - MSc (with distinction), University of Otago - Director, Tou-Roa Ecology - Co-founder, Advanced Field Skills Ltd

Mike is a practising bat ecologist, director of Tou-Roa Ecology and co-founder of Advanced Field Skills Ltd. Mike has over a decade of experience in focussed bat ecology from working in both conservation and consultancy in both NZ and Europe. Mike has provided specialist bat ecology services for numerous wind farms including Hapuakohe, Huriwaka, Mimihau, Kaihiku, WEA Schwalmstadt (Germany), WEA Roth (Germany). Mike has also provided specialist bat services for various other large-scale infrastructure projects in NZ and Europe, including the Mt Messenger Bypass, East-West Rail (UK) and N2T Lines Upgrades (UK). Mike currently provides specialist bat ecology services on Waiinu Wind Farm, Puketoi Wind Farm and Waste Management NZ Landfill (formerly Auckland Regional Landfill).

Mike is a certified Trainer under the DOC bat competency scheme for all competencies excluding wing biopsies and pit tagging. Mike is one of NZ's most experienced bat trainers, having trained the majority of NZ's recognised bat ecologists while leading the Eglinton research project. Mike continues to provide training in bat ecology through his highly popular Geraldine bat training program, High Risk Activities training courses and community projects such as Finding Franklin Bats.

Mike actively contributes to the Department of Conservation's Bat Recovery Group, having written and submitted guidance documents and proposed changes for High Risk Activities training, endoscope surveys, and pathways for others to become Trainers under the competency framework.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand Practice Note 2023, and section 9 of the Code of Conduct for Expert Witnesses.

Kelly Hayhurst - Associate Ecologist - Ecology and Marine, SLR Consulting

Kelly is an associate consultant - Ecology and Marine, SLR Consulting Limited (SLR) specialising in terrestrial fauna and wetlands. SLR is a global environmental and advisory consultancy specialising in sustainability and climate change strategy, planning, environmental management and impact assessment and waste management and remediation. I have been employed at SLR since 2025. I hold the qualifications of Postgraduate Diploma in Environmental Science degree (2023) from the University of Auckland and Bachelor of Applied Science (Biodiversity) (2016), from Unitec Institute of Technology.

I have over ten years' experience in consulting ecology, particularly in the terrestrial discipline. My experience includes leading fauna management programs, including species salvages and relocations for lizards, invertebrates, and birds. I am an active bat ecology consultant with Bat Handling Competency Authorisation (Competency 3.3 – High Risk Activities; v1.4, 20/09/2023). I apply DOC's Protocols for Minimising the Risk of Felling Occupied Bat Roosts and the National Best Practice Manual of Conservation Techniques for Bats to deploy automatic bat monitors, interpret acoustic data, assess roost risk, and implement compliant bat exclusion and staged-felling procedures for vegetation clearance.

Projects I have worked on include large scale roading projects such as Peacocks Waikato River Bridge (Hamilton City), Mangamuka Gorge (NZTA), Waitara to Bell Block SH3 Upgrades (NZTA), Mangahauini Gorge (Transport Rebuild East Coast – TREC), and smaller TREC projects that require fauna management.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand Practice Note 2023, and section 9 of the Code of Conduct for Expert Witnesses

Jade Van der Zanden - Senior Consultant - Ecology and Marine, SLR Consulting

I am a Senior Consultant – Ecology and Marine, SLR Consulting Limited (SLR). SLR is a global environmental and advisory consultancy specialising in sustainability and climate change strategy, planning, environmental management and impact assessment and waste management and remediation. I have been employed at 4Sight/SLR since 2019.

I hold the qualifications of Masters in Science degree (2018), Postgraduate Diploma in Science degree (2017) and Bachelor of Science degree (2016) from the University of Auckland.

I have over seven years' experience in consulting ecology particularly in the freshwater discipline. My experience includes fauna management including bat management under the guidance of approved bat handlers, and implementation of bat management plans. I also have experience in implementing lizard management plans and relocation permits.

Projects I have worked on include assistance with the Opunake solar farm which was approved under the Covid-19 Recovery (Fast-track Consenting) Act 2020. I also have worked on various smaller scale tree-felling projects which have required implementation of tree felling bat management protocols.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand Practice Note 2023, and in particular section 9 of the Code of Conduct for Expert Witnesses.

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1.0 Introduction

Harmony Energy NZ #6 Limited is proposing the development of a ~70 MW AC/100MW DC solar farm ('the site') at the corner of State Highway 29 and State Highway 27 near Hinuera, within the Matamata - Piako District. A map showing the locality of the site is provided in Figure 1. The solar farm infrastructure is to be located within an existing agricultural operation where the majority of landcover is pasture for livestock grazing. The proposed solar farm will comprise solar panel arrays, underground cabling, internal roading, inverter stations, battery stations, a switch room, operational buildings and perimeter fencing.

To address the potential ecological impacts of this development on bats, this Bat Management Plan (BMP) has been prepared to support the application for consent through the fast-track consenting process. This BMP applies to construction and operational activities associated with the proposed Hinuera Solar farm which could adversely affect bats and their habitat usage of the site.

Pekapeka-tou-roa (long-tailed bat - *Chalinolobus tuberculatus*), classified by the Department of Conservation (DOC) as Threatened – Nationally Critical[1], is the focus bat species of concern. The species is undergoing a severe national decline, driven primarily by introduced predators, habitat loss and fragmentation, and loss or disturbance of roost sites. While generally widespread across the North Island, populations are fragmented and unstable. Bioacoustic surveys (see Figure 1 for locations across the site) have confirmed that bats regularly use the project site and surrounds.

Following initial surveys, the project design was modified to avoid areas with high bat activity. This included a stand of mature pine and eucalyptus on the eastern side of the site (refer to Figure 1). Although high-activity areas have been avoided, other vegetation across the site still provides potential for foraging and other resources. As a result, the project may still cause the loss of foraging, commuting, and potential roosting habitat for long-tailed bats, and there remains risk of injury or mortality during construction.

1.1 Scope

Figure 1 outlines the entire property associated with the development; however, only part of this area will be affected by the project. The Bat Management Plan (BMP) applies only to works within the actual development footprint, including all earthworks. If the footprint changes, the BMP procedures may also be applied to any potential bat-roost trees elsewhere on the site, as directed by the implementing ecologist.

[1] 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

The processes which are to be applied by this BMP are as follows (and detailed in the following sections of this report)

- Identification of potential roost trees (identification of high / moderate and low risk at EcIA stage is to inform effects, and then prior to any felling to ensure no bat injury or mortality by addressing time lags) - to be repeated as required;
- Minimise the risk of harm to long-tailed bats which may be roosting in trees proposed to be removed, through the application of Bat Roost Protocols[2] (BRPs; Appendix A) where potential bat roost trees are proposed to be removed within the development footprint;
- Minimising disturbance from construction activities; and
- Artificial roost implementation (as a measure only if a tree is moved from potential roost classification to actual roost tree classification during the construction phase i.e. roosting bats are confirmed by the project).

