MEMORANDUM

Bioresearches
A Babbage Company

TO:	Harbour View Heights LP	Date:	25 October 2024
COPY TO:	Russell Baikie	Job No:	68548
FROM:	Michael Anderson		

ECOLOGICAL ASSESSMENT OF FOREST ADJOINING 28, 30 AND 66 CRESTVIEW RISE

Dear Fei Lin,

This memorandum provides an ecological assessment of the vegetation and potential habitats associated with 66 and 30 Crestview Road. The review is informed by both a desktop-based assessment and a site visit, which was undertaken on the 28th of April 2023. The original version was updated in December 2023 and again in July 2024. This current version (October 2024) includes the updates requested by the ecologist in the Auckland Council RFI (provided 24 October 2024) for the terrestrial components. These changes include the following: Lizard species information corrected and updated.

Introduction

The ecological assessment focused on the northern edge of a forest fragment that is located at the southern boundary of 66 and 30 Settlement Road and extends across 76 and 170 Settlement Road (Figures 1 & 2). The vegetation represents the western distal end of a finger of vegetation that extends approximately 1 km towards a larger area of indigenous forest (SEA_T_409) to the east. The vegetation itself is immediately outside the rural-urban boundary and is not subject to a SEA overlay.

Factors considered in this assessment were consistent with those used to determine significance under the Auckland Unitary Plan (AUP, Schedule 3), being:

1. Representativeness
2. Threat Status & Rarity
3. Diversity
4. Stepping Stones, Migration Pathways and buffers
5. Uniqueness or distinctiveness.

Bioresearches
Level 4, 68 Beach Road, Auckland 1010
PO Box 2027, Shortland Street,
Auckland 1140, New Zealand
T 09 379 9980 **F** 09 377 1170
E admin@babbage.co.nz **www.bioresearches.co.nz**

These factors are also generally consistent with those matters used to assess ecological value under the EIANZ's (Environment Institute of Australia and New Zealand Inc.) Ecological Impact Assessment Guidelines (EcIAG), being Representativeness; Rarity / Distinctiveness; Diversity and Pattern; Ecological Context (Table 5).

Proposal

Bioresearches was provided with a concept plan (Figure 1) for a proposal to undertake further development at this site and requested an assessment of the values of the vegetation with the view to understanding opportunities for protection and enhancement actions.

Figure 1: Concept plan of proposed rezoning and subdivision.

