

Boffa Miskell



Belmont Quarry

Acoustic Bat Survey Results
Prepared for Winstone Aggregates

5 December 2025





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Belmont Quarry BM250944

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Cover photograph: Vegetation on site, V.Jeon 2025

Executive Summary

Winstone Aggregates is seeking approval under the Fast-track Approvals Act 2024 for a land exchange as part of its Belmont Quarry Development. The exchange involves Crown-owned recreational reserve land, currently managed and controlled by Greater Wellington Regional Council as part of Belmont Regional Park, and privately owned land held by Winstone Aggregates.

Four land parcels are proposed to be acquired by the Crown for inclusion into the conservation estate. These are the Northern Gully, the Firth Block, the Southern Gully and the Dry Creek blocks. Together they comprise approximately 34.1 hectares of land adjoining Belmont Regional Park and include a series of ridgelines and gullies with regenerating shrubland, mānuka scrub, and mahoe–tree fern forest.

An acoustic bat survey was undertaken in October and November 2025 and did not record bats in any of the land parcels. The Southern Gully was included after the completion of this bat survey and was not surveyed.

Author

My name is Dr [REDACTED]. I am a terrestrial ecologist with Boffa Miskell. I have twelve years' experience working as an ecologist in the UK and Aotearoa/New Zealand. My first degree is in environmental science and my PhD is in soil microbial ecology. I have specialised in bats for the last ten years and hold competencies from the Department of Conservation to handle and survey long-tailed bats. I am a Certified Environmental Practitioner.

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

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1.0 Introduction

Bats are the only native terrestrial mammals in New Zealand. There are two species of bats in New Zealand, the long-tailed bat (*Chalinolobus tuberculatus*) and the lesser short-tailed bat which is separated into three subspecies (*Mystacina tuberculata* spp.). The long-tailed bat is classified as Threatened – Nationally Critical and the central lesser short-tailed bat is classified as At Risk – Declining due to predation, habitat degradation and loss, and competition (O'Donnell et al., 2023).

Both species of New Zealand bat are found in native forest from sea level to the treeline. Their natural habitat is mature forest with numerous hollows in large trees.

Long-tailed bats have also been found to utilise highly modified landscapes and have been recorded within agricultural land and exotic vegetation, and some have become established in mature pine (*Pinus radiata*) forests. They have been shown to use waterways, gullies, shelterbelts and hedgerows to cross the landscape.

Long-tailed bats are known to preferentially use linear habitat features such as shelterbelts or edges of vegetation margins to commute and forage but utilise a wide range of habitat types and reach foraging sites over 20 km from their roost, although the usual distance travelled is less.

Long-tailed bats preferentially roost in small cavities of old, large trees, but have also been observed to utilise other features such as loose bark, hollow limbs or epiphyte growth for roosting. This species is known to frequently switch roosts and relies on a large network of roosts which are used periodically.

Short-tailed bats typically live within areas of mature native forest where they use hollow trees for roosting. They are ground foragers as well as aerial hunters, and eat a variety of invertebrates, nectar, fruit, and pollen.

Both species of bats are protected under the Wildlife Act 1953 and are included in the list of “specified highly mobile fauna” in the National Policy Statement – Indigenous Biodiversity (NPS-IB).

This report forms part of a wider ecological assessment to assess the conservation values of the parcels of land being exchanged. Bat presence or likely absence is a consideration within this wider assessment. An acoustic survey has been undertaken to assess the presence or likely absence of bats within the areas of land included in the proposed exchange.

2.0 Site description

Belmont Quarry is located immediately adjacent to Belmont Regional Park, positioned in the western hills of the Lower Hutt area in the Wellington Region. The landscape is defined by steep ridgelines, rolling slopes, and incised gullies, forming part of the wider hill country backdrop to Lower Hutt. The exchange land sits within a varied environment of regenerating bush, shrubland, pasture, and modified slopes influenced by quarrying (Figure 1).

Vegetation reflects the mixed land use history, with patches of regenerating native bush, exotic shrubland, and areas of pasture. The majority of the trees within the survey areas were either immature or smaller species, with only a few scattered large trees. Potential roosting opportunities are present, but not within the smaller shrub vegetation.