[2] Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols) (2024). Bat Recovery Group. https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/bats/bat-recovery/protocols-minimising-risk-felling-occupied-bat-roosts.pdf

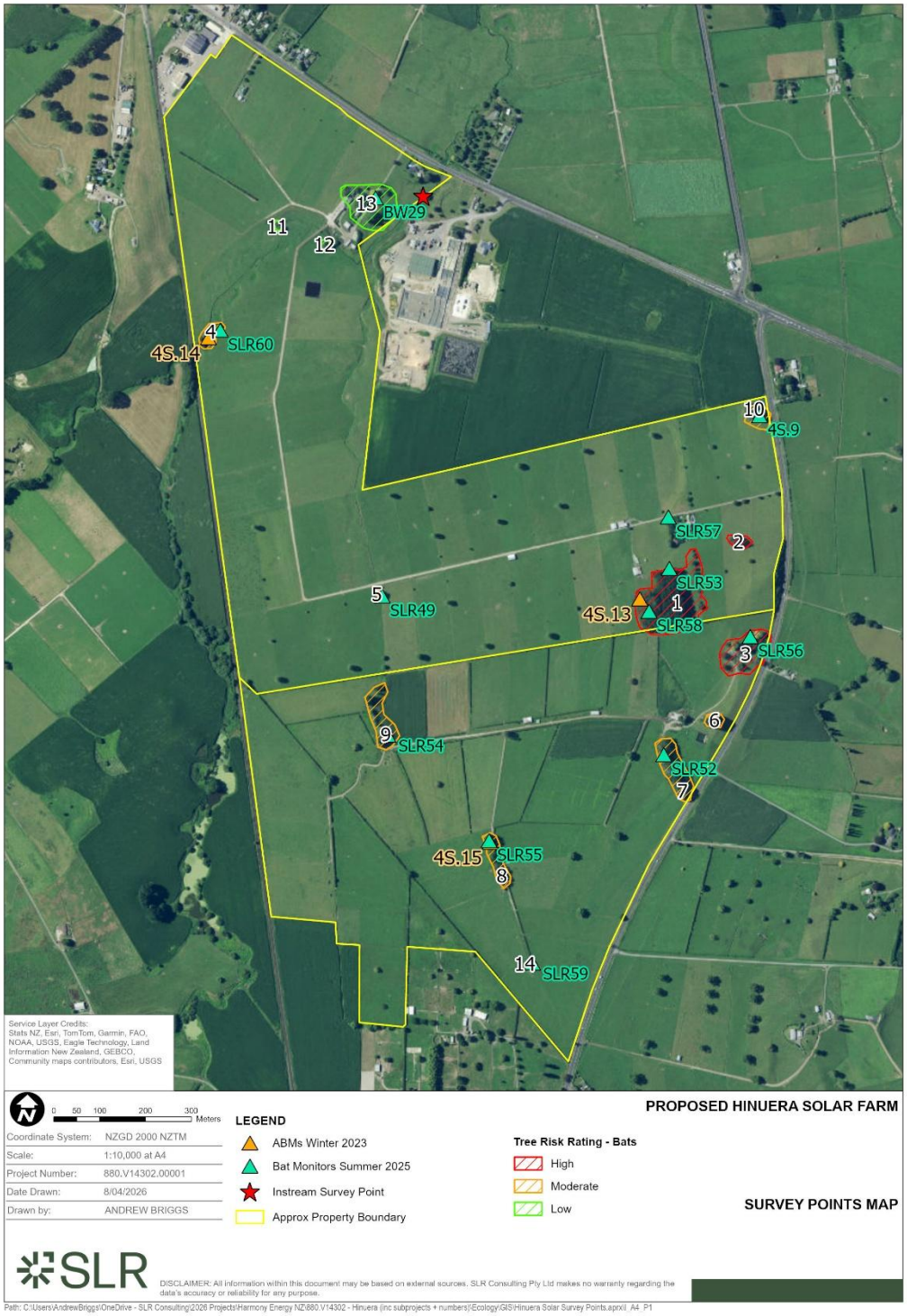

Figure 1: Overview of the site, and bat monitoring equipment (From SLR EcIA, 2026).

1.2 Statutory requirements

Aotearoa New Zealand bats are absolutely protected species under the Wildlife Act (1953, s63 (1)l). 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.

1.3 Responsibilities

1.3.1 Competencies for bat management

Any ecologist working with indigenous bats in New Zealand must be certified in accordance with the Department of Conservation's bat handling competencies authorisation. This is a set of skills that must be attained and certified by DOC's National Bat Recovery Group and technical experts. Any ecologists that are engaged to implement this BMP must be certified in the following task competencies:

- **Section 3.0 High risk activities – Roost felling.** All of the following 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]'
    - **3.1**. Assessing roost trees using ABMs
    - **3.2** Undertake roost watches / emergence counts
    - **3.3** Identification and evaluation of potential roost features

Bat ecologists with the above certified competencies are assumed as capable of understanding what to do if bats are found during tree felling. The competent bat ecologist is hereafter referred to as the project 'bat ecologist'[4] within this BMP.

[3] Initial Veterinary Care for NZ Bats Updated 2023.pdf (doc.govt.nz) and Bat Care Advice for first responders 2023.pdf (doc.govt.nz) available at www.doc.govt.nz/bat-worker-resources: https://cdn.ymaws.com/www.nzva.org.nz/resource/resmgr/docs/other_resources/Initial_Vet_Care_NZ_Bats. Pdf

[4] Defined as a person who has met the required technical and ethical standards to be registered as a competent, authorised bat worker by the New Zealand Bat Recovery Group for the work which they are undertaking.

1.3.2 Approvals holder

The Approvals holder is responsible for ensuring that the proposed solar farm is constructed and operated in accordance with the BMP. This includes ensuring a site induction for all employees and contractors is undertaken that informs them of the specific bat management risks, constraints, habitat use and requirements of the site. This should be completed prior to any works commencing on the site and a record of inductions kept. This induction can either be stand-alone or integrated into the typical health and safety induction process. 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 tree removal protocols; and
- Contact details for the bat ecologist, environmental compliance staff, and emergency numbers for any identified issues observed onsite.

2.0 Ecological Context and Recommendations

2.1 Summary of acoustic surveys

Bioacoustic surveys were undertaken in winter 2023, using twelve fixed automated bioacoustic bat detectors (ABMs). Although this is outside standard monitoring timeframes (i.e. within October – April inclusive - the warmer months, as bats go into a state of torpor and may not be moving, reducing detections) the intention was to supplement these surveys in summer.

The location for deployment was chosen based on the following criteria:

1. Vegetation type (targeting larger stands and isolated trees that were c.15cm DBH[5])
2. Linear pathways along hedgerows to assess foraging
3. Open pastoral areas.

Despite it being an out of season survey, the results of these surveys indicated the presence of long-tailed bats within the site, with high activity recorded in the proximity to a mature pine and eucalyptus stand (see “Area One” identified on Figure 2). A total of 776 bat calls across the deployment area were detected during the winter survey, averaging 6.5 bat passes per bat detector per night.

A further bioacoustic survey, using the same previous deployment sites and twelve ABMS, was conducted from 24 October to 11 November 2025. This survey detected 794 bat calls, largely at three key locations all centred around the mature pine and eucalyptus stand identified previously, suggesting this area provides key foraging and/or commuting habitat (area identified as “Area 1”, Figure 2).

Bat passes were also recorded in other areas of the site; however, passes per detector – night were comparatively lower in those locations. An average of 4.4 bat passes were identified per bat detector per night across the site.

2.2 Summary of potential roost trees

The locations of identified potential bat roost trees as of November 2025 are shown in Figure 2 and catalogued in Appendix C. The current inventory is preliminary and reflects site conditions at the time of survey; additional potential roost trees may be identified during subsequent inspections or prior to works. Further assessment shall be undertaken for trees

[5] Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols) (2024). Bat Recovery Group. https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/bats/bat-recovery/protocols-minimising-risk-felling-occupied-bat-roosts.pdf. Specifically, section “Step 2: (a) and (b)”.

proposed to be removed in accordance with the protocols set out in Section 3.1. Note areas identified as high risk (Areas 1, 2, 3 in Figure 2) and two medium risk areas (identified as Areas 6 and 10 in Figure 2) are now excluded from the project impact zone.

2.3 Summary of avoidance

After initial results from the acoustic surveys, the project extent has been modified to exclude “Area 1” as outlined in the EcIA[6] as a mature pine and eucalyptus stand that had high activity. Areas “2” and “3” also identified as high risk (Figure 2) are also now excluded from the footprint as of March 2026. In addition, areas identified as moderate risk as of November 2025 - Areas “6” and “10” (Figure 2) are also out of the current project extent. The change in project extent by the client has significantly reduced the removal of currently assessed roost trees. It is noted that groupings of trees have been assessed, however the individual trees scattered across the site have not been formally assessed for roost risk.

[6] Hinuera Solar Farm Ecological Impact Assessment. By SLR Consulting Ltd and dated April 2026.

