BlueGreen

Proposed Plan Change: *65 and 73 Ratanui Road, Paraparaumu*

Ecological Values, Constraints and Opportunities.

Prepared for Welhom Developments Limited
28 November 2024

Document Quality Assurance

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Cover photograph: Shelter belt stockpiled slash on property @BlueGreen Ecology 2024.

Executive Summary

The site subject to the proposed plan change at 65 and 73 Ratanui Road, Paraparaumu is an area of some 12.65 ha which is currently zoned Rural Lifestyle under the Kāpiti Coast District Plan and is rural in character and use.

Research and a site survey show that there are no indigenous terrestrial ecological values of note or that should be considered that could meet the significance criteria in Policy 23 of the Greater Wellington Regional Policy Statement (RPS). Areas not fully grazed are a small area of blackberry and herbaceous weeds on a boundary sand hill or otherwise exotic trees.

Undertaking of the MfE 2020 natural wetland delineation protocol shows the presence of 14 small natural inland wetlands in the proposed plan change area.

The area of the 14 wetland features sum to 621 m^2. They are largely exotic vegetation assemblages in currently grazed pasture. While technically dune hollows, the features do not represent examples of those naturally rare and threatened dune slacks. The features do not register as significant under the criteria of Policy 23 of the RPS and are all of low ecological value and function. Their locations are shown in the following report.

Bisecting the site there is a highly modified waterway that is of low aquatic value and often dry, such that there is unlikely to be any resident fish or permeant macroinvertebrate assemblage. It is currently crossed by a culvert crossing and only has a rank grass riparian vegetation state.

There are few ecological constraints on the site but reasonable opportunities to improve the state of natural wetland in the area by amalgamating the size and location of a natural wetland, associating with the waterway and causing an indigenous dominant community. There is no wider landscape linkage or connectivity potential with the surrounding area.

Contents

1.0 Introduction

Welhom Developments Limited (Welhom) is requesting a private plan change to rezone a 12.65 ha block of land comprising 73 Ratanui Road and part of 65 Ratanui Road which is to be subdivided off (site), from Rural Lifestyle to General Residential Zone under the Kāpiti Coast District Plan. Through this plan change, Welhom seeks to enable future residential development on the site, including the potential to develop a comprehensive care retirement village (Figure 1). This report sets the ecological framework for the plan change, considering the existing values on the site and where additional or enhancement of functions and values might be reasonably attained.

Figure 1 Plan change boundary.

Ecological Assessment Methods

1.1 Desktop investigation

The desktop investigation included a review of:

