BEFORE THE HEARING COMMISSIONERS AWANUI

 IN THE MATTER
 of the Resource Management Act 1991 (RMA or the Act)

 AND
 IN THE MATTER
 of the Proposed Far North District Plan 2022

STATEMENT OF EVIDENCE OF DR GARY BRAMLEY (ECOLOGY) ON BEHALF OF WAIAUA BAY FARM LIMITED

2 MAY 2025

HOLM MAJUREY

Mike Holm/Nicole Buxeda PO Box 1585 Shortland Street AUCKLAND 1140

INTRODUCTION

Qualifications and experience

- 1. My full name is Gary Neil Bramley.
- 2. I hold the degrees of Bachelor of Science (1992) and Master of Science (First Class Honours in Ecology, 1995) both from Massey University, and a Doctorate of Philosophy in Biology from the University of Waikato (1999).
- I am a member of the Ornithological Society of New Zealand, Ecological Society of New Zealand, New Zealand, Native Plant Conservation Network and Environmental Institute of Australia and New Zealand.
- 4. I am currently the Terrestrial Ecology Team Leader and a Director and owner of EcoLogical Solutions Limited, which is a multi-disciplinary ecology company with offices in Kāeo, Auckland, Tauranga and Nelson. In that role I support our managing director and provide technical and administrative leadership to a team of 8 – 10 terrestrial ecologists at varying stages of their career from new graduates to experienced practitioners. I also typically manage up to 30 projects at any one time at a range of scales from single lot subdivisions to large scale infrastructure projects.
- 5. I have previously worked as an ecologist for Reconnecting Northland (a landscape scale conservation project in Northland), as a tutor in Biology at Waikato Polytechnic and as a lecturer in Biology at the University of Waikato.
- 6. I have worked as a consultant ecologist since 2000, initially for NZ Environmental Limited and then Mitchell Partnerships Limited (now Mitchell Daysh). Between January 2016 and March 2022, I operated my own business (The Ecology Company) which merged with Freshwater Solutions Limited to become Ecological Solutions in April 2022.
- 7. I have published or contributed to twelve peer reviewed papers and more than 300 unpublished reports prepared for variety of clients. I have been responsible for the preparation of specialist ecological reports, Assessment of Environmental Effects documentation, management plans and Department of Conservation concession and wildlife permit applications.

In July 2017, I completed the "Making Good Decisions" programme and am a certified resource consent hearings commissioner.

- 8. I was recently a contributing author to a paper entitled "The Biodiversity Compensation Model: a framework to facilitate better ecological outcomes" published as a forum article in the New Zealand Journal of Ecology.
- 9. In 2004 I was awarded an "Old Blue" Conservation Award by the Royal Forest and Bird Protection Society followed in 2006 by a Northland Biodiversity Enhancement Group award for contribution to the conservation of Northland's natural heritage. In 2018, I was awarded life membership of the Puketi Forest Trust, a charitable trust which I helped establish in 2003 to restore Puketi Forest in Northland.
- 10. As a consultant ecologist I undertake, lead and contribute to a large number of ecological investigations, significance assessments and assessments of the ecological effects of developments in a wide range of environments throughout New Zealand. I have been involved in a variety of development projects including large-scale subdivisions and retirement villages, infrastructure projects (roading, electricity generation, a monorail, a cycle trail, wastewater treatment), irrigation projects and mining projects. I have been involved with several plan changes, including at Peninsular Bay in Wanaka, Estuary Estate at Mangawhai in Northland, Sailor's Rest in Coromandel and Drury East and Palliser Downs in Auckland.

Expert Witness Code of Conduct

11. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note dated 1 January 2023. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Involvement in project

- 12. I have been providing ecology advice relating to Waiaua Bay Farms Limited for eight years beginning in 2017. My earliest involvement was as a peer reviewer for the Far North District Council of an ecological assessment relating to an application for subdivision within the Kauri Cliffs property in 2016. Since then, I have provided assessments of effects of various activities including subdivision, construction of the water storage reservoir, wastewater discharge to land, and water takes, as well as site specific Environmental Management Plans.
- 13. I am also familiar with the property because I grew up in Kaeo and was friends with the Williams family (who then owned the land). The property was also where my great grandmother (Emily Stephenson/Tepene) was raised and spent her early adulthood.
- 14. My role in relation to the current rezoning proposal (the **Proposal**) has been to identify opportunities and constraints in relation to the Proposal, provide an Ecological Values Assessment for the proposed rezoning and consider the effects of the proposal. I was subsequently asked to provide a written brief of evidence and attend a hearing with the Far North District Council.