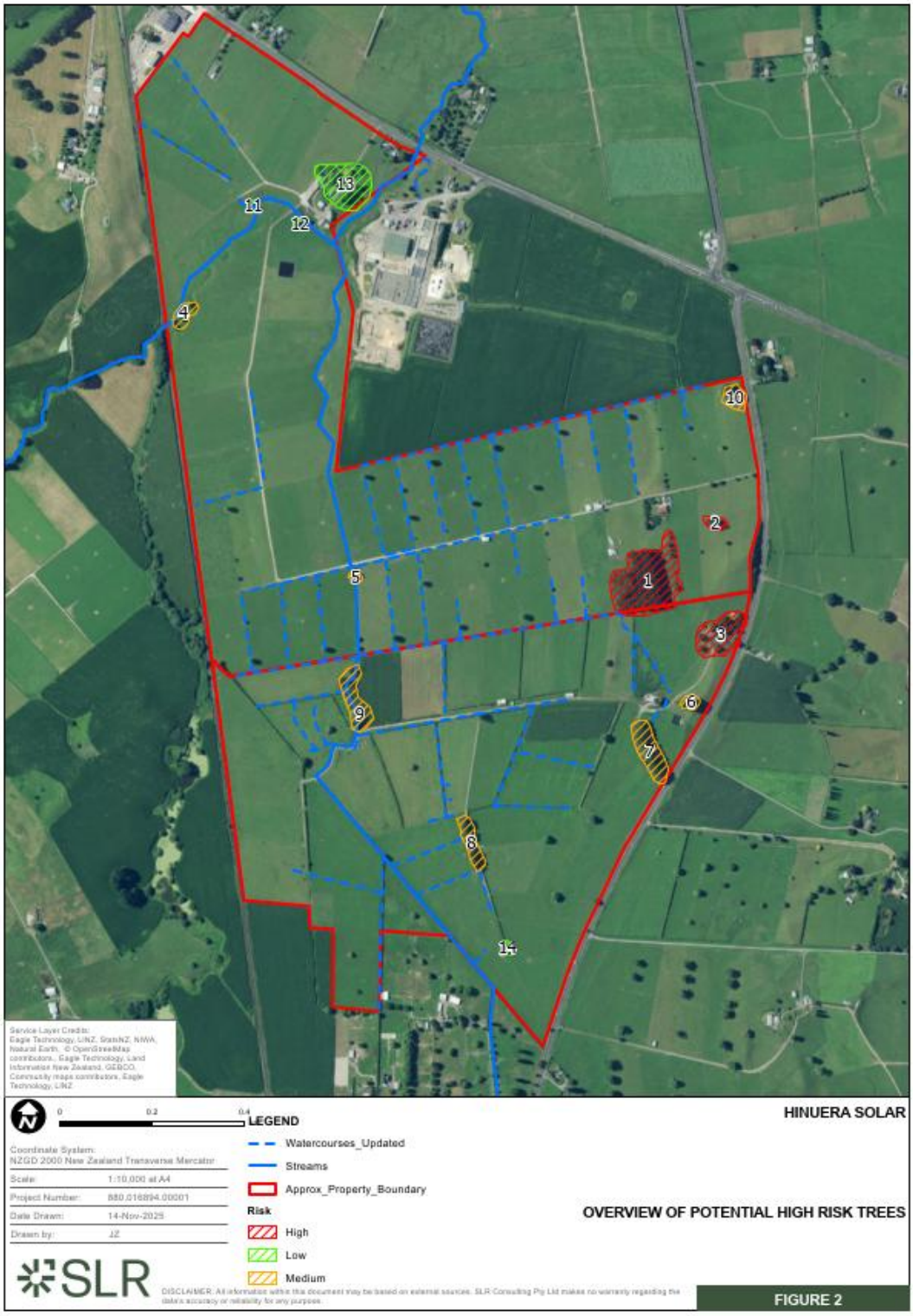

Figure 2: Areas of high and low risk for bat roost trees across the property.

3.0 Bat Management

3.1 Protocols overview

The bat roost tree protocols (Vegetation removal protocols – VRP[7]) outline the following decision tree for roost tree removal (from potential roost to actual roost) (Figure 3), and this will be followed by this BMP. The steps that can be undertaken to ensure that trees across the solar footprint do not have bats roosting in them at the time of removal are summarised in Table 1, the flow chart in Figure 3 below and described in the following sections.

Table 1: Management activities summary to ensure trees are not felled with bats present.

Management Action	Section	Personnel and competency required	Seasonal requirements
Roost tree rating	3.2.1	Certified bat ecologist with competency 3.3	None
Acoustic surveys (ABM's)	3.3.1	Certified bat ecologist with competency 3.1	October – April inclusive
Tree-climbing and roost inspections	3.3.2	Certified bat ecologist with competency 3.3	October – April inclusive
Roost emergence watches (dawn/dusk watches)	3.3.2	Certified bat ecologist with competency 3.2	October – April inclusive

[7] Department of Conservation Bat Recovery Group (2024). Protocols for minimising the risk of felling occupied bat roosts (Version 4). Te Papa Atawhai. https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/bats/bat-recovery/protocols-minimising-risk-felling-occupied-bat-roosts.pdf

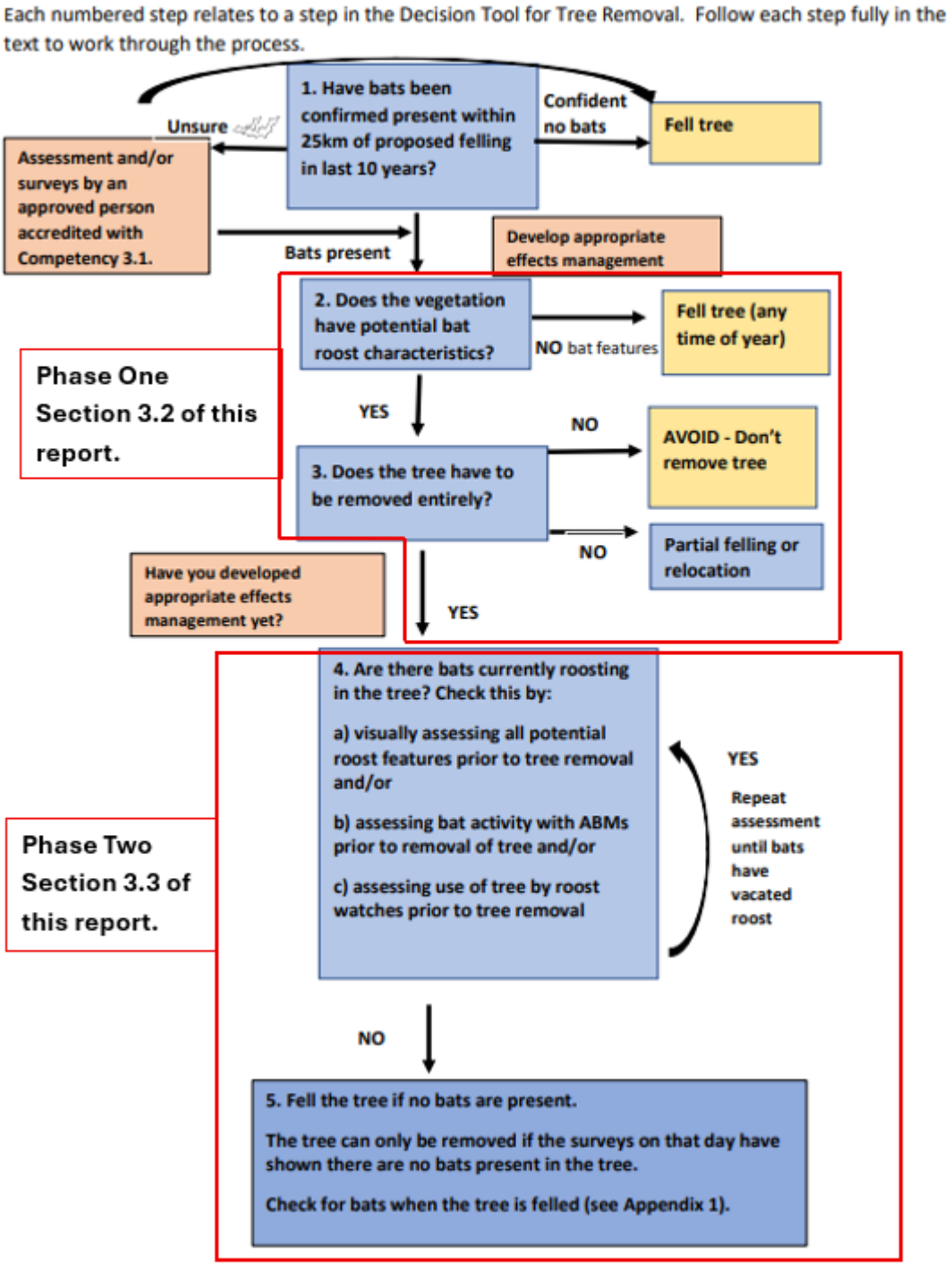

Figure 3: Decision chart for vegetation felling protocols (Bat Recovery Group, 2024). This BMP covers steps 2 – 5 for this solar project.

