
Fonterra Limited

Second Bat Survey for the Proposed Plan Change 14 at Swayne Road, Hautapu



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EXECUTIVE SUMMARY

RMA Ecology, on behalf of Fonterra Limited, engaged Bluewattle Ecology to undertake a second long-tailed bat survey at Swayne Road, Hautapu as part of a proposed plan change (Mangaone Precinct Structure Plan Area - Plan Change 14).

Automatic bioacoustic bat monitors were placed along a stand of mixed native and exotic vegetation near a waterbody and wetland, and within irrigated pasture grass. The monitors were placed on the property between 23 April and 9 May 2024 to survey for bat activity, and the data analysed in accordance with best practice methodology.

Relatively low, but regular, bat activity was detected during this bioacoustic survey around the wetland and through the eastern area of the vegetated stream and wetland system, with no detections in the adjoining pasture areas on the same property.

The survey shows that the wetland and stream ecosystems are providing visual cues for commuting, as well as foraging habitat. As no bats were detected within the surrounding pasture areas, the pasture likely provides low value bat habitat compared to the stream side vegetation and wetland.

The results of this survey reinforce the use of the streamside vegetation and wetlands for foraging and commuting habitat by long-tailed bats.

1 INTRODUCTION

1.1 SCOPE

RMA Ecology on behalf of Fonterra Limited, commissioned Bluewattle Ecology to undertake a second survey to monitor the activity of long-tailed bats (*Chalinolobus tuberculatus*) at Swayne Road, Hautapu for the proposed Plan Change 14 (Mangaone Precinct Structure Plan Area) to the Waipa District Plan (Figure 1).

A previous survey in September 2023 conducted by Bluewattle Ecology detected a low presence of bats within the north-east of the site boundary.

The identification of a High Value Bat Habitat Area in the vicinity of the Mangaone Stream in the first survey report, conducted in October 2023, is now proposed to form part of a larger reserve (about 16 ha) called the Mangaone Stream Reserve shown on the proposed structure plan for the Mangaone Precinct (see Appendix 1). This includes a 'built in' buffer around the High Value Bat Habitat Area of about 20 m where industrial activities cannot occur.

A further survey was recommended to investigate the extent and regularity of bat activity across the site, including whether bats were utilising irrigated pasture grass for commuting or feeding.

1.2 BACKGROUND

According to O'Donnell et al (2023), long-tailed bats (LTBs) are classified as "Threatened – Nationally Critical" by the Department of Conservation (DOC) with a population thought to be in decline across much of its range. Factors contributing to the decline of this species include clearance of roost trees for urban expansion and predation by introduced mammals. Despite being classified as Nationally Critically Endangered by DOC, the presence of long-tailed bats within this highly modified landscape demonstrates they are able to adapt to major landscape change from indigenous vegetation to landscape dominated by almost 100% exotic vegetation over time. This is despite likely ongoing pressures from introduced animal competition and predation.

They have been observed to use suitable habitat within Hautapu and the wider landscape surrounding the site on a regular basis (DOC database and personal observations), and it is likely they make use of the native and exotic trees and pasture habitat within the property for roosting and foraging, as well as visual cues for commuting (O'Donnell, 2000).

