VIRIDIS
Environmental Consultants

Campana Road, Private Plan Change

Ecological Impact Assessment

Prepared for: Campana Landowners' Consortium

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Cover photo: Crops planted on the site, 1 November 2023.

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1 EXECUTIVE SUMMARY

Capstone Projects Limited, on behalf of the Campana Landowners' Consortium, engaged Viridis Limited (Viridis) to undertake an ecological impact assessment of a proposed Private Plan Change application by the owners of five adjoining lots, for an area totalling 31.5 ha. It is currently zoned as 'Future Urban Zone' under the Auckland Unitary Plan Operative in Part and falls within the Puhinui Precinct. The client is proposing that the land be rezoned to 'Light Industrial Zone'.

This report details the ecological assessment that was undertaken by Viridis to determine the ecological features within the site and the significance of those features. Within this assessment, Viridis has considered the ecological value of existing terrestrial and freshwater features on site and evaluated how the proposed land use change from rural to light industrial may impact these ecological values. Where required, recommendations are provided to aid in the avoidance, minimisation, or remediation of adverse effects.

The terrestrial ecological value of the site was generally low due to the agricultural land use, with the limited vegetation present within the site largely consisting of exotic planted stands and shelterbelts. Mixed exotic and native vegetation is present on the site along the coastline and the riparian margins of a wetland and is of moderate value, with some potential habitat for herpetofauna and avifauna. The coastal marine area along the site boundaries is of moderate-high value given the Significant Ecological Area (SEA) classification and potential presence of threatened species. A number of wetlands are present on the site. Most are very small and degraded, providing low ecological values. The largest wetland provides moderate ecological values. Most watercourses on the site are artificial drains. Only two permanent streams are present, one has been assessed to be of low ecological value and the other of moderate ecological value.

The proposed zone change to light industrial zoning will provide for adequate maintenance and enhancement of ecosystem services, indigenous biodiversity and enhancement through revegetation planting, while accommodating the appropriate subdivision, use and development of urban land. The assessment has been informed by relevant regulations, including the National Policy Statement for Indigenous Biodiversity, the National Policy Statement for Freshwater Management 2020 the National Environmental Standards for Freshwater 2020 and the Auckland Unitary Plan Operative in Part.

2 INTRODUCTION

2.1 Overview

This Ecological Impact Assessment Report (EcIA) has been prepared to inform a Private Plan Change (PPC) application by Campana Landowners' Consortium ('the client') across five properties within the Puhinui Precinct area, covering an area of 31.5 ha. The lots included within the PPC area are:

- Lot 3 DP 71211
- Lot 2 DP 71211
- Lot 1 DP 402013
- Lot 2 DP 402013
- Allot 190 Psh of Manurewa

These lots are collectively referred to as 'the site' in this report. The properties are mainly bounded by the coast and Puhinui Road. The location of the site is shown Figure 1 and the lots in Figure 2.

Figure 1. Site location as indicated by purple polygon (map source: LINZ, NZ Topo50).

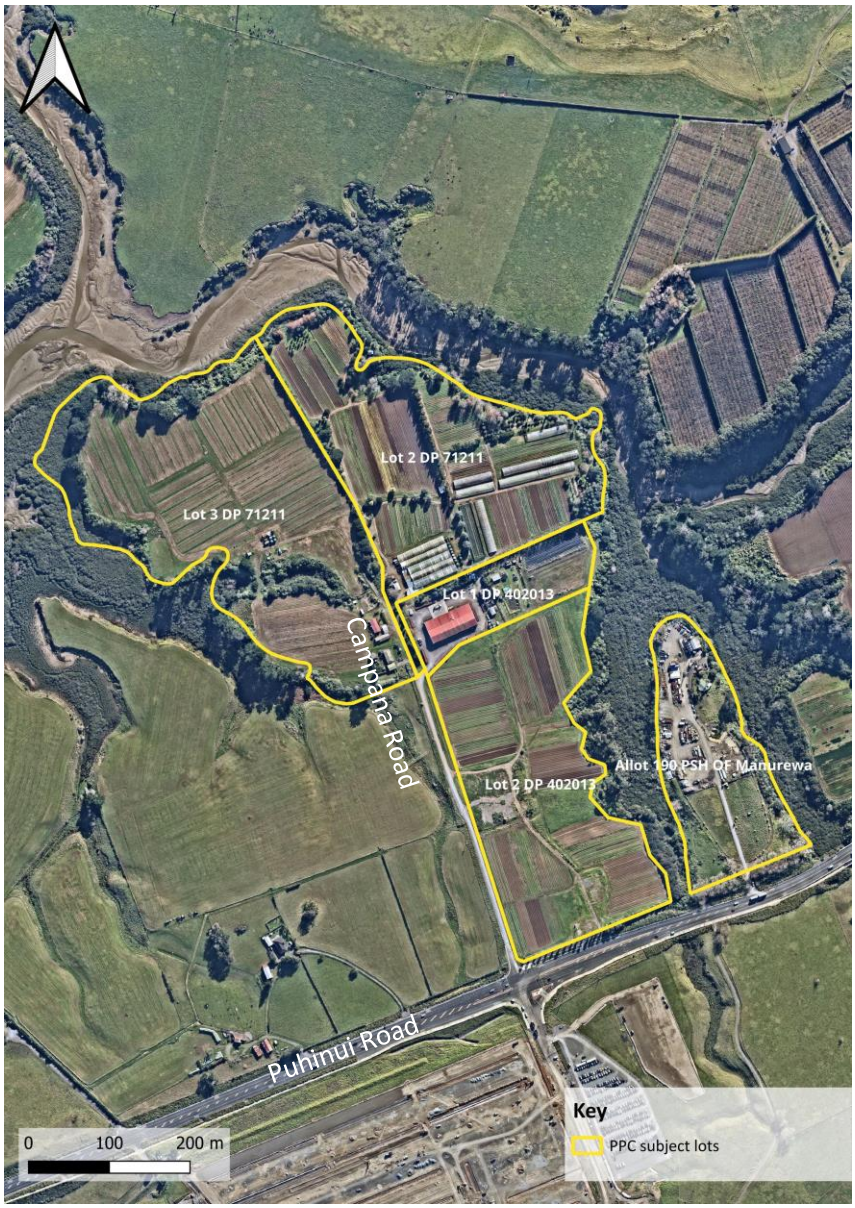

Figure 2. Site extent (aerial source: Nearmaps, 2023).

2.2 Report Scope

Viridis Limited (Viridis) was engaged by the client to undertake an EcIA for the PPC application under the Auckland Unitary Plan Operative in Part (AUP-OP). This ecological assessment has been prepared to inform the assessment of environmental effects that will support the PPC application.

The overarching approach of this EcIA is to ascertain the existing terrestrial and freshwater ecological values on the site and determine the impact of the proposed land use change and associated activities on those values. Recommended measures to avoid, remedy, or mitigate adverse effects on terrestrial and freshwater ecology are provided as required. Recommendations for addressing anticipated residual adverse effects on the ecological values of the site through enhancement are also made where applicable.

3 METHODOLOGY

3.1 Overview

The assessment included a desktop review and site visit, undertaken by a suitably qualified ecologist. The desktop review involved an examination of current and historical aerial imagery of the site, during which factors such as changes in vegetation and surface water were noted. A review of data on Auckland Council's Geomaps (such as current biodiversity layers, predicted watercourses and site topography) was also undertaken.

A site assessment was undertaken on 1 November 2023, during which the presence and extent of freshwater and terrestrial features within the property and surrounding area were recorded and the quality of associated habitat (if any) was visually assessed, in accordance with the methodology detailed in Sections 3.2 through 3.3, below. Photographs and notes were taken on-site, and key points/features were marked using a hand-held GPS unit where relevant. The weather at the time of the site visit was fine and sunny. According to the rainfall monitoring gauge at Greenwoods Road, Mangere (sourced from the Auckland Council Data Portal), there had been 18 mm of rainfall during the preceding two days.

3.2 Terrestrial Ecology

During the site visit, terrestrial vegetation and associated fauna habitat values were assessed. The extent of indigenous and exotic vascular vegetation was recorded, and botanical ecological values were considered.

A desktop review of terrestrial characteristics was undertaken, which included consideration of connectivity to surrounding terrestrial features. Habitats for indigenous fauna (lizards, bats and avifauna) were qualitatively assessed alongside reviews of wildlife databases of local records where applicable (e.g., Department of Conservation databases, Bioweb, eBird, iNaturalist). Opportunistic sightings of avifauna were recorded, and the conservation status of the species, as defined in Robertson et. al. (2021), was noted.

The ecological value of terrestrial features were determined in accordance with the methodology prescribed in the EIANZ guidelines (refer Section 2.4).

3.3 Freshwater Ecology

3.3.1 Watercourses

During the site assessment, the presence and extent of streams and wetlands on site (if any) were noted and the quality of any freshwater habitat was visually assessed. Watercourses were classified as per the AUP-OP definitions to determine, in accordance with the definitions in this plan, the ephemeral, intermittent or permanent status of the watercourse[1]. Ecological factors such as hydrological regime, aquatic habitat and riparian environment were assessed. Modifications to natural flow paths or the presence of artificial drainage channels were also noted. Riparian and catchment information was also

[1] Although the site assessment was undertaken just outside of the Auckland Council recommended time period for classifying streams of July – October (Auckland Council, 2021), there was a high confidence in the watercourse classification as classified watercourses were determined based on criteria that are not season dependent.

reviewed and the NIWA New Zealand Freshwater Fish Database (NZFFD) was examined for fish species potentially present within the site.

3.3.2 Wetlands

The Ministry for the Environment (MfE) wetland delineation protocols (MfE 2022a) and pasture exclusion assessment methodology (MfE 2022b) were used to determine whether an area met the definition of a 'natural inland wetland' under the National Policy Statement for Freshwater Management 2020 (NPS-FM). Assessments were carried out within the 'growing season' for the Auckland region (MfE, 2021). As per the Clarkson (2014) vegetation tool methods, plant species within putative wetlands were identified, and each species was assigned one of the below wetland indicator status ratings (Clarkson *et al*., 2021):

- Obligate (OBL) – almost always in wetlands, rarely in drylands;
- Facultative wetland (FACW) – usually in wetlands but occasionally found in drylands;
- Facultative (FAC) – commonly occurs in both wetlands and drylands;
- Facultative upland (FACU) – occasionally in wetlands but usually in drylands; or
- Upland (UPL) – rarely in wetlands, almost always in drylands.

Based on the dominance and prevalence of hydrophytic (wetland) species, natural inland wetland presence/absence was determined. Where results of the vegetation assessment remained uncertain or conditions were modified or atypical, hydric soils and hydrological assessments were undertaken.

Value assessments included identifying native and exotic vegetation species, examining the structural tiers within wetland areas, and assessing the quality and abundance of aquatic habitats. Signs of wetland degradation such as pugging and grazing from stock access, structures such as culverts impeding hydrological function, and weed infestation were also noted.

The ecological value of freshwater features were determined in accordance with the methodology prescribed in the EIANZ guidelines (refer Section 2.4).