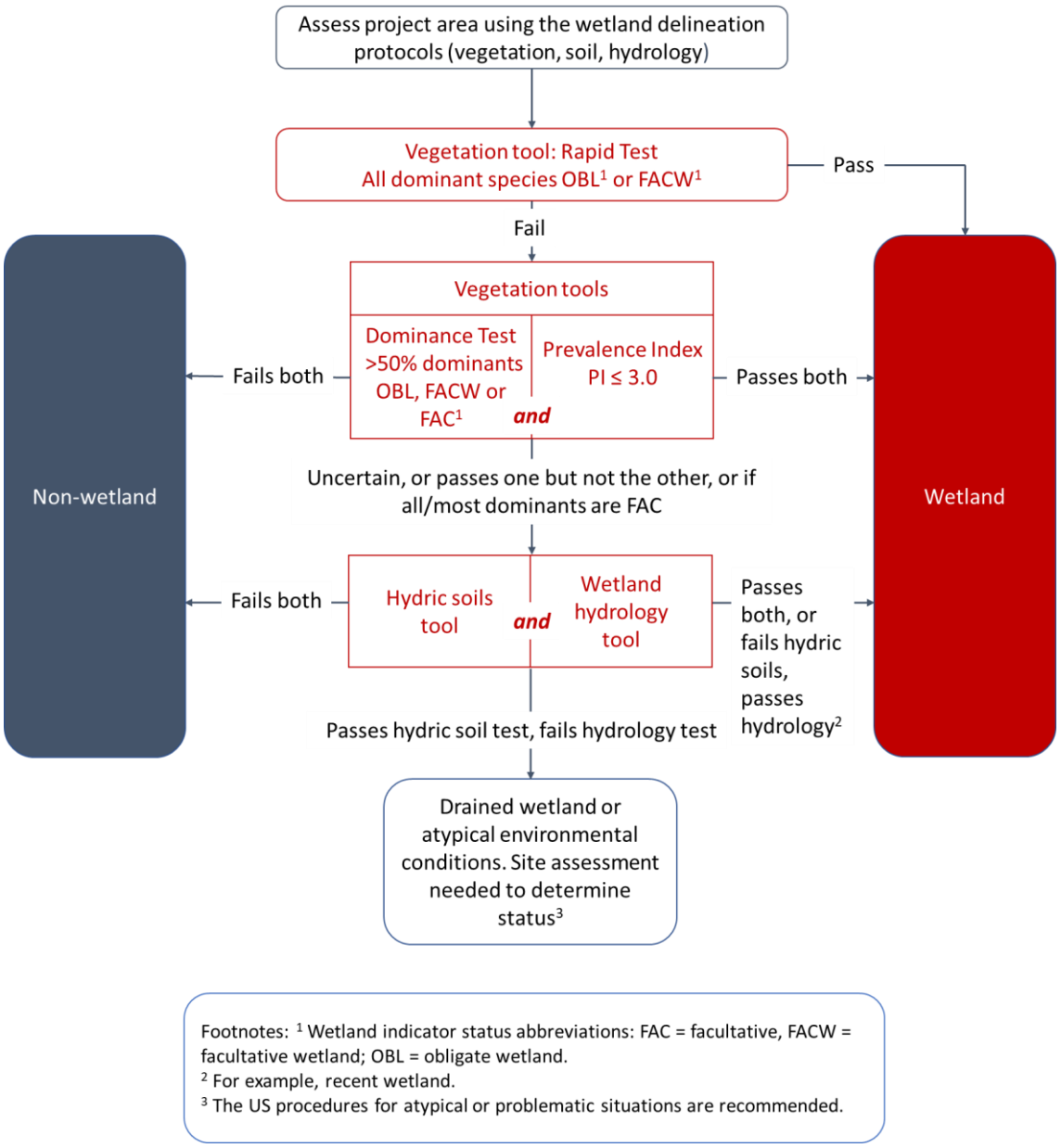
- Relevant databases such as the Our Environment habitat layers, iNaturalist citizen science website for logging species sightings, the New Zealand Freshwater Fish Database (NFFDB), and Land Environment New Zealand (LENZ) database cover for threatened vegetation types.
- Planning documents (such as the RPS and PNRP) as they relate to ecological features, schedules etc.
- "Retrolens" historic aerial photography as well as present day aerial imagery.
- Greater Wellington Regional Council (GWRC) regionally highly modified stream layer (after Dr. Greer)[1].

1.2 Wetland Statutory Framework / NPS-FM Wetland evaluation

This evaluation considers the National Policy Statement - Freshwater Management (2020 and as amended 2023) (NPS-FM); and the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F). These documents set out national and regional policies on freshwater, and regulations for what is a "natural inland wetland" and for works and discharges in, and in the vicinity of, natural wetlands. Most particularly, they reference the wetland delineation protocol and methods related to pasture exclusion. These protocol and methods have been followed in this report.

In essence, the following algorithm is used to determine if a feature is a natural inland wetland:

[1] Regional Highly Modified Streams (arcgis.com)



This process includes incorporation of the NPS-FM exclusions, i.e.:

a) in the coastal marine area; or

b) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland; or

c) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or

d) a geothermal wetland; or

e) a wetland that:

(i) is within an area of pasture used for grazing; and

(ii) has vegetation cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species using the Pasture Exclusion Assessment Methodology (see clause 1.8));

(iii) unless the wetland is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case this exclusion does not apply.

1.2.1 Dominance Test

A wetland species Dominance Test which considers the dominant species in the plot and their wetland affinity rating can aid in determining if an area is a natural wetland.