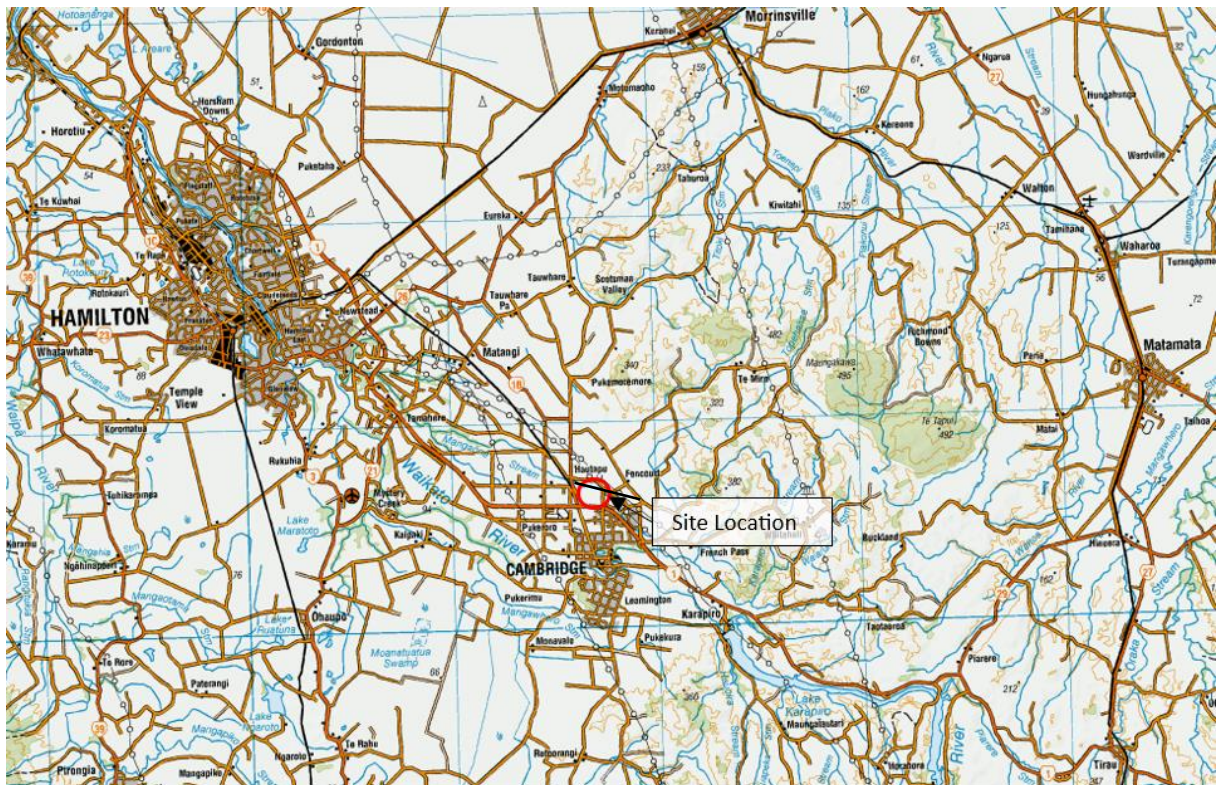


Figure 1. Location map of the property at Swayne Road, Hautapu.

2 METHODOLOGY

2.1 SURVEY METHOD AND DURATION

For the second field survey, static digital bioacoustic detection recorders, alternatively known as Automated Bat Monitors (ABMs), manufactured by Department of Conservation (DOC - 'Model 'AR-4'), were used according to methodological protocols developed by Dekrout & Reynolds (2009) and were, in turn, largely based on the long established protocols described by O'Donnell & Sedgley (1994).

In this survey, a total of twelve ABMs were deployed (Figure 2) between **23 April 2024** and retrieved on **9 May 2024**. Eight ABMs were placed at 100 metre intervals along a stand of mixed native and exotic vegetation near a waterbody and wetland, and four within irrigated pasture.

All ABMs were calibrated to have the same time and date settings (NZST) and were pre-set to start monitoring one hour before sunset until one hour after sunrise. The distance between detectors of distinct monitoring locations was at least 50 m apart to increase the chance of independent bat monitoring. The recorders were suspended at least 2 m above the ground to reduce superfluous detections caused by terrestrial insects (usually cicada species).

The ABM data from this survey was processed through the DOC BatSearch version 3.2.3 software. All LTB echolocation calls were manually checked by a DOC recognised bat expert. The timing of bat activity was reviewed with focus on activity within 1 hour of sunset and sunrise. The recording of activity during these periods was used to provide indications of potential LTB roosting activity on-site or nearby.

2.2 VALIDITY OF SURVEY EVENT

Previous research of an existing data sets shows long-tailed bat activity is strongly influenced by temperature (O'Donnell & Sedgely, 2012; O'Donnell, 2000; Smith et al., 2017). It is best practice that bat monitoring should take place when temperatures one to four hours after sunset are >7°C, ideally >10°C. In this context, minimum temperatures remained above 7°C during 13 nights of the survey period and five above 10°C (Table 1).

Maximum rainfall in the hours after sunset until midnight was less than 10 mm over the entire survey period – therefore, rainfall is unlikely to have affected bat emergence during the 16 nights of surveying (O'Donnell, 2000; Appel et al., 2019).

Wind conditions were suitable on 13 nights of the surveyed period, with maximum wind gusts during the emergence period below 5.6 m/s (Smith et al., 2017).