3.4 Ecological Impact Assessment

The ecological value of the site, relating to species, communities and systems, were determined as per the EIANZ Ecological Impact Assessment guidelines (EcIAG) for use in New Zealand (Roper-Lindsay et. al. 2018). This report also identifies statutory guidelines and regulation with respect to ecology (such as watercourses, wetlands, high value vegetation and habitats) where relevant to the proposed development. Using this framework, the EcIAG describes a simple ranking system to assign value to species as well as other matters of ecological importance such as species assemblages and levels of organisation. The overall ecological value is then determined on a scale from '*Negligible*' to '*Very High*'.

Criteria for describing the magnitude of effects are given in Chapter 6 of the EcIAG. The level of effect can then be determined through combining the value of the ecological feature/attribute with the score or rating for magnitude of effect to create a criterion for describing level of effects (Table 1). A moderate level of effect requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures need to be introduced to avoid through design, or appropriate mitigation needs to be addressed (Roper-Lindsay et al. 2018).

Table 1. Criteria for describing the level of effects (from Roper-Lindsay et al. 2018).

Magnitude of Effect	Ecological Value				
	Very High	**High**	**Moderate**	**Low**	**Negligible**
Very High	*Very High*	*Very High*	*High*	*Moderate*	Low
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

Notes: Where text is italicised, it indicates 'significant effects' where mitigation is required.

4 SITE ENVIRONMENT

4.1 Ecological Context

The site is situated in the Tāmaki Ecological District of the Auckland Region. This district comprises Takapuna, East Coast Bays, the Auckland isthmus and the drowned valley of the Waitemata Harbour. Its geology is largely Waitemata group sandstone, siltsone and minor limestone with some basaltic scoria cones, tuff rings and lava flows and some alluvium. Soils are mainly volcanic ash soils of medium to high fertility. Most of the district is heavily modified by urban development.

Historically (pre-human), the site would have likely contained the ecosystem type 'Kahikatea, pūriri forest' (WF7-3). Native flora characteristic of this ecosystem type would have included pūriri (*Vitex lucens*) with occasional kahikatea (*Dacrycarpus dacrydioides*), kohekohe (*Didymocheton spectabilis*) and nīkau (*Rhopalostylis spp.*), which could support a diverse community of invertebrates, amphibians, reptiles, birds and bats. Secondary successions are often dominated by podocarp trees, with tōtara (*Podocarpus totara*) and kahikatea most abundant (Singers *et. al.* 2017).

The site is located on the edge of the Pūkaki Inlet of the Manukau Harbour, with the tidal reach of the Waokauri Creek bordering the site to the west, north and east. The Waokauri Creek is identified as a Significant Ecological Area (SEA-M2-27a) in the AUP-OP. SEA-M2 areas are of regional, national or international significance which do not warrant an SEA-M1 identification as they are generally more robust (i.e., M1 areas are more vulnerable). This SEA area supports a range of intertidal banks and shellbanks that support a variety of animal and plant communities, including being a feeding ground for thousands of migratory and endemic wading birds. Significant areas of mangrove are present in the Waokauri Creek, with meadows of bachelor's button in some fringe areas.

4.2 Local Context

The site is mainly flat and elevated above the coastal marine area (CMA), with steep banks around the coastal edge of the site. A review of historical aerial imagery indicates that the site, and much of the surrounding landscape, was cleared over 80 years ago for agricultural purposes (Figure 3). The surrounding suburbs of Mangere, Papatoetoe, Puhinui and Wiri are well developed for urban land uses, including residential and light industry. To the west of the site is the Auckland Airport. The immediate surrounding land use is currently predominantly rural (although zoned mainly Future Urban or Light Industrial). The area to the south is currently being redeveloped into Light Industrial use.

Currently the site is being used mainly for horticultural crops, with the exception of Allot 190 PSH of Manurewa, which is used as a storage yard by a construction company. Historically the site was grazed pasture, with historic aerial photos indicating horticulture beginning on part of the site by 1975 and covering most of the site by 1983. The site contains several dwellings and a number of sheds and plastic houses associated with the horticultural and commercial land uses. Several buildings have been removed in recent years.

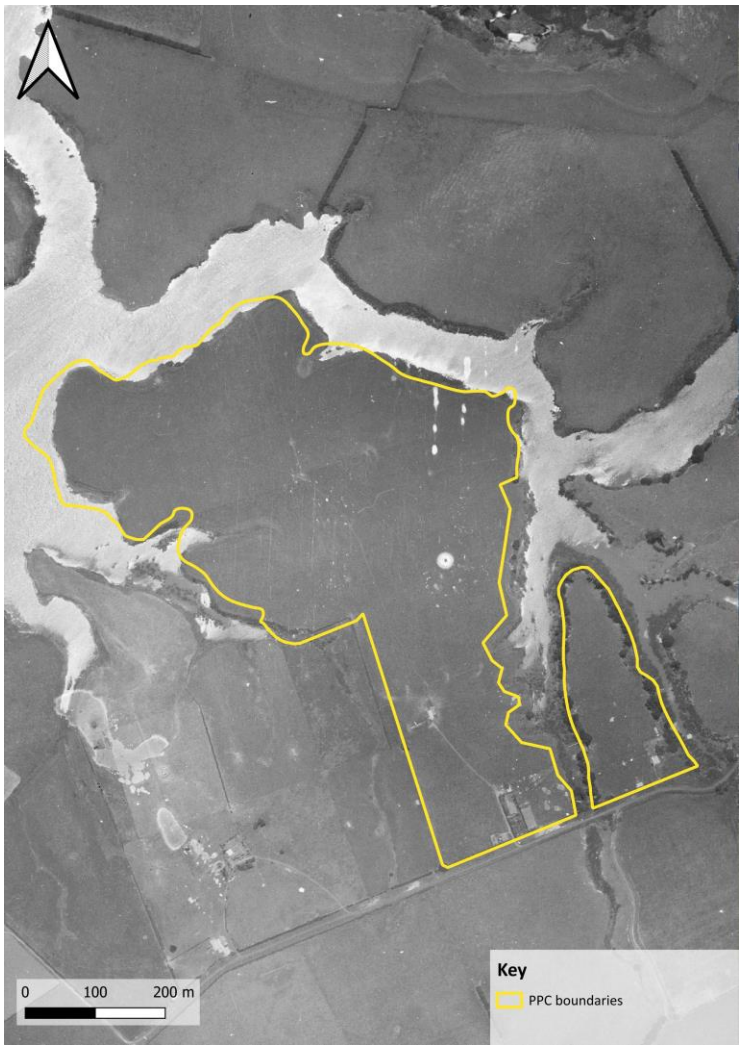

Figure 3. Historical aerial imagery of the PPC site from 1939, showing agricultural land use (aerial source: Retrolens).

5 TERRESTRIAL ECOLOGY

5.1 Terrestrial Vegetation

5.1.1 Overview

Utilising observations from the site visit and aerial images, the vegetation has been classified and mapped (Appendix A). The terrestrial vegetation within the PPC site was generally limited, and only a small amount of native vegetation was present. The majority of the vegetation present was pasture and commercial crops (mainly leafy vegetables, some grape vines and various others). Weedy native and exotic vegetation was present around the coastal edge, and throughout the rest of the site were shelterbelts, amenity plantings of native and exotic trees and orchard trees.

5.1.2 Mixed native - exotic vegetation

The steep banks of the coastal edge of the whole site and the riparian margins of the larger wetland on site were vegetated in a generally dense mix of exotic and native species. Species included exotic and pest plants such as woolly nightshade[2] (*Solanum mauritianum*), pampas[2] (*Cortaderia selloana*), tree privet[2] (*Ligustrum lucidum*), Chinese privet[2] (*Ligustrum sinense*), bear's breeches (*Acanthus mollis*), *Cestrum elegans, Malva multiflora, Pinus* sp., fennel (*Foeniculum vulgare*), hemlock[2] (*Conium maculatum*), and gorse[2] (*Ulex europaeus*). Native species included māhoe (*Melicytus ramiflorus*), karamu (*Coprosma robusta*), karo (*Pittosporum crassifolium*) and hangehange (*Geniostoma ligustrifolium*). Climbing plants were common scrambling over the vegetation such as moth plant[1] (*Araujia hortorum*), great bindweed (*Calystegia sylvatica*), Japanese honeysuckle[1] (*Lonicera japonica*), and the natives *Muelenbeckia australis* and *Muelenbeckia complexa.*

In addition to the above vegetation, scattered around the top of the banks was a variety of exotic and some native tree species that have been planted over time. Exotic tree species include macrocarpa (*Hesperocyparis macrocarpa*), box alder (*Acer negundo*), cypress (*Taxodium* sp.), *Gingko biloba*, pin oak (*Quercus palustris*), gum (*Eucalyptus* sp.), poplars (*Populus* sp.), redwood (*Sequoia* sp.), oak (*Quercus robur*), willow (*Salix* sp.), Mexican fan palm (*Washingtonia robusta*). Native species included pōhutukawa (*Metrosideros excelsa*), tanekaha (Phyllocladus trichomanoides) and rewarewa (*Knightia excelsa*).

The native-exotic vegetation around the coastal edge was considered to be of **moderate** ecological value. The abundance of pest plant and exotic species reduced the botanical quality of the vegetation, however it is expected that these areas would provide moderate value habitat for indigenous avifauna and potentially herpetofauna.

[2] Identified as a plant pest in the Auckland Regional Pest Management Plan 2020-2030 (Auckland Council, 2020)

a)

b)

c)

d)

Figure 4. Mixed native-exotic vegetation around the coastal edge.

5.1.3 Shelterbelts

Shelterbelts around the site were mainly of mature exotic tree species such as cedar (*Cryptomeria japonica*), macrocarpa, poplars, she-oak (*Casuarina cunninghamiana*) and Italian alder (*Alnus cordata*). One shelterbelt was of the common native species *Griselinia littoralis.*

The ecological value of the shelterbelts was considered to be **low**, given the high edge effects and exotic species. It is possible they provide habitat for bats, but as discussed below there is a lack of suitable vegetation and corridors for bats in the surrounding environment. The shelterbelts are not expected to provide important habitat for native birds or lizards.

a) b)

Figure 5. Examples of shelterbelts a) redwoods and b) cedars.

5.1.4 Amenity and orchard trees

Amenity and orchard trees had been planted around the site and consisted of a mix of exotic and native species planted either as specimen trees or grouped. Species included kauri (*Agathis australis*), karaka (*Corynocarpus laevigatus*), taraire (*Beilschmiedia taraire*), pōhutukawa, tītoki (*Alectryon excelsus*), fig (*Ficus carica*), macadamia (*Macadamia* sp.) and peach (*Prunus persica*).

While these amenity and orchard trees may provide some food sources for birds from time to time, their low numbers and scattered nature mean that their overall ecological value is considered to be **low.**

a) b)

Figure 6. Examples of a) amenity and b) orchard trees

5.1.5 Crops and pasture

Much of the site is covered in market gardens, which mainly appear to be used to grow leafy vegetables. There are also some smaller areas with grape vines and strawberries. These are highly modified areas with regular ploughing and maintenance. Around the edges of the crops is mown grass.