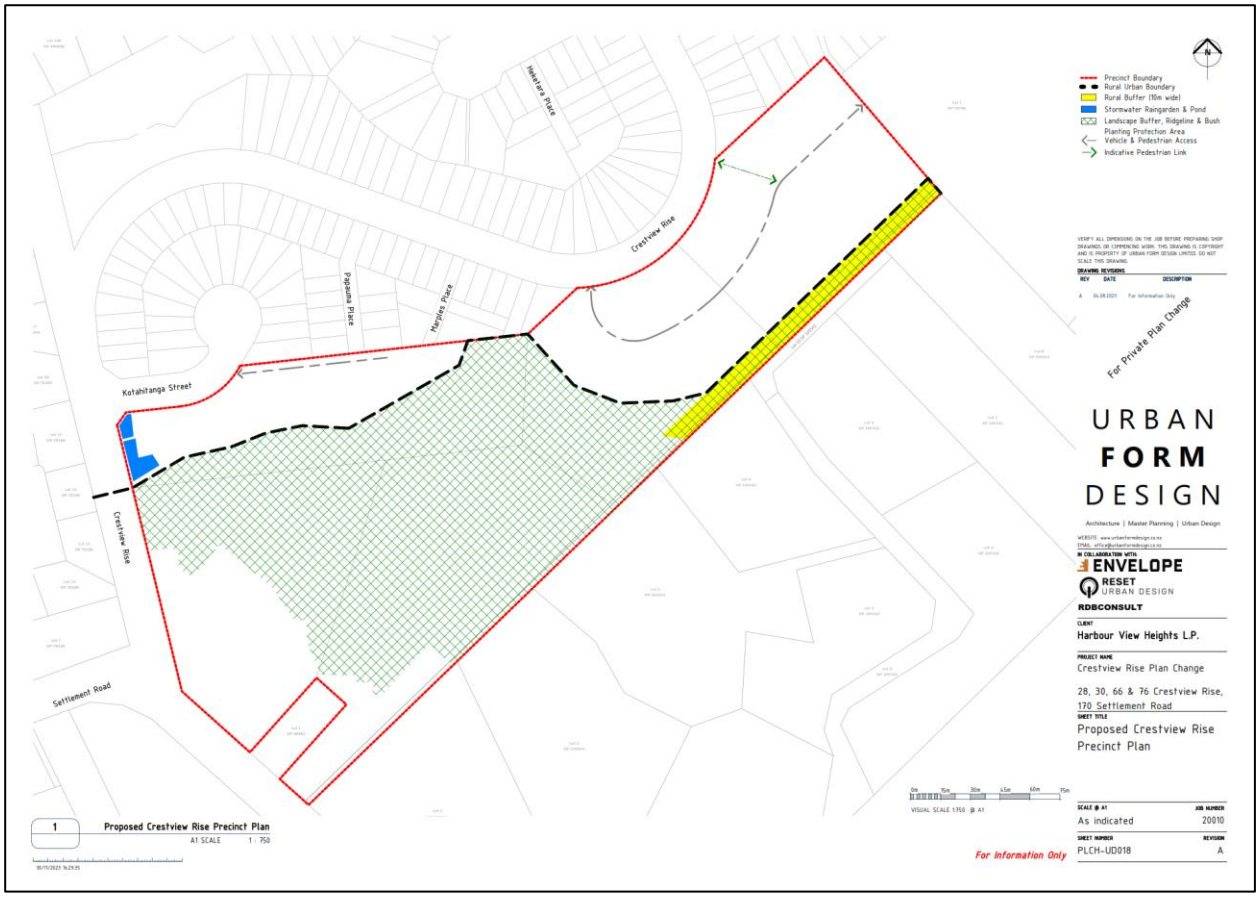

Figure 2: Proposed Rural-Urban Boundary and rural buffer planting and proposed location of ecological restoration actions (weed and pest control, infill, and edge buffer planting).

Ecosystem type and context:

The overall vegetation type is consistent with 'Broadleaved Species Scrub/Forest'- VS5 (Singers et al., 2017). This forest type has the Regional IUCN threat status of 'Least Concern'. This ecosystem type typically comprises regenerating pioneer vegetation species and is found throughout the country. It is associated with low-fertility hillslopes that were formerly forested. Within the Auckland region, VS5 forest is particularly common on south-facing slopes in southern parts of the region.

Under the Threatened Lend Environment classification[1], the location is classified as 'acutely threatened' due to their being < 10% indigenous cover left[2]. This is due to being on the margin of existing suburban area of Papakura township.

The remaining forest fragment is approximately 2.39 ha in size (Figure 3). It is not designated as an SEA, but there are several SEA sites to the east that form a matrix of forest fragments that extend towards the Hunua ranges.