This test ascertains the "dominant" species following a 50/20 rule, whereby all species are ranked according to their percentage cover, and the highest covering species are sequentially selected until cumulative coverage immediately exceeds 50%. Any other species which comprise at least 20% coverage are also selected. The "Dominance Test" threshold is then met if more than 50% of the dominant species are OBL, FACW, or FAC.

1.2.2 Prevalence Test

To determine if an area could be considered a wetland where it has not been done so in the dominance test, each vegetation species identified is allocated to a prescribed category based on their degree of affinity for water, as described by Clarkson (2013). These categories are:

• OBL: Obligate. Almost always is a hydrophyte, rarely in uplands (estimated probability >99% occurrence in wetlands)

• FACW: Facultative Wetland. Usually is a hydrophyte but occasionally found in uplands (estimated probability 67–99% occurrence in wetlands)

• FAC: Facultative. Commonly occurs as either a hydrophyte or non-hydrophyte (estimated probability 34–66% occurrence in wetlands)

• FACU: Facultative Upland. Occasionally is a hydrophyte but usually occurs in uplands (estimated probability 1–33% occurrence in wetlands)

• UPL: Obligate Upland. Rarely is a hydrophyte, almost always in uplands (estimated probability <1% occurrence in wetlands)

Using this data, a Prevalence Index Score was calculated for each plot. Mathematically, this score must fall between 1 and 5, with 1 indicating entirely wetland species (OBL), and 5 indicating entirely upland species (UPL). A score below 3 is indicative of a wetland/hydrophilic community, though Clarkson (2013) cautions that a score between 2.5 and 3.5 is not reliable for determining a hydrophilic community on vegetation measures alone.

1.2.3 Hydric soils and hydrology

Two tools are available for soils (Frazer et al 2018 and Lambie et al 2021) but neither are included by reference in the NPS-FM (2020) suite of methods to be used.

The hydrology tool has not been finalised (i.e. it is not a referenced document to the NPS-FM (2020)) and is not accepted by the hydrological fraternity in general as a sufficient layperson tool. This is especially due to the interpretation and caveat requirements. The hydrology tool was therefore not used as an ecological assessment method for this site.

1.3 Field investigations

A field survey of the site (both 65 and 73 Ratanui Road) was conducted on 29 May 2024. The survey followed scoping from an aerial photograph mosaic of different ages to establish likely features and obvious temporal changes. Then the site was walked in its entirety to identify terrestrial indigenous vegetation, habitat features, waterways and bodies, and possible natural wetlands. A discussion was held with both landowners with regard to historic actions undertaken on the farmland, especially with respect to pond and garden activities and shelter belts management.

With regard to fauna, no targeted surveys were conducted for lizards or bats following the initial walk over. This is because the site does not contain potential habitat for native species of fauna other than occasional avian visitation and common invertebrates. It is likely that there will be northern grass skink, as these are common in gardens and rural farm shed and debris areas and potentially in pine shelterbelt felled slash piles. Native bat species (long tailed) have not been recorded in Kāpiti for decades, with the last records on Kāpiti Island or east in the Tararua Ranges (both species) Figure 2. The translocated colony of short tailed bats to Kāpiti Island (2004) was considered to have failed at the time it was subsequently assessed (2018).

