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Tauranga City Council
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20 March 2025

Attention: s 7(2)(f)(ii)

Dear s 7(2)(f)(ii)

Ecological Impact Assessment Addendum - Mauao Placemaking Improvements

Beca Limited (Beca) prepared an Ecological Impact Assessment (EcIA) for Phase 3 of the Mauao Placemaking Project in 2022, supporting an associated resource consent application (RC29066).

Beca was engaged by Tauranga City Council in 2025 to provide an EcIA addendum to support a new proposal for additional seating, fencing, and a storytelling Pou on Mauao as part of the project, following a Section 92 request. This letter serves as the ecological assessment addendum and evaluates the effects of the proposed additional activities. The original EcIA is appended to this letter.

1.1 Site Context and Proposed Additional Works

Mauao is recognised as a Special Ecological Area (SEA) and an Indigenous Biological Diversity Area in the coastal environment due to its diverse and uncommon coastal forest types and significant wildlife values. The SEA is divided into two areas:

- Mauao 1 (SEA No. 7, Category 1): Dominated by pōhutukawa forest with various indigenous scrub and tree land types on the western slopes.
- Mauao 2 (SEA No. 32, Category 2): Contiguous with Mauao 1, featuring smaller forested areas primarily on the lower southern and eastern slopes.

The new proposal includes eight additional features: three benches, four palisade fencing sites, and one storytelling Pou with adjacent fencing (**Figure 1**). Some of these features (1, 2, 3 and 5) fall within designated SEAs and require consent under the City Plan as either:

- A Discretionary Activity for structures within a Category 2 SEA (Rule 5A.7), or
- A Non-Complying Activity for new structures within a Category 1 SEA (Rule 5A.8).

Fencing at the storytelling Pou site (Feature 2) has already been consented under RC29066 (Phase 3), though fencing is now proposed to cover a smaller area. However, the addition of a storytelling Pou at Location 2 requires additional consent.

Installation methods include ground screws for most features. At Feature 5, the fence will replace an existing post-and-wire/stock fence and may be installed by driving fence posts into the existing holes instead of using ground screws. No vegetation removal has been proposed for the additional features.

Figure 1: Approximate location of eight additional features and SEA Areas

1.2 Purpose and Scope

The purpose and scope of this addendum includes:

- A review of the EcIA (Beca, 2022) and supplied proposed construction methodology and plans.
- A site visit to the locations of proposed additional works and features to undertake rapid habitat assessment(s).
- A review of ecological characteristics of the proposed areas in the additional feature areas.
- An assessment of ecological effects associated with the proposed additional features and recommended management options.

1.3 Site Visit

A site visit was conducted by a Beca Ecologist on 12th March 2025 to observe proposed sites for additional feature development. Weather was warm and partly cloudy. Photos of the site visit are presented in **Appendix A**.

1.3.1 Terrestrial Vegetation Assessment

Terrestrial habitat assessments were completed in adherence to EcIA methods.

1.3.2 Fauna Presence Assessment

Any avifauna and herpetofauna species observed during the site visit were recorded.

1.4 Ecological Values

1.4.1 Vegetation at Additional Feature Sites

The forest types that form the vegetation at or surrounding the proposed additional feature sites mainly consist of pasture / exotic grass, VS1: Pōhutukawa scrub / forest, CL1: Pōhutukawa treeland / flaxland / rockland, VS4 Mānuka scrub, and exotic scrub. The ecological value assessment of the terrestrial vegetation at each site is outlined below in **Table 1**. The assessment took into consideration the wider vegetation at each feature site on Mauao, as although physical works are limited to each feature site, with predominantly gravel or exotic grass areas, the zone of influence is considered to extend to the wider area (an approximate 20m buffer was considered). Site photos are provided in **Appendix A.**

Table 1: Summary of the ecological value assessment for terrestrial vegetation at each additional feature site (see appended EcIA for classification and assessment criteria).

Feature Site	Description of Dominant Vegetation	Vegetation Classification	Attribute Assessment	Ecological Value
1. Bench	Feature site: Gravel area. Immediately surrounded by: *Native* Kānuka (*Kunzea robusta*, Not Threatened[1]), regenerating pōhutukawa (*Metrosideros excelsa*, Not Threatened), tauhinu (*Ozothamnus leptophyllus*, Not Threatened), New Zealand (NZ) flax (*Phormium tenax*, Not Threatened). *Exotic*	VS1: Pōhutukawa scrub / forest	**Representativeness: Moderate** • A mix of exotic and native species. • Modifications for an existing sculpture and walking track. **Rarity / distinctiveness: Moderate** • Mostly common native species. **Diversity and pattern: High** • Contributes to sequence of pōhutukawa and native scrub forest types. **Ecological context: High** • Part of SEA 1 and contributes to the wider ecological network of pōhutukawa scrub / forest vegetation. • Provision of indigenous habitat and ecological corridor for native avifauna and herpetofauna.	**High**

[1] All species conservation status determined using the New Zealand Threat Classification System https://nztcs.org.nz/nztcs-species-search

	Tree heath (*Erica arborea*), gorse (*Ulex europaeus*), Portuguese heath (*Erica lusitanica*), *Morelotia affinis*, pampas grass (*Cortaderia selloana*), other exotic grasses			
2. Pou	Site location dominated by exotic grasses in a mown path: creeping bent (*Agrostis stolonifera*), paramatta grass (*Sporobolus africanus*), kikuyu grass (*Cenchrus clandestinus*), sweet vernal grass (*Anthoxanthum odoratum*), dallis grass (*Paspalum dilatatum*). Regenerating native Mānuka (*Leptospermum scoparium*, Not Threatened) scrub present in the area (low stature ~1.5 m tall). Other species include, Portuguese heath, tauhinu, gorse, pōhutukawa.	Pasture / exotic grass VS4 Mānuka scrub Exotic Scrub	**Representativeness: Moderate** • The species assemblage of the dense vegetation area is not typical of mānuka or indigenous scrubland, due to the high proportion of exotic species (primarily grasses). • Modifications include gravel path and mown grass path, separating the scrub from wider native vegetation **Rarity / distinctiveness: Moderate** • Mostly common native or exotic species. **Diversity and pattern: Low** • Limited contribution to sequence of Mānuka scrub dominated forest types. **Ecological context: High** • Part of SEA 1 and contributes to the wider ecological network of scrubland vegetation. • Provision of indigenous habitat and ecological corridor for avifauna and at risk and/or threatened herpetofauna.	**Moderate**
3. Bench	Gravel area. Immediately surrounded by NZ flax, pōhutukawa, dallis grass, bermuda grass (*Cynodon dactylon*), paramatta grass.	CL1: Pōhutukawa treeland / flaxland / rockland	**Representativeness: Low** • Major modifications with benches, walking paths, and steps which separates the pōhutukawa and flaxes from the wider forest. **Rarity / distinctiveness: Moderate** • Dominated by native species, though exotic species present. **Diversity and pattern: High** • Contributes to sequence of pōhutukawa dominated forest types. **Ecological context: High** • Part of SEA 1 and contributes to the wider ecological network of pōhutukawa treeland / flaxland / rockland vegetation. • Provision of habitat and ecological corridor for avifauna and herpetofauna species	**High**
4. Fence	Gravel path/road, dominated by exotic kikuyu grass (short).	Pasture / exotic grass	**Representativeness: Very low** • Dominated by exotic species, and highly modified for farming and walking tracks.	**Negligible**

	Site contains planted NZ flax.		**Rarity / distinctiveness: Very low** • Mostly open areas of exotic grass. **Diversity and pattern: Very Low** • Lack of diversity and pattern **Ecological context: Very low** • Little to no contribution to wider surrounding forests.	
5. Fence	Dominated by exotic grasses (short and medium length) on upper hill side, with planted natives present downhill of existing fence line. *Exotic:* Kikuyu grass, Yorkshire fog grass (*Holcus lanatus*), creeping thistle (*Cirsium arvense*), *Planted and regenerating natives near existing fence line:* NZ flax, cabbage tree (*Cordyline australis*, Not Threatened), Puriri (*Vitex lucens,* Not Threatened). Includes one notable puriri tree >5m tall.	Pasture / exotic grass Planted native area	**Representativeness: Low** • Dominated by exotic species, and highly modified for farming and walking tracks. However, regenerative native vegetation is present. **Rarity / distinctiveness: Low** • Mostly open areas of exotic grass. **Diversity and pattern: Low** • Limited diversity and pattern. **Ecological context: Moderate** • Part of SEA 2 and provides some contribution to wider surrounding forests. • Ecological contribution will continue to increase as an ecological corridor for avifauna and herpetofauna.	**Low**
6. Bench	Dominated by short kikuyu grass.	Pasture / exotic grass	**Representativeness: Very low** • Dominated by exotic species, and highly modified for farming and walking tracks. **Rarity / distinctiveness: Very low** • Mostly open areas of exotic grass. **Diversity and pattern: Very Low** • Lack of diversity and pattern **Ecological context: Very low** • Little to no contribution to wider surrounding forests.	**Negligible**
7. Fences	Paved road and rock wall, including NZ flax, kikuyu grass, and umbrella sedge (*Cyperus eragrostis*)	Pasture / exotic grass CL1: Pōhutukawa treeland /	**Representativeness: Low** • Highly modified area (paved), high presence of exotic species, though native flaxes are present **Rarity / distinctiveness: Low** • Mostly common native or exotic species.	**Low**

		flaxland / rockland	• Some potential to provide habitat for avifauna and herpetofauna. **Diversity and pattern: Low** • Limited diversity and pattern. **Ecological context: Low** • Little to no contribution to wider surrounding forests. • Some habitat provision for avifauna and herpetofauna.	
8. Fences	Dominated by short exotic grasses and boulders, including St. Augustine grass (*Stenotaphrum secundatum*) and veldt grass (*Ehrharta erecta*). Surrounding area cotains: Pōhutukawa, Kawakawa (*Piper excelsum*, Not Threatened), Mirror bush (*Coprosma repens,* Not Threatened), Karo (*Pittosporum crassifolium*, Not Threatened).	Pasture / exotic grass CL1: Pōhutukawa treeland / flaxland / rockland	**Representativeness: Low** • Highly modified area (wooden paths, steps), high presence of exotic species, though native mature native species are present resembling natural habitat **Rarity / distinctiveness: Low** • Mostly common native or exotic species. • Habitat for avifauna and herpetofauna. **Diversity and pattern: Moderate** • Contributes to sequence of pōhutukawa dominated habitat **Ecological context: High** • Contributes to the wider ecological network of pōhutukawa treeland / flaxland / rockland vegetation. • Provision of habitat and ecological corridor for avifauna and herpetofauna species	**Moderate**

1.4.2 Fauna

1.4.2.1 Avifauna

As detailed in the EcIA, Mauao hosts a wide range of native avifauna. However, it is expected that only a small subset of these species will be present at each additional feature site. The ecological value and key species potentially impacted by the additional feature sites or proposed feature installation are discussed and summarised in **Table 2**, considering species identified in the EcIA and a 20m zone of influence buffer. No nests were identified during the site visit.