The only area of rank grass on the PPC site is on Allot 190 PSH of Manurewa. The southern part of this site is partly grazed by sheep except for a small area of rank grass at the south-western corner of the allotment.

Given the generally highly managed nature of the crop and pasture areas of the site, their ecological value is considered to be **low**.

a) **b)**

Figure 7. a) Crops, which cover most of the site and b) a small area of rank grass on the eastern portion of the PPC area.

5.1.6 Terrestrial Connectivity and Ecological Function

The terrestrial vegetation on the site is limited and is confined mostly to vegetation along the coastal edge and riparian vegetation, shelterbelts and areas of amenity and orchard planting. Edge communities such as these increase fragmentation of native vegetation within a landscape, and are heavily influenced by increased exposure to sunlight, wind and competition from pest plants. These factors restrict establishment of some native flora and fauna to forest interiors. Fragmentation of native vegetation increases the edge effect and decreases the availability of habitat for species that would normally occur in the interior of vegetated areas. Connectivity between areas of vegetation is important to facilitate ecological function, and loss of connectivity can impair reproductive function for both flora and fauna communities.

There are only small areas of vegetation, both exotic and native, present within the site and these are generally long and narrow. As a result, all vegetation within the site is subject to very high edge effects and as such the functioning of the vegetated areas and their ability to persist and resist the effects of adverse weather and weed invasion are significantly reduced. This is clearly demonstrated on the site by the abundance of exotic weedy species. Despite this degradation, the vegetated margins of the coast and wetland D provide some ecological functions. These include shading, bank stability, erosion protection, organic input, surface water filtration, habitat, a buffer to the adjacent marine SEA and potential habitat for fauna.

There is very little native terrestrial vegetation in the surrounding area. This, combined with the fragmented and degraded nature of the vegetation on site, mean that there are limited opportunities for the vegetation on site to provide connectivity for highly mobile terrestrial fauna such as birds or bats that move between habitats while foraging, nesting and roosting.

The connectivity and ecological functioning values of the site are considered to be **low**.

5.2 Terrestrial Fauna Habitat

5.2.1 Avifauna (birds)

Avifauna habitat within the site was fairly limited to isolated areas of mixed native/exotic scrub, along with amenity plantings, shelterbelts, and isolated trees. The limited tree and shrub vegetation within the site may provide low quality nesting and roosting habitat.

No formal avifauna surveys were undertaken, however birds seen/heard were opportunistically recorded during the site visit. Table 2 provides a list of species that are expected to be present, at least periodically, within the site. Records retrieved from eBird.org for nearby sites were used to indicate what other species may be present that were not observed during the site visit.

The dominant avifauna community within the site is expected to contain a combination of common exotic and native species that are abundant in the wider Auckland region including urban, urban fringe, and rural areas, such as the introduced magpie, skylark, black bird, finches, starling, thrush and myna and the native spur winged plover, paradise shelduck, Australasian harrier, kingfisher, welcome swallow and ruru.

There are a number of records of the At Risk / Declining New Zealand pipit / Pīhoihoi in the surrounding area on eBird. Pipits are more common in areas of rough pasture with patches of fern, marshes or bogs and nest on the ground under clumps of tussock or long grass (NZbirdsonline, 2023). As most of this site is highly managed for horticulture, this preferred habitat type is very limited, so while unlikely, pipits may visit the site from time to time, and if so their numbers are likely to be very low.

Birds usually associated with forest habitat such as tūī, fantail, and kererū are not expected to be abundant due to the lack of suitable habitat within the site. It is possible that kākā (*Nestor meridionalis* – At-Risk, Recovering) may visit the area, although this would be expected to be present only fleetingly if at all.

Some birds associated with the adjacent CMA may also use the site from time to time. The trees and vegetation along the coastal edge may provide roosting or nesting habitat for coastal birds such as heron, royal spoonbill and shags. There are some records for the At Risk / Declining wetland birds spotless crake, fernbird and banded rail in the surrounding coastal SEA area. These are most likely to be found within the marine SEA or on the SEA fringes surrounding the site, but it is possible that fernbird and spotless crake may occur in wetland D from time to time (discussed further in Section 6.2.1).

Birds within the site are expected to provide limited ecological functions within the site itself (e.g., seed dispersal, flower pollination, predation) due to the limited habitat available.

The ecological value of the site for avifauna was considered to be **moderate** due to the potential presence of several At Risk – Declining species.

Table 2. Birds known to be present in the wider area.

Common name	Species name	Conservation status	Observed on site
Australian magpie	*Gymnorhina tibicen*	Introduced and Naturalised	✓
Australasian harrier	*Circus approximans*	Not Threatened	
Banded rail / Moho pererū	*Gallirallus philippensis*	At Risk / Declining	

Common name	Species name	Conservation status	Observed on site
Blackbird	*Turdus merula*	Introduced and Naturalised	✓
Black backed gull	*Larus dominicanus*	Not Threatened	
Canada goose	*Branta canadensis*	Introduced and Naturalised	
Californian quail	*Callipepla californica*	Introduced and Naturalised	
Chaffinch	*Fringilla coelebs*	Introduced and Naturalised	
Eastern rosella	*Platycercus eximius*	Introduced and Naturalised	
Fantail	*Rhipidura fuliginosa placabilis*	Not Threatened	
Fernbird / mātātā	*Poodytes punctatus*	At Risk / Declining	
Goldfinch	*Carduelis carduelis*	Introduced and Naturalised	
Greenfinch	*Chloris chloris*	Introduced and Naturalised	
Grey warbler	*Gerygone igata*	Not Threatened	
Kererū	*Hemiphaga novaeseelandiae*	Not Threatened	
Kingfisher	*Todiramphus sanctus vagans*	Not Threatened	✓
Mallard duck	*Anas platyrhynchos*	Introduced and Naturalised	✓
Morepork / ruru	*Ninox novaeseelandiae*	Not Threatened	
Myna	*Acridotheres tristis*	Introduced and Naturalised	
Paradise shelduck	*Tadorna variegata*	Not Threatened	
Pheasant	*Phasianus colchicus*	Introduced and Naturalised	
Pied stilt	*Himantopus himantopus*	Not Threatened	
Pipit / Pīhoihoi	*Anthus novaeseelandiae*	At risk / declining	
Pūkeko	*Porphyrio melanotus melanotus*	Not Threatened	
Rock pigeon	*Columba livia*	Introduced and Naturalised	
Red-billed gull / Tarāpunga	*Chroicocephalus novaehollandiae*	At Risk, Declining	
Royal spoonbill / Kōtuku ngutupapa	*Platalea regia*	Naturally uncommon	
Silvereye	*Zosterops lateralis lateralis*	Not Threatened	
Shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	
Skylark	*Alauda arvensis*	Introduced and Naturalised	✓
Song thrush	*Turdus philomelos*	Introduced and Naturalised	✓
Sparrow	*Passer domesticus*	Introduced and Naturalised	
Spotted dove	*Spilopelia chinensis*	Introduced and Naturalised	
Spotless crake	*Zapornia tabuensis*	At Risk, Declining	
Spurwinged plover	*Vanellus miles novaehollandiae*	Not Threatened	
Starling	*Sturnus vulgaris*	Introduced and Naturalised	

Common name	Species name	Conservation status	Observed on site
Tūī	*Prosthemadera novaeseelandiae novaeseelandiae*	Not Threatened	
Welcome swallow	*Hirundo neoxena neoxena*	Not Threatened	
White faced heron	*Egretta novaehollandiae*	Not Threatened	✓
Yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	

5.2.2 Herpetofauna (lizards)

Herpetofauna (reptiles and amphibians) comprise a significant component of New Zealand's terrestrial fauna. There is currently 135 endemic herpetofauna taxa recognised in New Zealand (Hitchmough et al., 2021), 85.9% of which are considered 'Threatened' or 'At-Risk'. All indigenous reptiles and amphibians are legally protected under the Wildlife Act 1953, and vegetation and landscape features that provide significant habitat for native herpetofauna are protected by the Resource Management Act 1991. Statutory obligations require management of resident reptile and amphibian populations if they are threatened by a disturbance i.e., land development.

A review of the Department of Conservation's Herpetofauna database (accessed 13/11/2023) identified six lizard species recorded within 10 km of the site. The most commonly recorded species were the introduced plague skink (*Lampropholis delicata*) and the copper skink (*Oligosoma aeneum* – At-Risk, declining). Ornate skink (*Oligosoma ornatum* – At-Risk, declining) was recorded in Mangere a number of times between 1970 and 1980 and once in Otahuhu in 2007. Forest gecko (*Mokopirirakau granulatus* – At-Risk, declining) was recorded at one site approximately 10km to the north-east in 2013. Moko skink (*Oligosoma moco* – At Risk, relict) was recorded approximately 6 km to the north west in 2004. Shore skink (*Oligosoma smithi*, At Risk – declining) was recorded at one site approximately 4km to the north east in 1988. There were no records for other species recorded in the Auckland region such as elegant gecko (*Naultinus elegans* – At-Risk, declining) and Pacific gecko (*Dactylocnemis pacificus* – not threatened).

During the site visit, opportunistic observations of potential lizard habitat were made. The main potential skink habitat present was in the mixed native / exotic vegetation around the coastal edge, and the longer grass present in these areas. Copper skink may be present on site in suitable habitat (thick rank grass, log/rock/vegetation/rubbish debris), and it is likely the introduced plague skink is present. Given the paucity of observations in the surrounding area, it is considered unlikely that the ornate skink and moko skink are present, although there is potentially suitable habitat along the coastal edge vegetation. Shore skink is only known from the east coast. The lack of mature native vegetation on the site, lack of connection to other areas of bush, and the lack of observations in the surrounding area mean that it is unlikely that geckos are present on the site.

The ecological values of the herpetofauna habitat are conservatively assessed to be **moderate** due to the potential for the 'At-Risk' copper skink to be present within the site.

5.2.3 Chiroptera (bats)

New Zealand has two species of endemic bats on the mainland. The most widespread is the long-tailed bat (*Chalinolobus tuberculatus*, Threatened – nationally critical), although colonies are assumed to be small and their health is largely unknown (O'Donnell et al., 2023).

The lesser short-tailed bat has three described subspecies; the northern lesser short-tailed bat (*Mystacina tuberculata aupourica,* Threatened – nationally vulnerable), the central lesser short-tailed bat (*Mystacina tuberculata rhyacobia,* At-risk – declining) and the southern lesser short-tailed bat (*Mystacina tuberculata tuberculata,* Threatened – nationally increasing) (O'Donnell et al., 2023). There are no known populations of the short-tailed bat on the mainland in the Auckland region, with the closest known population being the northern lesser tailed bat population on Te Hauturu-o-Toi/Little Barrier Island.

Bats roost in tree hollows and under split bark of native and exotic trees, and also in rocky overhangs. Over the breeding season, large communal roosts occur in similar habitat. Bats tend to utilise linear features in the landscape, including vegetation edges, gullies, waterways, and road corridors as they transit between roosts and foraging sites. Long-tailed bats in particular are known to be highly mobile, with large home ranges (>5,000 ha) and can travel large distances (~25 km) each night during foraging. Short-tailed bats require specific habitat consisting of good-quality forest vegetation, so are highly unlikely to be present on the site.