Purpose and scope of evidence

- 15. In this brief of evidence I will;
 - (a) Describe the ecological context and identify terrestrial ecological features and wetlands within the site and immediate surrounds;
 - (b) Assess the ecological values of the features identified; and
 - (c) Assess the appropriateness of the proposed rezoning from an ecological perspective.
- The technical assessment my team and I prepared (attached as Appendix A) informed the Kauri Cliffs Development Concept and Master Plan (2025) (Master Plan).

EXISTING ENVIRONMENT

- 17. The area proposed for rezoning is situated on pastoral farmland above coastal cliffs just south of Matauri Bay on Northland's east coast. The surrounding land uses include a mix of agriculture and exotic forestry interspersed with indigenous shrubland and forest, farmland, the Matauri Bay settlement and the Mahimahi halloysite clay mine. The terrain is often steep, particularly on coastal escarpments, with indigenous vegetation and exotic forestry often associated with steeper slopes.
- 18. The area was originally placed in the Eastern Northland and Islands Ecological District (ED) by McEwen (1987). This was later revised by Brook (1996) who placed it into the Kerikeri Ecological District. The Kerikeri ED is approximately 67,600ha including the northern Bay of Islands from Tauranga Bay in the north to Kawakawa, Ōtiria, and Opua in the south. It includes offshore islands between Whangaroa Harbour and Cape Wiwiki (Purerua Peninsula) as well as the inshore islands of the northern Bay of Islands and Kerikeri Inlet.
- 19. The natural vegetation within the Kerikeri Ecological District was mapped and briefly described by Conning and Miller (1999) including threatened special interest taxa. They concluded that natural areas constituted approximately 21% of the Kerikeri ED. Of these, 31% were forest, 52% shrubland, 7% estuarine, 4% freshwater wetlands, and 6% island habitats.
- 20. Species of conservation interest occurring in the ED are spotless crake (Porzana tabuensis), Australasian bittern (Botaurus poiciloptilus) and North Island fernbirds (Bowdleria punctata vealeae) which all inhabit wetlands. The district is also a stronghold of North Island brown kiwi (Apteryx mantelli). Several lizards have been recorded from the Kerikeri ED including forest gecko (Mokopirirakau granulatus), Pacific gecko (Dactylocnemis pacificus), elegant gecko (Naultinus elegans), Northland green gecko (Naultinus grayii), moko skink (Oligosma moco), shore skink (Oligosma smithii) and copper skink (Oligosoma aeneum). Pacific gecko are regarded as 'not threatened' and moko skink are 'At risk (relict)' the remainder of these species are classified as "At risk (declining)" (Hitchmough et al. 2021).

- 21. Waiaua Bay Farm was one of the first areas in New Zealand to be cleared for farming by Phillip Hansen King followed by George and Eleanor Stephenson and their descendants, the Leslie family. Farming was the predominant land use until halloysite clay was discovered in the 1940s, with what is now the Mahimahi clay mine established in approximately 1969. The Kauri Cliffs golf course and lodge opened in approximately 2000.
- 22. The Leslie family were heavily involved in logging in Whangaroa and much of the original forest on the property was removed during their tenure, although small remnants were retained and steep gullies and coastal areas have since regenerated with secondary forest.
- 23. Areas of natural vegetation in the Kerikeri ED were assessed and described by Conning & Miller (1999) in a Reconnaissance Survey Report of the ED for the Protected Natural Areas Programme (PNAP). Each site was named and assigned to one of two categories based on an assessment of vegetation and habitat values.
- 24. Two PNAP sites (Matauri Bay Bush, and Tepene Bush) comprising indigenous forest and shrubland were identified adjacent to the Master Plan area. These sites were later enlarged and identified as Potentially Significant Natural Areas (pSNAs) by Wildland Consultants Limited on behalf of the Far North District Council. The revised areas extend slightly into the area proposed for rezoning at some locations. These pSNAs have not been incorporated into the district plan. The pSNA sites are;
 - Matauri Bay Bush which surrounds much northern part (a) of the area proposed for rezoning with one separate fragment included within the Master Plan area and two other areas which overlap the edges. Matauri Bay Bush was considered a Level 1 (highest value) site by Conning and Miller (1999). The vegetation comprises a mixture of mānuka / kānuka shrubland, with frequent towai (Pterophylla sylvicola) and older broadleaf forest dominated by taraire (Beilschmiedia tarairi), sometimes codominant with pūriri (Vitex lucens) with frequent kahikatea (Dacrydium dacrydioides);

(b) Tepene Bush comprises four separate locations at the south of the area proposed to be rezoned and was considered a Level 2 (lower value) site by Conning and Miller (1999). The vegetation there is characterised by a canopy of tōwai, taraire and tōtara (Podocarpus totara) with occasional Pūriri, rimu (Dacrydium cupressinum), kahikatea and kauri (Agathis australis) with some large trees but a lack of understorey.