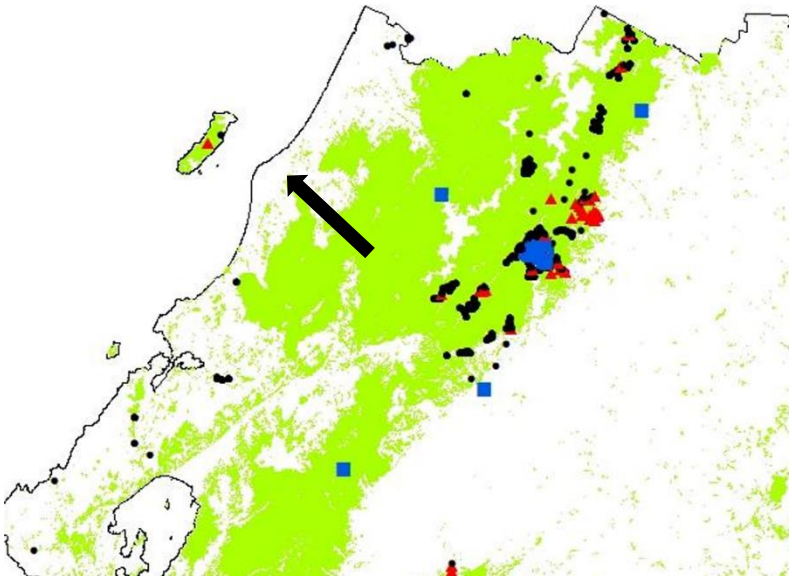


Figure 2. Bat data base records as at 23 December 2022 (Crisp et al 2023), long tailed bats (red triangle), short tail (blue square), none recorded (black dot). The Black Arrow indicates the approximate site location.

There are a few larger trees (exotic) on the property that may have roost potential but there is no corridor, no local source, no likely potential for bats to be present let alone use the trees as roosts. Indeed, a number of the larger pine were recently cleared. For these reasons I did not and do not consider this assessment requires specific lizard or bat survey.

Where potential natural wetlands were located and rapid tests were inconclusive, representative vegetation plots were undertaken (MfE 2020 protocol) and soil pits (to 0.5m depth) dug in a number of examples lowest lying areas to enable hydric soil tests (MfE 2020, Fraser et al 2018) and hydrology (MfE 2021, Lambie et al). This is the standard methodology when rapid test results are inconclusive. That data collection allows development of the required dominance and prevalence indices (as described in sections 2.2.1 and 2.2.2). I note that both properties were fenced and running stock and are clearly farms grazed by stock, and so are areas of pasture. This means that the exception to the natural inland wetland classification based on pasture species dominance (NPS-FM (2020, section 3.21 definitions "natural wetland" (e)) is available.

With respect to the highly modified stream dissecting the near centre of the site (Figure 3), the bed was dry at the time of the field survey, so no instream faunal surveys were possible. The bed was walked and a description and photos recorded.

1.4 Assessing ecological significance

The relevant policy for assessing ecological significance is captured by the significance criteria in the RPS Policy 23. That said, Policy 42 of the Greater Wellington Natural Resources Plan (PNRP) states in the note that "*all natural wetlands in the Wellington Region are considered to be ecosystems and habitats with significant indigenous biodiversity values as they meet at least two of the criteria listed in Policy 23 of the Regional Policy Statement for identifying indigenous ecosystems and habitats with significant indigenous biodiversity values; being: representativeness and rarity*."

This is not true of all natural inland wetlands classified by the NPS-FM protocol, such as the wetlands identified on the site, which do not have indigenous species or are predominantly exotic species assemblages and so ordinarily cannot pass the Policy 23 criteria in regard to indigenous biodiversity. As discussed in the Section 4.0 below, the current wetland assemblages present on the site are not in any way representative of the marsh or swamp communities (historic or current) or of the rare wetland types in the Wellington region.

2.0 Results

Across both 65 and 73 Ratanui Road, I observed one linear waterway, one large, ponded area, one small dug pond, one large driveway garden feature, two sand hill scrub features that were not pasture, an area of recent shelterbelt pine felled piles, dune hill and hollow pasture, shelterbelts, isolated trees and the driveway tree line, as well as 20 small dune hollow (a low point in the terrain) potential wetland areas scattered throughout the site.

The site sums to around 12.65 ha on which there is no Significant Natural Area (SNA) or other ecological feature identified in the regional or district plan, no QEII reserve, and no other registered ecological value. There are no obvious sizable ecological features on the site.

2.1 Terrestrial

The great majority of trees are exotic (pine, blackwood, cypress, willow in the paddocks). The few native species seen were Coprosma, karo, ti koura and pittosporum in the driveway gardens. The raised sand hill area near the northern boundary of 65 Ratanui Road is largely populated with blackberry, rank pasture grasses, common weeds and two or three exotic trees.