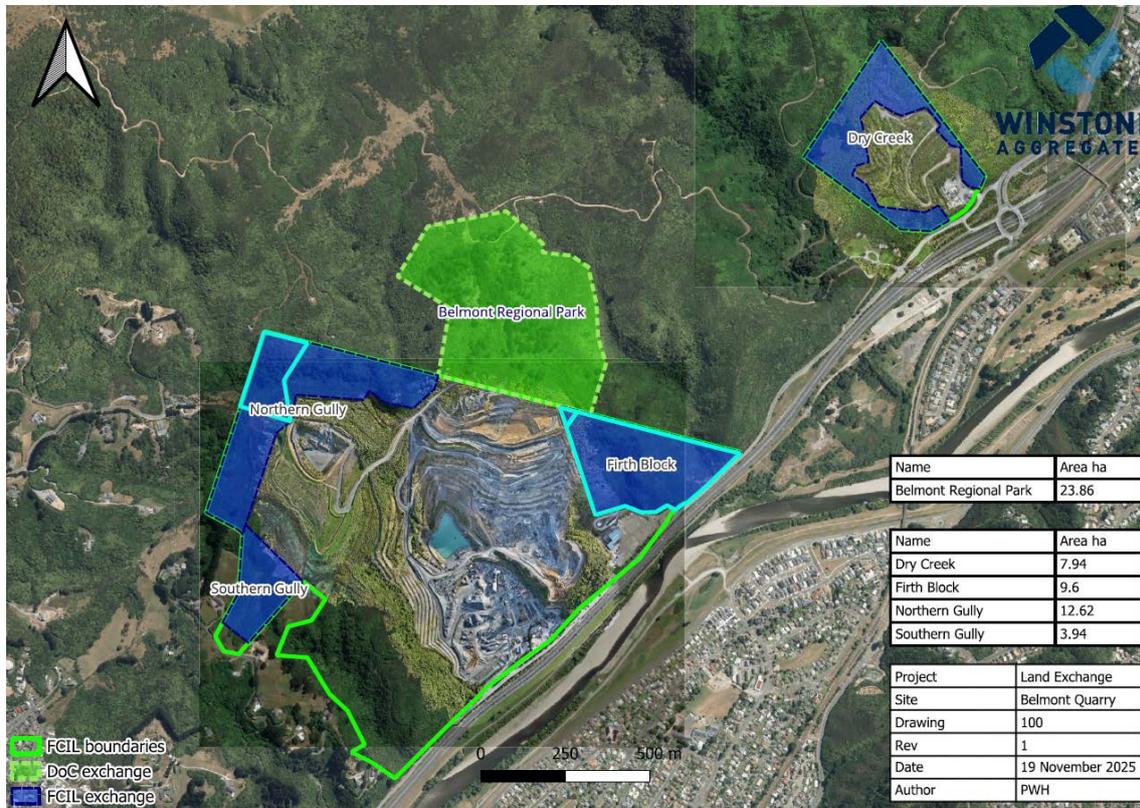


Figure 1 – Locations of land parcels being assessed

3.0 Methods

3.1 Desktop review

The Department of Conservation (DOC) bat database was reviewed for previous records of bats within a 25 km radius of the site¹.

3.2 Acoustic bat activity surveys

An acoustic bat survey was undertaken using Song Meter Mini Bat (Wildlife Acoustics) full spectrum recorders which passively record both long-tailed bat (at 40 kHz) and short-tailed bat (at 28 kHz) echolocation calls.

The survey was conducted over 21 nights between 24 October and 14 November 2025. 22 detectors were deployed. Habitat features preferred by long-tailed bats for roosting, commuting, and foraging were targeted across both the land to be potentially used as the overburden site, and the parcels of land to be transferred to DOC in exchange (Figure 2).

Long-tailed bat activity can be influenced by overnight weather conditions such as temperature, rainfall and wind speed. Weather data from the survey period was analysed to ensure conditions were suitable for bats to be active and hence detectable via acoustic monitoring. Suitable conditions are defined for the purpose of this survey report are as follows:

- Temperature 8°C or greater for the first four hours after official sunset time for the North Island
- Ideally no to very little precipitation within the first 4 hours after official sunset.
- No to light wind within the first four hours after official sunset.

The number of suitable monitoring nights within a survey are used as a measure of survey effort. However, all data, including recordings during non-suitable survey nights were analysed.

All detectors were programmed to monitor from 30 minutes before sunset to 30 minutes after sunrise. All recordings were downloaded and acoustic data from all nights were analysed using Kaleidoscope Pro (Wildlife Acoustics).

The detectors were set to record in full spectrum format and the default sample rate of 256kHz was used. The minimum trigger frequency was 16kHz. Any signal below the minimum trigger frequency would not be recorded, preventing unwanted recordings of low frequency sounds.

The maximum recording length was set to 12 seconds.

The trigger window was set to 3 seconds. This is the amount of time the Song Meter Mini Bat continues to record after the last signal that satisfies the minimum trigger frequency unless the recording reaches the maximum recording length first. This avoids recordings ending after each single echolocation pulse.

Each spectrogram showing calls is recorded as a separate bat pass. The average number passes per night can then be calculated to compare activity levels across the site and with comparable

¹ <https://docnewzealand.shinyapps.io/shiny/>

sites. There is no standardised definition of high, medium and low activity levels for long tailed bats.