TECHNICAL ASSESSMENT

- 25. My Ecological Assessment was informed by a combination of field surveys undertaken between 2020 and 2023 for other proposals and a specific field survey of the area in December 2024. In addition, my team undertook desktop research including searches of herpetofauna, avifauna and bat databases.
- 26. The presence and extent of natural inland wetlands as defined by the National Policy Statement for Freshwater Management (2020) (NPS-FM) were determined during the 2024 survey, based on visual assessment of the vegetation present, soils and hydrological indicators.
- 27. In assigning ecological values I followed the approach outlined in the Environment Institute of Australia and New Zealand (EIANZ) Ecological Impact Assessments (EcIA) guidelines (Roper-Lindsay et al. 2018).
- 28. The area to be rezoned to the Golf Living sub-zone is predominantly comprised of pasture vegetation with small stands of native shrubland/forest and pine (*Pinus radiata*). The native stands were typically grazed and dominated by mature tōtara. Individual paddock trees, comprised of tōtara and native hardwoods such as pūriri (*Vitex luciens*) and kanuka (*Kunzea robusta*) were also present.
- 29. Five small pasture wetlands covering c. 0.3ha in total were identified. These were restricted to gullies. A short reach of two tributaries of Waiaua Stream and the associated riparian margin are within the area. These areas have existing farm crossings.

- 30. Approximately 1.9ha of Matauri Bay Bush and 3.4ha of Tepene Bush PNAP sites are within the area proposed to be zoned Golf Living. Vegetation within these areas was primarily composed of small stands of trees where livestock are not excluded. As a result, these areas lack palatable species and a normal understorey.
- 31. The forest and shrubland habitats within the area proposed for rezoning provide habitat for common indigenous birds, including North Island brown kiwi (Apteryx mantelli). They may also provide habitat for long-tailed bats (Chalinolobus tuberculatus) and lizards (primarily arboreal geckos and perhaps copper skinks (Oligosoma aeneum).
- 32. The pasture was assessed has having 'Negligible' ecological value with the stands of tōtara within the pasture having 'Low' ecological value, along with the grazed fragments of Matauri Bay Bush and Tepene Bush. Wetlands as a habitat type are rare in the Kerikeri ED, but the wetlands within the proposed Golf Living sub-zone are small, isolated and dominated by exotic vegetation and are therefore considered to have 'Moderate' ecological value. If bats were confirmed to be present, the value of these habitats would be 'Very High' because of their 'Threatened Nationally Critical' conservation status. If lizards were present that would also likely elevate the value of the forest remnants.

POTENTIAL EFFECTS OF THE PROPOSED REZONING

- 33. The potential effects of residential development of the Golf Living sub-zone include effects on wetlands and streams, effects on wildlife and effects on habitat values due to vegetation clearance.
- 34. Specifically, these include:
 - (a) Loss in extent or values of wetlands due to either earthworks (removal, sedimentation) or altered hydrology (increased site imperviousness, increased stormwater inputs, altered groundwater).
 - (b) Increased sedimentation, erosion and contamination of waterways and coastal receiving environment due to earthworks and increased impervious surfaces.

- (c) Loss of aquatic habitat, reduced fish passage and injury/mortality to fish arising from stream works associated with the construction of a bridge or culverts.
- (d) Loss of indigenous vegetation resulting in a loss of habitat for fauna.
- (e) Disturbance and modification of behaviour of avifauna and bats as a result of increased artificial lighting at night,
- (f) Increased vehicle traffic and human activity which can disturb wildlife. In particular increased vehicle movements pose a mortality risk to kiwi as a result of vehicle collision.
- (g) Increased ingress of exotic weeds from gardens into to nearby natural vegetation.
- (h) Increased domestic pest (cats and dogs) which can result in an increase in predation of native birds, bats and lizards.
- Increased presence of vermin such as rodents (rats and mice), which also prey on native species and affect natural ecological processes such as seed set and germination.
- 35. In my opinion, whilst the potential effects set out above are possible, the area proposed for rezoning has avoided the highest value ecological areas (the forests, shrublands, coastal areas and any wetlands with indigenous vegetation).
- 36. The amendments to the development standards (specifically KCZ-S1 and KCZ-S2) and the zone provisions recommended by Mr Tuck specifically address ecological matters including the extent to which any future proposal avoids, remedies or mitigates adverse effects on ecological values and the extent to which ecological values are protected and enhanced as part of the proposal. There are also district wide provisions relating to indigenous vegetation clearance and earthworks that would need to be considered. On that basis, the area is suitable for residential development. Incorporating appropriate zone provisions and resource consent conditions

as part of subsequent subdivision processes would ensure that any future housing development is sensitive to the ecological values present within and around the proposal and that the effects identified above can be avoided, remedied or mitigated so that the level of effects is acceptable.