No formal survey for long tailed bats was completed as part of the investigations for this report. A review of data in the Department of Conservation's bat database (accessed July 2023), found that the nearest record for long tailed bat was 8.7 km to the east, with the next closest being 14 km away to the south-east.

The larger exotic trees on the site (e.g. macrocarpas) may provide some suitable roosting and/or nesting habitat (cavities, large sections of flaking bark) habitat for bats. However, the lack of corridors or stands of indigenous vegetation in the surrounding area, the dominance of agriculture nearby, and the urban influences of the wider area such as lighting, noise and disturbance all reduce the suitability of the area for bats.

It is therefore considered possible that long tailed bats may periodically be present in the area, and potentially within the site, however the habitat is not expected to support regular visits or communal roosts. Therefore the ecological value of the site for bats is considered to be **moderate**, as a small amount of vegetation may provide suitable habitat, and their presence cannot be ruled out.

6 FRESHWATER ECOLOGY

6.1 Watercourses

All watercourses within the site were classified and mapped according to the definitions within the AUP-OP as either permanent, intermittent, ephemeral, or artificial drains. Artificial drains were classified according to their flow regime (i.e. ephemeral or intermittent). Each modelled overland flow path shown in Auckland Council's Geomaps was investigated, and its status assessed.

The watercourse classification types are described in this section. A map with labelled watercourses and a table showing the criteria met for each watercourse are provided in Appendices B and C respectively.

6.1.1 Artificial drains

Multiple artificial watercourses are present within the site (Appendix B). These features were constructed for drainage purposes. Drains were identified based on attributes including alignment with natural topography, presence/absence of a historic natural channel, catchment size, and artificial characteristics such as deepening and straightening. Artificial drainage channels are excluded from the relevant stream protection rules under the AUP-OP and the NPS-FM. None of the drains were considered to be permanently flowing.

Intermittent drains

'Intermittent drains' have been mapped as per Appendix B. Drains have been labelled as 'intermittent where they had a channel bed below the water table for most of the year. Intermittent drains were artificially straightened and channelised, and did not align with the natural topography. A review of the historic aerials indicated that some were formed during recent years while others have been present for more than 80 years. The drains were typically clogged with vegetation including budding club-rush and waterpepper. Aquatic habitat was limited to slow-flowing or stagnant water that would not be expected to support indigenous fish and there was no upstream habitat. The ecological value of the intermittent drains was considered to be **negligible**.

a) **b)**

Figure 8. a) Intermittent drain 11 looking downstream and b) Intermittent drain 13

Figure 9. Intermittent drain 18

Ephemeral drains

'Ephemeral drains' were represented by straight, shallow artificial channels. Most had a cover of rooted terrestrial vegetation and acted as swales to direct overland flow. These drains were considered to remain above the water table throughout the year. Ephemeral drains contained no aquatic habitat and were considered to have **negligible** ecological value.

a) **b)**

Figure 10. a) Ephemeral drains 19 and b) 23

a)

b)

Figure 11. a) Ephemeral drains 21 and b) 22

a)

b)

Figure 12. a) Ephemeral drains 24 and b) 25 (to left of accessway)

a)

b)

Figure 13. a) Ephemeral drain 28

6.1.2 Modelled overland flow paths

Many of the modelled overland flow paths (OLFPs) investigated had no discernible channel, and therefore did not meet the definition of stream or drain and are shown in Appendices B and C as "modelled OLFP". Photos of some of the larger modelled OLFPs are provided in Figures 14 to 19 below.

a) b)

Figure 14. a) Looking towards OLFP 3 and b) OLFP 5

a) b)

Figure 15. a) Looking along OLFP 6 and b) toward OLFP 8.

a) b)

Figure 16. a) Looking along OLFP 9 and b) OLFP 17

a) b)

Figure 17. a) Looking down along OLFP 26 and b) along OLFP 29

a) b)

Figure 18. a) Looking up along bottom reach of OLFP 27 and b) along upper reach of OLFP 27

a)

b)

Figure 19. a) Looking up along OLFP 30 and b) down along OLFP 31

6.1.3 Streams

Small catchment sizes within the site means that there are few streams. Only two permanent streams, and no intermittent streams, have been identified within the PPC area.

Permanent stream 14

This permanent stream is fed by artificial drains (13 and 11) and at its upstream end is fed by an underground drain that discharges from beneath infrastructure associated with an oil pipeline crossing the site. No channel or OLFP is visible upstream of this point. Downstream the stream widens into wetland habitat (D). The channel is incised for the reach between wetland D and a culvert beneath an accessway, and it contained a small amount of flowing water at the time of the site visit, 0.3 – 0.5 m in width and a depth of around 0.03 m. Upstream of the accessway the stream is more poorly defined, but contained shallow running water at the time of the site visit. The substrate is soft sediment. It is clear that the channel has been modified in the past through modification of its path and culverting and historic aerial photos indicate that some channel straightening was undertaken between 2006 – 2008, although the culvert would predate this.

The channel is well shaded by overhanging exotic vegetation such as long grasses, pampas, umbrella sedge (*Cyperus eragrostis*) and elephant ear (*Alocasia brisbanensis*) and at the most upstream reach by mixed native and exotic trees and shrubs. Water celery (*Helosciadium nodiflorum*) grows within the stream channel. Figure 20 illustrates the nature of the stream. The small amount of water and lack of pools means that there is little suitable fish habitat. There is a lack of suitable fish habitat upstream. Fish passage to the stream is compromised by the culvert beneath the accessway across the wetland further downstream as it appears that this culvert has a vertical riser at the upstream end. This ecological value of this stream is **low**, given the small amount of flowing water, the lack of hydrological heterogeneity and the narrow width of riparian vegetation.

a)

b)

Figure 20. Permanent stream 14 a) downstream reach, b) upstream reach

Permanent stream 33

This stream is located between Lot 2 DP 402013 and Allot 190 Psh of Manurewa and flows through esplanade reserve and crown land. Its catchment is approximately 30 ha in size and is on the opposite side of Puhinui Road from the PPC area and is currently being developed. It is permanent in nature and in the PPC area it transitions into the coastal marine area. Figure 21 shows the nature of the stream in this transitional area. Upstream of Puhinui Road the stream is wetland-like in nature.

This stream is immediately upstream of the marine SEA and therefore may be utilised by At-Risk – Declining species known to be present within the wider area such as banded rail, fern bird, spotless crake and long finned eel (*Anguilla dieffenbachia*). The stream has a natural channel in this location. Although its quality is currently likely degraded due to a history of agriculture and the development occurring in its catchment, it has higher potential value in the future. The ecological value of this wetland has been assessed as **moderate**.

Figure 21. Permanent stream 33

6.2 Wetlands

6.2.1 Natural Inland Wetlands

Five natural inland wetlands were identified within the site and have been mapped in Appendix B. All of the wetlands within the site met the rapid vegetation test for wetland delineation and contained permanent hydrological indicators such as saturated ground or surface water. Wetland extent was delineated based on contours and/or a clear change in vegetation community from OBL/FACW dominant to FACU/UPL dominant.

Wetland areas immediately adjacent to the site (but outside the PPC area boundaries) are also described and mapped. Areas assessed as putative wetland are also indicated and discussed below.

Wetland A

This wetland is approximately 170 m^2 in size and is located at the confluence of two modelled OLFPs and adjacent to the CMA. The ground is saturated here and there is a mix of mercer grass (*Paspalum distichum*, FACW, exotic), *H. nodiflorum* (OBL) and water cress (*Nasturtium* sp., OBL), overgrown in places by nasturtium (*Tropaeolum majus*) which forms a dense covering of the banks of this gully area. There is a bund present within this wetland through which a culvert discharges. Auckland Council Geomaps aerial timeslider tool was used to investigate the history of this wetland. The photos indicate that the bund was constructed around 2006 to form a pond. Whilst this may indicate that the wetland has formed in or around a deliberately constructed water body, a pre-construction aerial photograph from 2001 indicates the presence of the gully area and possibly wetland vegetation, suggesting that a wetland may have been present prior to pond construction. Therefore, a conservative approach has been taken to classify this as a natural inland wetland. This wetland is considered to be of **low** ecological value given its small size, dominance by exotic species and lack of suitable habitat for indigenous aquatic fauna.

Figure 22. Wetland A

Wetland B

This small wetland (approximately 40 m^2) is located along the coastal edge at the base of a more gentle slope compared to the steeper banks elsewhere around the site. It grades into coastal wetland / salt marsh and mangrove habitat. It is dominated by marsh ribbonwood (*Plagianthus divaricatus*, FACW) and is overgrown with climbing *Muehlenbeckia compexa* (FACU). This wetland is considered to be of **low** ecological value given its small size.

Wetland C

Wetland C is located within a modelled OLFP and is approximately 330 m^2 in size. The vegetation here is dominated by *C. eragrostris* (FACW). Scattered other plants include thistle (*Cirsium vulgare*, FACU), black nightshade (*Solanum nigrum*, FACU), moth plant, and castor oil plant (*Ricinus communis*). This wetland is considered to be of **low** ecological value given its dominance by exotic species and lack of suitable habitat for indigenous aquatic fauna.

a) **b)**

Figure 23. a) Wetland B and b) Wetland C.

Wetland D

This is the largest and wetland on site. It is approximately 1370 m^2 in size and is split into two parts by an accessway that has been constructed over it. Historic aerial photos indicate that the accessway construction occurred between 2006 and 2008. Aerial photos prior to its construction suggest that there was wetland habitat present here prior to 2006.

The lower portion grades into coastal mangrove habitat. Downstream of the accessway, the exotic reed sweet grass (*Glyceria maxima*, OBL) and the native *Bolboschoenus fluviatilis* (OBL) dominate. Upstream of the accessway the vegetation is a mix of *B. fluviatilis*, mercer grass, *H. nodiflorum*, and creeping bent (*Agrostis stolonifera*, FACW, exotic).

The riparian margins of this wetland are well vegetated, although the vegetation is dominated by exotic species such as Chinese privet.

This wetland has a significant fish barrier within it as the inlet of the culvert that passes below the accessway is a vertical riser. This means that only fish species with strong climbing abilities could potentially access the upper part of the wetland. The wetland provides habitat for eels in particular (short finned eel (*Anguilla australis*, not threatened) and long finned eel (*A. dieffenbachii*, At Risk – Declining)), which are strong climbers as juveniles and may therefore be able to access the upper part of the wetland.

As discussed in Section 5.2 above, the wetland birds banded rail, fern bird and spotless crake are known to be present in the wider surrounding area, albeit likely in low numbers. All three have a conservation status of At Risk - Declining. This wetland area provides potential habitat for spotless crake and fern bird in particular, so it is possible they may be present at times. Banded rail are more commonly associated with coastal areas, so may occur in the downstream section of the wetland.

The ecological value of this wetland has been assessed as **moderate**. Although the botanical values are compromised by the dominance of exotic/invasive species and there is a barrier to fish passage, the wetland potentially provides habitat for several at risk species. It also provides valuable ecological services such as enhancing water quality and regulating flows.

a)

b)

c)

Figure 24. a) Wetland D, downstream of accessway, b) Wetland D, upstream of accessway, c) accessway retaining wall and culvert inlet.