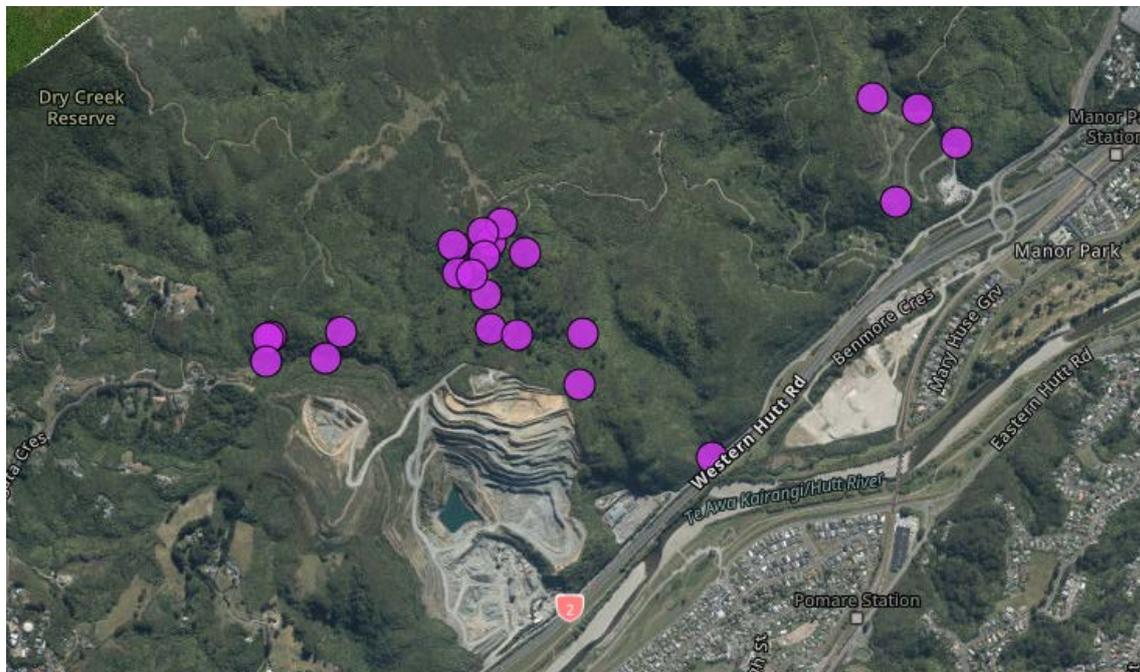


Figure 2 - Locations of bat detectors

4.0 Results

4.1 Desktop Study

Very little bat survey work has been recorded in Upper and Lower Hutt. The closest bat record is approximately 3 km east of the site. This is a record of an unknown bat species. Another record of an unknown bat species is approximately 15 km northeast of the site, and multiple records of short tailed bats are present approximately 13 km south of the site. These records are within commuting distance to the site for bats.

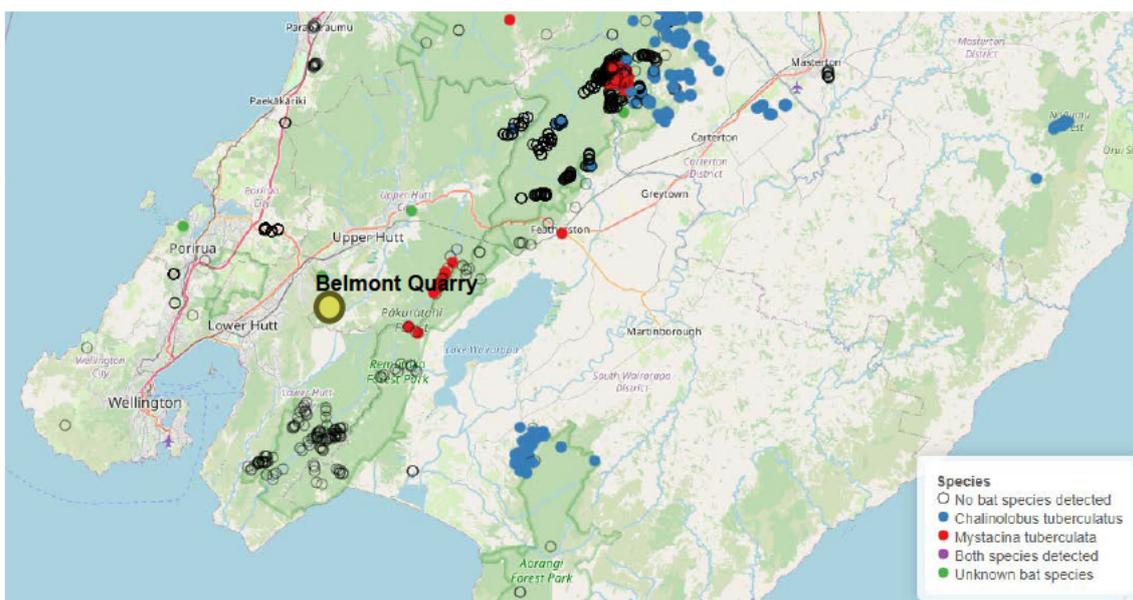


Figure 3 - Bat records provided by DOC

4.2 Acoustic Survey

Out of the 21 survey nights, all evenings exceeded the minimum temperature requirements, and only four evenings had intermittent showers.

No recorders detected any bat passes.

Examples of habitat and locations of detectors within each land parcel are provided in the following sections.

Northern Gully (12.62 ha)

The Northern Gully is located to the north-west of the quarry. This parcel comprises south-facing hill slopes and deep gullies with forested stream margins. It includes areas of mature tawa–kamahi and pukatea forest, regenerating broadleaf vegetation, and a fragment of old canopy tawa along the western boundary. Parts of the area are within an existing QEII covenant which is 2.87 hectares (outlined in yellow in Figure 4).