37. The removal of livestock from the area which is currently farmed would have positive effects on vegetation and particularly wetlands, where pugging, trampling and grazing would be removed. The extent of landscape and amenity planting likely to result from such a proposal could also have positive ecological effects resulting in an increase in the area of indigenous vegetation and an overall improvement in ecological quality.

MITIGATION MEASURES

- 38. The potential effects of any future development on the highest value features could be managed via the implementation of the effects management hierarchy as follows:
 - (a) Avoidance
 - i. the ecological features are discreet and located near the periphery of the area proposed for rezoning. Some are located in gullies and/or on steep slopes. Future development could easily avoid these areas, as shown by the indicative configuration shown in the Master Plan.
 - ii. Some effects on the Waiaua Stream due to construction of crossings can be avoided by appropriate timing of works.
 - iii. Effects on fish passage can be avoided by the use of bridges.
 - iv. Potential adverse effects on indigenous fauna using the surrounding habitats (forest, coastal areas) could be avoided by prohibiting (via covenant) future residents of dwellings within the Master Plan area from

keeping domestic pet species which pose a threat to native wildlife.

- (b) Remediation
 - i. Any removal of small areas of vegetation could be remedied by revegetation planting.
 - ii. Where culverts might affect fish passage, these can be remedied via appropriate installation of culverts.
 - iii. Increases in vermin and weeds can be remedied via appropriate pest and weed control, e.g., via effective implementation of management plans.
- (c) Minimisation
 - i. Effects due to lighting and increased traffic can be minimised via appropriate controls such as type, direction and timing of lighting and speed of vehicles.
 - Use of water sensitive site design principles would allow for maximum opportunity for infiltration of run off and stormwater to maintain local hydrology.

CONCLUSIONS AND RECOMMENDATIONS

39. It is my view that the area proposed to be included in the Golf Living sub-zone, as shown in the Master Plan is suitable for the proposed rezoning since the area contains vegetation and habitats of relatively low ecological value with the higher value habitats mostly outside the area. Where higher value areas occur within the proposed Golf Living sub-zone they are confined to a small proportion of the site, typically near the edge, and could easily be avoided. Where these areas of higher ecological value occur, I consider that the potential effects arising from any future subdivision and residential development can be adequately managed through appropriate zone provisions and subsequent resource consent conditions. With appropriate management measures the ecological effects of future development will likely be negligible, and may be positive, depending on the extent and nature of any planting and other ecological management proposed.

Dr Gary Bramley

2 May 2025

APPENDIX A – TECHNICAL ASSESSMENT

ecoLogical Solutions Environmental Consultants



May 2025

Kauri Cliffs Master-planning Ecological Assessment

Submitted to: Waiaua Bay Farm Limited



Quality Assurance

This report has been prepared and reviewed by the following:

Prepared by: Dr Gary Bramley

Reviewed by: Ri

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Status:

Final

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Table of Contents

1.0	Introduction1				
1.1	Background and Scope 1				
2.0	Ecological Setting				
2.1	Terrestrial Ecology				
3.0	Methodology				
3.1	Introduction	6			
3.2	Terrestrial Ecology	6			
	3.2.1 Terrestrial Vegetation	6			
	3.2.2 Herpetofauna	6			
	3.2.3 Avifauna	6			
3.3	Wetlands	6			
3.4	Method for Assigning Ecological Values7				
4.0	Terrestrial Ecology Features	7			
4.1	Vegetation				
4.2	Avifauna 12				
4.3	Herpetofauna				
4.4	Bats1				
5.0	Freshwater Ecology Features14				
6.0	Ecological Values1				
7.0	Conclusion1				
8.0	References18				

Index to Tables

Table 1:	Bird species of conservation concern recorded within 10 km of the site (Robertson et al. 2021).	13
Table 2.:	Conservation status of herpetofauna potentially present (Hitchmough et al. 2021).	14
Table 3. Sur	mmary of terrestrial ecological values following the approach in EcIA guideline	es. 16
Index to	Figuros	

Index to Figures

Figure 1:	Location of the proposed master plan area (Golf Living Subzone) within Kauri			
	Cliffs property.	2		
Figure 2:	Location of proposed Significant Natural Areas in relation to the Site.	5		
Figure 3:	Pasture vegetation with pine and totara trees.	8		