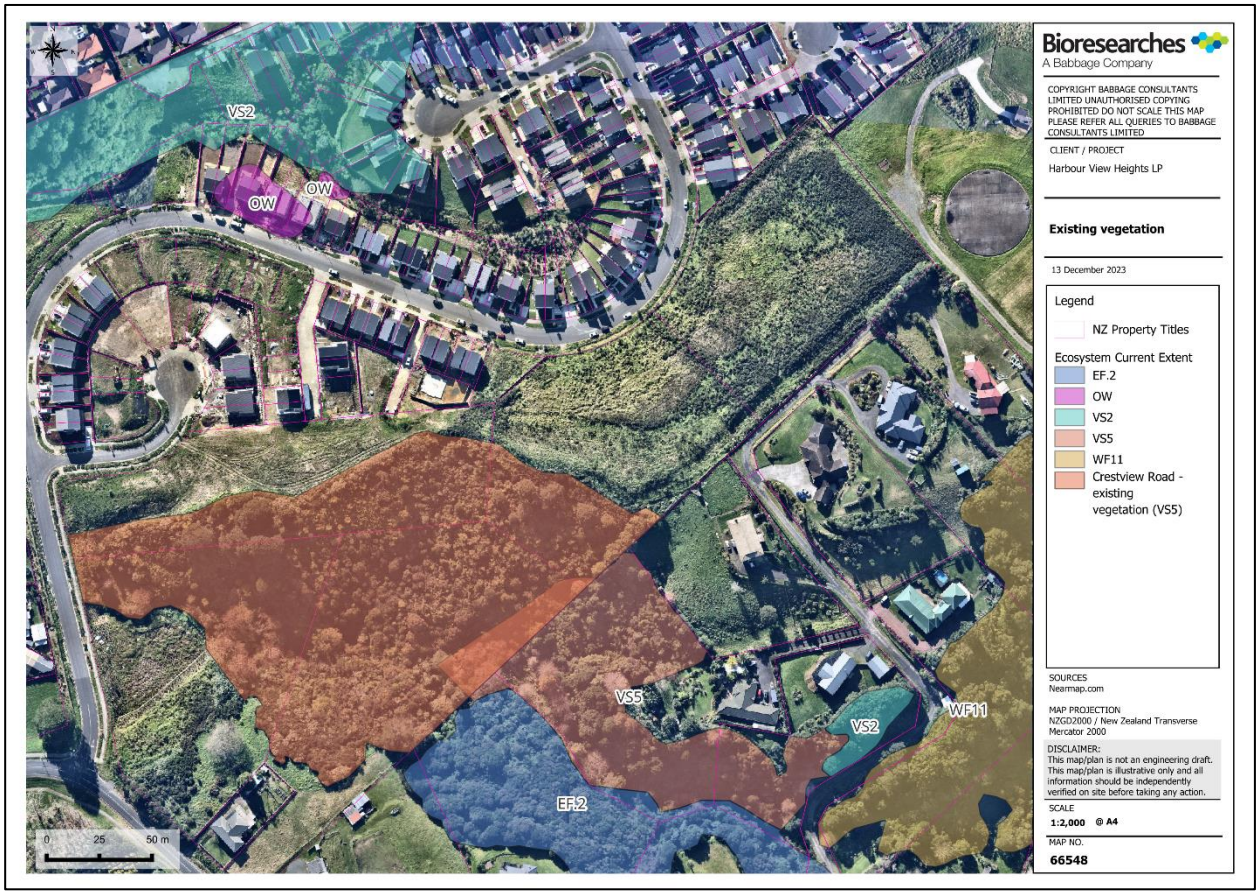

Figure 3: Area of vegetation adjoining proposed subdivision and other adjoining vegetation types. The adjoining vegetation is not currently classified but has been defined here as VS5.

[1] Cieraad E, Walker S, Price R, Barringer J. 2015. An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments. *New Zealand Journal of Ecology* 39 (2).

[2] https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Habitats/lenz_tec/490,414,491,415,399,400?m=NTBlMmNmNWE

Vegetation and description:

The representativeness was assessed against the SEA criteria, which aligns with the EIANZ guidelines (Table 5). In particular, the assessment focused on ecosystem structure and composition, presence of indigenous species, and presence of expected species and tiers.

The forest patch at this location has the general characteristics of VS5, with the canopy tending to be dominated by tree ferns (mamaku, ponga, wheki-ponga). There are a few mature and larger trees emergent above the tree fern canopy present on the upper slopes, including kanuka (*Kunzea robusta*), puriri (*Vitex lucens*) and totara (*Podocarpus totara*) (Figure 4). The subcanopy is approximately 3-5 m tall and includes a number of common native tree species associated with VS5, including hangehange (*Geniostoma ligustrifolium var. ligustrifolium*), mahoe (*Melicytus ramiflorus*), silverfern (*Alsophila tricolor*), *Coprosma rahmnoides*, manuka (*Leptospermum scoparium*), kawakawa (*Piper excelsum*), and pigeonwood (*Hedycarya arborea*).

Seedlings / saplings of regenerating indigenous species were almost completely absent, indicating a high level of browsing from introduced mammals (Figure 5). Some plant growth was occurring in light gaps, but the diversity was very low and was mostly dominated by kawakawa and hangehange.

