BLUEPRINT ECOLOGY

Memo

To:	[redacted]; Wikaira Consulting Ltd	Project:	2529
From:	[redacted]; Blueprint Ecology Ltd	Date:	3 December 2025
cc:			
Subject:	Belmont Quarry Land Exchange: Lizard Assessment		

Dear [redacted]

We understand that Winstones Aggregates Limited (WAL) is in a process with the Department of Conservation (the Department) to swap an area of Belmont Regional Park (BRP) in exchange for three areas known as Northern Gully, Southern Gully, Firth Block and Dry Creek (the exchange sites) (**Figure 1**).

The Department has provided feedback during pre-lodgement consultation to an initial application, with their main comments regarding lizards including:

- An inadequacy of survey effort to date; and
- A request for a detailed lizard survey at all land parcels including number of species and relative density.

The purpose of this memo is to respond to the Department's request. We provide the following information:

- Details of a lizard survey undertaken at BRP.
- A comparison of lizard habitat values between BRP and the exchange sites.
- A reply to the Department's request for a detailed lizard survey at each of the exchange sites including the reasons why this is not necessary or appropriate in this instance.

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

+64 27 807 9018
tony@blueprintecology.co.nz
blueprintecology.co.nz


Dry Creek
Belmont Regional Park
Northern Gully
Firth Block
Southern Gully

Figure 1.

1 BRP Lizard Survey

1.1 Methodology

All survey devices were set on 25 September 2025. 75 triple-stacked ACOs[1] were set in 15 locations in transects of five devices and checked a total of three times on 3 to 5 November 2025 (**Figure 2**).

105 baited pitfall traps[2] were set in six locations and checked on 4 and 5 November 2025 as follows:

- Two transects of 5 devices within māhoe forest margin (dappled light, leaf packs).
- One transect of 15 devices within pine forest, regenerating mahoe understory (dappled light, pine needle litter).
- One transect of 20 devices within māhoe forest margin and more central forest (dappled light, light wells, leaf packs).
- One transect of 10 devices within māhoe central forest (dappled light, leaf packs).
- One transect of 50 devices within mānuka dominant forest (dappled light, light wells, leaf packs).

A spotlight search was undertaken as follows:

- A suitably qualified herpetologist and two assistants walked through the potential habitat on site, focusing predominantly on the mānuka forest and a portion of the southern extent of māhoe forest in the best quality habitats (**Figure 3**).
- Spotlighting involved using high-powered head-mounted spotlights (LED Lenser H15R - 2500 lumens) and binoculars (Leupold BX-1 McKenzie HD 10x42mm) to detect body shape or reflected eye-shine of arboreal geckos.
- Three nights of spotlighting were undertaken on 3 to 14 November 2025 from 9:15 pm to 11:30 pm, a total of 15.5 search hours.
- Searches were undertaken during calm, mild nights (between12 and 15 ºC) i.e. avoiding cooler nights when geckos will be less active and therefore more difficult to catch.
- Searches included a systematic, grid-searches of all suitable habitat within the site (with reasonable, safe access) (Figure 3).

The lizard survey was undertaken during suitable weather conditions for the species potentially present on site (**Table 1**).

Table 1. Environmental conditions during the survey.

Date	Time	Temperature (°C)	Overhead conditions	Ground conditions	Wind
3Nov25	10:25 am to 12:30 pm	17-18	Partly cloudy	Damp	Light breeze
	9:20 pm to 11:30 pm	14	Partly cloudy	Dry	Light to moderate breeze
4Nov25	9:15 am to 11:20 am	15-16	Partly cloudy	Damp	Moderate to strong winds
	9:10 pm to 11:20 pm	12	Partly cloudy	Dry	Calm
5Nov25	9:20 am to 10:40 am	15	Overcast	Damp	Calm
14Nov25	9:50 pm to 11:00 pm	15	Fine	Dry	Light breeze

[1]DOCDM-797638 Herpetofauna: artificial retreats v1.0.
[2] DOCDM-760240 Herpetofauna: pitfall trapping v1.0.

Plate 1. Pitfall traps set in māhoe forest.

Plate 2. Pitfall traps set in mānuka forest.

Plate 3. Spotlighting in mānuka forest.