Figure 4:	Part of pSNA Matauri Bay Bush viewed from the proposed master plan area	. 8
Figure 5.	Riparian margin of Waiaua Stream tributary (Matauri Bay Bush pSNA).	9
Figure 6:	Pasture vegetation with mature stand of totara trees (part of Matauri Bush pSNA) within proposed masterplan area.	9
Figure 7.	Indigenous pasture trees and fragment of Tepene Bush pSNA.	10
Figure 8.	Pasture wetland in gulley within master plan area.	10
Figure 9:	High value vegetation and wetlands within the proposed master plan area.	11
Figure 10.	Reach of Waiaua stream tributary on site.	15



1.0 Introduction

1.1 Background and Scope

Waiaua Bay Farm Limited ('**WBFL**') is the owner of a property (Kauri Cliffs) located at 139 Tepene Tablelands Road, Matauri Bay which comprises approximately 2,430 ha and includes an area of drystock farm, conservation areas and the internationally ranked Kauri Cliffs Golf Course and tourist lodge. In 2022, WBFL made submissions on the Proposed Far North District Plan ('**Proposed Plan**') and sought to establish a framework to enable future master-planned development at Kauri Cliffs as part of a proposed plan change. In particular WBFL sought to:

- Reconfigure areas zoned for lodge, golf and future residential activities; and
- Update the Proposed Plan's existing bespoke policy and rule framework for Kauri Cliffs into a form that more appropriately provides for the consenting of future development and subdivision.

Ecological Solutions Limited (ESL) was retained to identify and summarise the relevant ecological considerations which would influence the master plan, particularly the future housing area (Golf Living Subzone) shown in Figure 1.





Figure 1: Location of the proposed master plan area (Golf Living Subzone) within Kauri Cliffs property.



2.0 Ecological Setting

2.1 Terrestrial Ecology

The site is located within the Eastern Northland and Islands Ecological District (ED) of the Eastern Northland Ecological Region by McEwen (1987). McEwen's delineation of ecological districts was revised by Brook (1996) who placed the area in the Kerikeri ED which covers approximately 67,600 ha centred on the Bay of Islands (Conning and Miller 1999). The Kerikeri ED adjoins the Whangaroa ED in the north, Kaikohe and Puketi EDs in the west and Whangaruru and Tangihua EDs to the south. The ED extends from Tauranga Bay in the north to Kawakawa, Ōtiria, and Opua in the south and includes offshore islands between Whangaroa Harbour and Cape Wiwiki (Purerua Peninsula) as well as the inshore islands of the northern Bay of Islands and Kerikeri Inlet (Conning and Miller 1999).

Conning and Miller (1999) mapped and briefly described most of the areas of indigenous natural vegetation within the Kerikeri Ecological District and also provided an analysis of the main vegetation types as well as information on threatened species and other taxa of scientific interest present. They concluded that natural areas constituted approximately 21% of the Kerikeri ED. Of these, 31% were forest, 52% shrubland, 7% estuarine, 4% freshwater wetlands, and 6% island habitats. A high degree of fragmentation is a feature of many of the habitats in the Kerikeri ED with almost no original coastal vegetation remaining. Despite this, the Kerikeri ED has one of the highest densities of North Island brown kiwi (*Apteryx mantelli*) known.

Conning and Miller (1999) identified a number of constructed ponds and associated wetlands, as well as natural raupō (*Typha orientalis*) wetland areas throughout the Kerikeri ED (particularly on the Purerua Peninsula) which they considered to have high value as wildlife habitat, and their protection and restoration was recommended. Within the Kerikeri ED, wetland areas provide important habitat for spotless crake (*Porzana tabuensis*), Australasian bittern (*Botaurus poiciloptilus*) and North Island fernbirds (*Bowdleria punctata vealeae*) as well as refugia for North Island brown kiwi (*Apteryx mantelli*) during droughts. All of these bird species are regionally or nationally significant species of conservation interest. Constructed ponds are also potential habitat for brown teal (pateke, *Anas chlorotis*) and dabchick (*Poliocephalus rufopectus*), both of which occur in adjoining EDs and are also regionally significant species of conservation interest.

Several reptile species have been recorded from the Kerikeri ED including forest gecko (*Mokopirirakau granulatus*), Pacific gecko (*Dactylocnemis pacificus*), elegant gecko (*Naultinus elegans*), Northland green gecko (*Naultinus grayii*), moko skink (*Oligosma moco*), shore skink (*Oligosma smithii*) and copper skink (*Oligosoma aeneum*). Pacific gecko are regarded as 'not threatened' and moko skink are 'At risk (relict)' the remainder of these species are classified as "At risk (declining)" (Hitchmough et al. 2021).