Introduced weeds were particularly abundant. Forest margins were dominated by regional pest plant species, including gorse (*Ulex europaeus*), tree privet (*Ligustrum lucidum*) and woolly nightshade (*Solanum mauritianum*). These species also penetrated the forest interior in parts, as well as other invasive weeds such as climbing asparagus (*Asparagus scandens*), black wattle (*Acacia mearnsii*) and cotoneaster (*Cotoneaster glaucophyllus*). Lower altitude parts of the site contained riparian margins with large willow trees (*Salix sp.*) (Figure 6).

Figure 4: Looking North-east up the valley. The few remaining larger trees on the ridgeline are kanuka. Privet trees are visible on the slope to the mid-left of the photo.

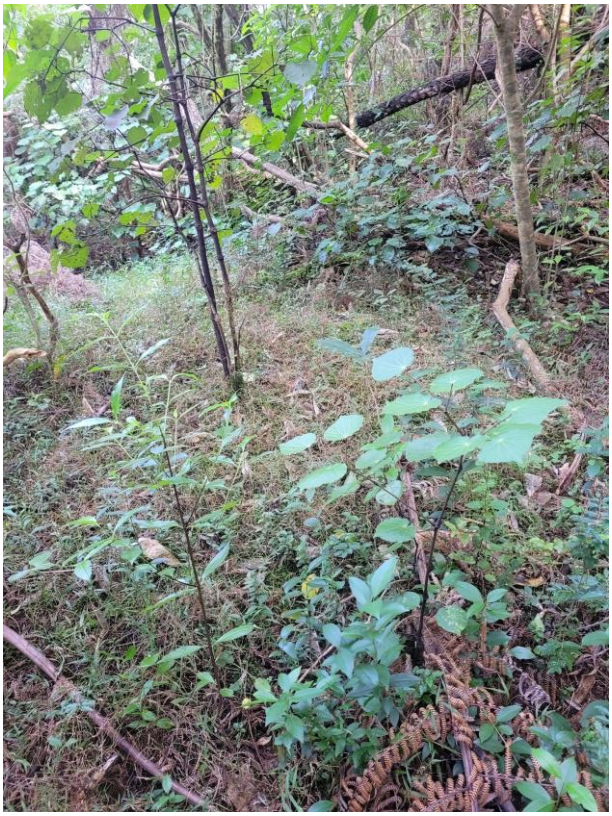

Figure 5: Undergrowth within the forest. Left photo shows absence of seedlings and natural regeneration. Right photo shows low diversity regrowth (kawakawa and hangehange) in light gaps.

Figure 6: Western end of 66 Crestview Road, showing large areas of exotic vegetation on the slope leading down to the road. Upper parts of the slope are dominated by gorse, mid-slope by woolly nightshade, and willow trees can be seen on the lower slopes along the riparian margin.

Fauna values:

A formal survey of fauna was not carried out, but anecdotal observations were recorded on site and a review of avifauna databases (ebird, iNaturalist) was undertaken. Birds observed on site included a few common native species that would be expected in rural locations, including fantail (*Rhipidura fuliginosa*), silvereye (*Zosterops lateralis*), tui (*Prosthemadera novaeseelandiae*), kingfisher (*Todiramphus sanctus*). Introduced species included common myna (*Acridotheres tristis*), eastern rosella (*Platycercus eximius*), common pheasant (*Phasianus colchicus*), and European starling (*Sturnus vulgaris*). No threatened species were observed, or are expected, given the limited resources within predominantly young, weedy vegetation and its peri-urban location. A review of online databases (ebird.org and inaturalist.org) did

not indicate any records of threatened terrestrial bird species within a 5 km radius of the site. Some more mobile threatened species may use the site on an intermittent basis, such as the North Island kākā (*Nestor meridionalis septentrionalis*) and the long-tailed cuckoo (*Eudynamys taitensis*).

No lizards were observed during the site visit, but native skinks are potentially present. The DOC-administered amphibian and reptile database, the Auckland Council herpetofauna database, and inaturalist indicate only one species has been recorded within 5 km of the site (Table 1). Ground cover, while very weedy, provides more retreat opportunities for skinks, including dense vegetation mats, leaf litter, and fallen woody debris. This vegetation has potential to support high-value habitat copper and / or ornate skinks, both of which are classed as 'At Risk - declining', particularly given that copper skinks are generally widespread in the Auckland Region.