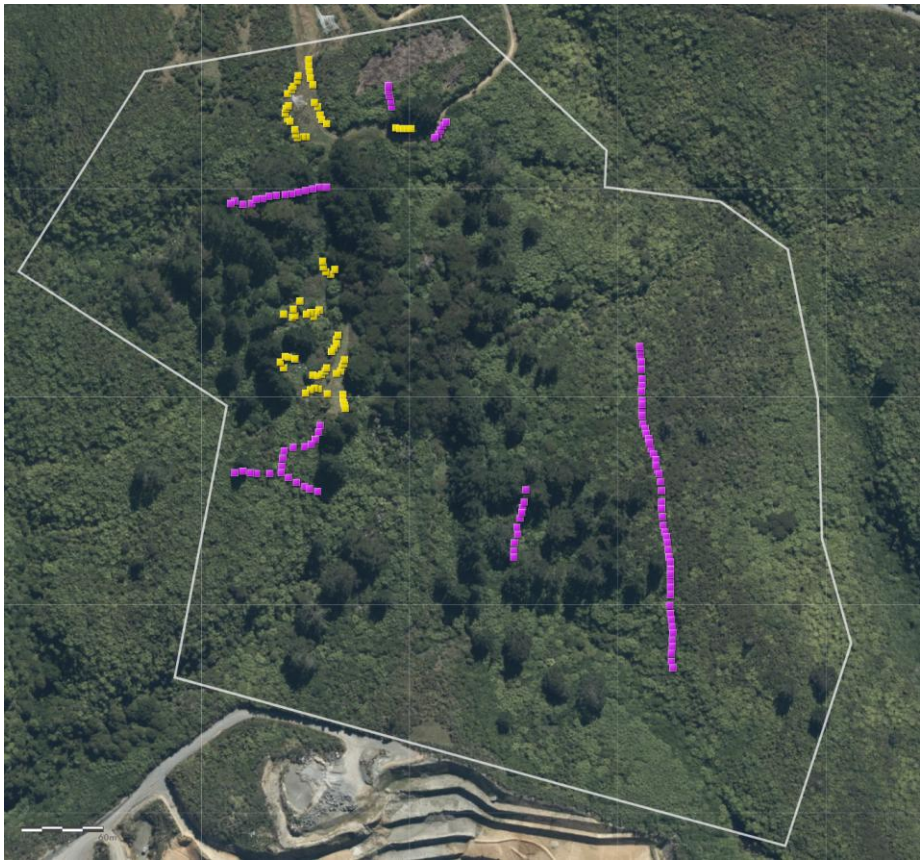

Figure 2. ACO (yellow square), pitfall trap (pink square), BRP site boundary (white line).

Figure 3. Approximate spotlight survey location (yellow line), BRP site boundary (white line).

1.2 Results

In total, four northern grass skink (*Oligosoma polychroma*) and three ngahere gecko (*Mokopirirakau* "Southern North Island") were recorded at BRP. Lizard capture results are provided in **Table 2** and **Figure 4.**

The results show that northern grass skink are present in low abundance (CPUE 3%)[3] in thick grass along the forest margins within the centre of BRP. The population recorded is not regionally or locally significant, and the number of lizards recorded indicates that the population is small but permanent and self-sustaining.

Ngahere gecko are present within mānuka forest to the east of BRP, with one animal detected per 5 hours of search effort on average. This species is listed as 'At Risk - Declining' in the latest threat classification (Hitchmough et al., 2021) and the population on site is locally significant.

When considering the relatively large area of suitable habitat for other forest dwelling species, and northern grass skink and ngahere gecko as a proxy for other lizard species, we are cautious to entirely discount the presence of other potential lizard species on site (e.g., copper skink *Oligosoma aeneum*). Other species may occur in low abundance (below detectability) or in discrete, localised areas outside of our direct survey areas.

Table 2. Daily lizard survey results

Date	Method	Result	CPUE/ effort
3 Nov 25	ACO/ pitfall traps	2x northern grass skink in ACOs	ACO = 3% Pitfall traps = 0%
	Spotlighting	1x ngahere gecko	1 per 6 hrs search effort
4 Nov 25	ACO/ pitfall traps	2x northern grass skink in ACOs	ACO = 3% Pitfall traps = 0%
	Spotlighting	1x ngahere gecko	1 per 6 hrs search effort
5 Nov 25	ACO/ pitfall traps	2x northern grass skink in ACOs	ACO = 0% Pitfall traps = 0%
14 Nov 25	Spotlighting	1x ngahere gecko	1 per 3.5 hrs search effort

[3] Catch Per Unit Effort

Figure 4. Northern grass skink (green point), ngahere gecko (blue point), BRP site boundary (white line).

Plate 4. A ngahere gecko recorded at BRP.

Plate 5. Marking the tree where ngahere gecko were recorded.

Plate 6. A northern grass skink recorded at BRP

2 Lizard Habitat Quality

Lizard habitat quality has been assessed based on existing lizard record datasets (Bioweb database, iNaturalist), aerial imagery, BlueGreen Ecology's vegetation mapping, our site survey results and previous survey results undertaken at the exchange sites.