3.2 Phase one

3.2.1 Bat roost tree identification

Trees on site are planned to be removed or limbed as part of the construction of the solar farm. Across the site, groups of trees (exotic or native) with a diameter at breast height (DBH)[8] greater than 15 cm were assessed for the impact assessment related to the solar project, to confirm they are either high, moderate or low risk potential bat roost trees[9], to provide the project with an indication of the effects it may have on bats (see the ecological impact assessment for further details).

It is noted that the site does contain additional trees scattered across the farmland that have not been formally assessed for roost risk, however they are intended to be covered by this BMP as well at the time of construction. Where additional trees are rated through the construction timeline, these will be added to the Potential Bat Roost Trees Inventory (Appendix C), along with the risk rating classification (see Appendix B for details).

3.2.1.1 Potential roost trees

Trees deemed as potential bat roosts are those with a DBH greater than 15 cm and exhibiting one or more of the following features:

- Cracks, crevices, cavities, or fractured limbs of sufficient size to accommodate roosting bat(s).
- Sections of loose flaking bark large enough to provide roosting space for bats.
- A hollow trunk, stem, or branches.
- Deadwood within the canopy or stem that is of suitable size to support roost cavities or hollows.
- Presence of bat guano droppings, grease marks, or urine staining around cavities or ground.

See Appendix D for examples of natural bat roosts. As discussed in Section 2.3 areas of currently assessed high risk roost trees[9] are to be avoided by the project.

[8] Diameter at breast height, or DBH, is a standard method of expressing the diameter of the trunk or bole of a standing tree. DBH is one of the most common dendrometric measurements. DBH is measured at approximately 1.3 m above ground measures form the base of the tree trunk in question.

[9] As outlined for the effects assessment in Hinuera Solar Farm Ecological Impact Assessment. By SLR Consulting Ltd and dated May 2026.

3.2.1.2 Low risk trees / no features present

All trees with a DBH less than 15 cm, as well as trees with a DBH greater than 15 cm lacking the characteristic features of a potential bat roost, are categorised as low-risk trees. These trees can be felled at any time without the need for further assessment or monitoring. It is expected that the majority of scattered trees across the pastoral landscape will fall into this category but this will be subject to confirmation from a bat ecologist at the time of construction.

Roost criteria advice note:

It is important to note that regardless of trunk diameter, any vegetation demonstrating evidence of roosting bats (e.g., roost features, droppings, grease marks, urine staining) can be treated as a potential roost tree and can be classified accordingly by the bat ecologist on a case-by-case basis.

3.2.2 Summary of roost rating application

- Given the time lapse between the current assessment and the actual construction, this BMP is intended to cover all scenarios guided by the project bat ecologist.
- If at the time of construction, there are potential bat roost trees proposed to be removed, this shall be undertaken in accordance with the protocols outlined in Appendix A.
- Where additional trees are classified as a potential roost tree through the construction timeline, these will be rated as per the EcIA (High, Moderate and low risk, Appendix B) for effects purposes and added to the Potential Bat Roost Trees Inventory (Appendix C).
- These protocols are not required for Low Risk potential roost trees identified on site. Low-Risk trees can be felled at any time with no further input from a bat ecologist.
- No trees or vegetation identified as potential roosts can be felled or cleared without obtaining explicit prior approval from the bat ecologist.

3.3 Phase Two

3.3.1 Pre-felling bioacoustic survey

The following outlines the survey methodology to be used for a pre-felling bioacoustic survey immediately before felling of potential roost trees occurs:

- At least one bioacoustic ABM (for example DOC model 'AR4', Aalto "AR5" or other industry accepted bioacoustic bat detection device) shall be deployed at each potential bat roost tree, or when in clustered stands of potential bat roost trees, within 50 m of each tree, for no less than two valid survey nights[10] immediately before felling is scheduled.

- All detectors shall be calibrated to have the same time and date settings (NZST) and pre-set to start monitoring one hour before sunset until one hour after sunrise.

- ABMs shall be deployed with overlap in detection radius to assess potential use by bats, with no more than 50m space between overlapping monitors. This ensures adequate coverage of potential roost trees and provides contingency where monitors may fail.

- The recorders shall be suspended at least 2 m above the ground to reduce superfluous detections caused by terrestrial insects (usually cicada species).

- The locations of the ABMs shall be tagged and mapped.

Note: Acoustic surveys can be done if the risk of bats being recorded is expected to be low/nil at the site, as this will allow the felling of trees immediately after the ABM data is analysed. If this is not considered feasible, at the implementing bat ecologists' discretion, the process will move through to the next step instead. Note that this step is often taken along with the following, to allow the implementing bat ecologist to understand levels of activity around trees that are being felled.

[10] A valid survey night is between the months of October – April, and one when weather conditions allow bats to be most likely to be detected: avoiding heavy rain (>10mm/h), and windy (>5.6m/s) or cold (<8°C, ideally >10°C) nights.

3.3.2 Pre removal assessment for identified potential roost trees

3.3.2.1 Pre-works briefing

All personnel involved with the felling (including but not limited to tree climbers, plant equipment operators) shall receive a briefing from the competent bat specialist prior to inspections. This briefing shall cover bat identification and indicators of bat presence (e.g., guano, staining, odour – refer to Appendix A). For tree climbers in particular, care will be taken to provide them with appropriate handling techniques when inserting an endoscope to minimise disturbance to any bats that may be present.

3.3.2.2 Tree climbing and roost survey

Where there is uncertainty if a tree roost feature/s are occupied (i.e. acoustic surveys have activity, or a feature is hidden from view / can't be targeted with the ABM appropriately), roost features can be inspected by a suitably experienced tree climber under the supervision of the bat ecologist. 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 deadwood. The following procedures shall be implemented during inspection of all potential bat roosting features:

a) Endoscopic inspection

All accessible parts of each potential roost feature (including cavities, cracks, splits, and hollows) shall be inspected using an endoscopic camera to determine the presence of bats or evidence of bat use, under the bat ecologist's direct supervision.

b) Use of bat detector

A hand-held bat detector shall be used concurrently during inspection of tree features. Where bats are present and active (i.e., not in torpor), monitoring at approximately 25 kHz (social calls) and 40 kHz (echolocation calls) may assist in confirming the presence of long-tailed bats.

3.3.2.3 Minimising disturbance

All inspections shall be undertaken in a manner that minimises disturbance to bats. If bats are detected or suspected to be present within a feature, works in that area shall cease immediately and the competent bat specialist shall determine appropriate management actions in accordance with this BMP.

3.3.2.4 Roost emergence surveys

Roost emergence and return watches are the alternative option if a climber cannot be arranged, where the tree is not climbable (e.g. standing dead trees) or where a feature

cannot be fully inspected with an endoscope. Roost watches involve observing identified trees or groups of trees containing potential roost features at dusk (emergence) and at dawn (return), with the aim of detecting bats exiting from or returning to roost sites. These surveys shall only be undertaken under suitable weather conditions[11] by a bat ecologist certified with bat competency 3.2. Where conditions are suitable, the following protocol shall be implemented:

3.3.2.5 Survey timing:

For emergence watches, observations shall commence at least 30 minutes prior to sunset and continue until 1 hour after sunset. For re-entry watches, observations shall commence 2 hours prior to sunrise or 2 hours prior to the last recorded bat pass from acoustic monitoring and continue until 1 hour after sunrise. This is in alignment with best practice, as although the VRPs state that once it becomes dark the surveys can stop, bat emergence after dark still occurs.