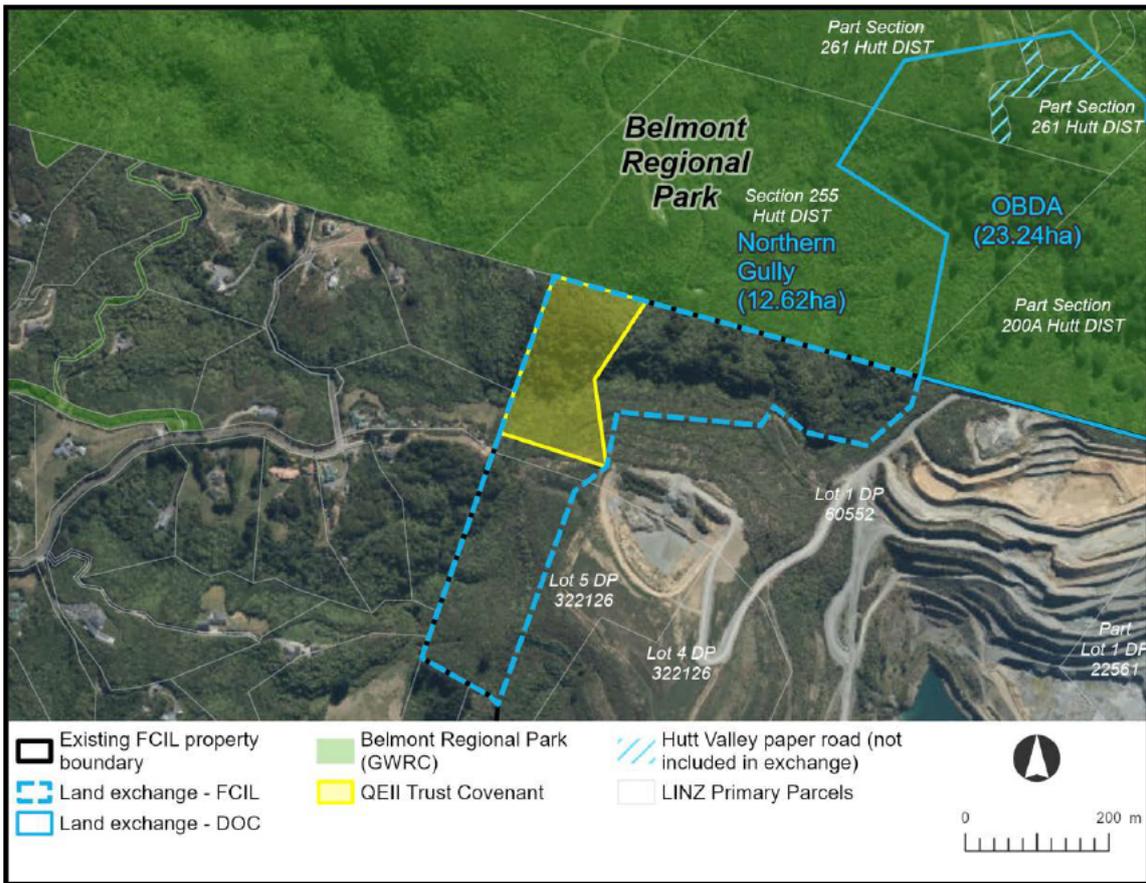


Figure 4 – Location of the Northern Gully



Figure 5 – Habitat within Northern Gully



Figure 6- Location of detectors within Northern Gully

Table 1 - Acoustic results for Northern Gully

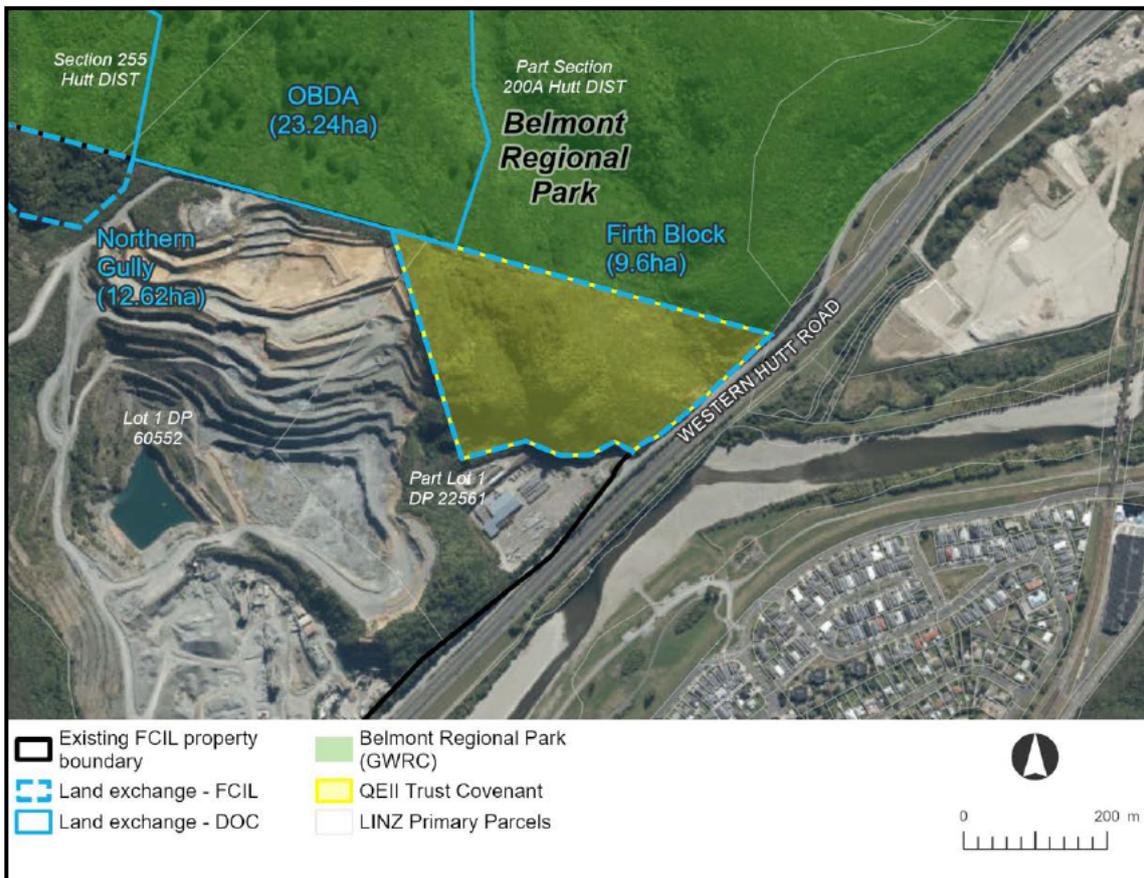
Location number and detector serial number	Nights recorded	Bat passes
1 (05598)	25 Oct to 13 Nov	0
2 (12438)	25 Oct to 5 Nov	0
3 (03125)	25 Oct to 13 Nov	0
4 (01341)	0 Equipment failed	No data

Firth Block (9.60 ha)

Located to the east of the quarry is the Firth Block which comprises a QEII-covenanted parcel with high ridgeline and steep south-facing slopes (figure 3). The landform includes early and mid-seral broadleaf scrub regeneration on steep and very steep faces. The seral stages have largely progressed beyond the gorse phase to form a predominantly indigenous canopy.