Having evaluated the sites with indigenous vegetation throughout the district, Conning and Miller (1999) grouped them according to two levels of ecological significance, with Level 1 sites being of the highest ecological value and Level 2 sites supporting populations of indigenous flora and fauna, but of generally lower ecological value than Level 1 sites. There are both Level 1 and Level 2 sites identified within the Gold Living Subzone; Matauri Bay Bush (Site P05/075) and Tepene Bush (Site P04/077). Tepene Bush (Site P04/077 was considered a Level 2 site (Conning and Miller 1999).

Matauri Bay bush comprises a mixture of mānuka / kānuka shrubland, with frequent towai. Older broadleaf forest dominated by taraire, sometimes codominant with pūriri (*Vitex lucens*) with frequent kahikatea (*Dacrydium dacrydioides*) was also present. At Tepene Bush the vegetation was characterised by towai, taraire and tōtara. Pūriri, rimu (*Dacrydium cupressinum*), kahikatea and kauri (*Agathis australis*) also occurred in the canopy, and kiwi



were present in 1999.

More recently, Far North District Council engaged Wildland Consultants Limited to undertake identification and delineation of Potentially Significant Natural Areas (**'pSNAs'**) throughout the Far North district. The proposed master plan area adjoins and includes small portions of two of the pSNAs identified, Matauri Bay Bush, and Tepene Bush. Omahanui is located adjacent to the site to the south while Takou Bay Estuary and Mahimahi are areas approximately 800m away as shown in Figure 2.

The proposed master plan area drains to Waiaua Bay via several small tributaries of the Waiaua Stream and to Takou Bay via tributaries of the Hikurua River.





Figure 2: Location of proposed Significant Natural Areas in relation to the Site.



3.0 Methodology

3.1 Introduction

Ecological assessments undertaken to inform the proposed plan change and resultant master plan included desktop research and field surveys. The following sections describe the methods applied during the ecological surveys.

Field surveys throughout parts of the property associated with other activities were undertaken between 2020 and 2023. A specific survey of the proposed master plan area undertaken in December 2024, during which the proposed master plan area was explored and vegetation composition, value, structure, and integrity was mapped in accordance with relevant district and regional council policies and rules. Any rare and threatened flora species (if encountered) were documented.

3.2 Terrestrial Ecology

3.2.1 Terrestrial Vegetation

Terrestrial vegetation and fauna features were surveyed using a series of walkthrough surveys. Photographs were taken to supplement the vegetation descriptions. A handheld Garmin 62s GPS was used during the site visits and locations of interest were recorded as waypoints and the track for each visit was also recorded.

3.2.2 Herpetofauna

Hand-searching of suitable habitats including rank grass, old stumps and remnant totara vegetation was used to locate lizards during the site visits. Field data was supplemented with herpetofauna records (Department of Conservation Bioweb database).

3.2.3 Avifauna

Birds identified visually and audibly were recorded across the site, including native and introduced species. Field data was supplemented with records downloaded from the New Zealand eBird database.

3.3 Wetlands

The presence and extent of natural inland wetlands as defined by the NPS-FM were determined during walk through surveys, based on visual assessment of hydric indicators.

Clause 3.21 of the NPS-FM defines 'natural inland wetland to mean:

"a wetland (as defined in the Act¹) that is not:

- (a) in the coastal marine area; or
- (b) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland; or
- (c) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or
- (d) a geothermal wetland; or





¹ Resource Management Act 1991. Wetland includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.

- (e) a wetland that:
 - (i) is within an area of pasture used for grazing; and
 - (ii) has vegetation cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species using the Pasture Exclusion Assessment Methodology (see clause 1.8)); unless
 - (iii) the wetland is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case the exclusion in (e) does not apply".

3.4 Method for Assigning Ecological Values

Terrestrial ecological values were assigned following the approach outlined in the Environment Institute of Australia and New Zealand (EIANZ) Ecological Impact Assessments (EcIA) guidelines (Roper-Lindsay et al. 2018). The EcIA guidelines outline a standardised approach for assessing ecological values. The approach involves assessing the site against four matters including representativeness, rarity/ distinctiveness, diversity and pattern and ecological context with consideration of the attributes outlined in Table 4 and 7 of the EcIA guidelines. Overall value is assigned to a feature based on the four matters listed above and the scoring system provided in Table 6 of the EcIA guidelines.

4.0 Terrestrial Ecology Features

4.1 Vegetation

The majority of the proposed masterplan area comprised pasture vegetation with small stands of Pine (*Pinus radiata*) and native shrubland/forest. Within the pasture areas were individual trees and small stands, typically comprising totara (*Podocarpus totara*), pūriri (*Vitex lucens*), kānuka (*Kunzea robusta*), and Pine (Pinus radiata) which were providing livestock shade and shelter, and had a pasture understorey as shown in Figure 6. Extensive indigenous forest is present around the boundary of the site in the Matauri Bay Bush and Tepene Bush pSNAs as shown in Figure 4. Small portions containing edge and fragments of pSNAs are also included in three locations as follows;

- a short reach of riparian margin of two tributaries of Waiaua Stream, with existing stream crossings Figure 5(0.5 ha of Matauri Bay Bush pSNA).
- the stand of mature totara trees shown in Figure 6(1.4 ha of Matauri Bay Bush pSNA) and,
- three small fragments of Tepene Bush (total 3.4 ha) as shown in Figure 7.