3.3.2.6 Observer positioning:

Observers shall be positioned at an appropriate distance to maintain a clear line of sight to target trees and appropriate detection distance for handheld bat detectors while minimising disturbance to bats.

3.3.2.7 Detection methods:

Observations shall be undertaken using a combination of visual observation, hand-held bat detectors and infra-red and/or thermal imaging cameras to identify bat activity and confirm species presence.

3.3.2.8 Recording observations:

All bat activity shall be recorded, including time of emergence/return, number of individuals observed, flight direction, and any behaviours indicative of roost use.

3.3.3 Roost tree removal

Once the above pre-felling protocols have been completed to the satisfaction of the bat ecologist, and a tree has been approved for removal, the tree shall be felled on the same day under the supervision of the bat ecologist. Immediately following felling, the bat ecologist shall inspect all exposed roost features to identify any evidence of bat presence that may not have been detected during pre-felling checks. A hand-held bat detector shall be used during this inspection to detect any audible signs of distressed bats.

[11] See standards to achieve a valid survey night in section 4(b) of the pre-felling protocols – Appendix A.

If any bats (including injured or deceased individuals) are located during these inspections, works shall cease immediately in the vicinity and the bat ecologist shall implement appropriate management actions in accordance with this BMP (see Section 3.5), including notification of the relevant authorities where required.

3.4 Confirmed roost trees (bats are present)

No tree that has been confirmed as containing bats may be felled until bats have been confirmed as vacated using one or a combination of the previous and following protocols. This is of particular importance during the breeding months between November and January (inclusive). If during the implementation of the BMP discovery of a roost active/occupied roost is confirmed, the following actions shall be undertaken:

- The immediate area shall be cordoned off with safety fencing and signage erected in a 25 m radius around the roost, alerting any person approaching the area that a bat roost is present and to stay clear.
- The existence of the roost shall be publicised to all works staff and work instructions for the immediate area shall be updated to reflect the presence of the roost and the measures to minimise disturbance.
- No works shall occur within the 25m zone until a minimisation plan has been devised by the bat ecologist and construction team and can be implemented.
- The bat ecologist shall keep a written record (including photos) of 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; then number of bats present; and
- Re-consider again whether the tree must be felled and design and implement appropriate additional mitigation measures required to offset or compensate for the loss of the occupied roost tree if it is required to be removed.

Where the tree/s still require felling and before the tree can be felled, evidence that bats have vacated the roost shall be confirmed by (as a minimum):

- Visual inspections (including thermal imagery) and roost watch methodologies described in Section 3.4.2 and Appendix A shall be carried out to confirm the non-occupancy of the roost.

- Occupied and therefore confirmed roost trees shall trigger compensation management as outlined within the EcIA[12] and section 5.0 below.

3.5 Accidental discovery / injured or dead bats

Appendix A of the BMP outlines the notification and harm minimisation processes which must be adhered to in the event of a disabled, injured or dead bat found during any vegetation clearance occurring on site, irrespective of whether the clearance is in accordance the BMP or not.

Note that this contingency is NOT to be used in place of appropriate bat management as outlined in the BMP.

3.6 Construction Management

The following measures are required where bat roosts are identified during the above process.

3.6.1 Lighting requirements if an occupied bat roost is discovered

If occupied bat roosts are detected on site during construction, the following standards are to be achieved for artificial lighting emissions measured at the outer edge of a 25 m lighting buffer for all occupied bat roosts (during construction):

- Use of amber-coloured lighting (2700K, 590 nm); and
- A luminosity level less than 0.3 lux.

3.6.2 Noise and vibration control measures

Construction activities can generate loud noises and vibrations, which may disrupt bats in an occupied bat roost unaccustomed to these noises. Measures to reduce noise effects may include creating work exclusion zones around the occupied bat roost until the roosts are vacated, erection of noise barriers, acoustic curtains, or vibration dampening techniques to minimise the impact on bats near known roost sites. The exclusion zones will be determined by the implementing bat ecologist at the time, due to the different circumstances surrounding the area that would be required (i.e. singular trees, stand of trees, construction proximity).

4.0 Reporting

The outcomes of the bat-roost protocol will be documented in a completion/compliance report, provided as a letter or memorandum within 15 working days of completing vegetation

[12] Hinuera Solar Farm Ecological Impact Assessment. By SLR Consulting Ltd and dated May 2026.

clearance. The report will detail all potential bat-roost trees monitored, including their size, location, and roost-type characteristics, as well as relevant weather conditions recorded during protocol implementation. All pre- and post-clearance survey results will be submitted to DOC for inclusion in the national bat distribution database.

5.0 Residual Effects Management

To compensate for the loss of up to 1.37ha of potential bat foraging and roosting habitat (exotic shelter belts and scattered exotic trees across the site) and 111 ha of lower value pasture foraging habitat, the following compensation actions will be undertaken.

5.1 Riparian and wetland planting

Across the site, riparian areas and their 10m riparian setbacks, and wetland / wetland floodplain areas adjacent to the riparian areas are to be fenced and planted. Planting native vegetation increases vegetation productivity, which supports higher insect abundance and biodiversity. This, in turn, improves food availability for bats, enhancing the landscape's value as a foraging habitat. A total of 4.81 ha across the site is expected to be restored.

This planting and its management shall be subject to a specific ecological management plan, that is in alignment with the recommendations in the that details the following:

- A list of species suitable to the site conditions and ecological habitats (including consideration of future habitat for long-tailed bats[13]; where larger specimen trees can be implemented without shading the solar panels);
- Plant mixes (including canopy succession species, see note above for shade requirements);
- Spacing/densities and sizes at the time of planting;
- Layout and planting methods;
- Details of the sourcing of indigenous plants, including genetic sourcing from the ecological district in which they are to be planted or a neighbouring ecological district;
- A planting programme, including the staging of planting in relation to the construction programme, which must, as far as practicable, include provision for planting following completion of construction works;

[13] As outlined within the DOC Bat recovery Group Advice Note: Planting to provide roosts for bats in the long-term (2025).

- Detailed specifications relating to weed control and clearance, ground preparation (decompaction and top soiling) and mulching;
- Fencing to permanently exclude stock; and
- Monitoring requirements.

5.2 Pest control within restored areas

Pest animal control including possums, rats, and mustelids is to be undertaken across the riparian and wetland areas of the site. This pest control will be implemented in accordance with Department of Conservation (DOC) bat-specific best-practice guidelines, with the aim of reducing predation pressure on pekapeka.

Predator suppression is expected to improve bat foraging habitat by increasing nocturnal invertebrate abundance and enhancing vegetation structure along riparian corridors, which are recognised by DOC as key movement and feeding habitats for bats (Department of Conservation, 2024; Rockell, Littlemore & Scrimgeour, 2017). Pest control measures will be undertaken across the full 4.81 ha of riparian and wetland area. This pest management shall be subject to a specific ecological management plan, as required in section 5.1 above.

5.3 Additional pest control – whole site

In addition to the targeted riparian pest control, all of site (c. 134 ha) pest control will be implemented. This management will be outlined within the ecological management plan as discussed in the sections above, and focus on possums, rats and mustelids.

5.4 Enhancement of a roost tree area

The enhancement of a 1 ha area identified as having potential for roost trees close to the solar site is to be undertaken. This enhancement includes infill planting of faster growing exotic trees, as well as suitable native species for longer term gains (Department of Conservation, 2025). The selection of these tree species shall consider their compatibility with the local ecosystem and their recognised suitability for bat roosting.

Predator control tailored to bats specifically (e.g. as detailed in the DOC bat-specific best-practice guidelines), with the aim of reducing predation pressure on pekapeka shall be undertaken within the enhancement area for 10 years minimum. Predator suppression is expected to improve bat roosting and foraging habitat by increasing nocturnal invertebrate

abundance and reducing predator pressure on bats present in roosts or during vulnerable times of the year (e.g. torpor[14] and raising pups[15] – Department of Conservation, 1995).