In determining habitat quality, we have considered:

- Representativeness: Typical structure, species composition (abundance) and indigenous representation of forest as a proxy for lizard habitat quality.
- Rarity / distinctiveness: Species of conservation significance. This includes At Risk species (copper skink, ornate skink, glossy brown skink, ngahere gecko, barking gecko). There are no relevant Threatened species.
- Diversity and pattern: Habitat diversity, lizard species diversity and patterns in habitat use (e.g., multiple habitat types, multiple lizard species).
- Ecological context: Size, shape, ecological networks (e.g., linkages, pathways).

Habitat quality categories are as follows:

1. No effective habitat. Areas are excluded from mapping. Includes within pine trees.
2. Low quality habitat. Where very few lizards are expected and/ or no At Risk species are likely to occur.
3. Moderate quality habitat. Not threatened species (e.g., northern grass skink) are present or At Risk species are expected to be recorded at least infrequently and may include more than one species. Includes seral broadleaved, treefern forest, rank grass margins.
4. High quality habitat. Includes mature forest with numerous preferred habitat values (e.g., forest with lianes, perched epiphytes, and higher diversity through forest tiers). Provides high quality habitat for multiple At Risk lizard species. Includes mature forest and larger areas of kānuka or mānuka dominant scrub or forest.

BRP has 18.83 ha of lizard habitat and the exchange sites have 33.19 ha of lizard habitat (**Table 3**, **Figure 3**).

The exchange sites have an additional 14.36 ha of lizard habitat, of which there is an additional 3.46 ha of high quality habitat and 7.01 ha of moderate quality habitat.

Table 3. Lizard habitat quality area at BRP and the exchange sites.

Location	Habitat	Quality	Area (ha)
Northern Gully	Mature forest	High	4.37
	Seral forest	Moderate	6.71
	Gorse rank grass	Low	1.04
		Total	12.12
Firth Block	Mature forest & mānuka forest/ scrub	High	1.79
	Seral forest	Moderate	6.69
	Gorse rank grass	Low	1.07
		Total	9.55
Dry Creek	Mānuka forest/ scrub	High	1.59
	Seral forest	Moderate	5.34
	Gorse rank grass	Low	0.96
		Total	7.89
Southern Gully	Seral forest	Moderate	2.26
	Gorse rank grass	Low	1.37
		Total	3.63
Exchange sites Total	Mature forest & mānuka forest/ scrub	High	7.75
	Seral forest	Moderate	21
	Gorse rank grass	Low	4.44
		Total	**33.19**
Belmont Regional Park	Mānuka forest/ scrub	High	4.29
	Seral forest	Moderate	13.99
	Gorse rank grass	Low	0.5
		Total	**18.83**