This leaves for a total of 10 suitable survey nights, which is slightly outside of best practice but in the context of this survey, aims to confirm or otherwise have regular use of the area by LTBs, which is not a critical factor (Mueller et al 2022).

Table 1: Summary of weather conditions during the survey period. Temperatures in °C, precipitation in mm and wind speed in m/s. Data obtained from NIWA CliFlo database, at station number 26117.

Date (NZST)	Min. temperature (°C) between 18:00 – 22:00	Max. Precipitation (mm/h) between 18:00 – 22:00	Max. wind speed (m/s) between 18:00 – 22:00
23/04/2024	8.0	0	5.5
24/04/2024	12.2	0	6.0
25/04/2024	13.0	0	3.0
26/04/2024	9.4	0	9.1
27/04/2024	6.4	0	5.7
28/04/2024	7.8	0	3.3
29/04/2024	12.9	0	3.0
30/04/2024	9.7	0	4.4
1/05/2024	13.3	3.4	6.2
2/05/2024	9.0	0.2	6.5
3/05/2024	7.8	0	2.2
4/05/2024	6.7	0	1.8
5/05/2024	8.6	0	2.2
6/05/2024	12.0	0	1.3
7/05/2024	8.6	0	2.2
8/05/2024	4.4	0	5.4

3 RESULTS & DISCUSSION

3.1 BAT ACTIVITY ANALYSIS

Monitoring with a total of twelve ABMs resulted in the detection of bat activity at four locations (Figure 2; Table 2). This is a relatively low level of bat activity detected within the landscape during the survey. A total of **6** bat passes were recorded on **3** of the **16** nights of surveying, averaging **0.03** bat passes per ABM per night. Bat passes detected at BW21, BW22 and BW27 are likely to have detected the same bat, on May 5th 2024 as they are within one minute of each other. Bat activity at BW22 and BW27 on April 29th 2024 are also likely to be from one animal flying through the landscape.

Bat activity levels ranged from 0 to 2 bat passes across one detector in one night, with activity levels detected at BW22, BW27 and BW28 located in the central area of the gully and BW21, located along the restored wetland margin.

Ten of the twelve ABMs were functional for the entire 16 nights of the survey period; BW29 was functional for 14 nights of the survey period and BW45 was functional for 15 nights. Although the battery was functional for BW07 for the entire survey, no recordings were made; there may have been a technical fault with BW07.

For context bat surveys in similar habitat surveys at the following sites across the wider Waikato Region have demonstrated much higher nightly pass rates:

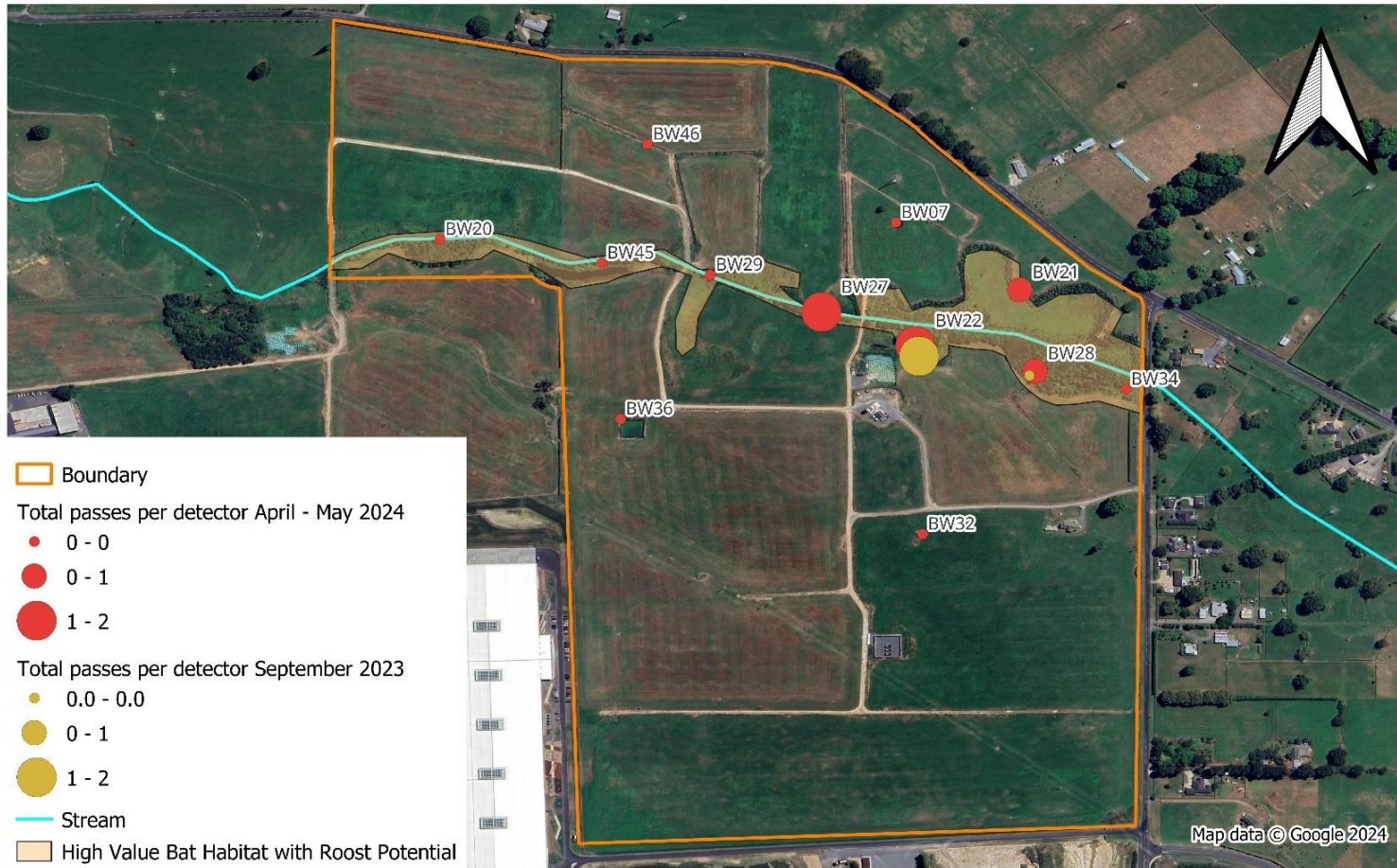
- Hautapu Waste Water Treatment Plant – an average of 16 passes/night (4 ABMs, 15 valid nights)
- Proposed Newcombe Sand Quarry – an average of 14 passes/night (8 ABMs, 44 valid nights – May & June)
- Staarvon Sand Quarry, Ngāhinapōuri (Ecology NZ) – an average of 260 passes/night (11 ABMs, 12 valid nights)
- Peacocke Development, Hamilton (Ecology NZ) – an average of 43 passes/night (11 ABMs, 18 valid nights)
- Tauhei Quarry, Gordonstoun – an average of 233 passes/night (11 ABMs, 12 valid nights)

3.2 HOURS AFTER SUNSET

All of the bat activity was recorded on the ABMs was between 18:15 – 18:40, within or near to the first hour following sunset (17:30). Although total records of bat passes were low, the timing of the activity indicates that one or more bats may be roosting relatively nearby within the wider landscape and using this patch of vegetation as a flight corridor following nightly roost emergence.

Table 2: 23 April – 9 May 2024 bat survey information and results summary

Site	Nights detector was functional	Total no. bat passes	Mean no. of bat passes per night	No. of nights with bat passes	% of nights with bat passes	Bat passes per night within 1-hour after sunset (17:30)
BW07	16	0	0	0	0%	0
BW20	16	0	0	0	0%	0
BW21	16	1	0.0625	1	6%	0.0625
BW22	16	2	0.125	2	13%	0.0625
BW27	16	2	0.125	2	13%	0.0625
BW28	16	1	0.0625	1	6%	0.0625
BW29	14	0	0	0	0%	0
BW32	16	0	0	0	0%	0
BW34	16	0	0	1	6%	0
BW36	16	0	0	0	0%	0
BW45	15	0	0	0	0%	0
BW46	16	0	0	0	0%	0



Hautapu Bat Survey Results

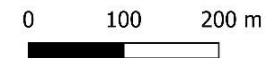


Figure 2: Locations and results of bat detectors during the April/May 2024 deployment and pre-existing survey results from September 2023. In April/May, four locations recorded positive bat passes (refer to Appendix A for coordinates)



4 CONCLUSIONS AND RECOMMENDATIONS

Long-tailed bats are utilising the Proposed Plan Change 14 area at relatively low levels through the previously identified and mapped 'High Value Bat Habitat Area' along the Mangaone Stream (see Schamhart 2023).