Where the identified area to be enhanced does not have roost features identified by the bat ecologist already, then trees within the enhancement area will be fitted with artificial bat roost boxes designed for long-tailed bats. Alternatively, artificial roost features may be created within retained trees, such as chainsaw-cut cavities or "hollow hog[16]" cavities formed by a qualified arborist. Where available, salvaged hollows recovered from elsewhere on the site may also be securely installed in retained trees. These measures aim to provide suitable roosting, breeding, and maternity habitat to support local bat populations. Where roost boxes have been installed or roosting habitat has been created in retained trees, those trees shall receive metal tree rings to prevent predators from accessing provisioned habitat. Implemented bat boxes will be monitored for uptake either by yearly checks for bat sign or with yearly eDNA checks (experimental).

The enhancement of the area chosen, shall be subject to an enhancement plan tailored to the site and long tailed bat enhancement. The management plan shall include:

- A list of infill planting species suitable to the site conditions and ecological habitats (including consideration of future habitat for long-tailed bats; where larger specimen trees can be implemented without shading the solar panels);
- Layout and planting methods;
- Details of the sourcing of indigenous plants, including genetic sourcing from the ecological district in which they are to be planted or a neighbouring ecological district;
- A planting programme, including the staging of planting in relation to the construction programme, which must, as far as practicable, include provision for planting following completion of construction works;
- Detailed specifications relating to weed control and clearance, ground preparation (decompaction and top soiling) and mulching;
- Fencing to permanently exclude stock;

[14] A type of hibernation, where bats are less active and tend to stay in roosts – generally from May – September (Department of Conservation Bat Recovery Group, 2024).

[15] Maternity roosts where young are being raised to independence are susceptible from October – March (Department of Conservation Bat Recovery Group, 2024).

[16] The Living Tree Company (2014). Information Sheet Series 01: Trees for Habitats. https://www.thelivingtreecompany.co.nz/assets/Uploads/Habitat-PDF.pdf. See Appendix D

- Predator control tailored to bats specifically; and

- All replacement roost structures shall be subject to post installation sign off by a certified bat ecologist, with a follow up inspection six months afterwards. After which monitoring will continue annually for a period of 8 years.

5.5 Confirmed roost tree contingency

During the application of these management protocols, should a tree become a confirmed roost (through presence of bats during pre-removal surveys), the following contingency measures shall be implemented. The purpose of these measures is to provide for additional offsetting where confirmed roost trees are affected, reflecting their higher ecological value certainty relative to potential roost trees.

- A minimum replacement ratio of 1:5 for any lost roost habitat shall be achieved within the same construction phase. This replacement shall explicitly account for time lags associated with tree establishment and development and therefore is not intended to be a tree-for-tree replacement.

- Replacement shall be provided through one or more of the following methods, as approved by a suitably qualified bat ecologist:

    - Installation of artificial bat roost boxes of a design suitable for long tailed bats;

    - Creation of artificial roost features within retained trees, such as chainsaw, or “hollow-hog” created cavities, undertaken by a qualified arborist;

    - Salvage and reuse of the confirmed roost structure features, securely installed in retained trees in a way that recreates the original roost conditions as closely as possible (e.g. orientation, height, adjacent foliage, distance from light sources etc.).

- All replacement roost structures shall be installed in locations with appropriate aspect, height, and surrounding habitat to maximise functionality and long-term suitability for bats.

- All replacement roost structures shall be subject to post installation sign off by a certified bat ecologist, with a follow up inspection six months afterwards. After which monitoring will continue annually for a period of 8 years.

6.0 Review and reporting

This BMP will undergo an annual review and will be adjusted as needed to accommodate any changes in the construction schedule, design, or the operational status of the proposed solar farm. Any necessary amendments or reporting requirements will be conducted in compliance with the relevant consent conditions for reporting.

7.0 Closure

Sincerely,

Kelly Hayhurst

Associate Ecologist

8.0 References

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Appendix A Bat Roost Protocols (DOC, 2024)

Bat Management Plan

Harmony Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.:880.016894.00001

25 June 2026

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 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.

[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.

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 bathandler@doc.govt.nz 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'[4])

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.

3.2 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).

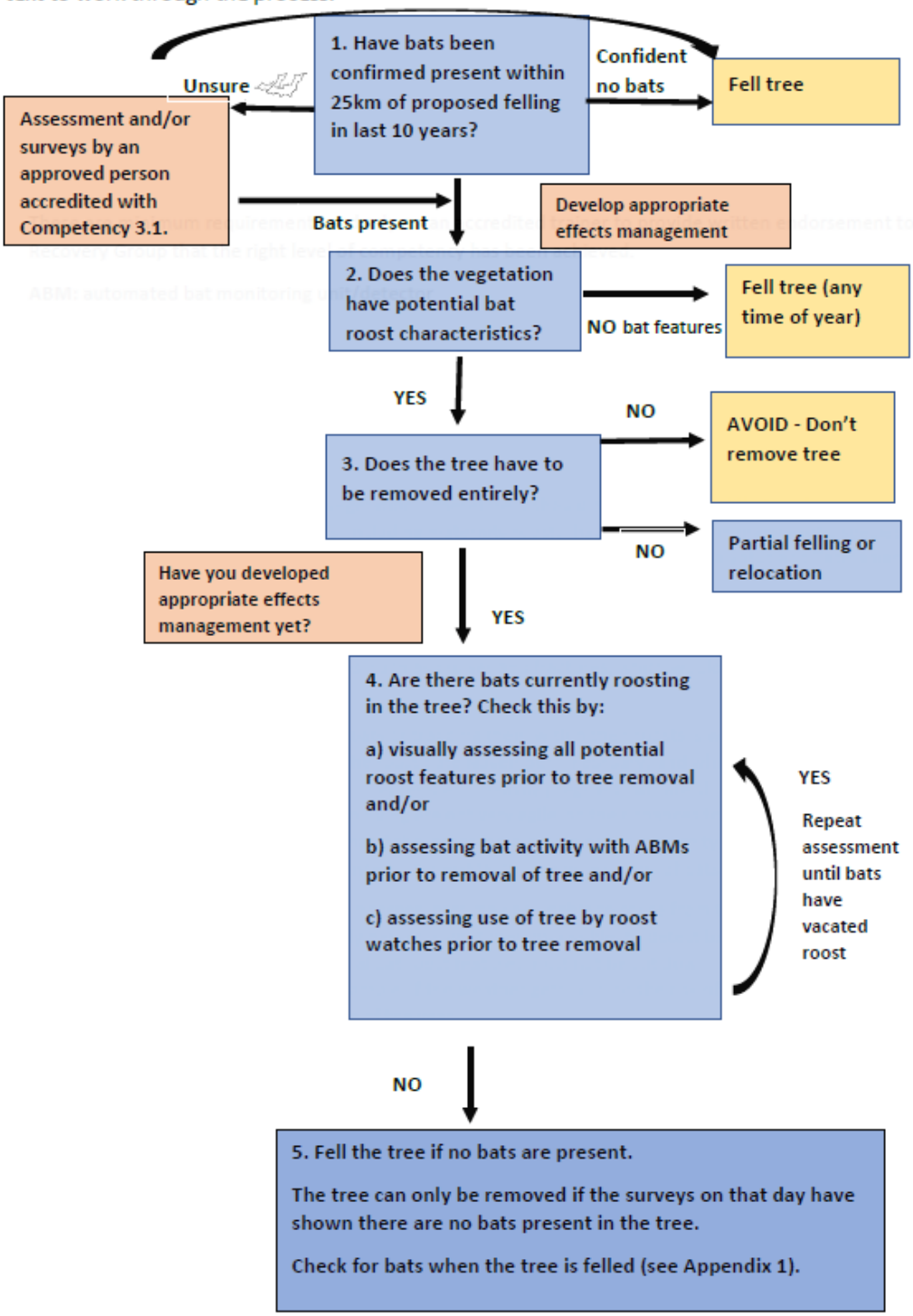
[3] A group of bat specialists that advise on bat issues and assess bat competencies
[4] Available at www.doc.govt.nz/bat-worker-resources

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 [5] and [6] 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)[7]. 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.

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.

[5] 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).
[6] 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).
[7] Borkin K.M. 2010. Ecology of New Zealand's Long-tailed bat (*Chalinolobus tuberculatus*) in exotic plantation forest. Unpublished PhD thesis, University of Auckland.