Table 2: Summary of the species ecological value assessment for avifauna at each additional feature site (see appended EcIA for classification and assessment criteria).

Feature Site	Avifauna Habitat Description and Availability	Potential Species Present	Ecological Value
1. Bench	• Welcome swallows (*Hirundo neoxena,* Not Threatened) observed around site. • Surrounding scrub vegetation is likely to be utilised by various native avifauna for nesting and roosting. This could include North Island robin (*Petroica longipes,* At-	Forest and scrubland birds, possibly At-Risk species	**High**

	Risk – Declining). However, there is an ongoing, background disturbance by pedestrians using the walkway.		
2. Pou	• Welcome swallows observed around site. • Regenerative surrounding scrub vegetation provides habitat and potential nesting sites for native avifauna. This could include North Island robin. However, there is an ongoing, background disturbance by pedestrians using the walkway.	Forest and scrubland birds, possibly At-Risk species	**High**
3. Bench	• Welcome swallows observed around site. • Surrounding Pōhutukawa treeland / flaxland / rockland vegetation is likely to be utilised by native avifauna for nesting and roosting. This could include North Island robin. However, there is an ongoing, background disturbance by pedestrians using the walkway.	Forest and scrubland birds, possibly At-Risk species	**High**
4. Fence	• Silvereyes (*Zosterops lateralis,* Not Threatened) observed around site. • The site is dominated by an open area of exotic grass, with an ongoing, background disturbance by pedestrians using the walkway/road. • As there are forest and coastal habitats in the wider surroundings, some avifauna may visit the site, including North Island robin, but this would be transient at most. • Planted, young growth flax is yet to provide significant habitat for native avifauna. • Overall, there is little to no avifauna habitat.	Forest and scrubland birds, possibly At-Risk species (transient only)	**Low**
5. Fence	• Sacred Kingfisher (*Todiramphus sanctus,* Not Threatened) observed around site. • The site is dominated by an open area of exotic grass, with an ongoing, background disturbance by pedestrians using the walkway/road. • Surrounding vegetation is likely to be utilised by native avifauna for nesting and roosting, such as North Island robin, though transient visits at the immediate site are more likely. This includes At-Risk coastal species, such as Red-billed Gulls (*Chroicocephalus novaehollandiae,* At-Risk - Declining)	Coastal birds including At-Risk species, Forest and scrubland birds	**High**
6. Bench	• No native bird species observed. • Open area of gazed pasture, with an ongoing, background disturbance by pedestrians using the walkway.	Forest and scrubland birds, possibly At-Risk species (transient only)	**Negligible**

	• As there are trees, forests, and coastal habitats in the wider surroundings, some avifauna may visit the site, but this would be transient at most. • Overall, there is little to no avifauna habitat.		
7. Fences	• Black-backed gulls (*Larus dominicanus,* Not Threatened) and Red-billed Gulls observed around site. • NZ flax around the site may attract Tūī (*Prosthemadera novaeseelandiae,* Not Threatened). • The site is heavily modified with an ongoing, background disturbance by pedestrians using the walkway/road. As there are forest and coastal habitats in the wider surroundings, some avifauna may visit the site, but this would be transient at most.	Coastal birds, Forest and scrubland birds	**High**
8. Fences	• Pied shag (*Phalacrocorax varius*, At Risk - Recovering) and Red-billed Gulls observed around site. • The site contains an open area of grasses, though potential surrounding habitat is available for coastal species. However, the site is exposed to a background level of disturbance from busy pedestrian traffic on the walkway.	Coastal birds including At-Risk species	**High**

1.4.2.2 Herpetofauna Habitat

Based on information provided in the EcIA, the only native herpetofauna species considered likely to be present and may be impacted by the proposed works is the copper skink (*Oligosoma aeneum*, At Risk - Declining). Copper skinks inhabit areas with dense ground cover, including forests, coastal zones near the high tide line, and other environments such as thick grass and beneath rocks, logs, or debris.

Other native herpetofauna species, such as arboreal gecko species, are not considered likely to be present at additional feature sites or impacted by proposed feature installation. As such, the species ecological value of herpetofauna for each interpretation site is assessed based on the potential presence of copper skinks, summarised in **Table 3**. Across all additional feature areas, with the exception of 4 and 6, the likelihood of copper skink presence is considered 'About as likely as not'; that is, the balance of evidence provides some small support for the enduring presence of the species, and their interaction with the site. A 20m zone of influence buffer was considered. No herpetofauna were observed onsite.

Table 3: Summary of the species ecological value assessment for herpetofauna at each additional feature site (see appended EcIA for classification and assessment criteria).

Feature Site	Copper Skink Habitat Description and Availability	Ecological Value
1. Bench	Potential habitat within 1m of proposed bench site due to dense ground cover, native vegetation, grasses, rocks, and debris.	**High**
2. Pou	Potential habitat due to areas of thick, exotic grass, as well as neighbouring scrub which provides cover.	**High**
3. Bench	Potential habitat within 1m of proposed bench site due to areas of dense ground cover, native vegetation grasses, rocks, and debris.	**High**

4. Fence	Open area of grazed, pasture with a paucity of cover objects (e.g., leaf litter, logs, rocks etc.). Little to no habitat for copper skinks.	**Negligible**
5. Fence	Potential habitat due to areas of thick, exotic grass, as well as nneighbouring bark and woody debris	**High**
6. Bench	Open area of grazed, pasture with a paucity of cover objects (e.g., leaf litter, logs, rocks etc.). Little to no habitat for copper skinks.	**Negligible**
7. Fences	Potential habitat due to some areas of thick, exotic grass, as well as neighbouring flax vegetation which provides cover.	**High**
8. Fences	Potential habitat within 1m of proposed bench site due to areas of ground cover, native vegetation, grasses, rocks, and debris .	**High**

1.5 Summary Table for Ecological Values

Table 4 summarises the ecological value assessments for each additional feature site.

Table 4: Summary of the ecological value assessment for terrestrial vegetation, avifauna, and herpetofauna at each additional feature site, also considering the wider vegetation at each site (an approximate 20m buffer was considered).

Additional Feature Site	Terrestrial Vegetation		Avifauna			Herpetofauna		
	Description	***Ecological Value***	*Habitat Availability*	*Potential Species Present*	***Ecological Value***	*Habitat Availability*	*Potential Species Present*	***Ecological Value***
1. Bench	VS1: Pōhutukawa scrub / forest	**High**	✓	Forest and scrubland birds, possibly At-Risk species	**High**	✓	Copper skinks	**High**
2. Pou	Pasture / exotic grass, VS4 Mānuka scrub, Exotic Scrub	**Moderate**	✓	Forest and scrubland birds, possibly At-Risk species	**High**	✓	Copper skinks	**High**
3. Bench	CL1: Pōhutukawa treeland / flaxland / rockland	**High**	✓	Forest and scrubland birds, possibly At-Risk species	**High**	✓	Copper skinks	**High**
4. Fence	Pasture / exotic grass	**Negligible**	-	Forest and scrubland birds, possibly At-Risk species (transient only)	**Low**	-	-	**Negligible**

5. Fence	Pasture / exotic grass, Planted native area	**Low**	✓	Coastal birds including At-Risk species, Forest and scrubland birds	**High**	✓	Copper skinks	**High**
6. Bench	Pasture / exotic grass	**Negligible**	-	Forest and scrubland birds, possibly At-Risk species (transient only)	**Negligible**	-	-	**Negligible**
7. Fences	Pasture / exotic grass, CL1: Pōhutukawa treeland / flaxland / rockland	**Low**	✓	Coastal birds, Forest and scrubland birds	**High**	✓	Copper skinks	**High**
8. Fences	Pasture / exotic grass, CL1: Pōhutukawa treeland / flaxland / rockland	**Moderate**	✓	Coastal birds including At-Risk species	**High**	✓	Copper skinks	**High**

1.6 Ecological Effects

A 20m-radius construction buffer was considered as the zone of influence as a precautionary measure, though the actual footprint of the works will be restricted to a small footprint at each feature site. Despite many fauna and vegetation classifications possessing high ecological values within the zones of influence and areas of each proposed feature, it is noted that any disturbances or ecological impacts are expected to be minimal as features are to be installed either on gravel or exotic grassland, with access possible via established modified tracks and/or exotic grassland. Furthermore, the installation methods proposed (ground screws and access via existing tracks and mown grass) are not expected to result in the damage or clearance of surrounding vegetation. As a result, the constrained works footprint at each additional feature site was considered when assessing ecological effects.

Actual and potential adverse ecological effects from the proposed additional features include the following:

- Permanent loss of terrestrial vegetation and associated fauna habitat
- Injury and/or mortality of native fauna (during construction)
- Temporary disruption and permanent alteration of native fauna habitat

An assessment of the magnitude of effects is provided below.

1.6.1 Magnitude and Overall Level of Effects

1.6.1.1 Permanent loss of terrestrial vegetation and associated fauna habitat

While no vegetation removal has been proposed at any additional feature site, a small number of regenerating flaxes (less than five) appear to be in line with proposed fencing at Feature 7 that may be disturbed. Given that there is a large amount of pōhutukawa treeland / flaxland / rockland habitat nearby and abundant flax vegetation both neighbouring the site and in the wider surroundings, removal of these flaxes (if necessary) is not expected to alter the underlying character of the site or the ecosystem function of the remaining vegetation. As such, the magnitude of effect is assessed as negligible for vegetation loss at all sites and **the subsequent overall level of effect is very low at all sites.**

1.6.1.2 Injury and/or mortality of native fauna (birds and lizards)

The proposed works can potentially cause injury or mortality to native fauna present at some of the feature sites, which are protected under the Wildlife Act 1953.

Avifauna

Given that vegetation removal is not anticipated, no avifauna nesting or foraging habitat will be affected (including the few Feature 7 flaxes that may be affected, which do not provide suitable nesting habitat). Disturbance during actual works will be temporary with adult birds able to avoid feature areas while works are underway. No ongoing disturbance is expected.

As such, the magnitude of effect is assessed as negligible for avifauna at all sites and **the subsequent overall level of effect is very low at all sites.**

Herpetofauna

Copper skinks may be present within areas of suitable habitat (rank grass, flaxes, plantings and leaf litter) at Feature 1, 2, 3, 5, 7, and 8. However, the impacted habitat at each interpretation site is small in extent and copper skinks are likely to only be present, if at all, in low numbers at these sites. Therefore, the risks of encountering and causing injury / mortality to copper skinks at these sites is minimal. As such, the magnitude

of effect is assessed as low for herpetofauna at these sites and **the subsequent overall level of effect is low** (noting that the magnitude of effect at Features 4 and 6 is considered negligible with a very low overall level of effect).

1.6.1.3 Temporary disruption and permanent alteration of native fauna habitat

The installation of placemaking structures at the feature sites will create disturbance via noise and movement, which can result in short-term avoidance behaviour from native avifauna and herpetofauna and reduce the extent of available habitat temporarily. Despite this, both avifauna and herpetofauna habitat impacted at each of sites only represents a small proportion of similar or higher value habitat within the surroundings that affected species may disperse to. Disturbance or abandonment of nests due to works near scrub or forest vegetation is possible but also considered unlikely; species most likely to nest are common native species, such as silvereyes, while coastal avifauna are highly unlikely to nest within coastal feature site areas due to significant modification and frequent human activity.