Wetland E

Most of wetland E is on the neighbouring property, just a small area of approximately 500 m^2 is on the PPC site at the base of a steep slope close to the boundary (the whole wetland is more than 3000 m^2). Most of the catchment of Wetland E is within the neighbouring property, with only a small area of the PPC site draining into it.

The wetland is part of a stream system draining the neighbouring grazed farmland and is unfenced. Access here was difficult due to the steep slope and lack of access through the neighbouring property, so it was viewed from the road and mapped using aerial photos. The main species present appeared to be *Juncus edgariae* (native, FACW), *J. effusus* (exotic, FACW), mercer grass, creeping bent, Yorkshire fog (*Holcus lanatus*, exotic, FAC) and bindweed.

The value of this wetland is assessed as **moderate**, due to its larger size, connection to the marine SEA, and the potential for at risk species to be present.

a)

b)

Figure 25. a) Wetland E close to the PPC site and b) Wetland E looking towards the PPC site from Campana Road.

Wetland G

Wetland G is a small area of wetland approximately 65 m^2 in size, located outside of the PPC site boundaries on an esplanade reserve. Its catchment is mainly on the PPC site. Plant species here are predominantly exotic, including *H. nodiflorum*, *Ranunculus repens* (exotic, FAC), *J. effusus*, *J. bufonius* (exotic, FACW) and *G. maxima.* Closer to the coastal area was oioi (endemic, *Apodasmia similis*).

This wetland is considered to be of **low** ecological value because of its small size and dominance by exotic species.

Figure 26. Wetland G

6.2.2 Putative Wetlands

Putative wetland F

Two vegetation plots were assessed in this area as it was within a modelled OLFP and had been left uncultivated in recent years. The results of the vegetation plots are shown in Tables 3 and 4. Because both vegetation plots failed the dominance test and the prevalence index test, this area is not considered to be a natural inland wetland as per the definition within the NPS-FM.

Table 3. Details of vegetation plot 1 within putative wetland area F

Binomial name	Common name	Rating	Biostatus	Cover (%)	Dominant
Trifolium repens	White clover	FACU	Exotic	30	Yes
Plantago major	Broad leafed dock	FACU	Exotic	30	Yes
Poa trivialis	Rough stalked meadow grass	FACU	Exotic	20	
Paspalum dilatatum	Paspalum	FACU	Exotic	10	
Anthriscus caucalis	Bur parsley	-	Exotic	10	
% of dominant species that are FAC/FACW/OBL					**0%**
Prevalence value					**4.0**

Table 4. Details of vegetation plot 2 within putative wetland area F

Binomial name	Common name	Rating	Biostatus	Cover (%)	Dominant
Plantago major	Broad leafed dock	FACU	Exotic	30	Yes
Ranunculus repens	Creeping buttercup	FAC	Exotic	20	Yes
Trifolium repens	White clover	FACU	Exotic	20	Yes
Poa trivialis	Rough stalked meadow grass	FACU	Exotic	20	Yes
Rumex obstusifolius	Broad-leaved dock	FAC	Exotic	10	
% of dominant species that are FAC/FACW/OBL					**25%**
Prevalence value					**3.7**

6.3 Constructed ponds

Pond X

This rectangular pond was constructed around 2008, as indicated by historic aerial photos. It appears to have little water within it now and is covered in mercer grass. As it is a deliberately constructed waterbody, this pond does not fall within the definition of a natural inland wetland under the NPS-FM.

Ponds Y

There are six small ponds in this location that historic satellite images on Google Earth indicate were constructed between 2020 – 2022. Whilst these ponds are located within a modelled OLFP, historic aerial photographs do not show any evidence that there was a wetland or waterbody present in this location historically. Previously, what appears to have been an oval race track bounded this area of ponds (constructed between 1975-1983) and animal yards were present from the 1980s to 2009. As they are deliberately constructed waterbodies, these ponds do not fall within the definition of a natural inland wetland under the NPS-FM.

a)

b)

Figure 27. a) Pond X and b) Ponds Y.

7 COASTAL ENVIRONMENT

As discussed in Section 4.1 above, the site is bounded by the tidal reaches of the Waokauri Creek to the west, north and east. The indicative coastline from Auckland Council's geomaps is shown in Appendix A and B. In some areas, particularly to the north-west, the PPC site boundaries extend into the CMA.

The coastal area is identified as a SEA in the AUP-OP because of its range of habitat types including intertidal banks and shellbanks that support a variety of flora and fauna. The extensive gently-graded sand flats support dense populations of intertidal sand flat organisms and are an excellent feeding ground for thousands of international migratory and New Zealand endemic wading birds including a number of threatened species. In the shelter of the Puhinui, Pukaki, and Waokauri Creeks are significant areas of mangroves. Those in the Puhinui Creek are some of the oldest mangroves in the harbour and have bachelor's button meadows on the fringe in places. (Schedule 4, AUP-OP). As discussed in Section 5.2 above, spotless crake, fernbird and banded rail are known to be present in the wider surrounding area.

The entirety of the coastal margin around the PPC site is fringed by mangroves. Along the eastern and western boundaries of the site the mangroves infill the full width of the estuarine arms. Along the northern edge of the site, where flow through the Waiokauri Creek is greatest and the main channel is closer to the site boundary, the fringe of mangroves along the coastline is narrower, down to a few metres in places, but more commonly 10 – 30 m in width. Much of the coastal edge around the site is steep banks with mangroves right up to the edge of the bank, however in some areas, where there is a shallower gradient at the coastal edge, there is a narrow fringe of salt marsh, with species such as marsh ribbonwood, sea rush (*Juncus kraussii*), glasswort (*Salicornia quinqueflora*) and remuremu (*Selliera radicans*) present.

Historical aerial photographs show that in 1939 there were very few mangroves present along the site's coastal edge. At this time mangroves were more scattered, with small pockets within the most sheltered areas such as up the stream arms or in small bays. The coverage of mangroves since then has gradually increased to the current extent, likely reflecting the response of the mangrove community to sediment deposition from clearance of the original forest cover, land development and agricultural and horticultural practices.

The value of the coastal environment surrounding the site is considered to be **moderate - high**, given the potential for threatened species to be present and the classification of the coastal environment as an SEA.

Figure 28 shows the nature of the coastal environment surrounding the site.

a)

b)

c)

d)

e)

f)

Figure 28. The surrounding coastal environment: a) Eastern edge of site near modelled OLFP 17, b) northern edge of site near modelled OLFP 7 & 8, c) northern edge of site near modelled OLFP 7 & 8, d) between Allot 190 PSH of Manurewa and Lot 2 DP 402013 e) the transition between terrestrial vegetation along the site's bank edge and mangrove habitat f) transition from terrestrial vegetation, to salt marsh, to mangroves

8 SUMMARY OF ECOLOGICAL VALUES

The ecological values of the habitat features on the site are summarised in Table 5. The terrestrial ecological values of the site are generally low, except for the mixed native-exotic vegetation that is mainly around the coast which is considered to be of moderate value and may provide some habitat for birds, bats and lizards. Exotic trees within the site (e.g. orchards, shelterbelts) are considered to provide low ecological value. Very little native vegetation remains across the site to provide any significant habitat for indigenous fauna. Most of the site is largely comprised of low value crops and pasture.

There are few natural freshwater features on the site, given the generally small catchment sizes. The wetlands present are generally of low value, except the largest one on the site, and a wetland on the neighbouring property, which are of higher value due to the potential presence of at risk species and the ecological functions provided by the wetlands. One permanent stream on the site is degraded and of low current value, and the other larger stream is between two parts of the PPC area and is of moderate value.

The adjacent coastal area is of higher ecological significance, and is identified as an SEA in the AUP-OP.

Table 5. Summary of the ground-truthed terrestrial and freshwater ecological values within the site.

Ecological feature	Ecological Value
Mixed native-exotic vegetation	Moderate
Shelterbelts	Low
Amenity and orchard trees	Low
Crops and pasture	Low
Terrestrial connectivity and ecological function	Low
Avifauna (birds)	Moderate
Herpetofauna (lizards)	Moderate
Chiroptera (bats)	Moderate
Artificial drains	Negligible
Permanent streams	Low - moderate
Natural inland wetlands	Low - moderate
Coastal environment	Moderate - high

9 ASSESSMENT OF ECOLOGICAL EFFECTS

9.1 Proposal

The PPC seeks to rezone approximately 31.5 ha of land from Future Urban Zone under the AUP-OP to Business – Light Industry Zone. The land area is proposed to be mainly in Puhinui sub-precinct C, with smaller areas in sub-precinct A (for protection of coastal areas) and sub-precinct E (for retail and amenities to support the surrounding light industry areas). All Auckland-wide and Business – Light Industry Zone provisions of the AUP-OP, the current Puhinui precinct provisions and the proposed sub-precinct provisions will apply to the rezoned land and will enable Council to exert control over subdivision development. Where relevant, national environmental standards (e.g. the NES-F and the NPS – Indigenous Biodiversity (NPS-IB)) and legislation (such as the Wildlife Act 1953) will also apply to development activities.

This section assesses the potential effects of the proposed private plan change on the current and potential ecological values within the Site and the associated wider landscape.

9.2 Impact on Terrestrial Ecology

9.2.1 Vegetation

The main threats to the long-term viability of ecosystems in the Auckland region are often intensified by increases in urbanisation and human population density. These include habitat destruction, fragmentation, increased edge effects, and subsequent invasion by pest plants and animals. The clearance of native vegetation will be avoided where practicable during future development. Any proposed vegetation clearance within the PPC areas will be assessed at resource consent stage, and the effects management hierarchy applied to avoid, minimise, mitigate, or otherwise offset/compensate to address residual effects.

Vegetation values within the site are significantly limited due to the small amount of trees and shrubs present on the site and the dominance of exotic vegetation. Most of the mixed native and exotic vegetation on the site is located within 25 m of the CMA or within 20 m of a wetland and therefore would be protected from removal through the coastal yard (Chapter H17 and Puhinui Precinct rules) or vegetation management (Chapter E15) rules of the AUP-OP.

Rezoning the site will result in low adverse effects on the existing vegetation. It is expected that vegetation beyond the coastal yard, riparian yards and wetland margins will be removed (e.g. the shelterbelts, specimen trees, orchards and amenity planting), however this can already be removed as a permitted activity.

There will be landscaping and amenity planting included in any development of the site which will be required by the proposed precinct provisions and the requirements of AUP-OP chapter H17 Business – Light Industry Zone, including requiring:

- Landscaped areas comprising at least 10 % of a site in sub-precincts C - E (I432.6.4)
- Planted buffers along some street frontages (I432.6.4)
- Requiring planting of riparian yards to a minimum depth of 10 m from the edge of intermittent or permanent streams and wetlands and coastal protection yards to a minimum depth of 20 m with locally sourced indigenous species (I432.6.3 (2) and (3) and I432.8.2)
- Consideration of landscaping issues in the matters of discretion and assessment criteria for restricted discretionary activities, including whether planting and maintenance plans provide for plant and animal pest control and maintenance of planted areas (I432.8.1 (6) and I432.8.2(1) and (6))
- Planting, landscape and weed management plans for buildings and structures over 50 m^2 (I432.9.1(2))
- Plans showing proposed public open space and landscaping areas for development or subdivision of land (I432.9.2).