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 batdatabase@doc.govt.nz 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)[8]?	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 • Artificial roost boxes	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[9], but if upon felling you find a bat follow section 5.	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.
Step 3. Does the tree have to be removed entirely?	**Response**	**Who can make this assessment?**	**When?**

[8] 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.
[9] 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.

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. 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.	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. If the latter, the tree climber must provide information along with photographs or video footage, to the	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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	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.	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[10]? 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 survey nights using the method in 5.	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).
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	If yes (bats are seen at either watch), it is a confirmed roost.	An approved person accredited with Competency 3.2.	Between October 1st and April 30th only **AND** when weather parameters meet

[10] 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.

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.	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.	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.	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 [11] (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.

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

[11] 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.

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[12].
- 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 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

[12] 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.

The time when bats return to roosts can vary based on temperature and time of year.[13,14]

- 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. If you have undertaken ABM surveys or roost watches 4b or 4c the vegetation can be removed **ONLY ON THE DAY IMMEDIATELY**		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 in footnote[15], and physically able to	When the inspection method chosen allows.
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.		check/inspect tree for signs of bats once felled.	

[13] Dekrout AS. 2009. Unpublished PhD thesis. University of Auckland, New Zealand Pp 168.
[14] 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.

[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) available at www.doc.govt.nz/bat-worker-resources

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[16] 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).

[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) available at www.doc.govt.nz/bat-worker-resources

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[17]. 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.

[17] Initial Veterinary Care for NZ Bats UPDATED 2023.pdf (doc.govt.nz) and Bat Care Advice for first responders 2023.pdf (doc.govt.nz) available at www.doc.govt.nz/bat-worker-resources

Appendix B Roost Tree Risk Rating Criteria (SLR, 2026)

Bat Management Plan

Harmony Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.:880.016894.00001

25 June 2026

High risk trees

Trees deemed to pose a high risk as potential bat roosts are those with a DBH greater than 15 cm and exhibiting one or more of the following features:

- Cracks, crevices, cavities, or fractured limbs of sufficient size to accommodate roosting bat(s).
- Sections of loose flaking bark large enough to provide roosting space for bats.
- A hollow trunk, stem, or branches.
- Deadwood within the canopy or stem that is of suitable size to support roost cavities or hollows.
- Presence of bat guano droppings, grease marks, or urine staining around cavities or ground.

Moderate risk trees

Trees deemed to pose a moderate risk as potential bat roosts are those with a DBH greater than 15 cm and exhibiting one or more of the following features:

- Single trees or small (i.e. 2-3) clusters of trees that are isolated within an exposed environment surrounded by pasture, lawn or paved surfaces.
- Trees that exhibit some, but few and smaller cracks, crevices, cavities, or fractured limbs of sufficient size to accommodate up to 2 roosting bat(s).
- Sections of loose flaking bark large enough to provide roosting space for up to 2 bats.

Low risk trees

All trees with a DBH less than 15 cm, as well as trees with a DBH greater than 15 cm lacking the characteristic features of a high-risk or moderate-risk bat roost, are categorised as low-risk trees. These trees can be felled at any time without the need for further assessment or monitoring.

Appendix C Potential Bat Roost Trees Inventory (November 2025)

Bat Management Plan

Harmony Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.:880.016894.00001

25 June 2026

ID	Tree Species	DBH (cm)	Description	Potential Bat Roost suitability
1	*Pinus radiata, Eucalyptus globulus* and *Sequoia sempervirens*	various	Pine, eucalypt and redwood patch in the centre of the site, large specimens with flaking bark and suitable sized cavities for roosting. **NOW EXCLUDED FROM THE FOOTPRINT**.	High
2	*Platanus × acerifolia*	>15cm	Located near the large patch of potential roosting habitat. Features flaking bark which may be suitable for roosting. **NOW EXCLUDED FROM THE FOOTPRINT**	High
3	*Populus deltoides, E. globulus* and *Platanus × acerifolia*	various	A collection of ornamental and common exotic trees located nearest the farm dwelling. Large specimens with flaking bark and suitable sized roosting cavities. **NOW EXCLUDED FROM THE FOOTPRINT**	High
4	*P. deltoides*	various	Three trees located within the floodplain of the existing watercourse. Some suitable roosting characteristics including cavities. Limited recordings identified during survey.	Medium
5	*P. radiata*	>50cm	Isolated pine located along the stream bank. Suitable roosting characteristics including cavities. Limited recordings identified during survey.	Medium
6	*P. radiata*	various	Collection of pines along ridge, suitable roosting characteristics including cavities. Located near high-risk roosting area. **NOW EXCLUDED FROM THE FOOTPRINT**	Medium
7	*P. deltoides*	various	Row of trees containing some suitable roosting characteristics including flaking bark. Limited recordings identified during survey. Located near high-risk roosting area.	Medium
8	*P. deltoides*	various	Row of trees containing some suitable roosting characteristics including flaking bark. Limited recordings identified during survey. Located near high-risk roosting area.	Medium
9	*P. radiata, E. globulus* and *P. deltoides*	various	Row of trees containing some suitable roosting characteristics including flaking bark and cavities. Limited recordings identified during survey.	Medium
10	*E. globulus*	various	Large eucalypts along roadside. Many suitable roosting features including flaking bark and cavities. No recordings during survey however located close to high-risk trees. **NOW EXCLUDED FROM THE FOOTPRINT**	Medium
11	*P. deltoides*	>15cm	Isolated tree, some minimal roosting characteristics. No recordings of bats in monitors nearby.	Low
12	*P. deltoides*	>15cm	Isolated tree, some minimal roosting characteristics. No recordings of bats in monitors nearby.	Low
13	*P. deltoides, E. globulus* and *Platanus × acerifolia*	various	A collection of ornamental and common exotic trees located nearest the farm dwelling. Limited roosting characteristics and no bat recordings in recent survey.	Low
14	*P. deltoides*	>15cm	Isolated tree, some minimal roosting characteristics. No recordings of bats in monitors nearby.	Low
	Various	various	All remaining trees not otherwise specified across the site. Largely small diameters, or poorly suited for bat roosting.	Low

Photo 1: Overview of trees at location grouping 3.

Photo 2:Overview of trees at location grouping 7.

Photo 3: Overview of trees at location grouping 1.

Appendix D Examples of Natural and Artificial Bat Roosts

Bat Management Plan

Harmony Hinuera Solar Farm

Harmony Energy NZ #6 Limited

SLR Project No.:880.016894.00001

25 June 2026

TREES FOR HABITATS

the living tree company

Habitat creation in trees for the New Zealand environment.

Hollows occur naturally in the old grove forests, mature exotics and native trees around New Zealand, and provide an opportunity to encourage biodiversity in our environments.

Natural hollows are a direct result of physiological stress to the tree, when the heartwood is exposed to the environment. This can be caused by environmental factors, fungi, bacteria, insects, natural canopy reduction and age.

Pruning for Biodiversity

Hollows for habitat creation can also be encouraged by human intervention. Pruning for biodiversity is commonly done in Europe, America and Australia and is called habitat pruning, eco-pruning or fracture pruning.

These types of pruning involve simulating natural break-outs in the tree to leave natural-looking stumps and branch tear-outs.

The Oak below has been left in Auckland Domain and is a great example of how declining trees can be an asset in speeding up the senescence in a tree and encouraging decaying wood to harbour a bigger biodiversity.

Natural hollow in a Kauri

Auckland Domain, Oak.

FACTORS TO CONSIDER WHEN CREATING HABITATS:

- **Various entrance hole and cavity sizes which will determine the different types of wildlife that might use them**
- **Protection from predators and pests**
- **Light minimisation for nocturnal wildlife**
- **Drainage**
- **Association with food crops**
- **Introduction of guano to encourage roosting sites**
- **Use of a vegetable oil as lubrication for your chainsaw bar**
- **Protection against prevailing wind and weather**

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TREES FOR HABITATS

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Habitat Creation in Trunk Wood

By chainsawing into the heartwood, habitats can be customised for numerous wildlife species. Here is an example of habitats we created for the long-tailed bat in standing trunks. (This requires good chainsaw knowledge as many of the cuts use the tip of the bar and can promote dangerous kickback.)