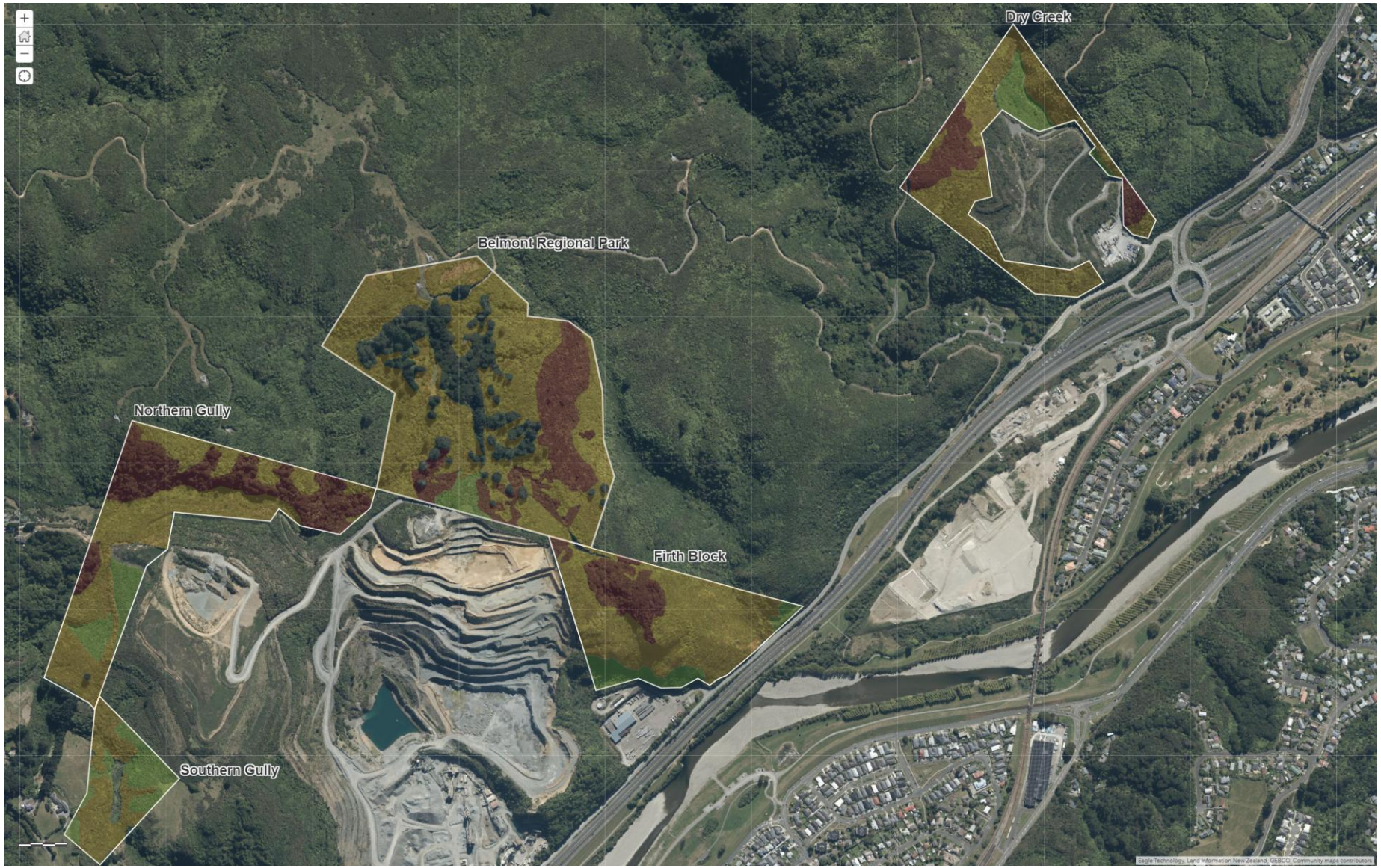

Figure 5. Low habitat quality (green), moderate habitat quality (orange), high habitat quality (red), site boundaries (white line).

3 Conclusion

This assessment provides a basis to determine the equivalence of lizard habitat values between BRP and the exchange sites such that an informed decision can be made by the Department for a land exchange.

Given the seral forest areas are all nearby with directly connected synonymous vegetation, we can make reasonable assumptions about like-for-like habitat quality/composition, equivalence of values and the likelihood of lizards occurring within these areas based on the detailed survey undertaken at BRP. The results of the BRP survey are expected to be similar if undertaken at the each of the exchange sites. This is because each site has multiple hectares of forest, that forest is contiguous between sites, is of very similar age and quality, and each of the sites occur nearby to each other.

Field surveys in these locations would be limited by steep terrain, thick and inaccessible scrub and seral forest, and the inefficacy of current lizard survey methods in detecting low-density, cryptic forest lizard species. In all cases, we expect northern grass skink and/ or a low number of forest-dwelling lizard species to be recorded at each site, as per BRP.

It is possible that higher proportions of barking gecko or ngahere gecko could occur within the high-quality habitats "hot spots". The presence and abundance of these species in these locations have been assumed in our habitat quality assessment. A detailed lizard survey at each of the exchange sites is highly unlikely to have a meaningful influence on our assessment, and it would be difficult to rely on such survey data where poor detection rates are common, especially in terrain that is difficult to access.

We understand that a number of ecological improvements are proposed at the exchange sites including native planting, weed control and pest animal control (e.g., rats and possums). Possums are opportunistic omnivores, and while leaves are the main part of their diet they can predate on lizards and compete with them for food sources, and rats are a key predator to lizards.

Native planting and weed control is proposed over many hectares and this will provide a considerable improvement to lizard habitat provisions over the medium to long term. Of particular benefit to lizards is the specific targeted rat control. It has been demonstrated that a significant increase in lizard numbers can be achieved in areas subject to intensive mammalian predator control (Reardon et al., 2012; Norbury et al., 2022), and this rat control is expected to greatly enhance lizard values in this area.

Overall, the Department receives a significant increase in lizard habitat extent and quality as part of the proposed land exchange.

Yours sincerely,

[redacted]

Principal Ecologist[4]

[4] This report has been prepared by Blueprint Ecology Limited on the instructions of our Client in accordance with the agreed scope of work. It is intended to support the Client's application for a land exchange and may be relied upon by the Department of Conservation and relevant administering agencies for the purposes of assessing the application. While Blueprint Ecology Limited 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.