Vegetation is a mix of broadleaf scrub and tree fern mosaics, with an older tawa stand at the head of a south-draining gully. Small patches of mānuka occur on upper slopes, while the eastern faces contain middle seral forest with māpou in the canopy. The ridgeline and slopes provide continuity of native cover across the block.

A farm pond and associated wetland are located near the boundary with the proposed OBDA. These features contribute additional habitat diversity, supporting species associated with freshwater environments. The block is within the wider home range of native bird species recorded in Belmont Regional Park.



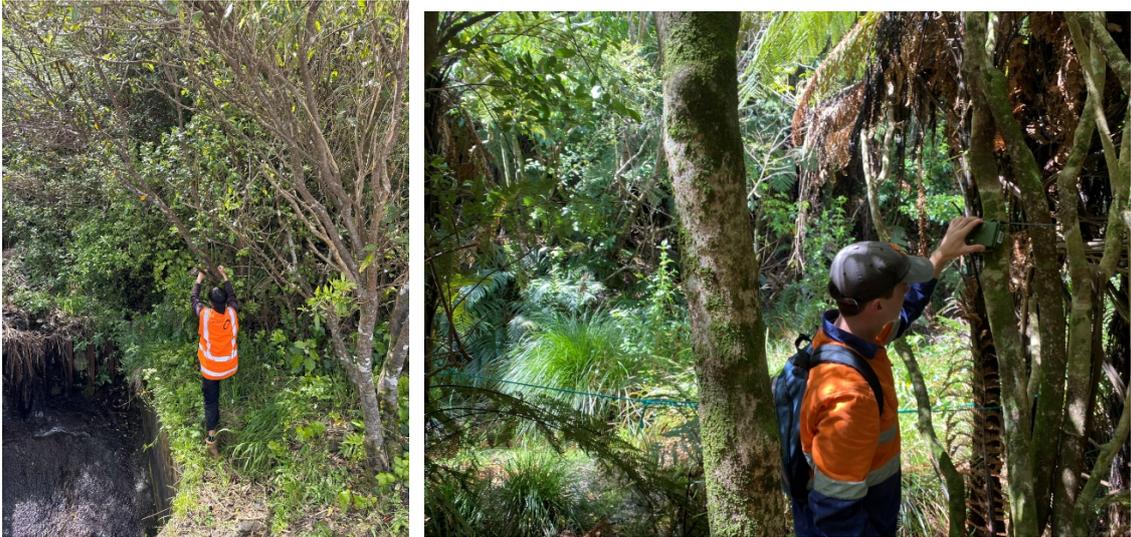


Figure 7 – Habitat within Firth Block



Figure 8 – Detector locations within Firth Block

Table 2 – Acoustic results for Firth Block

Location number and detector serial number	Nights recorded	No. bat passes
5 (03166)	24 Oct to 5 Nov	0
6 (02972)	26 Oct to 13 Nov	0

Dry Creek (7.94 ha)

Located on the outer slopes of the Dry Creek catchment, this parcel comprises regenerating broadleaf forest and scrub across a series of gullies and slopes (Figure 4). The middle section of Dry Creek has been excluded from the exchange due to ecological and landscape considerations, and further adjustments were made to remove land that does not achieve acceptable long-term stability. The retained area provides a continuous block of regenerating native cover that links with the adjoining regional park land.

The land proposed to be transferred to Winstone comprises approximately 23.2 hectares of Crown-owned reserve land within Belmont Regional Park. The area adjoins the existing quarry footprint and includes a series of ridgelines and gullies with regenerating shrubland, mānuka scrub, and mahoe–tree fern forest.

Parts of the block contain exotic-dominated vegetation, including gorse and other woody weeds, reflecting its modified condition.