Figure 3: Pasture vegetation with pine and totara trees.



Figure 4: Part of pSNA Matauri Bay Bush viewed from the proposed master plan area.





Figure 5. Riparian margin of Waiaua Stream tributary (Matauri Bay Bush pSNA).



Figure 6: Pasture vegetation with mature stand of totara trees (part of Matauri Bush pSNA) within proposed masterplan area.





Figure 7. Indigenous pasture trees and fragment of Tepene Bush pSNA.

Wetlands and more intact areas of indigenous vegetation were typically associated with gullies and steep slopes respectively. The small pasture wetland shown in Figure 8 is typical of the five wetlands identified. The total area of wetlands identified total 0.3 ha, a small portion of the 83.7 ha site. Locations of higher value areas of indigenous vegetation and wetlands within the proposed master plan area are shown in Figure 9.



Figure 8. Pasture wetland in gulley within master plan area.





Figure 9: High value vegetation and wetlands within the proposed master plan



area.

4.2 Avifauna

Ebird records within 10 km of the WBFL property included 1,362 records of 65 species including 25 introduced and naturalised species and 40 native species. Of the native species, five were pelagic (ocean going) seabirds, ten were coastal birds (gulls, penguins, godwit), eight were aquatic species (ducks, shags and the like) and 17 species of open habitats, shrublands or forest. Several bird species of conservation concern have been recorded within 10 km of the site (Table 1). They are mostly coastal species but some species may potentially be using the nearby reservoir and wetland areas.

No threatened or at-risk bird species were observed during the field visits, although ducks thought to be mallard (*Anas platyrhyncos*) / grey duck (*Anas superciliosa*) hybrids were seen on the existing reservoir nearby on several occasions. Grey duck are an indigenous, threatened ('nationally vulnerable' - Robertson et al. 2021) species and hybridise with the exotic mallard, which is one of the main threats to grey duck populations. Seven other native bird species, some of which are self-introduced into New Zealand, and four introduced bird species were recorded (i.e., a total of 11 bird species). The bird species most commonly recorded were the native paradise shelduck (*Tadorna variegata*) and the introduced skylark (*Alauda arvensis*).

The wet areas such as pasture in and surrounding the wetlands identified in Figure 9 may afford feeding habitat for birdlife including North Island brown kiwi during drought conditions, although these areas are without cover and located some distance from preferred kiwi habitat. North Island brown kiwi are present at Kauri Cliffs and have recently had their conservation status revised to 'not threatened' (Robertson et al. 2021).





Common name	Latin name	Conservation status	
Banded dotterel	Charadrius bicinctus	At Risk – Declining	
Bar-tailed Godwit	Limosa lapponica	At Risk – Declining	
Black Petrel	Procellaria parkinsoni	Threatened – Nationally Vulnerable	
Black Shag	Phalacrocorax carbo	At Risk – Relict	
Caspian Tern	Hydroprogne caspia	Threatened – Nationally Vulnerable	
Fluttering Shearwater	Puffinus gavia	At Risk – Relict	
Grey Duck	Anas superciliosa	Threatened – Nationally Vulnerable	
Little Black Shag	Phalacrocorax sulcirostris	At Risk – Naturally Uncommon	
Little Penguin	Eudyptula minor	At Risk – Declining	
Little Shag	Microcarbo melanoleucos	At Risk – Relict	
New Zealand Dotterel	Charadrius obscurus	At Risk – Recovering	
New Zealand Pipit	Anthus novaeseelandiae	At Risk – Naturally Uncommon	
Pacific Reef Heron	Egretta sacra	Threatened – Nationally Endangered	
Pied Shag	Phalacrocorax varius	At Risk – Recovering	
Red-billed Gull	Chroicocephalus novaehollandiae	At Risk – Declining	
South Island Pied Oystercatcher	Haematopus finschi	At Risk – Declining	
Spotless Crake	Zapornia tabuensis	At Risk – Declining	
Variable Oystercatcher	Haematopus unicolor	At Risk – Recovering	
White-fronted Tern	Sterna striata	At Risk – Declining	

Table 1:Bird species of conservation concern recorded within 10 km of the site
(Robertson et al. 2021).