LONG-TAILED BAT HABITAT:

1. Cut into the trunk horizontally with two cuts at the desired height. Bore cut the face plate out.

2. Bore into the wood and make the chosen number of chambers. Cut the chambers into a fork-shaped pattern with the horizontal cut meeting the entrance hole (as shown in the picture). The entrance needs to be on a slope so it works as drainage. The size of the sloping entrance should be 17–21mm for long-tailed bats. Make sure the chambers are smaller than the face plate so that the hollow will be sealed.

3. Drill into the face plate and then screw the face plate back on to the wood.

Pest Proofing

Pest proofing the tree is important. On the trunk of the tree, below where the habitat is to be created, it is a good idea to mound around the tree's circumference a metal, aluminium or plastic sheath that predators cannot climb above. We tend to use polycarbonate joined with aluminium as it does not visually degrade the integrity of the tree as much. Make sure to prune neighbouring trees well clear of the host tree as possums can easily jump from one tree to another. For living trees, the pest guard needs to be revisited and checked to allow the expansion of the trunk.


Pest Guard

PEST GUARD EXAMPLE

1. Measure the tree and cut out the polycarbonate (60mm wide) with a 20mm overlap for joining with the aluminium bracket.

2. Drill into the aluminium and make three holes. Match up the middle hole with the plastic and drill into the plastic.

3. Tape the plastic tight to the tree and insert the aluminium bracket underneath the plastic.

4. Pop rivet the middle hole through the aluminium bracket and plastic.

5. Pull the plastic together and match up the top and bottom drill holes in the plastic and the aluminium bracket. A piece of wood could come handy to make sure there is no drilling into the tree.

6. If the tree has a natural taper, the guard can be moved downwards to get it as tight as possible.

Human-made constructions

Human-made constructions are also an alternative. Here is a bat house made for long-tailed bats; there are endless ways to make them and numerous materials that might be used. These constructions could harbour any type of wildlife depending on construction type.

TREES FOR HABITATS

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Relocation of Habitats

Relocation of habitats is sometimes required. For example, relocation would be needed in tree failures or trees that are condemned for removal. The tree wood containing the habitat can be safely lowered to the ground by rigging and can be re-erected onto living trees. With the help of familiar pheromones, the wildlife could have a better chance of finding their way to the new roosting site. This has been shown to be successful for bats in the UK and we are now making trials in New Zealand and are excitedly awaiting results.

Many trees are being removed to ground level in urban environments due to factors such as:

- Changes in RMA
- Urban development
- Diseases and pests, such as Kauri Dieback, Dutch Elm and Cypress canker
- Declining and dying trees for public and structural safety
- Landscaping trends and poor knowledge.

By using some of the techniques discussed in this text, we could enhance biodiversity by leaving trunks as new habitats and still ensure safety for the public.

"We should always remember that the description 'dead wood' implies a static state, without consideration for the process of decay and the diversity of lifeforms involved." *(Andrew Cowan)*.

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ENVIRONMENTAL, CLIMBING AND TREE CARE SERVICES

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Revegetation

For revegetation we could also apply some of these techniques to use in existing exotic trees. We might also use fast-growing exotic trees that could be transformed into desirable nesting spots to harbour many species essential to our ecosystem before the native trees reach their maturity.
As one tree species might be a problematic weed in Auckland but considered a specimen tree in the Waikato, it pays to talk to local Arborists, council, DOC or environmental organisations.

Some Factors to consider are:

- Will these trees become a weed infestation?
- What would you like to attract—invertebrates, birds or bats?
- Could the temporary exotic tree be easily be killed off after a desired period of time?
- Heavy fruiting and flowering could work as a food crop for birds but also pests.
- Will they naturally be good species to create hollows?
- What has been used in other projects around your area?

ABOUT THE LIVING TREE COMPANY

The Living Tree Company is an Auckland-based environmental arborist company with a passion for maintaining and improving New Zealand's unique natural environment. We are currently taking part in various trials for habitat creation and other ecological and arboreal projects. We believe the more work we do together the bigger and stronger the impact we can have. Please contact us with any enquiries or to share information.

This is an introduction to habitat creation in trees for the New Zealand environment. The text is prepared from an arboricultural standpoint and is to be used as an introductory discussion for ecologists.

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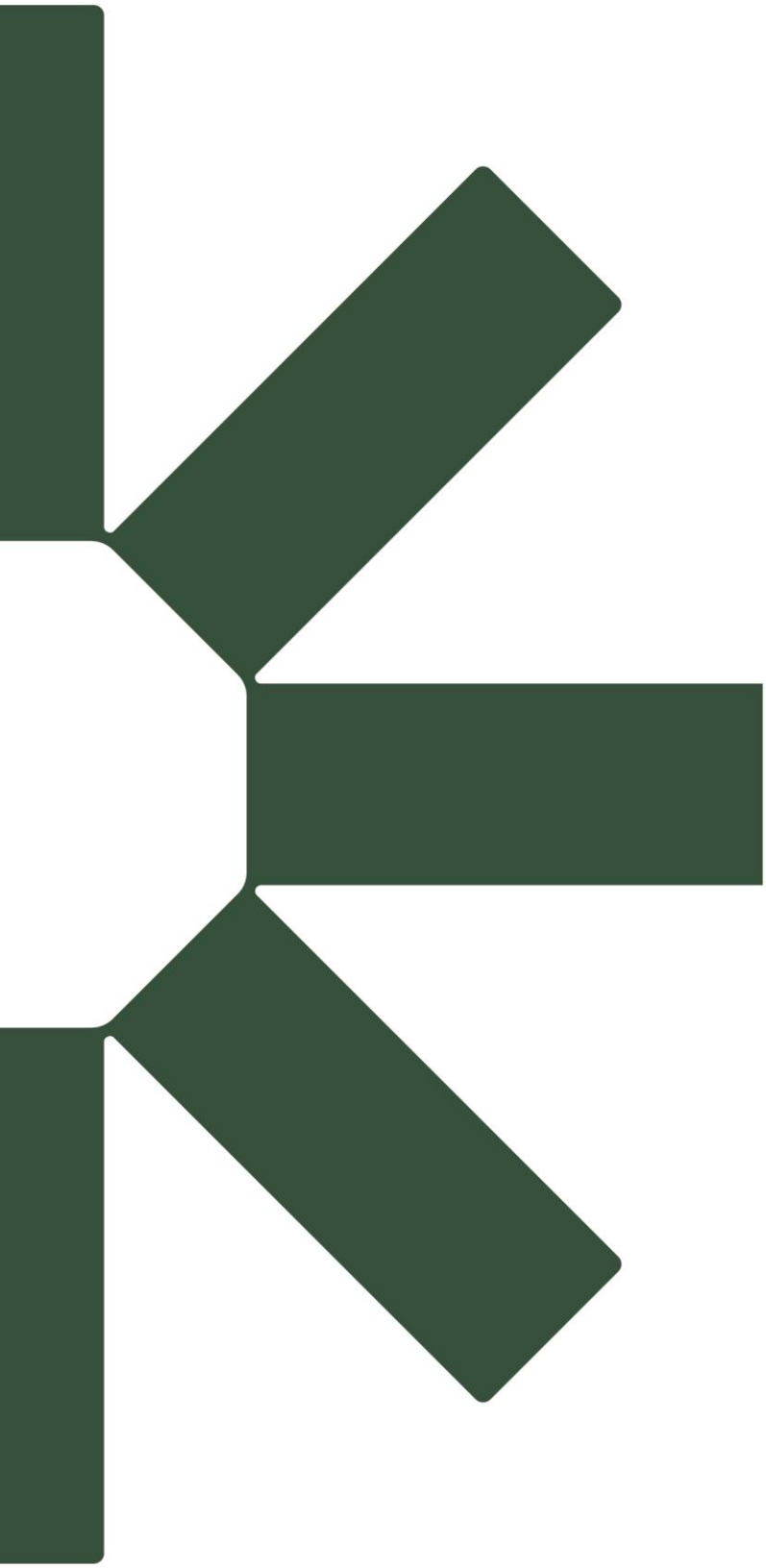

Making Sustainability Happen