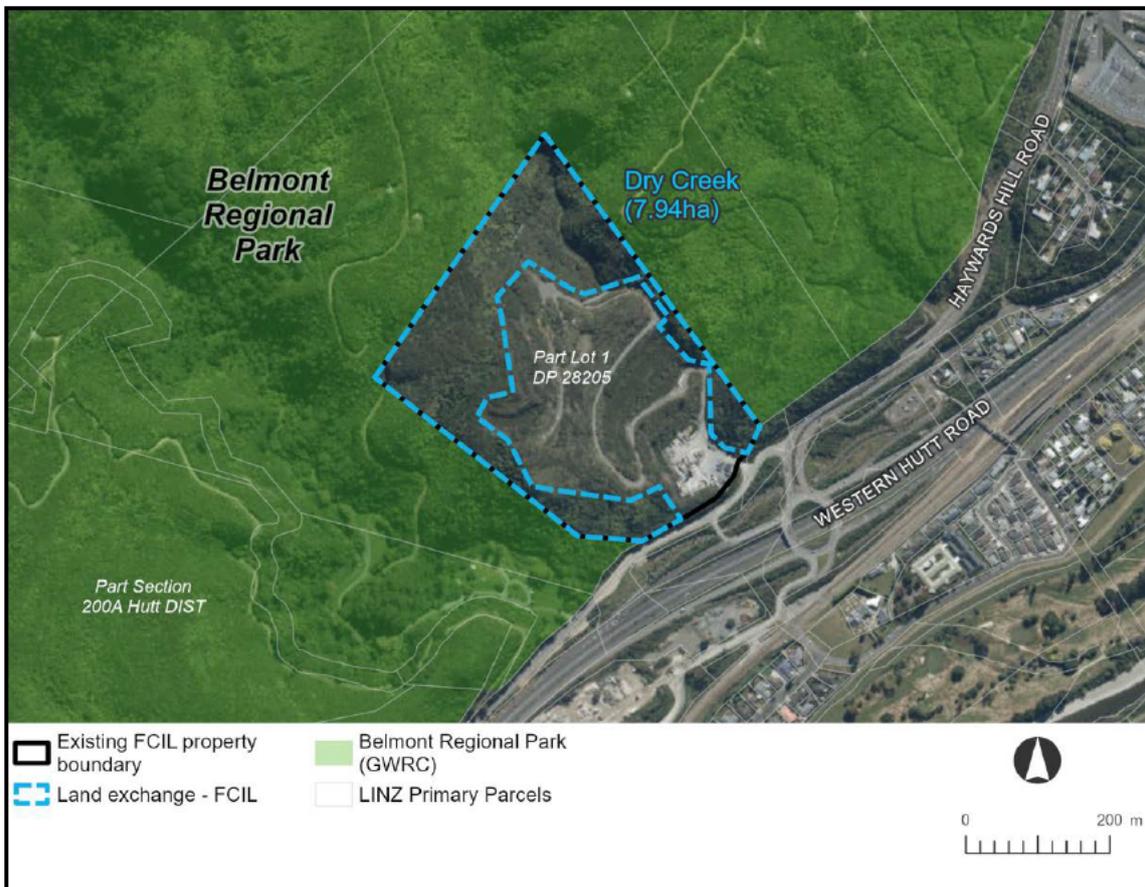


Figure 9 – Location of Dry Creek



Figure 10 – Habitat within Dry Creek



Figure 11 – Detector locations within Dry Creek

Table 3 – Acoustic results from Dry Creek

Location number and detector serial number	Nights recorded	No. of bat passes
7 (02004)	24 Oct – 13 Nov	0
8 (02043)	24 Oct – 12 Nov	0
9 (03674)	24 Oct – 9 Nov	0
10 (05617)	24 Oct – 13 Nov	0

Southern Gully (3.9ha)

Following consultation with the Department of Conservation and to contribute to a higher conservation value, the Southern Gully block has been added into the exchange package. The area shown in yellow line is excluded. This area was added after the bat survey was undertaken.

The proposed Southern Gully extension encompasses the upper-middle reach of a small catchment located to the southwest of the existing Cottle Block OBDA. This catchment drains the upper section of Kaitangata Road and runs between Liverton Road and Belmont Quarry before discharging into Te Awa Kairangi. The proposed exchange area encompasses the lower slopes on both sides of the gully. The area also includes a small north facing gully that leads up to the existing road frontage with Liverton Road.

No mature forest is visible from aerial photography in this parcel of land and it is assumed that the vegetation is similar to the other parcels, comprising mainly vegetation of low value to bats.