4.3 Herpetofauna

A search of the Bioweb Herpetofauna database returned five records within 10 km of the site, all of shore skink (*Oligosoma smithi*). As the name suggests, shore skinks occupy coastal habitats and can extend up to 200 metres into back dune habitats. They often use washed up debris as refugia. There were no lizard records within the site. Other species possibly present in the area include Northland green gecko (*Naultinus grayii*) and copper skink (*Oligosoma aeneum*), pacific gecko (*Dactylocnemis pacificus*) Table 2.

No lizards were observed during the suitable habitat searches. Suitable habitat noted and searched included coastal areas (shore skink) rank grass and debris piles (Copper skink, shore skink nearer the coast), native forest and shrubland (Pacific gecko and Northland green gecko).



Common name	Latin name	Conservation status
Copper skink	Oligosoma aeneum	At Risk – Declining
Northland green gecko	Naultinus grayii	At Risk – Declining
Pacific gecko	Dactylocnemis pacificus	Not Threatened
Shore skink	Oligosoma smithi	At Risk – Declining

Table 2.:Conservation status of herpetofauna potentially present (Hitchmough
et al. 2021).

4.4 Bats

Both long-tailed (*Chalinolobus tuberculatus*) and northern lesser short-tailed (*Mystacina tuberculata*) bats are known to inhabit Puketī – Ōmahuta forest Approximately 20 km to the east. Long-tailed bats (Threatened - Nationally Critical (O'Donnell et al. 2023)) could potentially utilise the site for foraging, commuting or roosting, while the lesser short-tailed bat (Threatened – Nationally Vulnerbale (O'Donnell et al. 2023) is not expected to utilise the site due to their preference for interior forest habitats. There are no known records of bats within the site. No acoustic bat or potential roost risk surveys were undertaken as part of this assessment.

5.0 Freshwater Ecology Features

Short reaches of two small tributaries of Waiaua Stream occur within within the site. These streams emerge from and flow into indigenous forest of the Matauri Bay Bush pSNA either side of a narrow (approximately 50 m) span of the site. The streams are permanent, have a gravel and sand bottom with some bedrock. They are well shaded in the forest both upstream and downstream as shown in Figure 10. The streams are crossed by farm tracks for vehicle and stock access in the master plan area.





Figure 10. Reach of Waiaua stream tributary on site.

6.0 Ecological Values

The ecological values on site range from Negligible to Moderate. The areas of ecological interest are primarily associated with forest fragments, wetlands and edges of bordering pSNAs. Apart from the wetlands, forest edges and fragments identified in Figure 9, vegetation cover primarily comprised of pasture with occasional individual native or exotic specimen trees with overall negligible ecological value.

Habitat value for fauna values Low for herpetofauna and Moderate for avifauna and bats. The value of ecological features noted are summarised in Table 3.





able 3. Summary of terrestria	l ecological values followi	ng the approach in EcIA guidelines.
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Feature	Representativeness	Rarity and Distinctiveness	Diversity and pattern	Ecological Context	Overall value	Comments
Pasture vegetation - grassland	Very low	Very low	Very low	Very low	Negligible	Vegetation does not represent any native ecosystem type. It is exclusively exotic and is neither rare, threatened nor distinctive.
Pasture vegetation – stand of pine/tōtara	Low	Low	Low	Low	Low	Stand mixed exotic/native trees dominated by tall pine with young tōtara and grazed understorey. Low diversity vegetation, providing limited habitat for native fauna.
Pasture vegetation – Matauri Bush and Tepene Bush pSNA fragments	Moderate	Moderate	Moderate	Moderate	Moderate	Representative of canopy tiers only of seral indigenous forest.
Avifauna	Moderate	Low	Moderate	Low	Moderate	Habitat value for avifauna was considered moderate. Habitat provided within master plan area for common native forest birds in stands of tōtara and more extensively in adjacent forest.
Herpetofauna	Moderate	Low	Low	Low	Low	Habitat value for herpetofauna overall was considered low, though some suitable habitat for herpetofauna exists in rank grass, debris piles and stands of trees.
Bats	Moderate	Moderate	low	Moderate	Moderate	Habitat value for bats was considered moderate. It is considered possible that Long-tailed bats use stands of trees for commuting and roosting and forage within the pasture.



7.0 Conclusion

The proposed master plan area contains primarily pasture vegetation of Negligible ecological value, though it is bordered by and includes small portions Matauri Bay Bush and Tepene Bush pSNAs. In addition, two short reaches of stream and five small pasture wetlands are present. The features of ecological interest identified on site are confined to these discrete areas, which may be less desirable for development. It appears feasible for future subdivision and residential to avoid impacting these areas. If avoidance of these areas is not possible, then the low to moderate value of the ecological features present indicates that with appropriate management measures, the ecological effects of future development will likely be minimal.



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