Installed features are not anticipated to produce a discernible decrease in the botanical value, provision of ecosystem services, or habitat quality at each of their respective sites, nor are they expected to alter the underlying character of the site or the ecosystem function of the remaining vegetation.

As such, all proposed additional feature installations are considered to pose a negligible magnitude of effect on all native fauna habitat, subsequently posing a **very low overall level of effect at all sites.**

1.7 Proposed Management

As described above, the overall unmitigated level of effect of additional features is either low (for herpetofauna) or very low; therefore, no further management of effects is required under the RMA framework. However, should disturbance or removal of a small number of flaxes at Feature Site 7 be required, the plants should be carefully lifted or removed intact and left adjacent to the site within similar vegetation. This precautionary approach will allow any native lizards inhabiting the plants to naturally disperse into the surrounding habitat.

With the above proposed management measures, the overall level of effect of (anticipated) permanent loss of terrestrial vegetation and associated fauna habitat, injury and/or mortality of native fauna (during construction), and temporary disruption and permanent alteration of native fauna habitat is assessed as very low.

Yours sincerely

s 7(2)(a) - Privacy

on behalf of

Beca Limited

Email: s 7(2)(a) - Privacy

A

Appendix A – Site Photos

Feature 1 Site

Feature 2 Site, Lower Northern Side (Pou Location)

Feature 2 Site, Upper Southern Side (Upper Fence Location)

Feature 3 Area (exact proposed bench site out of few)

Feature 4 Site

Feature 4 Site

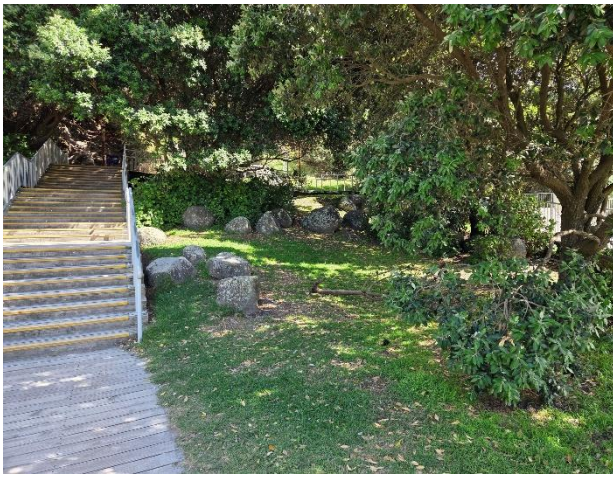
Feature 5 Site

Feature 5 Site

Feature 6 Site

Feature 7 Site

Feature 7 Site



Feature 8 Site

B

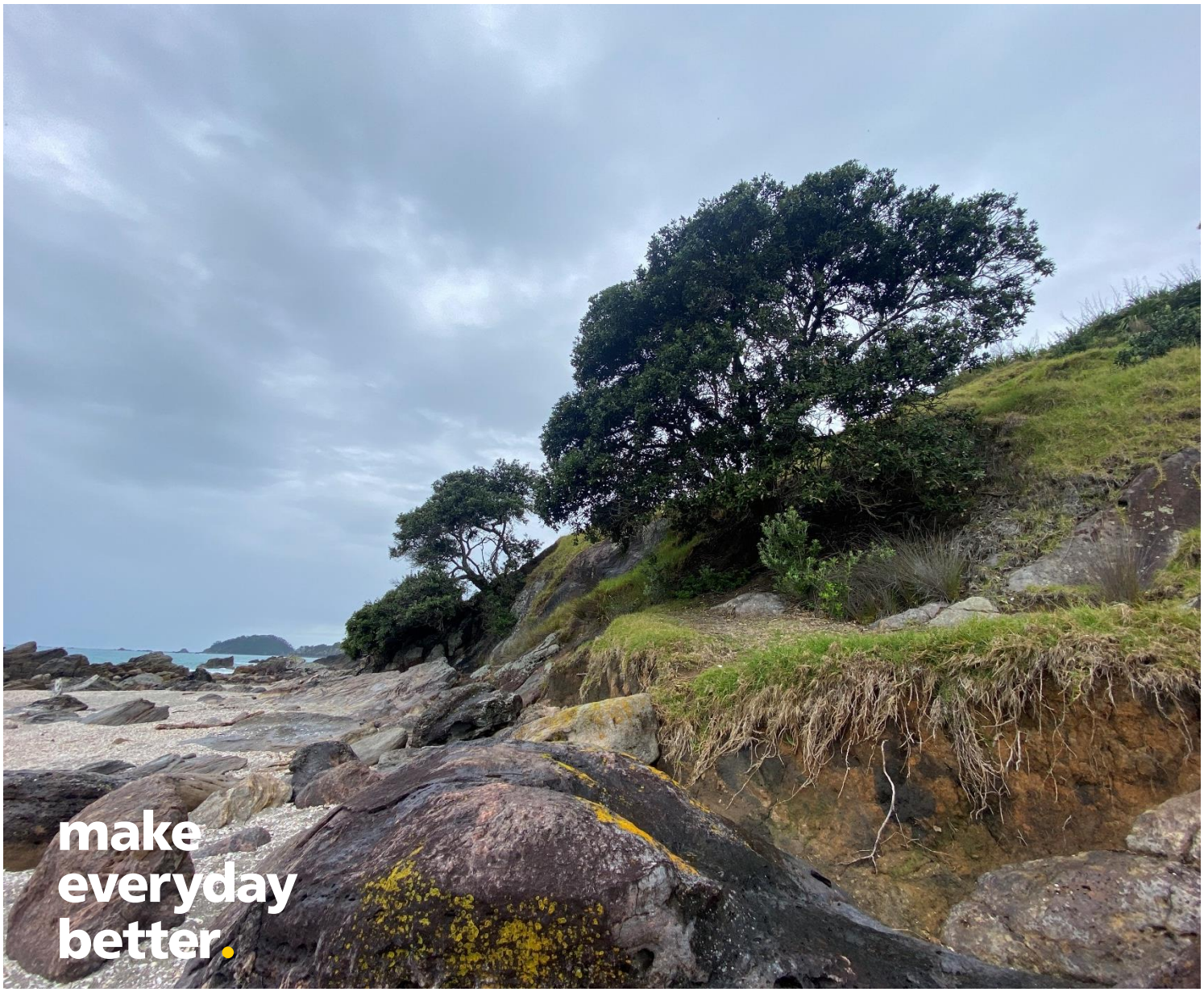
Appendix B – Ecological Impact Assessment, Beca (2022)

Mauao Placemaking Improvements

Ecological Impact Assessment

Prepared for Tauranga City Council
Prepared by Beca Limited

19 December 2022



Contents

Appendices

Revision History

Revision №	Prepared By	Description	Date
1	s 7(2)(a) - Privacy	Draft for technical review	14/10/2022
2		Draft for internal review	19/12/2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	s 7(2)(a) - Privacy		19/12/2022
Reviewed by			19/12/2022
Approved by			
on behalf of	Beca Limited		

Executive Summary

Tauranga City Council (TCC) is proposing to construct and install placemaking structures at four interpretation sites around Mauao Historic Reserve (also known as Mount Maunganui) to provide cultural recognition of the area. These sites are as follows: Waikorire Entrance, Awaiti, Water Tank, and False Summit. This report sets out an assessment of the ecological values of these sites that may be impacted by the proposed works to determine ecological effects and the need for any management measures.

The terrestrial vegetation, and native avifauna and herpetofauna, including At Risk or Threatened species, were identified as important ecological features at the site. In particular, the northern little blue penguin (*Eudyptula minor*; At Risk – Declining) and the grey-faced petrel (*Pterodroma macroptera gouldi*; Not Threatened) are known to use Mauao as a breeding site.

The following potential adverse ecological effects associated with the construction and installation of placemaking structures were determined to impact on the ecological features at each interpretation site:

- Temporary loss of terrestrial vegetation
- Permanent loss of terrestrial vegetation
- Temporary loss of native avifauna and herpetofauna habitat
- Permanent loss native avifauna and herpetofauna habitat
- Injury or mortality of native avifauna and herpetofauna

To reduce the potential of injury or mortality to native fauna, the following management measures are recommended:

- Avoidance of construction during peak avifauna breeding and moulting season, as well as site surveys to detect active nests / burrows if these timings cannot be avoided.
- Herpetofauna survey prior to construction, with potentially a further salvage or management plan based on survey results.

Overall, with the above management measures integrated, the proposed works will lead to **Very Low or Low** effects.

1 Introduction

1.1 Purpose and Scope

Tauranga City Council (TCC) is proposing to construct and install placemaking structures around Mauao Historic Reserve (also known as Mount Maunganui and hereafter referred to as Mauao). Beca Ltd (Beca) has been commissioned by TCC to prepare an Ecological Impact Assessment (EcIA) to support resource consents for the placemaking structure installations by quantifying the ecological values of the habitat and species within the proposed work area, and determining any potential effects that may occur as a result of the works.

The scope of this report includes:

- A desk-based review of publicly accessible reports or information.
- A site visit to the location of proposed works on 22nd September 2022.
- An assessment of the ecological values of the terrestrial vegetation and native fauna.
- An assessment of ecological effects associated with the loss of habitat and recommended management options.

1.2 Proposed Activity

The project aims to provide cultural recognition to Mauao and has been developed with both iwi and Council representatives, and also aligns with the guiding principles of The Mauao Joint Administration Body and the Mauao Historic Reserve.

Placemaking structures will be constructed and installed at several interpretation sites throughout Mauao according to the *Mauao –Interpretation and Placemaking Design Draft* (refer to Law Creative, 2022 for further details). The interpretation sites and the proposed structures that are relevant to this EcIA are summarised in Table 1, and their locations are shown in Figure 1. Imagery indicating the works at each site are shown in Appendix A.

Table 1. Summary of the interpretation sites and the proposed structures at each site that are relevant and being considered under this EcIA (Law Creative, 2022; also see Appendix A).

Interpretation Site	Location (latitude, longitude)	Proposed Works / Structures to be Installed
Waikorire Entrance	37.634006S, 176.174236E	Fencing
Awaiti	37.625306S, 176.173626E	Raised platform with seating and wheelchair ramp
Water Tank	37.633997S, 176.169624E	Ranked earth terrace seating
False Summit	37.628805S, 176.170338E	Fencing, exposure of archaeological features / terraces

1.2.1 Vegetation Clearance

a. Permanent Vegetation Loss

Vegetation will be lost due to the installation of permanent structures at each interpretation site, as well as at False Summit in order to permanently expose the archaeological features / terraces.

b. Temporary Vegetation Loss

Vegetation will also be cleared during the structure installation process at interpretation each site, and during earthworks at Awaiti and Water Tank, but will be allowed to re-establish post-construction.