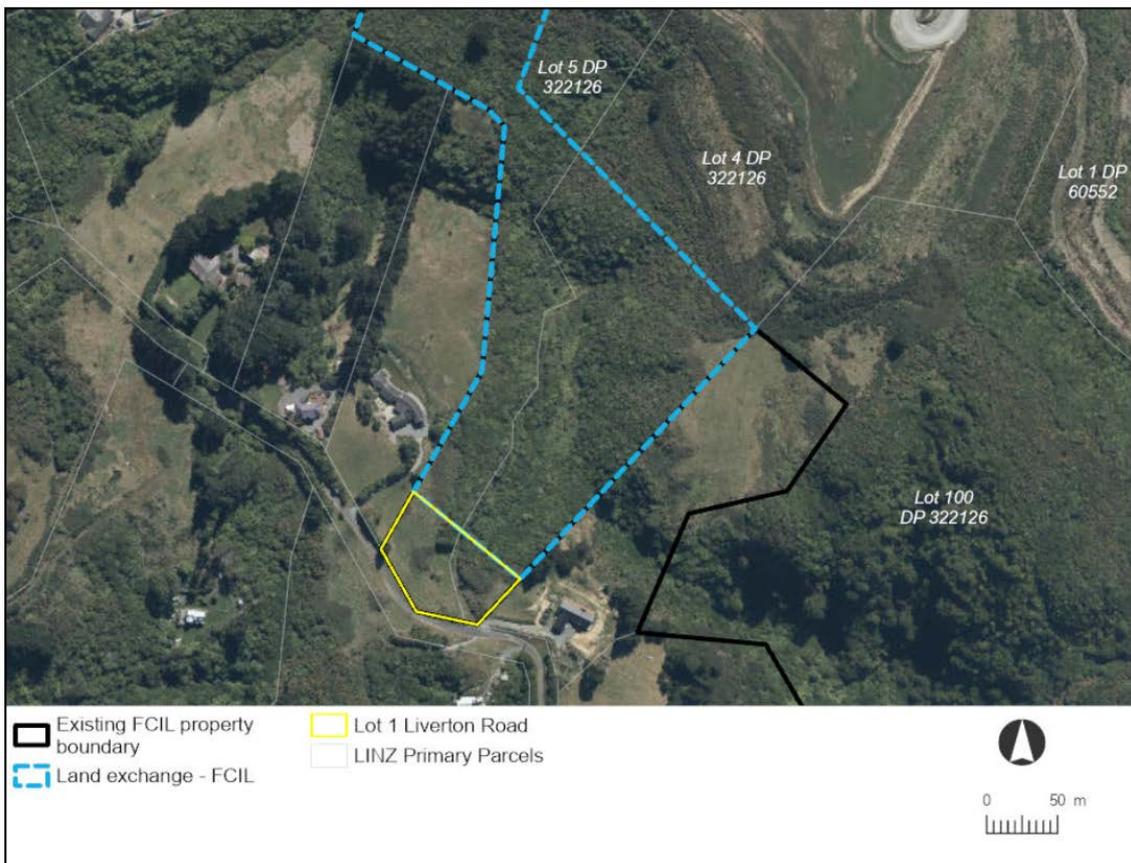


Figure 12 – Location of Southern Gully

Belmont Regional Park OBDA (23.2ha)

The land proposed to be transferred to Winstone comprises approximately 23.2 hectares of Crown-owned reserve land within Belmont Regional Park. The area adjoins the existing quarry footprint and includes a series of ridgelines and gullies with regenerating shrubland, mānuka scrub, and mahoe-tree fern forest. A small wetland is also present.

Parts of the block contain exotic-dominated vegetation, including gorse and other woody weeds, reflecting its modified condition. Occasional mature trees were present in this parcel which had potential roost features, however no bats were recorded in the vicinity.