Table 1. Native herpetofauna (reptile and amphibian) records from the wider landscape surrounding the site (5 km radius). Records obtained from the Department of Conservation Amphibian and Reptile Distribution Scheme databases and Auckland Council Fauna database (accessed April 2023) and inaturalist.

Species	National Conservation Status[3]	Regional Conservation Status[4]
Copper skink (*Oligosoma aeneum*)	At Risk - declining	Regionally Declining
Ornate Skink (*Oligosoma ornatum*)*	At Risk - declining	Regionally Declining

*records >5 km from site

Ecological Summary:

Overall, the ecological value of the vegetation at 28, 30 and 66 Crestview is **low** (see

[3] Rod Hitchmough, Ben Barr, Carey Knox, Marieke Lettink, Joanne M. Monks, Geoff B. Patterson, James T. Reardon, Dylan van Winkel, Jeremy Rolfe and Pascale Michel (2021). *Conservation status of New Zealand reptiles, 2012*. Publishing Team, Department of Conversation.

[4] Melzer, S., Hitchmough, R., van Winkel, D., Wedding, C., Chapman, S., & Rixon, M. (2022). *Conservation status of reptile species in Tāmaki Makaurau/Auckland*. Auckland Council technical report TR2022/3.

Table 2), though acknowledging that it is a potentially important transition stage between early regeneration stages and established broadleaved podocarp forest. However, it is currently degraded due to the widespread presence of weeds, both on the edges and interior. The site would benefit a lot from enhancement, in particular weed and pest control.

Table 2: Individual factors for assessing ecological value. These are based on the Auckland Unitary Plan (AUP, Schedule 3) that is used for assessing Significant Ecological Areas.

SEA assessment criteria	Value	Comment
Representativeness	Low	The vegetation and habitats are a mix of regenerating native and regional pest species. Fauna species are likely to be representative of a more urban/rural environment ecosystem. Fauna species likely to be common native species and introduced/pest species.
Threat status rarity	Low	No rare or distinct plant or fauna species were observed. Only a few rare avifauna species have potential to pass through the Project area intermittently, though none would be expected to be present on any permanent basis and they would be more likely to use higher value habitats nearby. The potential for 'At Risk - declining' (high value) lizards is considered moderate, as copper and ornate skinks may persist in such environments.
Diversity	Low	The diversity is limited to young, regenerating and relatively edge-tolerant species, given its urban proximity and narrow projection in pattern. The vegetation and habitats are strongly influenced by the history of the site, as it is regenerating vegetation on the rural/urban boundary.
Stepping stones, migration pathways & buffers	Moderate	The site is on the boundary of the urban environment and is unlikely to be used as a stepping stone or migration pathway for indigenous biodiversity across the RUB. However, the site is very loosely connected to nearby SEA sites to the east (e.g., SEA_T_409, SEA_T_4469), which is part of a matrix of SEA sites that extend towards the Hunua ranges (see Figure 7). Given this connectivity, it is likely to mature and eventually transition to a kauri podocarp ecosystem type.
Uniqueness or distinctiveness	Low	Although this site is an indigenous regenerating ecosystem, there was no indication that meeting the criteria for uniqueness or

		distinctiveness (e.g., habitat for a unique organism, ecosystem endemic to Auckland region).