1.3 Site Location and Ecological Context

Mauao is located at the eastern entrance of Tauranga Harbour in the Bay of Plenty, within the Tauranga Ecological District (ED) (McEwen, 1987). It is an extinct volcano comprising of native coastal and bush vegetation, a rocky coastline and sandy beach, and grazing paddocks. (Tauranga City Council, 2018a).

Mauao is part of a reef system and ecological corridor with Motuotau Island and Moturiki, and its coastline forms part of a wider customary fisheries area over which the Te Maunga o Mauao Mataitai Reserve (2008) occurs (Ministry of Fisheries, 2011). Around the base of Mauao, the reefs are settlement areas for juvenile crayfish, paua and kina (Bay of Plenty Regional Council, 2021).

1.3.1 Ecological Significance

Mauao is scheduled as a Special Ecological Area (SEA) (Tauranga City Council, 2018b) and Indigenous Biological Diversity Area in the coastal environment (Bay of Plenty Regional Council, 2021) (see Figure 1), based on its large array of coastal forest types, which are now uncommon in Tauranga ED, and its significant wildlife values (Wildland Consultants Ltd, 2000, 2005, 2009, 2013).

The SEA areas are divided into Mauao 1 (SEA No. 7, Category 1) and Mauao 2 (SEA No. 32, Category 2). Mauao 1 is dominated by Pohutukawa forest, with multiple types of indigenous scrub and tree land on the western slopes. Mauao 2 is contiguous with and complimentary to Mauao 1, and contains numerous small areas of forest, generally on the lower southern and eastern slopes of Mauao.

One Threatened species plant is present on Mauao – *Pimelea tomentosa* (Threatened – Nationally Vulnerable; De Lange et al., 2018), as well as several regionally uncommon plant species that are located near their known limits of distribution – *Schoenus apogon*, *Psilotum nudum*, *Lepidosperma laterale*, *Trisetum arduanum*, *Astelia banksia*, *Tetraria capillaris*, *Zoysia pauciflora*, and *Oxalis rubens*.

Furthermore, Mauao, is home to one of the few mainland breeding populations of the northern little blue penguin (*Eudyptula minor*; At Risk – Declining) and grey-faced petrel (*Pterodroma macroptera gouldi*; Not Threatened).

Figure 1. The location of Mauao and the interpretation sites within Mauao.

2 Methodology

2.1 Desktop Assessment

A desktop-based review was undertaken to identify and assess sites of ecological value using GIS data and ecological information from the following sources:

- Tauranga City Council:
  - geospatial layers: special ecological areas, indigenous biological diversity areas.
  - ecological monitoring reports:
    - Indigenous biodiversity of Tauranga district - state of the environment reporting (Wildland Consultants Ltd, 2000, 2005, 2009).
    - Significant natural areas in the coastal environment of Bay of Plenty region. (Wildland Consultants Ltd, 2013).
    - Baseline survey and monitoring plan for herpetofauna on Mauao (Wildland Consultants Ltd, 2018).
    - Baseline Survey of Threatened, at Risk, and / or Regionally Uncommon Plant Species (Wildland Consultants Ltd, 2017).
- Past little blue penguin surveys on Mauao (Sievwright, 2014; Winter, 2000).
- Google Earth and Land Information New Zealand (LINZ) – aerial imagery.
- Department of Conservation – Herpetofauna records.
- eBird – Avifauna records.
- Other publicly accessible reports or information.

2.2 Field Investigation

A site walkover was undertaken on 22nd September 2022 to assess terrestrial and fauna habitats at each interpretation site. During the site visit, the weather was cloudy with a temperature high of 16.3°C, and light rain accumulating up to 17.2mm of rainfall (MetService, 2022).

2.2.1 Terrestrial Vegetation Assessment

Terrestrial habitat assessments were completed following Rapid Ecological Assessment methodology developed by Auckland Council (2012) to capture the species composition, value, structure, and integrity of the terrestrial vegetation at the Site. The vegetation was then was classified to the ecosystem level using Singers et al., (2017). All rare and threatened flora species encountered were documented.

2.2.2 Coastal Avifauna Burrow Survey

The assessment involved targeted searches for the nests / burrows of the little blue penguin and grey-faced petrel within 20 m of the proposed works at Awaiti.

a. Little blue penguin

- The survey consisted of searching all rocky crevices and burrow-like areas for penguins and signs of penguins (guano [penguin poo], feathers, old burrows, and abandoned eggs) under the vegetated slope / hillside and rocky shoreline above mean high water springs (MHWS).
- The timing of the survey coincided with the egg laying and chick rearing stage of the little blue penguin breeding season (the breeding season is from approximately July to February; New Zealand Birds Online, 2013), a time at which active burrows are more likely to be permanently occupied during the day (so if burrows were being used, eggs, chicks and / or potentially adult penguins would have been observed).

b. Grey-faced petrel

- The survey consisted of searching for burrow-like areas under the trees, tree roots, and grass, and at areas of malleable soil along the vegetated slopes / hillsides.
- The timing of the survey coincided with the mid-latter end of the chick rearing stage of the grey-faced petrel, breeding season (the breeding season is broadly from approximately March to January), a time at which active burrows are permanently occupied.

2.2.3 Fauna Presence Assessment

Any avifauna and herpetofauna species observed during the site visit was recorded. However, targeted fauna sampling was not carried out due to the labour intensity required and as ample data on avifauna and herpetofauna at Mauao already exist (i.e., DOC records, eBird records, past ecological monitoring reports). Instead, information obtained during the literature review was used to inform the current assessment and a precautionary approach of assuming the potential presence of species was used.

2.3 Assessment Methodology

A desktop assessment of ecological effects was undertaken in accordance with Ecological Impact Assessment (EcIA) EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems (Roper-Lindsay et al., 2018).

The Environment Institute of Australia and New Zealand (EIANZ) guidelines set out a methodology to assign ecological value to species and ecosystems based on four assessment criteria which are consistent with significance assessment criteria set out in the Proposed National Policy Statement for Indigenous Biodiversity (2019) Appendix 1: Criteria for identifying significant indigenous vegetation and significant habitat of indigenous fauna. These are reproduced in this report as Appendix B: Table B 1 -Table B 3.

- Attributes are considered when considering ecological value or importance. They relate to matters such as representativeness, the rarity and distinctiveness, diversity and patterns, and the broader ecological context.
- Determining Factors for valuing terrestrial species; terrestrial species span a continuum of very high to negligible, depending on aspects such as whether species are native or exotic, have threat status, and their abundance and commonality at the site impacted
- Ecological Values are scored based on an expert judgement, qualitative and quantitative data collected.

Once ecological values have been identified and valued, the severity of potential impacts is assessed by determining the change from baseline ecological values likely to occur as a result of the proposal / project along the lines of a magnitude of effect as determined by the criteria set out in Appendix B: Table B 5.

Finally, once these two factors have been determined (the ecological value and the magnitude of effect), an overall level of effect on each of the identified ecological values is assessed (Appendix B: Table B 6).

3 Ecological Values

3.1 Terrestrial Vegetation

3.1.1 Overview of Vegetation on Mauao

Within the Tauranga Ecological District, tall podocarp broadleaved forest would have historically covered all the hill country and some of the flat land and dune systems, with the exception of the foredunes and the freshwater wetlands on the plains (Wildland Consultants Ltd, 2000).Today relatively little of the ED remains in indigenous vegetation / habitats (c.6.6 %) and most of the remaining examples (c.5.3 %) are in the coastal bioclimatic zone, concentrated on estuary margins, dunes along the open seacoast, and on Mauao (Wildland Consultants Ltd, 2000).

Mauao is currently covered in large areas of pōhutukawa dominated forest which can be categorised into WF4: Pōhutukawa, pūriri, broadleaved forest [Coastal broadleaved forest] and VS1: Pōhutukawa scrub / forest, transitioning into CL1: Pōhutukawa treeland / flaxland / rockland towards the coastline (Singers & Rogers, 2014). These forests are the most extensive and highest-quality area of pōhutukawa forest within Tauranga City and the Tauranga ED. Furthermore, they provide habitat and ecological corridors for threatened avifauna and herpetofauna (see Section 3.2 and 3.3). Due to the size, diversity, and high quality of the vegetation, these indigenous forests scheduled as SEAs, and fall into either Mauao 1 or 2 (see Figure 1; Tauranga City Council, 2018b). The remaining areas of Mauao without indigenous forest, consist of grazed pasture / farmland and exotic grass.

While most indigenous species present on Mauao are regionally and nationally common, rare plants have also been recorded. This includes *Pimelea tomentosa* (Threatened – Nationally Vulnerable) and several regionally uncommon species *Schoenus apogon, Psilotum nudum, Lepidosperma laterale, Trisetum arduanum, Astelia banksii, Tetraria capillaris, Zoysia pauciflora, and Oxalis rubens* (Wildland Consultants Ltd, 2013). Furthermore, despite their widespread populations, pōhutukawa (*Metrosideros excelsa*) and kānuka (*Kunzea ericoides*) have a threat status of Threatened – Nationally Vulnerable, and mānuka (*Leptospermum scoparium*) has a threat status of At-Risk – Declining due to their susceptibility to myrtle rust (De Lange et al., 2018).

3.1.2 Vegetation at Interpretation Sites

The forest types that form the vegetation at the interpretation sites mainly consist of pasture / exotic grass, CL1: Pōhutukawa treeland / flaxland / rockland, and mānuka and exotic scrub. While no rare plants were observed during the site visit, *Zoysia pauciflora* was recorded in 2017 near Awaiti (Wildland Consultants Ltd, 2017). Additionally, pōhutukawa (Threatened – Nationally Vulnerable) and mānuka (At-Risk – Declining) were present at some of the sites (see Appendix A for site photos and Appendix C for full plant list).

The ecological value assessment of the terrestrial vegetation at each site is outlined below in Table 2. The assessment took into consideration the wider vegetation on Mauao (as described in Section 3.1.1), as although the physical works is limited to each interpretation site, the zone of influence is considered to extend to the wider Mauao area.

Table 2. Summary of the ecological value assessment for terrestrial vegetation at each site (see Appendix A for site photos and Appendix C for full plant list). The vegetation classification is based on Singers & Rogers (2014), and the assessment of attributes and ecological values is based on Roper-Lindsay et al., (2018) (see Appendix B).