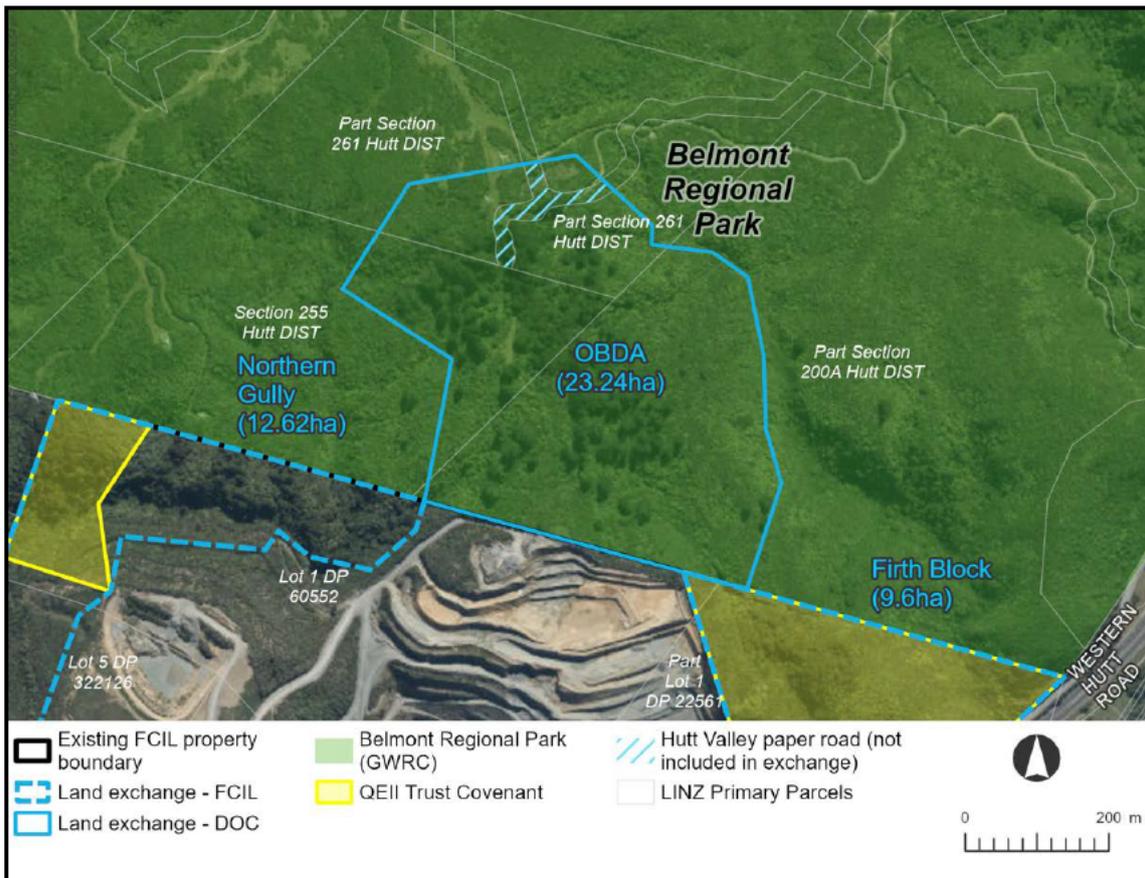


Figure 13 – Location of the Belmont Regional Park OBDA



Figure 14 – Habitat within the Belmont Regional Park OBDA

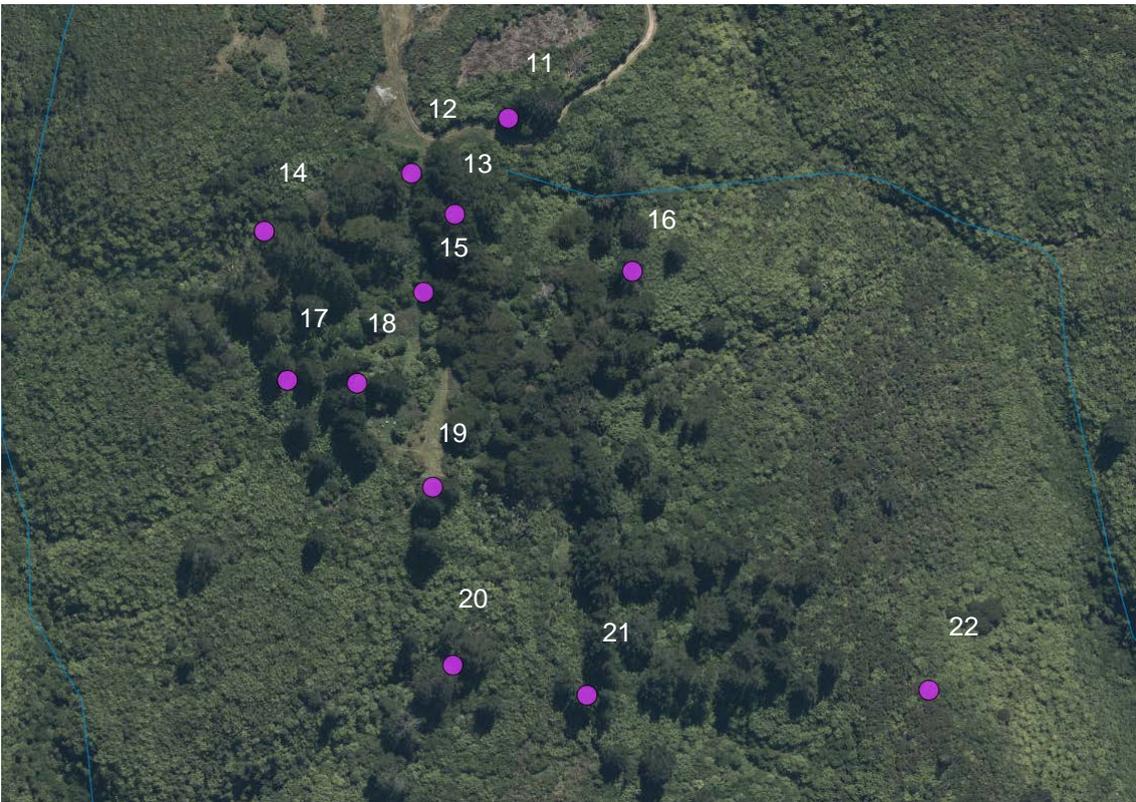


Figure 15 – Detector locations within the Belmont Quarry OBDA

Table 4 – Acoustic results from within the Belmont Quarry OBDA

Location number and detector serial number	Nights recorded	No. Bat passes
11 (01797)	24 Oct to 12 Nov	0
12 (08695)	24 Oct to 13 Nov	0
13 (03948)	24 Oct to 13 Nov	0
14 (10796)	24 Oct to 6 Nov	0
15 (11404)	24 Oct to 8 Nov	0
16 (01320)	24 Oct to 13 Nov	0
17 (08453)	24 Oct to 13 Nov	0
18 (11007)	24 Oct to 7 Nov	0
19 (01494)	24 Oct to 13 Nov	0
20 (12396)	24 Oct to 5 Nov	0
21 (10989)	24 Oct to 11 Nov	0
22 (08790)	24 Oct to 13 Nov	0

5.0 Conclusions

From the survey undertaken it is not considered likely that long-tailed or short-tailed bats are regularly roosting within either the parcel of land to be used as the overburden area or the parcels of land to be transferred to DOC. No evidence of foraging was detected.

While bat activity in a particular area can fluctuate across a season, the absence of any recordings from a survey undertaken in November indicates that the site is unlikely to be important habitat for bats. Any bat activity within the land parcels being exchanged is likely to be low level and occasional.

Although no surveys were undertaken within the southern gully, the similar vegetation and proximity to the other land blocks indicates that this parcel of land is also unlikely to be of importance to bats.

Due to the lack of bat activity in the area, all the parcels of land included in this land exchange proposal are assessed as having **low** value to bats.

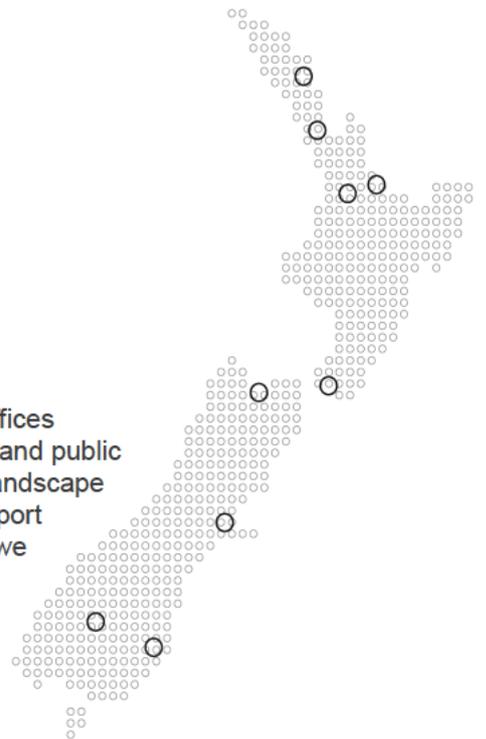
References

Bat Recovery Group - Department of Conservation. (2024). *Protocols for minimising the risk of felling occupied bat roosts (Bat roost protocols): Version 4*. Bat Recovery Group - Department of Conservation.

O'Donnell, C. F. J., Borkin, K. M., Christie, J. E., Davidson-Watts, I., Dennis, G., Pryde, M. A., & Michel, P. (2023). *Conservation status of bats in Aotearoa New Zealand, 2022* (New Zealand Threat Classification Series 41). Department of Conservation.

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