Generally, it is expected that the landscaping required by the existing provisions of the AUP-OP and the current and proposed precinct provisions will provide species diversity and periodic areas of vegetation similar to what is currently present on site. The requirements for planting of riparian yards mean that the permanent stream (14) within the PPC area, which currently has a limited amount of riparian vegetation, will benefit. The coastal and riparian yard planting requirements will also mean that the proportion of indigenous species along the coast and riparian areas should improve.

9.2.2 Pest mammals

Rezoning the site from Future Urban to Business – Light Industry is expected to increase human population density in the area, at least during daylight hours. An increase in human population density often brings an increase in rat and mice abundance. Two feral cats were observed on site during the site visit. No significant increases in domestic cat numbers are expected due to the limited residential properties present within and around the site, and the fact that domestic cats are generally associated with residential development, not industrial development as proposed by the PPC. It is not expected that possum, mustelid, hedgehog, and rabbit abundance would increase as a result of the re-zoning as there wouldn't be an increase in habitat suitable for them.

A few pest traps were observed on the site during the site visit, but it did not appear that there was a comprehensive pest control plan in place, therefore most pests are likely at carrying capacity. It is likely that pest control would be required as part of native vegetation protection and enhancement required with development of the site, which will aim to decrease possum, mustelid, hedgehog and rodent densities within the proposed ecological spaces.

Overall, it is considered that the rezoning of the site will result in a negligible increase of pest animal effects.

9.2.3 Terrestrial indigenous fauna

Due to the low adverse effects on vegetation and the negligible effects on pest animals, it is considered that the re-zoning will result in a low adverse effect on native terrestrial habitat.

There is the potential for a loss of low quality bat habitat associated with removal of some of the larger shelterbelt trees, however roosting habitat is expected to remain within vegetation within the coastal protection yard.

The potential lizard habitat on the site is mainly within the coastal protection yard, and therefore will be protected by the rules in the AUP-OP.

Most of the birds likely to be present on the site are common and exotic species that are abundant in the Auckland landscape. The pipit is the only species with an At Risk – Declining conservation status that is associated with open areas, however as discussed above most of the habitat on site is not suitable for them to nest and therefore they are only likely to be present in low numbers if at all. The habitat of the other At Risk Declining species that may be present within the wetland and coastal areas of the site (e.g. banded rail, spotless crake, fern bird) will be protected within the rules of the AUP-OP.

Light pollution has the potential to affect the migratory birds that feed within the adjacent marine SEA. Currently the PPC area produces a very low level of light during the night, however when the area is developed to light industrial land uses it is expected that the levels of light will increase with light from buildings, street lighting, yard lighting and landscape lighting. This could potentially affect communication, feeding and migratory behaviour of birds using the adjacent coastal areas. The coastal protection yard and vegetation along the coast will help to reduce the amount of light pollution experienced in the coastal area. The potential impact of lighting on birds should be considered during the resource consenting phases of development and best practice lighting design approaches should be adopted. Best practice lighting design includes:

- Adding light only for specific purposes.
- Use of adaptive light controls to manage light timing, intensity and colour.
- Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill.
- Use the lowest intensity lighting appropriate for the task.
- Use non-reflective, dark coloured surfaces.
- Use lights with reduced or filtered blue, violet and ultraviolet wavelengths.

More information is available from DCCEEW, 2023.

Any potential direct adverse effects on native terrestrial fauna as a result of subsequent development works (e.g. earthworks) would be assessed at the resource consenting phase and can be appropriately mitigated through the implementation of fauna management plans.

9.3 Impact on Freshwater Ecology

9.3.1 Watercourses

The main threats to streams as a result of a change to Business – Light Industrial and the Puhinui Precinct rules are:

- A decrease in the riparian yard set back from 20m to 10m (however this effect is already anticipated as any rezoning of this land to an urban zoning (as anticipated by the Future Urban zone) will decrease this set back);
- The potential for increased impervious surfaces as a result of industrial development; and
- The potential increase in contaminant runoff as a result of industrial development.

Permanent stream 14 is considered to be of low ecological value and currently has limited riparian vegetation. Permanent stream 33 is of moderate ecological value. Activities that may affect the streams (e.g. riparian yard infringements, riparian vegetation clearance, stream reclamation, discharges) will

require assessment during future resource consenting processes. It is considered that the effects management hierarchy will be appropriate for managing adverse effects of future proposals and mitigating / offsetting where required. All threats can be effectively managed with appropriate controls such as erosion and sediment control plans, appropriate design and riparian planting and management. Additionally, the Stormwater Management Plan for the PPC area (see Section 9.3.3 below) promotes water sensitive design to protect the streams on site. There will be some positive effects on the permanent stream on the site through a reduction in pollutants associated with horticulture such as fertlisers, herbicides and pesticides and the potential for an increase in riparian vegetation planting. As such, the proposed rezoning is not anticipated to result in residual adverse effects on the streams.

It is expected that artificial drains on the site (which were found to be of negligible ecological value) will be reclaimed during future works or incorporated into onsite stormwater management. Artificial channels are not subject to protection or management rules under either Future Urban or Business – Light Industry Zones and therefore no change in effects is anticipated.

9.3.2 Wetlands

There are five natural inland wetlands within the PPC site, and two adjacent. The location of all wetlands is shown on the plan in Appendix B. There is the potential for wetlands to be affected by future land use changes in the same manner as watercourses. Wetlands are protected from development by the AUP-OP (Chapter E3) and the NES-F. Any future works within, or earthworks within 10 m of any wetland, vegetation removal within 20 m of a wetland (and works within 100 m if it will result in drainage of the wetland) will be subject to resource consent applications. Identification of the wetlands at this stage allows future development to be designed around the wetlands and their catchments to help ensure no complete or partial drainage occurs.

It should be noted that as the zoning is currently Future Urban Zone, it is a prohibited activity to reclaim natural inland wetlands under the NES-F. The urban rezoning will provide a consenting pathway for wetland reclamation under Regulation 45C of the NES-F (again this effect is anticipated by the Future Urban Zone). Compliance with relevant NES-F regulations in relation to natural inland wetlands will be required for subsequent development following rezoning, and it is considered that any adverse effects on natural inland wetlands will be able to be assessed and managed appropriately at future resource consent stage.

Regardless of their current classification, all wetlands and potential wetlands within the site would be required to be reassessed at resource consent stage prior to future development.

9.3.3 Stormwater management

If not appropriately managed, a land use change from rural to urban land uses may threaten freshwater ecological values through the potential increase in impervious surfaces and pollutant runoff due to subsequent development. Increases in impervious surfaces can amplify the adverse stormwater effects on the receiving environment by resulting in scouring, erosion or high levels of contaminant input if not designed and mitigated appropriately.

A Stormwater Management Plan (SMP) has been developed by Maven (Maven 2024a) for the Campana Road PPC area. This adopts the framework from the Auckland Council Network Discharge Consent and has also taken into account feedback from Te Ākitai Waiohua and Healthy Waters. Te Ākitai Waiohua has advocated for a water-sensitive design approach that emphasises managing contaminants at their source through the use of bio-retention stormwater treatment devices and utilising the natural

infiltration capacity of the ground on site where possible. Key stormwater management strategies proposed for the PPC area include:

- Water quality treatment for potentially contaminated impervious areas via at- source stormwater devices that promote natural infiltration such as rain gardens, swales or tree pits.
- Retention (5 mm) via rainwater reuse tanks for roof areas. Where ground soakage is feasible, other impervious areas within the PPC area will be subject to this requirement.
- Allowing for only inert building materials to reduce impacts on water quality.
- Protect existing wetlands by maintaining wetland hydrology.

These strategies have also been implemented in the proposed precinct provisions. The relevant proposed policies for sub-precinct C include:

- Requiring water sensitive design approaches and addressing effects as close as possible to the source and mimicking the function of natural systems (3)
- Requiring the use of inert building material and coatings (4)
- Encouraging use of innovative building solutions to achieve water sensitive design outcomes (6).

Industrial activities are often associated with elevated contaminants such as heavy metals and hydrocarbons. Contaminants can have detrimental effects on aquatic flora and fauna. Industrial and Trade Activities will require site and activity specific controls and specific consents in accordance with the AUP-OP, and as such, effects will be addressed during future consenting processes. Changing from a rural land use is likely to result in a decrease in certain contaminants such as those associated with fertilisers and pesticides and sediment runoff from cultivated horticultural soils.

9.3.4 Erosion and sediment control

A high standard of earthworks management is proposed within the PPC area in accordance with the principles proposed by Te Ākitai Waiohua. The proposed sediment control measures are outlined in the SMP, but briefly will include:

- Erosion and sediment control measures design and maintained in accordance with the Auckland Council Guideline Document 2016 (GD05).
- Oversizing all sediment retention ponds, including forebay volumes, to enable greater sediment setting time and reduce sediment discharge to the receiving environment.
- Incorporating decant bund and drop out pits within sediment retention pond catchments to reduce sediment load on the ponds.
- Silt control measures on site.
- A comprehensive sediment and erosion control maintenance and inspection plan.
- Progressive stabilisation of the site as areas of earthworks are completed.

9.4 Impact on Coastal Ecology

The coastal environment will be protected from development by the 50 m Coastal Protection Yard proposed in the precinct provisions and Esplanade Reserve requirements, which will keep works away from the coastline and allow for maintenance of a vegetated buffer. Activities that may affect the coastal environment (e.g. vegetation clearance, discharges) will require assessment during future resource consenting processes.

It is considered that the effects management hierarchy will be appropriate for managing adverse effects of future proposals. All threats can be effectively managed with appropriate controls such as stormwater management plans, erosion and sediment control plans, appropriate design and planting and weed and pest control. As such, the proposed rezoning is not anticipated to result in residual adverse effects on the coastal environment.

9.5 Relevant Policies

9.5.1 National Policy Statement for Indigenous Biodiversity 2023

The National Policy Statement for Indigenous Biodiversity (NPS-IB) sets out objectives, policies and implementation requirements to manage natural and physical resources to maintain indigenous biodiversity in the terrestrial environment under the Resource Management Act 1991 (RMA). It outlines a system for the management of biodiversity outside of public conservation land.

There is no significant indigenous biodiversity in the terrestrial environment within the site and no areas that meet the definition of a Significant Natural Area as per the NPS-IB Appendix 1. The effects management hierarchy will be applied to manage residual ecological effects. The PPC will provide opportunities to increase indigenous vegetation cover through planting and enhancements of riparian areas, wetlands and the coastal margin.

9.5.2 National Policy Statement for Freshwater Management 2020

The NPS-FM provides national direction for decisions regarding water quality and quantity, and the integrated management of land, freshwater and coastal environments under the RMA. The NPS-FM contains national objectives for protecting ecosystems, indigenous species and the values of outstanding water bodies and wetlands.