Interpretation Site	Description of Dominant Vegetation	Vegetation Classification	Attribute Assessment	Ecological Value
Waikorire Entrance	• Slopes dominated by exotic grass, namely kikuyu (*Cenchrus clandestinus*), and a patch of coastal cutty grass (*Cyperus ustulatus*). • Grass verges dominated by mowed, kikuyu.	Pasture / exotic grass	**Representativeness: Very low** • Dominated by exotic species, and highly modified for walking tracks. **Rarity / distinctiveness: Low** • Mostly common native or exotic species. • Some potential to provide habitat for at risk and / or threatened herpetofauna. **Diversity and pattern: Very Low** • Lack of diversity and pattern. **Ecological context: Low** • Little to no contribution to wider surrounding forests. • Some habitat provision for at risk and / or threatened herpetofauna.	**Low**
Awaiti	• Top of slope (where existing bench is) entirely covered in exotic grass. • The slope and toe of slope consist of several pōhutukawa (~ 5 m tall), small karo (*Pittosporum crassifolium*), and scattered knobby club rush (*Ficinia nodosa*) growing between the rocks. • *Zoysia pauciflora,* which is considered to be regionally uncommon but Not Threatened (De Lange et al., 2018) was recorded in 2017 near Awaiti (Wildland Consultants Ltd, 2017)	Pasture / exotic grass CL1: Pōhutukawa treeland / flaxland / rockland	**Representativeness: Moderate** • A mix of exotic grass and native species. • Some modifications for a seat and walking track which separates the pōhutukawa from the wider coastal forest. **Rarity / distinctiveness: High** • Mostly common native species; however, pōhutukawa is Threatened – Nationally Vulnerable. • *Zoysia pauciflora,* which is regionally uncommon, was not observed during site visit, but has been recorded nearby in the past. • Forest type is regionally rare. • Potential to provide habitat for northern little blue penguins (At Risk – Declining). **Diversity and pattern: High** • Contributes to sequence of pōhutukawa dominated forest types.	**Very High**

			Ecological context: High • Provision of indigenous habitat and ecological corridor for northern little blue penguins (At Risk – Declining).	
Water Tank	• Slopes covered in grazed pasture grass. • Several large poplars (*Populus alba*; 10 – 15 m) line the back of the slope, but are outside of proposed work area.	Pasture / exotic grass	**Representativeness: Very low** • Dominated by exotic species, and highly modified for farming and walking tracks. **Rarity / distinctiveness: Very low** • Mostly open areas of exotic grass. **Diversity and pattern: Very Low** • Lack of diversity and pattern **Ecological context: Very low** • Little to no contribution to wider surrounding forests.	**Negligible**
False Summit	• Dense vegetation covering the archaeological feature / terrace is dominated by a mix of mānuka, mingimingi (*Leucopogon fasciculatus*), and Spanish heath (*Erica lusitanica*) scrub, with some scattered gorse (*Ulex europaeus*). The vegetation appears to be young / regenerating, and is of low stature (~1.5 m tall). • The vegetation is separated from the wider high value, indigenous shrubland / scrubland by a mowed, grassy path. • Area with existing bench and seats is covered in bare soil and exotic grass.	Pasture / exotic grass Mānuka and exotic scrub	**Representativeness: Moderate** • The species assemblage of the dense vegetation area is not typical of mānuka or indigenous scrubland, due to the high proportion of exotic species and scattered gorse. • Modifications of the grass path has also separated the mānuka and exotic scrub from the wider native forest. **Rarity / distinctiveness: Moderate** • Mostly common native or exotic species, however, mānuka is At-Risk – Declining. • Some potential to provide habitat for at risk and / or threatened herpetofauna. **Diversity and pattern: Low** • Limited contribution to sequence of pōhutukawa dominated forest types. **Ecological context: High** • Part of a SEA and contributes to the wider ecological network of scrubland vegetation and ecotone sequences. • Provision of indigenous habitat and ecological corridor for at risk and / or threatened herpetofauna.	**Moderate**

3.2 Avifauna

3.2.1 Overview of Avifauna on Mauao

Based on records within 3 km of Mauao from eBird, there is a wide range of avifauna, including 80 different species. These species have been compiled into a master list in Appendix D, and is considered to represent the suite of possible species found on Mauao and its surrounding harbour. However, it is expected that only a small subset of these species will be present at each interpretation site (and will be impacted by the proposed works) based on their available habitat.

3.2.2 Avifauna at Interpretation Sites

The species ecological value of avifauna for each interpretation site is assessed based on the key species that are likely to inhabit each site. These key species were identified using the master list of possible species found on Mauao, the habitat availability and characteristic of each site, and species requirements for nesting, roosting, and foraging. The ecological value and key species are discussed and summarised below in Table 3 – Table 4.

Table 3. Summary of the species ecological value assessment for avifauna at each interpretation site (Roper-Lindsay et al., 2018; see Appendix B). The species likely to be present based on the habitat description and availability and at each site is listed in Table 4.

Interpretation Site	Avifauna Habitat Description and Availability	Potential Species Present	Ecological Value
Waikorire Entrance	• No avifauna or nests observed during the site visit. • Open area of exotic grass, with an ongoing, background disturbance by pedestrians using the walkway. • As there are forest and coastal habitats in the wider surroundings, some avifauna may visit the site, but this would be transient at most. • **Overall, there is little to no avifauna habitat.**	–	–
Awaiti	• No avifauna, nests, or burrows were observed during the site visit. • **Potential habitat is available for coastal species** based on the coastline area of small trees, rocks, and sand located above the MHWS, including nesting and roosting opportunities provided by the rock and tree root crevices, and sandy beach. Foraging opportunities would also be provided by the intertidal rocks and mud flats further seaward, but is outside of the proposed works area • However, the site is exposed to a background level of disturbance from pedestrians using the walkway. • While no little blue penguin, grey-faced petrels, or burrows were found during the site visit, Awaiti is near the location of past penguin nesting sites (Sievwright, 2014; Winter, 2000) and a colony of grey-faced petrel (approximately 200 pairs) have been breeding at Mauao since 1989 (33 years).	Coastal birds including Threatened and At-Risk species (see Table 4 for species)	**Very High**
Water Tank	• No avifauna or nests observed during the site visit. • Open area of gazed pasture, with an ongoing, background disturbance by pedestrians using the walkway. • As there are trees, forests, and coastal habitats in the wider surroundings, some avifauna may visit the site, but this would be transient at most. • **Overall, there is little to no avifauna habitat.**	–	–
False Summit	• During the site visit grey warblers (*Gerygone igata*), and silver eyes (*Zosterops lateralis*) were observed at False Summit foraging within the mānuka and exotic scrub, and are likely to also use this area for roosting and nesting. • The mānuka and exotic scrub would also provide habitat to other **native forest and scrubland avifauna**. • However, the site is exposed to a background level of disturbance from pedestrians using the walkway.	Forest and scrubland birds, including At Risk species (see Table 4 for species)	**High**

Table 4. Native avifauna species that are likely to be present at Awaiti and False Summit interpretation sites. Primary and secondary habitats* in dark and light yellow, respectively. With respect to habitat use, N= Nesting, F = Foraging, R = Roosting / Resting, with any observed use in bold.

Sorted by threat status			**Observed or Potential Habitat Use**		**Habitat Preference**							
Common name	**Scientific Name**	**Threat Status (Robertson et al., 2021)**	*Awaiti*	*False Summit*	*Oceanic*	*Coastal / Estuary*	*Freshwater / Wetlands*	*Farmland / Open Country*	*Scrub / Shrubland*	*Native Forest*	*Exotic Forest*	*Urban Residential*
Black-billed gull	*Larus bulleri*	Threatened – Nationally Critical	R	–								
Northern NZ dotterel	*Charadrius obscurus*	Threatened – Nationally Increasing	N, R	–								
Reef heron	*Egretta sacra*	Threatened – Nationally Vulnerable	F	–								
Little Blue Penguin	*Eudyptula minor*	At Risk - Declining	N, R	–								
Red-billed gull	*Larus novaehollandiae scopulinus*	At Risk - Declining	R	–								
North Island robin	*Petroica longipes*	At Risk - Declining	–	F								
Variable oystercatcher	*Haematopus unicolor*	At Risk - Recovering	N, R	–								
Pied shag	*Phalacrocorax varius*	At Risk - Recovering	–	–								
Little Shag	*Microcarbo melanoleucos*	At Risk - Relict	–	–								
Black shag	*Phalacrocorax carbo*	At Risk - Relict	–	–								
Little black shag	*Phalacrocorax sulcirostris*	At Risk - Naturally Uncommon	–	–								
Bellbird	*Anthornis melanura*	Not Threatened	–	F								
White-faced heron	*Egretta novaehollandiae*	Not Threatened	F	–								
Grey warbler	*Gerygone igata*	Not Threatened	–	N, R, **F**								
Black-backed gull	*Larus dominicanus*	Not Threatened	R	–								
Spotted shag	*Phalacrocorax punctatus*	Not Threatened	–	–								
Tūī	*Prosthemadera novaeseelandiae*	Not Threatened	–	F								
Grey-faced petrel	*Pterodroma macroptera gouldi*	Not Threatened	N, R									
Fantail	*Rhipidura fuliginosa*	Not Threatened	–	F								
Silvereye	*Zosterops lateralis*	Not Threatened	–	N, R, **F**								

NZ Kingfisher	*Todiramphus sanctus*	Not Threatened	N, R, F	–								
Turnstone	*Arenaria interpres*	Non-Resident Native - Migrant	R	–								

*Primary habitat refers to the habitat in which the species spends most of its time. Secondary habitats are other habitat types which the species may also utilise. Habitat information sourced from Boffa Miskell Limited (2018) and New Zealand Birds Online (2013).

3.3 Herpetofauna

3.3.1 Overview of Herpetofauna on Mauao

Past surveys and DOC have recorded seven species of herpetofauna on Mauao (see Table 5). Of these species, only the copper skink (*Oligosoma aeneum*; At Risk - Declining) and plague skink (*Lampropholis delicata; Introduced and Naturalised*) have been observed during a formal baseline survey, which was undertaken in November 2017 (Wildland Consultants Ltd, 2018; J. Wairepo, personal communication, September 30, 2022). Notably, only eight copper skinks were recorded during this survey. Copper skinks have also been translocated to Mauao (but not in proximity to the interpretation sites) from the wider Tauranga as part of the lizard management for other projects (B. Balsom, personal communication, November 2, 2022). Other species have only been historically reported on an anecdotal basis or are suspected to only be present in very low densities despite the availability of suitable habitat (Wildland Consultants Ltd, 2018).

Table 5. Herpetofauna species recorded on Mauao by DOC and / or Wildland Consultants Ltd (2018). Threat status assigned using Hitchmough et al. (2021). Species observed in the 2017 survey by Wildlands are highlighted in yellow.

Common name	Scientific Name	Threat Status
Forest Gecko	*Mokopirirakau granulatus*	At Risk - Declining
Elegant Gecko	*Naultinus elegans*	At Risk - Declining
Copper Skink	*Oligosoma aeneum*	At Risk - Declining
Shore Skink	*Oligosoma smithi*	At Risk - Declining
Moko Skink	*Oligosoma moco*	At Risk - Relict
Pacific Gecko	*Dactylocnemis pacificus*	Not Threatened
Plague Skink	*Lampropholis delicata*	Introduced and Naturalised

3.3.2 Herpetofauna at Interpretation Sites

Based on the above herpetofauna records information, the only native species that is likely to present be at an interpretation site and to be affected by the proposed works is the copper skink. As such, the species ecological value of herpetofauna for each interpretation site is assessed based on the potential presence of copper skinks and is summarised in Table 6.

Table 6. Summary of the species ecological value assessment for herpetofauna at each interpretation site (Roper-Lindsay et al., 2018; see Appendix B).