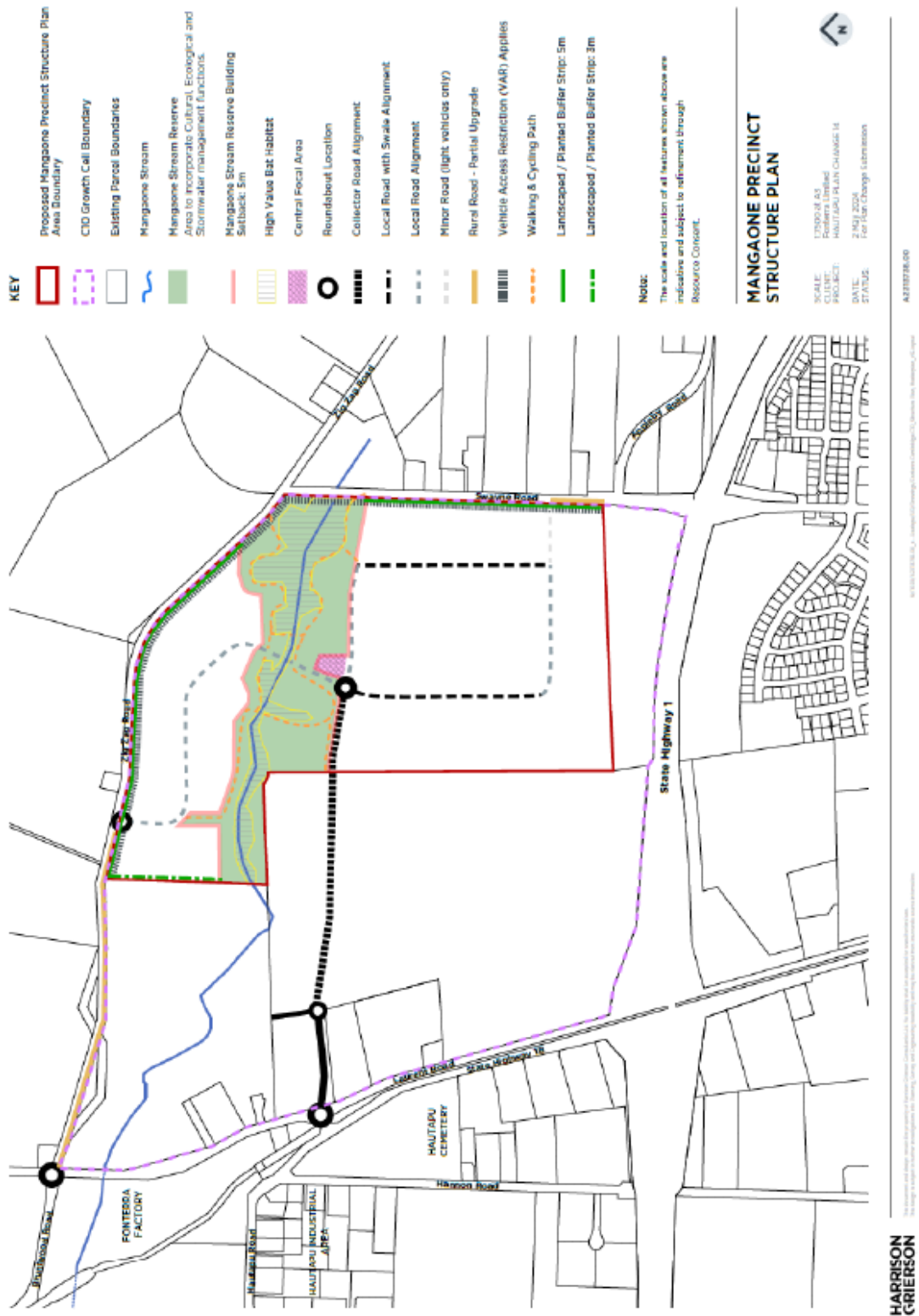
High mobility and seasonal variations in habitat usage of long-tailed bats, and the higher detection rates of bats in surveys nearby suggest that bats will regularly use this general locality for foraging and commuting, but that the Mangaone Stream, wetlands and riparian vegetation are the most important habitats to protect, rather than the intensively managed pastureland. Pasture, while possibly being utilised on occasion, is likely to be less important in this locality for bats as they are an edge adapted species, and open grassland is not preferred habitat (Parsons et al. 1997).