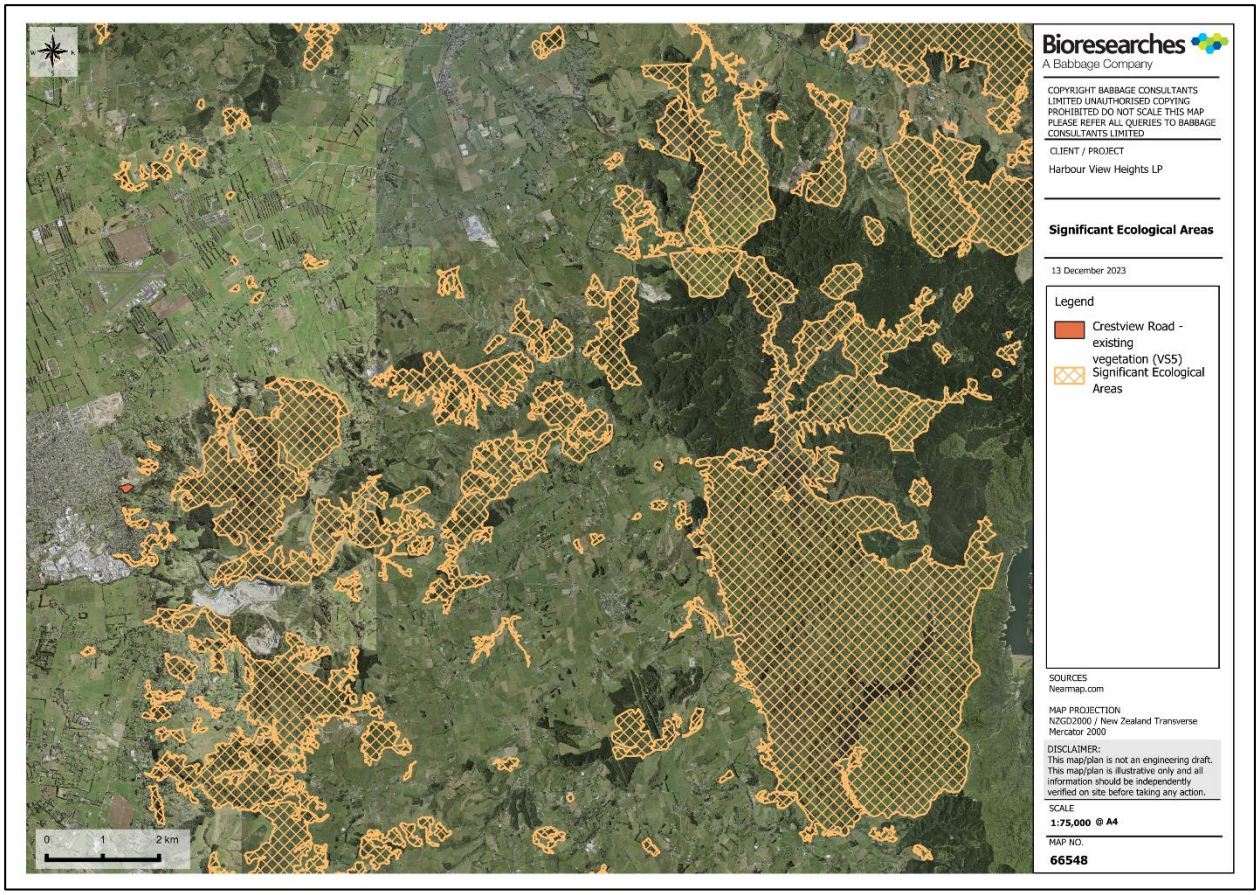

Figure 7: Context of the site in relation to nearby SEAs, extending towards the Hunua Ranges to the east.

Proposed restoration actions

Ecological restoration of the site would involve controlling pest-animal and pest-plant species, infill planting of existing vegetation, and buffer planting of edges. A weed and pest management plan and a planting plan would be required for these actions to occur.

In short, the potential animal pest species would include possums, mustelids (stoats), rats, mice, cats, hedgehogs, and rabbits[5]. Larger animal pests, such as pigs, goats and deer are less likely, as the forest patch is probably not large enough to support a population of these species.

As much of the existing vegetation is heavily infested with pest plant species, these would need to be controlled. Larger weed species (e.g. privet, woolly nightshade) would need to be poisoned then can be left standing. This would require infill planting to reduce the incidence of these species returning from existing seedbanks. It is recommended to infill plant at a rate of 25% of the total area, or 1 plant per 4 m^2 (Figure 8). To reduce the impacts of edge effects and reduce reinvasion of pest plant species, it is recommended to infill plant the 5 metres of exposed forest edge margin with suitable native shrub species. In addition an area of landscape buffer planting is proposed, adding an additional ~1600 m2 of new native vegetation.

Table 3: Proposed restoration actions, including total area, planting density and estimated number of plants required.

Location	Area (m^2)	Planting Density	Number of plants (estimated)
Landscape buffer	1601	1 plant per m2	1601
Infill planting	21,347	1 plant per 4 m2	5337
Buffer (forest edge)	2873	1 plant per 4 m2	718
Total	25,821		7656

Potential plants for infill planting that would be suitable for enhancing a broadleaved species scrub/forest (VS5) ecosystem are listed in Table 4. These species are based on Singer et al. 2017[6], assuming that this VS5 habitat is going to transition to Kauri, podocarp, broadleaved forest (WF11).