Interpretation Site	Herpetofauna Habitat Description and Availability	Copper Skinks Present	Ecological Value
Waikorire Entrance	• **Potential habitat** due to patch of thick, exotic grass and coastal cutty grass on the slopes, which provides cover. • Also located within a wider area of grass.	✓	**High**
Awaiti	• **Potential habitat** due to coastline area of small trees, rocks, and sand located above the MHWS, including crevices and areas for hiding / cover.	✓	**High**
Water Tank	• Open area of grazed, pasture with a paucity of cover objects (e.g., leaf litter, logs, rocks etc.). • **Little to no habitat for copper skinks.**		**–**
False Summit	• **Potential habitat** due to edges of the dense scrub vegetation, and the adjacent path of thick, exotic grass.	✓	**High**

3.4 Summary Table for Interpretation Sites

The below table summarises the ecological value assessments for each interpretation site.

Table 7. Summary of the ecological value assessment for terrestrial vegetation, avifauna, and herpetofauna at each interpretation site

Interpretation Site	**Terrestrial Vegetation**		**Avifauna**			**Herpetofauna**		
	Description	***Ecological Value***	*Habitat Availability*	*Species Present*	***Ecological Value***	*Habitat Availability*	*Species Present*	***Ecological Value***
Waikorire Entrance	Farmland / exotic grass	**Low**	–	–	**–**	✓	Copper skinks (At Risk – declining)	**High**
Awaiti	Farmland / exotic grass CL1: Pōhutukawa treeland / flaxland / rockland	**Very High**	✓	Predominately coastal birds including Threatened and At-Risk species	**Very High**	✓	Copper skinks (At Risk – declining)	**High**
Water Tank	Farmland / exotic grass Exotic trees	**Negligible**	–	–	**–**	–	–	**–**
False Summit	Mānuka and exotic scrub	**Moderate**	✓	Predominately forest and scrubland birds, including At Risk species.	**High**	✓	Copper skinks (At Risk – declining)	**High**

4 Assessment of Ecological Effects

4.1 Key Ecological Effects

Actual and potential adverse ecological effects due to the proposed works include the following:

- Loss of terrestrial vegetation (temporary and permanent)
- Loss of native fauna habitat (temporary and permanent)
- Injury and /or mortality of native fauna (during construction)

As there are some differences between each interpretation site with regard to the ecological values present and the extent of physical works to be undertaken, the resulting ecological effects can vary across sites (see Table 8).

Table 8. Summary of ecological effects across the interpretation sites.

Interpretation Site	Key Ecological Effects				
	Loss of terrestrial vegetation	*Loss of native avifauna habitat*	*Loss of native herpetofauna habitat*	*Injury and /or mortality of native avifauna*	*Injury and /or mortality of native herpetofauna*
Waikorire Entrance	✓	–	✓	–	✓
Awaiti	✓	✓	✓	✓	✓
Water Tank	✓	–	–	–	–
False Summit	✓	✓	✓	✓	✓

4.2 Magnitude of Effects

4.2.1 Temporary and permanent loss of terrestrial vegetation

Terrestrial vegetation will be lost at each of the interpretation sites due to the installation of placemaking structures, as well as works to expose archaeological features / terraces. This includes the permanent loss of vegetation to these structures, as well as some clearance extended slightly around these structures during the installation process. The vegetation that is cleared to aid installation, as well as for earthworks (at Awaiti and Water Tank), will be allowed to re-establish post-construction, and therefore will only be lost temporarily.

The terrestrial vegetation to be cleared consists mostly of pasture / exotic grass and / or small, common native shrubs, except for the area of mānuka and exotic scrub (approximately 550 m^2) at False Summit. Therefore, much of the vegetation clearance will not produce a discernible decrease in the botanical value and provision of ecosystem services at each of their respective sites. With regard to the loss of mānuka and exotic scrub at False Summit, given that there are large areas of high value, indigenous shrubland / scrubland and forest, both neighbouring the scrub and in the wider surroundings, it is not expected to alter the underlying character of the site or the ecosystem function of the remaining vegetation. In particular, as it is already isolated from the surrounding indigenous bush by a wide, grassy path and the main walkway, its clearance would not introduce new edge effects to the remaining bush.

Based on the above, the magnitude of effect has been assessed for terrestrial vegetation loss at each interpretation site, with consideration to the extent of vegetation loss based on the proposed works / structures to be installed, type of vegetation to be lost (and the botanical value and ecosystem services they would have provided), and the duration of loss. The assessments are summarised in Table 9.

Table 9. Summary of the magnitude of effects for terrestrial vegetation loss at each interpretation site.

Interpretation Site	Proposed Works / Structures to be Installed	Terrestrial Vegetation		Magnitude of Effect
		Description of impacted Vegetation.	*Loss Type*	
Waikorire Entrance	Fencing	Pasture / exotic grass, a patch of coastal cutty grass	Permanent and temporary	**Negligible**
Awaiti	Raised platform with seating and wheelchair ramp	Pasture / exotic grass. The small pōhutukawa and karo trees will not be removed, but may be impacted due to proximity to works.	Permanent and temporary	**Low**
Water Tank	Ranked earth terrace seating	Grazed pasture	Temporary	**Negligible**
False Summit	Fencing, exposure of archaeological features / terraces	Mānuka and exotic scrub	Permanent	**Low**

4.2.2 Temporary and permanent loss of native fauna habitat

Fauna Habitat will be lost at some of the interpretation sites due to the installation of placemaking structures, as well as works to expose archaeological features / terraces. The magnitude of effects for fauna habitat loss at each locality is further discussed below for avifauna and herpetofauna (see Section 4.2.2a – 4.2.2b), and is summarised in Table 10.

a. Avifauna

The magnitude of effect for the temporary and permanent loss of avifauna habitat is **low** for Awaiti and False Summit (see Table 10).

The installation of placemaking structures and / or vegetation clearance at the above sites will create disturbance via noise and movement, which can result in short-term avoidance behaviour from native avifauna and reduce the extent of available avifauna habitat temporarily. Any permanent loss of the habitat, however, is only expected to occur at False Summit due to the reduction of scrubland habitat (i.e., mānuka and exotic scrub), as the area of trees, rocks, and sand at the base of the slope at Awaiti will not be altered. Therefore, with regard to the little blue penguin and grey-faced petrels, while construction can temporarily reduce the roosting and nesting opportunities at Awaiti, no permanent loss of habitat will occur.

Additionally, the avifauna habitat impacted at each of these interpretation sites also only represents a small proportion of similar or higher value habitat within the surroundings. Site connectivity will also not be severed from the forests and coastline in the wider landscape during works, and the avifauna should be able to easily disperse to neighbouring habitats.

b. Herpetofauna

The magnitude of effect for the temporary and permanent loss of copper skink habitat is **low** for Waikorire Entrance, Awaiti, and False Summit (see Table 10).

Most of the habitat loss is due to copper skink displacement during vegetation clearance and construction, and as such, will be temporary only. Permanent habitat loss is only expected to occur at False Summit due to the reduction of mānuka and exotic scrub (i.e., habitat created by the edges of the scrubland, especially where it intersects with the grass). Almost all of the vegetation will be allowed to re-establish at Waikorire Entrance, and the area of trees, rocks, and sand at the base of the slope at Awaiti will not altered. Furthermore, the areas of impact at each site are relatively small when considering the availability of higher

quality herpetofauna habitat in the wider surroundings. Therefore, any skinks would likely self-relocate to other viable habitat during the period of works.

c. Summary Table

Table 10. Summary of the magnitude of effects for loss of native fauna habitat at each interpretation site.

Interpretation Site	Magnitude of Effect	
	Avifauna	*Herpetofauna*
Waikorire Entrance	–	Negligible
Awaiti	Negligible	Negligible
Water Tank	–	–
False Summit	Low	Low

4.2.3 Injury and /or mortality of native fauna

The proposed works can potentially cause injury or mortality to native fauna present at some of the interpretation sites, which are protected under the Wildlife Act 1953. The magnitude of effects for avifauna and herpetofauna are further assessed in Section 4.2.3a– 4.2.3b, and summarised in Table 11.

a. Avifauna

Native avifauna can potentially be injured or killed during earthworks at Awaiti, and vegetation clearance at False Summit. Nesting birds and their eggs or chicks are the most likely to be impacted, as other adult birds will likely avoid the area once vegetation clearance or construction begins due to disturbance.

Although the area of works at Awaiti is relatively small and is construction not anticipated to be undertaken on the beach / rock area, large colonies of the little blue penguin and grey-faced petrel are known to breed around the coastlines of Mauao (Sievwright, 2014; Wildland Consultants Ltd, 2009; Winter, 2000), which can increase the likelihood encountering a nest at the interpretation sites.

At False Summit, the likelihood of injury and mortality is low, as only some trees or shrubs within the clearance area may contain active nests. Additionally, the avifauna most likely to nest at this site are common native species that are locally abundant (i.e., grey warblers and silvereyes), thus, only a small proportion of the local population will be affected if injury / mortality occurs.

Based on the above, the magnitudes of effects have been assessed for each interpretation Site and are summarised in Table 11.

b. Herpetofauna

Copper skinks, which have a conservation status of At-Risk: Declining, can potentially be injured or killed during the installation of the fence lines at Waikorire Entrance, earthworks at Awaiti, and vegetation clearance at False Summit. However, the impacted habitat at each interpretation site is small in extent, and copper skinks are likely to only be present in low numbers at these sites based on past records. Therefore, the likelihood of encountering and causing injury / mortality to copper skinks at these sites are low, and magnitude of effects are assessed as low for each site (Table 11).

c. Summary Table

Table 11. Summary of the magnitude of effects for the injury / mortality of native fauna at each interpretation site.

Interpretation Site	Magnitude of Effect	
	Avifauna	*Herpetofauna*
Waikorire Entrance	–	Low
Awaiti	Moderate	Low
Water Tank	–	–
False Summit	Low	Low

4.3 Proposed Management

For some of the above ecological effects, their (unmitigated) level is already considered to be low and there is no further management of effects required with regard to the RMA framework. However, as most native fauna is absolutely protected under the Wildlife Act 1953 even at low magnitudes of effect, it is advised to engage a suitably qualified and experienced ecologist to assist in the management of fauna.

4.3.1 Avoidance of Avifauna Breeding Season and Nest / Burrow Survey

a. Native passerine birds – False Summit

To avoid injury / mortality to native passerine birds (i.e., grey warblers and silvereyes) that are nesting and their eggs or chicks during works, tree felling as part of vegetation clearance at False Summit should ideally be avoided during peak breeding season (August to March; New Zealand Birds Online, 2013).

If tree felling within the breeding season cannot be avoided, the shrubs / trees must be inspected for nests by a qualified ecologist one week prior to the planned felling. If the active nests of any native bird species protected under the Wildlife Act 1953 are found, the tree cannot be felled and a buffer of 20 m must be clearly marked and cordoned off until the nesting birds have fledged, or the nest has been naturally abandoned as confirmed by an ecologist.

b. Little blue penguins and grey-faced petrels – Awaiti

To avoid injury / mortality to nesting little blue penguins, grey-faced petrels, and their eggs or chicks during works, earthworks at Awaiti should ideally be avoided during peak breeding and moulting season (July to March for little blue penguins and broadly June to February for grey-faced; New Zealand Birds Online, 2013).