Future resource consents required for the development of the site will require compliance with relevant NES-F regulations in relation to natural inland wetlands, noting that a consenting pathway is provided for urban development (refer Regulation 45C).

9.5.3 Auckland Unitary Plan – Operative in Part 2016

The AUP-OP sets out a number of policies and objectives that give effect to the RMA to promote the sustainable management of natural and physical resources. This section addresses the objectives and policies set out in the AUP-OP pertaining to ecology.

Chapter B7 – Natural Resources

In line with the objectives and policies in this chapter, areas of significant indigenous biodiversity value and freshwater environments have been identified. Freshwater habitat will be protected from inappropriate adverse effects of subdivision use and development, or otherwise the effects management hierarchy applied to manage ecological effects. There are opportunities for indigenous biodiversity to be maintained and enhanced through indigenous revegetation within and protection of riparian margins and the coastal yard and precinct landscaping provisions.

Chapter E1 – Water Quality and Integrated Management

Consistent with Chapter E1, the development of the site will provide opportunities for the appropriate integrated management of water discharges, subdivision and greenfield development to maintain and/or enhance water quality, flows, permanent streams and associated riparian margins. A water

sensitive design approach is proposed in the SMP for the PPC area and in the policies proposed for sub-precinct C, which covers most of the site.

Chapter E3 – Lakes, Rivers, Streams and Wetlands

All potential streams, rivers and wetlands have been identified within the sites in line with per Chapter E3. Additionally, significant adverse effects can be avoided though retaining all intermittent and permanent streams where practicable, and where avoidance cannot be achieved, through implementation of the effects management hierarchy. Restoration, maintenance or enhancement of Auckland's lakes, rivers, streams and wetlands is included in E3 as an objective. The PPC will provide opportunities to improve the ecological values of these freshwater features through planting, enhancements and weed and pest control where these are required through the resource consent process.

Chapter E15 – Vegetation Management and Biodiversity

Consistent with Chapter E15, the vegetation and biodiversity values of the site have been identified. Development of the site provides opportunities to maintain and enhance ecosystem services and indigenous biodiversity values, while providing for appropriate subdivision, use and development.

9.5.4 Auckland Plan 2050

The Auckland Plan is a long-term spatial plan that aims to ensure Auckland grows in a sustainable way that supports people and the local environment and ecosystems. When considering environmental outcomes, the plan seeks to preserve, protect, and care for the natural environment, and use development as an opportunity to do so, as well as future-proof Auckland's infrastructure.

Consistent with the Auckland Plan 2050, the PPC provides opportunity to restore degraded ecosystems where appropriate, while providing for appropriate development and adopts a water sensitive design approach to managing stormwater on the site.

9.5.5 Auckland's Urban Ngahere (Forest) Strategy 2018

Auckland's Urban Ngahere (Forest) Strategy aims to promote the protection, expansion, management, and education around the network of vegetation within current and future urban Auckland. The includes remaining forest fragments, native trees, natural stormwater assets, community gardens and parks, and private gardens.

The vegetation within the PPC sites has been identified and classified, and the proposed precinct provisions provide opportunities that align with the strategy's nine principles: Right tree in the right place; Preference for native species; Ensure urban forest diversity; Protect nature, healthy trees; Create ecological corridors and connections; Access for all residents; Management urban forest on public and private land; and deploy regulatory and non-regulatory tools.

10 SUMMARY AND RECOMMENDATIONS

Viridis has assessed the proposed PPC area. The impact of rezoning from Future Urban Zone (rural land use) to Business – Light Industry Zone has been considered in relation to the terrestrial and freshwater values present on the site. It is considered that a plan change is appropriate for the site to maintain and enhance the existing ecological values.

The most significant ecological values associated with the PPC area are the values of the adjacent coastal environment, which is identified as an SEA in the AUP-OP. There is little freshwater habitat present within the PPC area. One large wetland and several smaller wetlands are present and another is adjacent to the site. All of these wetlands are currently in a degraded state due to a history of horticultural and agricultural land uses and dominance by exotic species. The larger wetlands are of moderate ecological value due to the potential for at risk species to be present, and because of the ecological functions they provide such as enhancing water quality and attenuating flows. Most watercourses on the site are artificial drains. Only two permanent or intermittent streams are present on or immediately adjacent to the PPC area. These streams are of low-moderate ecological value and have also been impacted by historical land uses. The terrestrial ecological values of the site are generally low, except for the mixed native-exotic vegetation that is mainly around the coast which is considered to be of moderate value and may provide some habitat for birds, bats and lizards. Very little native vegetation remains across most of the site to provide any significant habitat for indigenous fauna.

The proposed precinct provisions require a water sensitive design approach for stormwater management, which will help to protect the site's wetlands, streams and adjacent coastal environment. Provisions relating to the coastal and riparian yards and landscaping are expected to maintain the current ecological values and provide the opportunity for an increase in indigenous biodiversity and improved habitat values for indigenous fauna. The current barrier to fish passage within the main wetland and stream system is required to be addressed by the NES-F and Chapter E3 of the AUP-OP. Light pollution may affect birds utilising the adjacent coastal environment, and this should be considered in the design of the future developments and appropriate measures adopted to reduce the potential effects.

Overall, it is considered that the outcomes of the proposed precinct plan are consistent with the objectives and policies of the AUP (OP). The AUP-OP, NPS-IB, NPS-FM, NES-F and the Wildlife Act 1953 provide a framework that manage any proposed future development at the resource consenting phase, to ensure any development aligns with the relevant policies and regulations. Future subdivision and development in accordance with the proposed zoning and precinct provisions is anticipated to result in the appropriate protection and enhancement of indigenous terrestrial, freshwater and coastal biodiversity values of the site.

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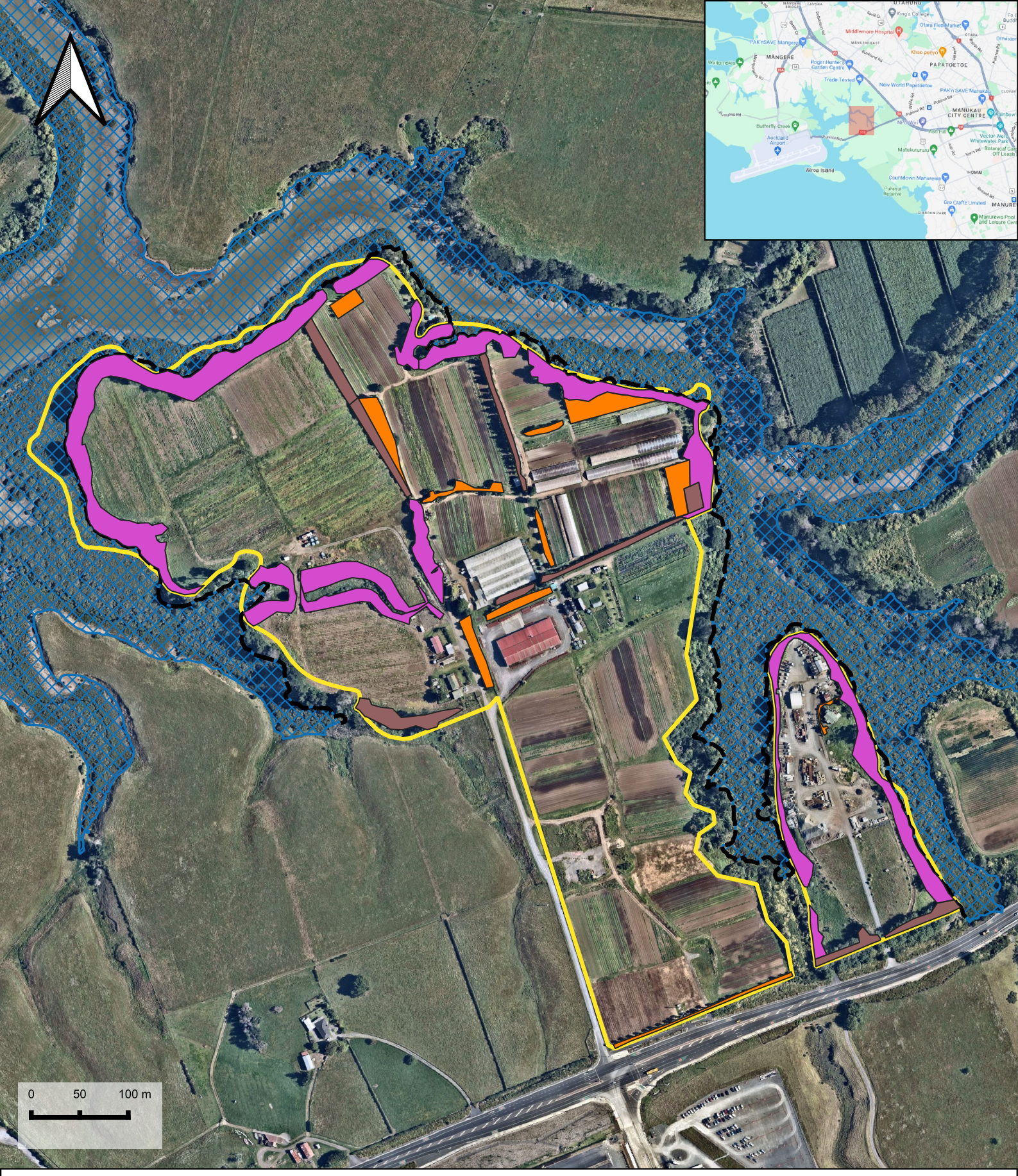
Appendix A Terrestrial Ecological Features



Appendix A: Terrestrial Ecological Features

Campana Road PPC
Campana Landowners'Consortium

PROJECT NO. 10158
DRAWN BY: A.T.
DATE: 7 March 2024

SCALE **1:5,000** **@ A4**

Legend

- PPC boundaries
- Indicative coastline
- Marine SEA

Vegetation types

- Amenity / orchard
- Mixed native / exotic
- Shelterbelt

VIRIDIS
Environmental Consultants

Aerial: Nearmaps 2023

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

Appendix B Freshwater Ecological Features

Appendix B: Freshwater Ecological Features

Campana Road PPC
Campana Landowners' Consortium

PROJECT NO.	10158
DRAWN BY:	A.T
DATE:	7 March 2024
SCALE	**1:5,000** @ A4

Legend

- PPC boundaries
- Indicative coastline
- Permanent stream
- Intermittent drain
- Ephemeral drain
- Modelled OLFP
- Culverts
- Soakage pit
- On site wetland
- Neighbouring wetland
- Putative wetland
- Coastal wetland
- Assessed vegetation plots
- Pond
- Marine SEA