This survey therefore consolidates the value of the proposed Mangaone Stream Reserve for long-tailed bats as part of Proposed Plan Change 14, as well as the recommendations of Bluewattle Ecology in the letter dated 2 May 2024 (see Appendix 2).

5 REFERENCES

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APPENDIX 1 - PROPOSED STRUCTURE PLAN



APPENDIX 2 – RECOMMENDATIONS FOR PROTECTION OF LONG-TAILED BAT HABITAT



2 May 2024

Fonterra Limited
c/- Mark Chrisp
Mitchell-Daysh
PO Box 1307
Hamilton 3240

Our Ref: RMA.00742

Dear Mark

**Opinion on protection of long-tailed bats and their habitat
Plan Change 14 – Management of Bat Habitat**

Bluewattle Ecology has undertaken a bat survey and provided advice to Fonterra Limited (Fonterra) in relation to the management of bat habitat within the Mangaone Precinct Structure Plan Area which is the subject of Plan Change 14 (PC14) to the Waipā District Plan. The advice provided by me has resulted in the development of the following planning provisions relating to the management of bat habitat which now form part of PC14:

- a) The identification of a High Value Bat Habitat Area in the vicinity of the Mangaone Stream which will form part of a larger reserve (about 16 ha) called the Mangaone Stream Reserve shown on the Structure Plan for the Mangaone Precinct (see Structure Plan attached). This includes a 'built in' buffer around the High Value Bat Habitat Area of about 20 m where industrial activities cannot occur.
- b) A rule requiring that buildings be setback 5 m from the Mangaone Stream Reserve (including the Central Focal Area which is where smaller buildings such as a café are proposed, and which will typically only be daytime activities in any event).
- c) A rule that requires the preparation of a Mangaone Stream Reserve Management Plan as part of the first subdivision or development of the Mangaone Precinct which, inter alia, will include: *"Measures (including planting and the nature of any street or on-site lighting) to protect the quality of the reserve area for bat habitat including controls on lighting while maintaining safety for people using roads and pathways within the reserve area."* The latter is where the specific measures can be specified and become the subject of consent conditions. This would include additional planting, controls on lighting, and any other specific measures considered appropriate.
- d) A comprehensive set of assessment criteria in relation to the High Value Bat Habitat Area within the Mangaone Stream Reserve against which the Mangaone Stream Reserve Management Plan will be assessed.

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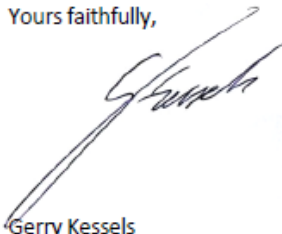
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- e) Rules requiring a 5 m wide Landscaped Buffer Strip along Swayne Road and Zig Zag Road as shown on the Structure Plan attached. This includes a requirement for trees at no less than 10 m apart (or less) that will grow to a height of at least 12 m at maturity. A rule also requires a Landscaped Buffer Strip along boundary of the Mangaone Precinct Structure Plan Area with any Rural Zone section of the C10 Growth Cell as shown on the Structure Plan attached.
- f) A rule that sets stringent limits in relation to lighting within the Mangaone Stream Reserve to protect the High Value Bat Habitat Area.
- g) A matter of assessment for any resource consent application (including any subdivision consent application) which is: *“Within the Mangaone Precinct Structure Plan Area, the extent to which light intensity and light spill from external lighting will adversely affect the ecological values of the High Value Bat Habitat Area.”*
- h) A provision to ensure that planned works, including removal of potential bat roost trees, are addressed, including requiring the use of the Department of Conservation ‘Protocols for Minimising the Risk of Felling Bat Roosts’ best practice guidelines where potential roosting trees for long-tailed bats are being removed and/or for trees with a diameter at breast height (DBH) of 15cm or greater.

It is my opinion that the package of measures forming part of PC14 as outlined above are sufficient to address the effects of the development of the Mangaone Precinct on long-tailed bats and their habitats.

We are currently undertaking a comprehensive bioacoustic survey of the plan change area in addition to the survey we undertook last year. I am expecting that the results of this survey will consultate the need for these policies and rule provisions to be included in the plan change.

Yours faithfully,



Gerry Kessels

Managing Director & Principal Ecologist

Bluewattle Ecology

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