If works cannot be avoided within the breeding season, the sites (in particular the crevices created by the vegetation and rocks, areas of malleable soil, etc) must be inspected for active burrows one week prior to the works by a suitably qualitied specialist utilising seabird detector dogs.

If any active nests of little blue penguins and / or grey-faced petrels are found, the area cannot be cleared and must be clearly marked, and 100 m buffer cordoned off until the nesting birds have fledged, or the nest has been naturally abandoned.

4.3.2 Herpetofauna Survey and Relocation

A precautionary approach should be taken to avoid the likelihood of any injuries / mortality to herpetofauna. Prior to vegetation clearance, the area should be surveyed by a herpetologist, permitted by the Department of Conservation. If native herpetofauna are confirmed to be present, the herpetologist must be onsite to oversee vegetation clearance, in order to search for and rescue any native lizards found, before relocating them to an alternative location on the Site. A lizard management plan may be required as a condition of herpetologist's wildlife permit.

4.4 Overall Level of Effects

A summary of the overall level of ecological effects following related management measures is provided in the table below.

Table 12. Summary of the overall ecological effects for each of the interpretation sites. The overall level of effect is assessed using Appendix B: Table B5.

Ecological Effect	Ecological Component	Ecological Value	Magnitude of Effect (Unmitigated)	Further Management Recommended	Magnitude of Effect (Revised)	Overall Level of Effect
Waikorire Entrance						
Loss of terrestrial vegetation	Terrestrial Vegetation	Low	Negligible	–	–	**Very Low**
Loss of native fauna habitat	Herpetofauna	High	Negligible	–	–	**Very Low**
Injury and /or mortality of native fauna	Herpetofauna	High	Low	Herpetofauna survey and relocation	Negligible	**Very Low**
Awaiti						
Loss of terrestrial vegetation	Terrestrial Vegetation	Very High	Low	–	–	**Low**
Loss of native fauna habitat	Avifauna	Very High	Negligible	–	–	**Low**
	Herpetofauna	High	Negligible	–	–	**Very Low**
Injury and /or mortality of native fauna	Avifauna	Very High	Moderate	Avoidance of avifauna breeding season and burrow survey	Negligible	**Low**
	Herpetofauna	High	Low	Herpetofauna survey and relocation	Negligible	**Very Low**
Water tank						
Loss of terrestrial vegetation	Terrestrial Vegetation	Negligible	Negligible	–	–	**Very Low**
False summit						
Loss of terrestrial vegetation	Terrestrial Vegetation	Moderate	Negligible (Temp.) – Low (Perm.)	–	–	**Very Low (Temp.) – Low (Perm.)**
Loss of native fauna habitat	Avifauna	High	Low	–	–	**Low**
	Herpetofauna	High	Low	–	–	**Low**
Injury and /or mortality of native fauna	Avifauna	High	Low	Avoidance of avifauna breeding season and nest survey	Negligible	**Very Low**
	Herpetofauna	High	Low	Herpetofauna survey and relocation	Negligible	**Very Low**

5 Conclusion

The proposed construction and installation of placemaking structures around Mauao have the potential to impact the terrestrial vegetation, and native avifauna and herpetofauna, including At Risk and Threatened species.

The actual and potential ecological effects arising from the works are outlined below and summarised in Table 12 for each interpretation site across Mauao.

- Loss of terrestrial vegetation (temporary and permanent)
- Loss of native avifauna and herpetofauna habitat (temporary and permanent)
- Injury or mortality of native avifauna and herpetofauna (during construction)

Additional management measures are recommended to reduce the potential of injury or mortality to native fauna as follows:

- Avoidance of construction during avifauna breeding season, as well as site surveys to detect active nests / burrows if these timings cannot be avoided.
- Herpetofauna survey prior to construction, with potentially a further salvage or management plan based on survey results.

Overall, with the above management measures integrated, the proposed works will lead to **Very Low or Low** effects.

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A

Appendix A –Proposed Works and On-site Photos for each Interpretation Site

Appendix A: Proposed Works and On-site Photos for each Interpretation Site

Waikorire Entrance

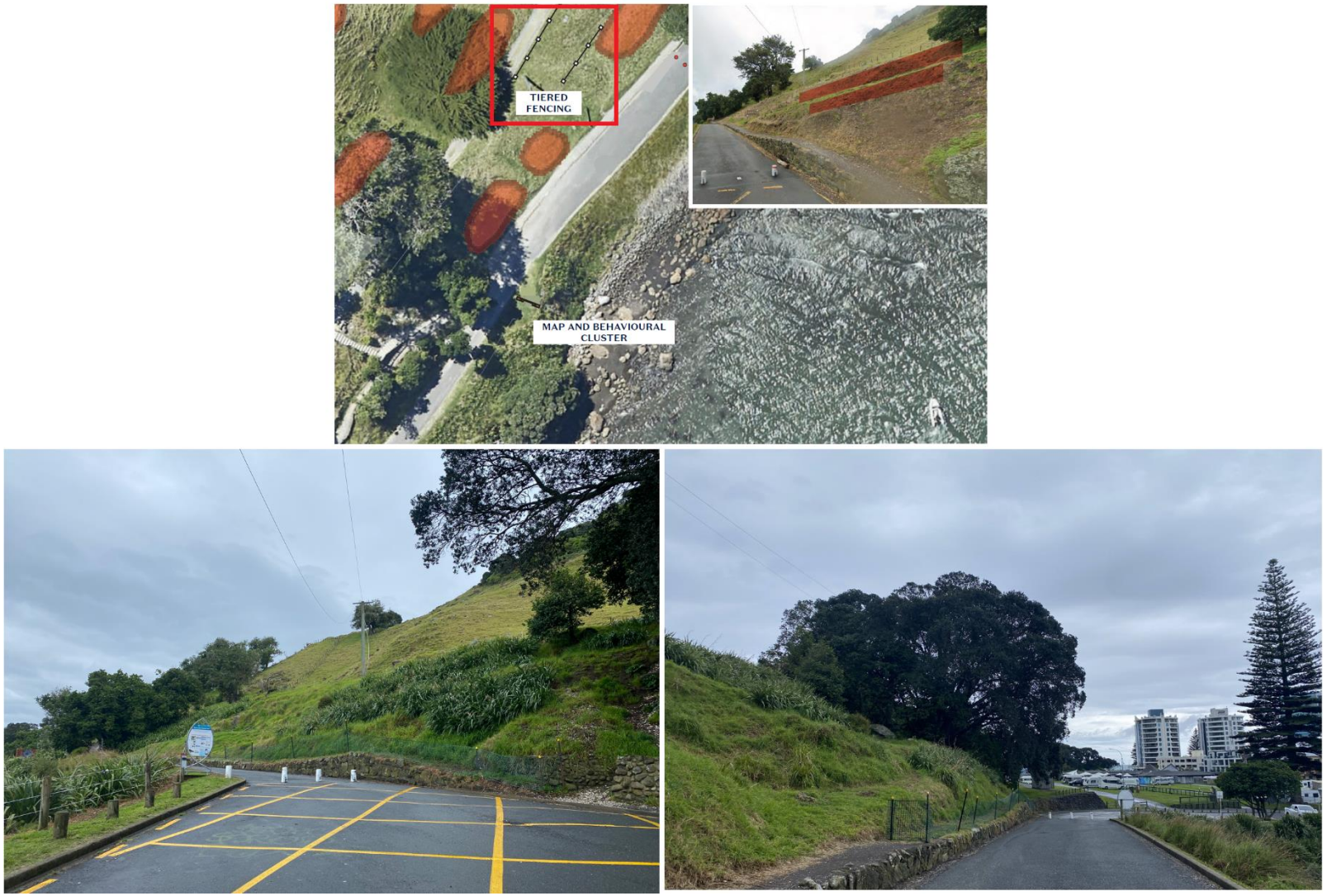

Figure A 1. Proposed works (image taken from Law Creative, 2022) and on-site photos for Waikorire Entrance (taken on 22nd September 2022).

Awaiti

Figure A 2. Proposed works (image of proposed works taken from Law Creative, 2022) and on-site photos for Awaiti (taken on 22nd September 2022).

Water tank

Figure A 3. Proposed works (taken from Law Creative, 2022) and on-site photos for Water Tank (taken on 22nd September 2022).

False Summit

Figure A 4. Proposed works (taken from Law Creative, 2022) and on-site photos for False Summit (taken on 22nd September 2022).

B

Appendix B – Ecological Impact Assessment Guidelines

Appendix B: Ecological Impact Assessment Guidelines

Assigning Ecological Value

Terrestrial Habitat / Community

The terrestrial habitat features were assessed considering attributes in Table B 1. Features of interest were subjectively given a rating on a scale of 'Very Low' to 'High' for each attribute and assigned a value in accordance with the description provided in Table B 2.

Table B 1. Attributes to be considered when assigning ecological value or importance to a site or area of vegetation/ habitat / community.

Matters	Attributes to be assessed
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 species and species assemblages: Species assemblages that are typical of the habitat Indigenous species that occur in most of the guilds expected of 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 or 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, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	Site history, and local environmental conditions which have influenced the development of habitats and communities The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (form "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

Table B 2. Rating system for assessing ecological value of a terrestrial system (Roper-Lindsay et al. 2018).

Value	Description
Negligible	Feature rates Very Low for at least three assessment attributes and Low to Moderate for the remaining attribute(s).
Low	Feature rates Very Low to Low for most assessment attributes and moderate for one. Limited ecological value other than providing habitat for introduced or tolerant indigenous species.
Moderate	Feature rates High for one assessment attribute and Low to Moderate for the remainder, OR the project area rates Moderate for at least two attributes and Very Low to Low for the rest. Likely to be important at the level of the Ecological District.
High	Feature rates High for at least two assessment attributes and Low to Moderate for the remainder, OR the project area rates High for one attribute and Moderate for the rest. Likely to be regionally important.
Very High	Feature rates High for at least three assessment attributes.

	Likely to be nationally important.

Species

The EIANZ provides a method for assigning value (Table B 3) to species for the purposes of assessing actual and potential effects of activities.

Table B 3. Criteria for assigning ecological values to species (Roper-Lindsay et al. 2018).

Ecological Value	Species
Very High	Nationally Threatened species, found in the ZOI either permanently or seasonally
High	Species listed as At Risk – Declining, found in the ZOI, either permanently or seasonally
Moderate	Species listed as any other category of At Risk, found in the ZOI either permanently or seasonally
Moderate	Locally (ED) uncommon or distinctive species
Low	Nationallly and locally common indigenous species
Negligible	Exotic species, including pests, species having recreational value

Assigning Magnitude of Impacts

The magnitude of impacts is determined by the scale (temporal and spatial) of potential impacts identified and the degree of ecological change that is expected to occur as a result of the proposed activity (Roper-Lindsay et al. 2018).