[5] https://www.bionet.nz/assets/Uploads/pest-animal-control-guide-Auckland-Council-2016.pdf

[6] Singers, N. J., Osborne, B., Lovegrove, T., Jamieson, A., Boow, J., Sawyer, J. W. D., ... & Webb, C. (2017). *Indigenous terrestrial and wetland ecosystems of Auckland*. Auckland Council, Te Kaunihera o Tāmaki Makaurau.

Table 4: Plant species that are potentially suitable for infill planting to enhance the forest patch.

Common name	**Species name**
karamū	*Coprosma robust*
mahoe	*Melicytus ramiflorus*
māmāngi	*Coprosma arborea*
mapou	*Myrsine australis*
miro	*Pectinopitys ferruginea*
puriri	*Vitex lucens*
putaputawētā	*Carpodetus serratus*
rimu	*Dacrydium cupressinum*
tree daisy	*Olearia arborescens*
totara	*Podocarpus totara*

Figure 8. (following page). Proposed infill, edge buffer and landscape buffer planting areas.

Bioresearches
A Babbage Company

CLIENT / PROJECT

Harbour View Heights LP

Proposed Planting Plans

13 December 2023

Legend

- Buffer Planting
- Infill planting
- Landscape buffer planting
- NZ Property Titles

SOURCES
Nearmap.com

MAP PROJECTION
NZGD2000 / New Zealand Transverse Mercator 2000

DISCLAIMER:
This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

SCALE
1:2,000 @ A4

MAP NO.
66548

Conclusion

Overall, the regenerating broadleaved species scrub / forest is compositionally weedy, partly as a result of being a component of a narrow finger of regenerating vegetation with high edge to area. While the vegetation is generally young and weedy, it does benefit from connectivity to higher value vegetation to the east, including kauri, podocarp, broadleaved forest that represents a potential, much higher future state of this vegetation, with appropriate enhancement and management. Overall, the vegetation and habitats are of low value. However, implementation of a restoration plan would improve the overall value of this feature, whereby weed removal, pest animal control and enhancement and buffer planting would greatly improve the values of this forest for fauna and flora.

Sincerely,

Michael Anderson PhD

Senior Ecologist | Bioresearches

Email: michael.anderson@bioresearches.co.nz

Mobile +64 210677453

Appendix

Table 5. Attributes to be considered when assigning ecological value or importance to a site or area of vegetation / habitat / community (as per Table 4 of Roper-Lindsay et al. 2018).

Matters	Attributes to be considered
Representativeness	*Criteria for representative vegetation and aquatic habitats:* • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified. *Criteria for representative vegetation and aquatic habitats:* • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/ distinctiveness	*Criteria for rare/distinctive vegetation and habitats:* • Naturally uncommon or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National Priority for Protection *Criteria for rare/distinctive species of species assemblages:* • Habitat supporting nationally threatened or At-Risk species, or locally uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations- pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	• Site history and local environment conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystems integrity, form, functioning and resilience (from 'intrinsic value' as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning - high level, key species identification, habitat as proxy

APPLICABILITY AND LIMITATIONS

Restrictions of Intended Purpose

This report has been prepared solely for the benefit of [Comments] as our client with respect to the brief. The reliance by other parties on the information or opinions contained in the report shall, without our prior review and agreement in writing, be at such party's sole risk.

Legal Interpretation

Opinions and judgements expressed herein are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions. Where opinions or judgements are to be relied on they should be independently verified with appropriate legal advice.

Maps and Images

All maps, plans, and figures included in this report are indicative only and are not to be used or interpreted as engineering drafts. Do not scale any of the maps, plans or figures in this report. Any information shown here on maps, plans and figures should be independently verified on site before taking any action. Sources for map and plan compositions include LINZ Data and Map Services and local council GIS services. For further details regarding any maps, plans or figures in this report, please contact Babbage Consultants Limited.

Reliability of Investigation

Babbage has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of matrix sampled away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

There is no investigation that is thorough enough to preclude the presence of materials at the site that presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may in the future become subject to different regulatory standards, which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.