VIRIDIS
Environmental Consultants

SOURCES
Aerial: Nearmaps 2023

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

Appendix C Watercourse Classification

Watercourse number	Classification	Natural pools	Well-defined channel, such that the bed and banks can be distinguished	Contains surface water more than 48 hours after rain	Rooted terrestrial vegetation is NOT established across the entire cross-sectional width	Organic debris resulting from flooding can be seen on the floodplain	Evidence of substrate sorting, including scour and deposition	Comments
1	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible. Wetland area C is within OLFP.
2	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
3	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
4	Modelled OLFP	X	X	X	X	X	X	No defined flow path visible
5	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
6	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
7	Modelled OLFP	X	X	X	X	X	X	No defined flow path visible. Wetland area A is at the junction of OLFP 7 & 8.
8	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible. Wetland area A is at the junction of OLFP 7 & 8.
9	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
10	Modelled OLFP	X	X	X	X	X	X	No channel present. Becomes an artificial drain downstream.
11	Intermittent drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight drain, some water and aquatic vegetation present. Historic aerial

Watercourse number	Classification	Natural pools	Well-defined channel, such that the bed and banks can be distinguished	Contains surface water more than 48 hours after rain	Rooted terrestrial vegetation is NOT established across the entire cross-sectional width	Organic debris resulting from flooding can be seen on the floodplain	Evidence of substrate sorting, including scour and deposition	Comments
								indicate construction 1975-1983. Poor fish habitat values given small amount of water and lack of suitable upstream habitat.
12	Modelled OLFP	✗	✗	✗	✗	✗	✗	No channel present. No evidence of stream here visible in historic aerial photos.
13	Intermittent drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight drain, some water and aquatic vegetation present. Historic aerial indicate construction 1975-1983. Poor fish habitat values given small amount of water and lack of suitable upstream habitat.
14	Permanent stream	✓	✓	✓	✓	✗	✓	Downstream reach 0.3 – 0.5 m wide, 0.03 – 0.05 m deep. Bed below water table. Soft sediment base. Well shaded by overhanging grasses and weeds. Poor fish habitat values given small amount of water and lack of suitable upstream habitat. Culverted under access way. Upstream of access way channel poorly defined, small amount of running water, source is discharge from pipe.
15	Modelled OLFP	✗	✗	✗	✗	✗	✗	No defined flow path visible.
16	Modelled OLFP	✗	✗	✗	✗	✗	✗	No defined flow path visible.

Watercourse number	Classification	Natural pools	Well-defined channel, such that the bed and banks can be distinguished	Contains surface water more than 48 hours after rain	Rooted terrestrial vegetation is NOT established across the entire cross-sectional width	Organic debris resulting from flooding can be seen on the floodplain	Evidence of substrate sorting, including scour and deposition	Comments
17	Modelled OLFP	X	X	X	X	X	X	Cultivated area, no defined flow path visible.
18	Intermittent drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight drain, some water and aquatic vegetation present. Historic aerial photos indicate constructed 1975-1983. Poor fish habitat values given small amount of water and lack of suitable upstream habitat.
19	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight shallow drain. Historic aerial photos indicate constructed 1975-1983.
20	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow drain. Dry. Historic aerials indicate constructed post 1975.
21	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow drain. Dry. Historic aerials indicate constructed post 1975.
22	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow drain. Dry. Historic aerials indicate constructed post 1983.
23	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow drain. Dry. Historic aerials indicate constructed post 1975.
24	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow swale. Dry. Historic aerials indicate constructed post 1983.
25	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow swale along driveway. Mainly dry. Historic aerials indicate constructed post 1983.

Watercourse number	Classification	Natural pools	Well-defined channel, such that the bed and banks can be distinguished	Contains surface water more than 48 hours after rain	Rooted terrestrial vegetation is NOT established across the entire cross-sectional width	Organic debris resulting from flooding can be seen on the floodplain	Evidence of substrate sorting, including scour and deposition	Comments
26	Modelled OLFP	✗	✗	✗	✗	✗	✗	Cultivated area, no defined flow path visible. Downstream end assessed as putative wetland F.
27	Modelled OLFP	✗	✗	✗	✗	✗	✗	Cultivated area, no defined flow path visible.
28	Ephemeral drain	N/A	N/A	N/A	N/A	N/A	N/A	Constructed, straight, shallow swale between cultivated rows of plants. Historic aerials indicate this swale is often cultivated and is likely of recent construction.
29	Modelled OLFP	✗	✗	✗	✗	✗	✗	No defined flow path visible.
30	Modelled OLFP	✗	✗	✗	✗	✗	✗	Cultivated area, no defined flow path visible.
31	Modelled OLFP	✗	✗	✗	✗	✗	✗	Low lying area, no defined channel, no wetland vegetation. Grass mainly *Poa trivialis*, some *Bromus catharticus, Poa pratensis, Holcus lanatus,* fennel, buttercup, gorse
32	Modelled OLFP	✗	✗	✗	✗	✗	✗	This area highly modified with yard and earthworked area and several constructed ponds. No defined flow path. No vegetation.
33	Permanent stream	✓	✓	✓	✓	✓	✓	This stream reach has some tidal influence due to the proximity of the coastal marine area.

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TO:	Campana Land Owners' Consortium	Date:	30 July 2024
COPY TO:	David Clark, Saddleback	Document No:	10158-003-1
FROM:	Angela Tinsel, Senior Ecologist		

ECOLOGY RESPONSE – REQUEST FOR FURTHER INFORMATION – CAMPANA PRIVATE PLAN CHANGE REQUEST

Campana Land Owners' Consortium submitted a private plan change request to rezone land at Campana Road, Puhinui. The application was supported by an Ecological Impact Assessment report (Viridis, 2024). Auckland Council has reviewed the application material and provided a request for further information.

Capstone Projects Limited, on behalf of the Campana Landowners' Consortium, engaged Viridis Limited to respond to the queries raised as they pertain to ecological matters. A summary of each query provided by Auckland Council is italicised below, followed by our responses to the applicable queries.

- *The Application Documentation has not assessed the proposal against the provisions of section B7 of the Auckland Unitary Plan (AUP) Regional Policy Statement (RPS) or the provisions of the National Policy Statement for Freshwater Management (NPS:FM), or the National Policy Statement for Indigenous Biodiversity (NPS:IB). Please provide an assessment against AUP RPS section B7, the NPS:FM and the NPS:IB.*

An assessment against these documents is contained within Section 9.5 of the EcIA. However it appears that further assessment against the provisions is required in the Planning Report by Saddleback. This is to be addressed by Saddleback.

- *The effects on indigenous fauna have been stated as low despite no formal surveys being undertaken to determine if indigenous fauna are present or not. The conclusion relating to fauna effects has been based off desktop and habitat assessments alone. Relying on desktop surveys and nearby records only infers what species may be present on site. Concluding effects based on this alone is speculative. Specific fauna assessments are required to determine which species are present to better inform the effects, mitigation measures and certainty the provisions of the precinct will give effect to the NSP:IB. Please provide a fauna assessment based on a specific survey of the site.*

No fauna surveys were undertaken because the small amount of vegetation on the site that would be affected by future development is of low ecological value and provides little habitat for native fauna such as birds, bats and lizards. The mixed native and exotic vegetation that is of moderate ecological value and provides most of the potential habitat for indigenous fauna within the site is within 25 m of the coast or within 20 m of a wetland and therefore would be protected from removal by the coastal yard (Chapter H17 and Puhinui Precinct rules) or vegetation management (Chapter E15) rules of the AUP-OP.

When the site is developed, resource consent applications will be required to assess the ecological effects of the proposed works and any vegetation removal on indigenous fauna. Where potential habitat for indigenous fauna is affected, then consent conditions can be applied to require fauna management plans, which could involve relocation of reptiles, bird surveys prior to vegetation clearance within the bird nesting season and bat roost habitat assessment of larger trees prior to felling.

Given the limited amount of potential fauna habitat affected, the protections provided by the coastal and riparian yards and associated precinct and AUP-OP provisions, and the ability to mitigate any adverse effects on fauna through requiring fauna management plans tailored to the proposed works, it is considered that the potential effects on indigenous fauna are able to be minimised and mitigated. Requiring fauna surveys across the site for the purposes of the plan change is considered excessive and not commensurate with the scale and significance (to indigenous biodiversity) of the proposal.

- *The structure plan appears to be inconsistent with the vegetation types present on site. The areas identified as 'orchard planting' also contain indigenous planting which the ecological assessment classifies as amenity plantings. The ecological value of the vegetation in these areas has collectively been classified as low. Despite these indigenous trees being small clusters or rows of trees there may be value in identifying and retaining them due to the ecological function that larger trees provide to the wider landscape. It should accordingly be confirmed what larger indigenous trees of value should be retained (where practicable) or relocated to other areas on site. Please provide an arboricultural assessment identifying and confirming the value of individual / groups of trees.*

Amenity and orchard trees have been grouped as a vegetation category because they provide similar ecological values, in that they are typically individual or small groups of spaced out trees planted for amenity or food purposes, with grass, or sometimes mulch, beneath and around them. Some of these trees are indigenous, however the nature of their planting, maintenance and lack of connection to other vegetated areas mean that they hold similar ecological values to the exotic trees within this category.

The purpose of an ecological assessment at a plan change stage is to identify ecological values at a high level to guide application of appropriate policies and rules for the wider site. More detailed and specific ecological assessments are undertaken at the resource consent stage when the specifics of the proposed works are being developed, and this is when it is appropriate to look more closely at the ecological values of individual and groups of trees and determine what type of mitigation may be appropriate where there are significant ecological effects. The resource consent application phase would also be a more appropriate time to undertake an arboricultural assessment of the values of individual and groups of trees.

- *There is no assessment on the adequacy of the proposed 10m riparian yard for wetlands. The AUP E15 Vegetation management and biodiversity standards applies a 20m protected vegetation setback from wetlands. Please provide an assessment of the appropriateness of providing for a smaller wetland yard (buffer) setback than what is anticipated in the existing AUP standards.*

The AUP-OP E15 clause relates to vegetation alteration or removal within 20 m of a wetland and will still apply. The AUP-OP provisions do not contain a wetland yard or setback. The proposed inclusion of wetlands in the riparian yard provisions of the precinct formalises a minimum wetland setback and gives the ability to require planting around wetlands, where there is no tool for that currently (other than consent conditions) in the AUP-OP. Therefore inclusion of wetlands in the 10 m riparian yard will improve the level of protection for wetlands and will not result in a smaller wetland yard or buffer than what currently applies in the AUP-OP.

- *While there is mention of planting riparian yards to 10m and the coastal protection yards to 20m, there is no mention of planting the wetland buffers. The yard enhancements should be more prescriptive than simply stating planting. A link to AUP:OP Appendix 16 Guideline for native*

revegetation plantings of the should also be specified. Please provide further detail of what species are appropriate for enhancing wetland buffers, referencing (as appropriate) the AUP:OP Appendix 16 Guideline

The inclusion of "wetlands" in the description of Riparian Yards in I432.6.3 has addressed this gap to ensure that planting is required in wetland buffers by Clause I432.6.3 (2). This clause should be expanded to clarify that wetland buffers must be planted to a 10m depth and include reference to Appendix 16:

> (2) Riparian yards must be planted with locally sourced indigenous species to a minimum depth of 10m from the edge of intermittent and permanent streams and wetlands, in accordance with Appendix 16 Guideline for native revegetation planting. Walkways and cycleways may be located within the riparian yard.

References

Viridis, 2024: Campana Road, Private Plan Change, Ecological Impact Assessment. 12 March 2024.

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