Based on the assessor's knowledge and experience, the magnitude of identified impacts on the ecological values within the project area and zone of influence were assessed and rated on a scale of 'Very High' to 'Negligible' based on the description provided in Table B 4.

Table B 4. Summary of the criteria for describing the magnitude of effect (Roper-Lindsay et al., 2018).

Magnitude	Description
Very High	Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature
High	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR Having a minor effect on the known population or range of the element/feature
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature

Assessment also considered the temporal scale at which potential impacts were likely to occur:

- Permanent (>25 years).
- Long-term (15-25 years).
- Medium-term (5-15 years).
- Short-term (0-5 years).
- Temporary (during construction)

Assessing the Overall Level of Effects

The overall level of effect on each ecological feature identified within the zone of influence were determined by considering the and the Value of impacted ecological habitat and species, and the Magnitude of impacts identified above (Roper-Lindsay *et al*. 2018).

Results from the assessment of ecological value and the magnitude of identified impacts were used to determine the level or extent of the overall impacts on identified ecological features within the project area and zone of influence using the matrix below.

Table B 5. Matrix combining magnitude and value for determining the overall level of ecological impacts (Roper-Lindsay et al. 2018).

Effect Level		Ecological and/or Conservation Value				
		Very High	High	Moderate	Low	Negligible
	Very High	Very High	Very High	High	Moderate	Low
Magnitude	High	Very High	Very High	Moderate	Low	Very Low
	Moderate	High	High	Moderate	Low	Very Low
	Low	Moderate	Low	Low	Very Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low	Very Low
	Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

Results from the matrix were used to determine the type of responses that may be required to mitigate potential direct and indirect impacts within the project area and within the zone of influence, considering the following guidelines (Roper-Lindsay *et al*. 2018):

- A ‘Low’ or ‘Very Low’ level of impact is not normally of concern, though design should take measures to minimise potential effects.
- A ‘Moderate’ to ‘High’ level of impact indicates a level of impact that qualifies careful assessment on a case-by-case basis. Such activities could be managed through avoidance (revised design) or appropriate mitigation. Where avoidance is not possible, no net loss of biodiversity values would be appropriate.
- A ‘Very High’ level of impact is are unlikely to be acceptable on ecological grounds alone and should be avoided. Where avoidance is not possible, a net gain in biodiversity values may be appropriate.

C

Appendix C – Plant List for Each Interpretation Site

Appendix C: Plant List for Each Interpretation Site

Interpretation Site	Common name	Scientific Name	Native / Exotic	Threat Status (assigned using De Lange, 2018)
Waikorire Entrance	Coastal cutty grass	*Cyperus ustulatus*	Native	Not Threatened
	Kikuyu grass	*Cenchrus clandestinus*	Exotic	–
	Common ramping-fumitory	*Fumaria muralis*	Exotic	–
	Yorkshire Fog	*Holcus lanatus*	Exotic	–
	Bermuda buttercup	*Oxalis pes-caprae*	Exotic	–
	Creeping buttercup	*Ranunculus repens*	Exotic	–
Awaiti	Knobby club rush	*Ficinia nodosa*	Native	Not Threatened
	Karo	*Pittosporum crassifolium*	Native	Not Threatened
	Pōhutukawa	*Metrosideros excelsa*	Native	Threatened – Nationally Vulnerable
	Kikuyu grass	*Cenchrus clandestinus*	Exotic	–
Water Tank	Kikuyu grass	*Cenchrus clandestinus*	Exotic	–
	White poplar	*Populus alba*	Exotic	–
False Summit	Mingimingi	*Leucopogon fasciculatus*	Native	Not Threatened
	Mānuka	*Leptospermum scoparium*	Native	At Risk – Declining
	Kikuyu grass	*Cenchrus clandestinus*	Exotic	–
	Spanish heath	*Erica lusitanica*	Exotic	–
	Gorse	*Ulex europaeus*	Exotic	–

D

Appendix D – eBird Avifauna List for Mauao

Appendix D: eBird Avifauna List for Mauao

Native avifauna species recorded within 3 km of the Site by eBird (eBird, 2022). Threat status assigned using Robertson et al., (2021), and preferred habitat information sourced from Boffa Miskell Limited (2018) and New Zealand Birds Online (2013). Primary and secondary habitats* in dark and light yellow, respectively.

Sorted by Habitat Preference and threat status				Preferred Habitats							
Common name	***Scientific Name***	***Threat Status***	***Year***	*Oceanic*	*Coastal / Estuary*	*Freshwater / Wetlands*	*Farmland / Open Country*	*Scrub / Shrubland*	*Native Forest*	*Exotic Forest*	*Urban Residential*
Little Blue Penguin	*Eudyptula minor*	At Risk - Declining	2022								
Fairy Prion	*Pachyptila turtur*	At Risk - Relict	2019								
Australasian gannet	*Morus serrator*	Not Threatened	2022								
Sooty shearwater	*Puffinus griseus*	At Risk - Declining	2020								
Northern Giant Petrel	*Macronectes halli*	At Risk - Recovering	2015								
New Zealand white-faced storm petrel	*Pelagodroma marina maoriana*	At Risk - Relict	2020								
Northern Diving Petrel	*Pelecanoides urinatrix urinatrix*	At Risk - Relict	2020								
Cook's petrel	*Pterodroma cookii*	At Risk - Relict	2020								
Flesh-footed Shearwater	*Puffinus carneipes*	At Risk - Relict	2020								
Fluttering shearwater	*Puffinus gavia*	At Risk - Relict	2022								
Buller's shearwater	*Puffinus bulleri*	At Risk - Naturally Uncommon	2020								
Grey-faced petrel	*Pterodroma macroptera gouldi*	Not Threatened	2022								
Tasmanian albatross	*Thalassarche cauta cauta*	Non-resident Native - Vagrant	2020								
Arctic skua	*Stercorarius parasiticus*	Non Resident Native - Migrant	2017								
Reef heron	*Egretta sacra*	Threatened – Nationally Vulnerable	2021								
Black swan	*Cygnus atratus*	Not Threatened	2020								
White-faced heron	*Egretta novaehollandiae*	Not Threatened	2022								
Black-billed gull	*Larus bulleri*	Threatened – Nationally Critical	2020								
Caspian tern	*Hydroprogne caspia*	Threatened – Nationally Vulnerable	2021								
Northern New Zealand dotterel	*Charadrius obscurus*	Threatened – Nationally Increasing	2022								

Red-billed gull	*Larus novaehollandiae scopulinus*	At Risk - Declining	2022								
Turnstone	*Arenaria interpres*	Non Resident Native - Migrant	2014								
Eastern bar-tailed godwit	*Limosa lapponica*	At Risk - Declining	2015								
White-fronted tern	*Sterna striata*	At Risk - Declining	2022								
Black-backed gull	*Larus dominicanus*	Not Threatened	2022								
Eastern little tern	*Sternula albifrons*	Non Resident Native - Migrant	2018								
South Island pied oystercatcher	*Haematopus finschi*	At Risk - Declining	2020								
Variable oystercatcher	*Haematopus unicolor*	At Risk - Recovering	2022								
Pied stilt	*Himantopus leucocephalus*	Not Threatened	2019								
North Island fernbird	*Poodytes punctatus*	At Risk - Declining	2021								
Pied shag	*Phalacrocorax varius*	At Risk - Recovering	2022								
Little Shag	*Microcarbo melanoleucos*	At Risk - Relict	2022								
Black shag	*Phalacrocorax carbo*	At Risk - Relict	2021								
Little black shag	*Phalacrocorax sulcirostris*	At Risk - Naturally Uncommon	2022								
Spotted shag	*Phalacrocorax punctatus*	Not Threatened	2018								
New Zealand pipit	*Anthus novaeseelandiae*	At Risk - Declining	2020								
Canada goose	*Branta canadensis*	Introduced and Naturalised	2015								
New Zealand Kingfisher	*Todiramphus sanctus*	Not Threatened	2022								
Grey duck	*Anas superciliosa*	Threatened – Nationally Vulnerable	2018								
Pukeko	*Porphyrio melanotus*	Not Threatened	2019								
Paradise shelduck	*Tadorna variegata*	Not Threatened	2022								
Mallard	*Anas platyrhynchos*	Introduced and Naturalised	2021								
Dabchick	*Poliocephalus rufopectus*	Threatened – Nationally Increasing	2018								
Australian coot	*Fulica atra*	At Risk - Naturally Uncommon	2019								
New Zealand Scaup	*Aythya novaeseelandiae*	Not Threatened	2019								
Australasian little grebe	*Tachybaptus novaehollandiae*	Non-Resident Native - Coloniser	2015								
Spur-winged plover	*Vanellus miles*	Not Threatened	2022								
Pacific golden plover	*Pluvialis fulva*	Non Resident Native - Migrant	2021								
Chaffinch	*Fringilla coelebs*	Introduced and Naturalised	2022								
Dunnock	*Prunella modularis*	Introduced and Naturalised	2022								

Song thrush	*Turdus philomelos*	Introduced and Naturalised	2022								
European greenfinch	*Carduelis chloris*	Introduced and Naturalised	2022								
Goldfinch	*Carduelis carduelis*	Introduced and Naturalised	2022								
Yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	2022								
Australian magpie	*Gymnorhina tibicen*	Introduced and Naturalised	2022								
Myna	*Acridotheres tristis*	Introduced and Naturalised	2022								
Starling	*Sturnus vulgaris*	Introduced and Naturalised	2022								
Swamp harrier	*Circus approximans*	Not Threatened	2022								
Welcome swallow	*Hirundo neoxena*	Not Threatened	2022								
Skylark	*Alauda arvensis*	Introduced and Naturalised	2020								
Blackbird	*Turdus merula*	Introduced and Naturalised	2022								
California quail	*Callipepla californica*	Introduced and Naturalised	2022								
Morepork	*Ninox novaeseelandiae*	Not Threatened	2022								
Rock pigeon	*Columba livia*	Introduced and Naturalised	2022								
House sparrow	*Passer domesticus*	Introduced and Naturalised	2022								
Grey warbler	*Gerygone igata*	Not Threatened	2022								
Silvereye	*Zosterops lateralis*	Not Threatened	2022								
Eastern rosella	*Platycercus eximius*	Introduced and Naturalised	2022								
Common pheasant	*Phasianus colchicus*	Introduced and Naturalised	2022								
Bellbird	*Anthornis melanura*	Not Threatened	2019								
Kererū	*Hemiphaga novaeseelandiae*	Not Threatened	2022								
Tūī	*Prosthemadera novaeseelandiae*	Not Threatened	2022								
Fantail	*Rhipidura fuliginosa*	Not Threatened	2022								
North Island robin	*Petroica longipes*	At Risk - Declining	2018								
New Zealand Falcon	*Falco novaeseelandiae*	At Risk - Recovering	2022								
North Island Kākā	*Nestor meridionalis*	At Risk - Recovering	2021								
Shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	2021								
Spotted dove	*Streptopelia chinensis*	Not Threatened	2018								

*Primary habitat refers to the habitat in which the species spends most of its time. Secondary habitats are other habitat types which the species may also utilise.