There is very limited to no habitat for native bats or skinks or gecko. Common rural birds were observed, including pukeko, spur winged plover, sparrow, finches, welcome swallow and blackbirds. When the large pond was open water during historical uses it is likely to have attracted a range of waterfowl.

Hare and rabbit were also seen, and it is likely that there are rats, mice, possum and mustelid present at least periodically on the site.

The piled macrocarpa and pine logs in the central eastern paddocks are a result of the recent felling of shelter belt / boundary property trees. While if left these wood piles could become skink refugia they are being removed for firewood.

2.2 Wetlands

Twenty potential wetland features were identified on the site, all in dune hollows on both properties comprising the plan change area. These features are illustrated on Figure 3. Most are small in the order of 4m by 5m area, all in fenced paddocks and none excluded from stock access. However, this assessment takes into account Wetland 1, which is currently part of the property at 65 Ratanui but will not be part of the Plan Change area.

The features are palustrine marsh wetlands (Johson & Gerbeaux 2004). That is, they are mainly mineral wetlands, having moderate to good drainage, fed by groundwater or surface water of slow to moderate flow, and characterised by moderate to great fluctuation of water table or water level.

The features are labelled 1-20 and in the main these hollows were vegetated in a mixture of creeping butter cup, *Juncus effusus, Juncus edgariae*, creeping bent, Yorkshire fog, *paspalum dilatatium* and chickweed. A range of other species occur sporadically in a

number of the features across the site. At the time of survey there was an evident central area of most features that was decaying water pepper which has seasonally died back, meaning most of the features had a largely bare central area. The implication of this natural process is that areas in wetter seasons will qualify with respect to the measure of cover dominance and prevalence indices but not in all seasons. A full list of species found to be present on the site is included in Appendix 1.

I do not consider feature 2 or 17 (Figure 3) further in this assessment other than to show pictures of them in the following photographic section as both are human-made features. The landowners provided evidence of the process of excavation and, in the case of the large pond (feature 2), planting of the edges. Thus, it is the case that both features are excluded from consideration under NPS-FM (2020) exclusions (b), as they are products of deliberating constructed waterbodies.

The remaining eighteen potential wetland features across the site were essentially the same. A number of the representative and also distinguished features of each feature are illustrated in the following table.

Figure 3. Potential wetland features found on the properties (blue indicating natural inland wetlands).

Dune hollow features are illustrated in the following photographic section.

1 - water pepper hollow outside plan change	
2 - pond bed	

3 - scattered juncus and some creeping bent	
4 - cluster of juncus	

5 - depression crescent with juncus and Isolepis	
Site 6 (similar to sites 7, 8, 9, 14, 16, 19) - water pepper centre and Juncus edge	

10 - seasonally dry hollow	
11 Northern boundary sand dune with exotic scrub	

12 - starwort hollow	
13 - water pepper hollow (died off)	

15 - dumbbell shaped wetland juncus effusus and edgariae east, J. articulatus west	
15, west arm	

20	

All of the features present on the site are highly modified, small low points in grazed paddocks. They do not fit the profile of a naturally uncommon dune deflation hollow (Wiser et al 2013) which are naturally uncommon ecosystems. Those systems referenced are indigenous vegetation associated with sands and wetlands, and these features are not indigenous or representative of indigenous dune deflation hollow habitats.

All the features (except feature 5) fail the rapid assessment required by the NPS-FM delineation protocol in that there is no observable clearly dominant cover of FACW and or OBL species (this is because of the seasonal dieback of water pepper). Therefore, each feature was inspected and where a mosaic of assemblages was present, characterised and a representative vegetation plot (2m by 2m) undertaken in each type and the data collected. A few areas had multiple plots due to varying character types in the one feature. A dominance and prevalence indices score was calculated and those results are reported below in Table 1.

There are 20 separate individual hollows or features, and some features have two or three areas of different quality. Ten of the 28 plots qualified as natural inland wetland by way of Dominance >0.67 and prevalence <3.0. These areas do not require a hydrology and hydric test to be ascribed as natural wetland classification (seven features in total). For most of the features, it was dominance of creeping bent, Junus or, in feature 1, live Persicaria that drove the result of it being classified as a natural inland wetland. Nine other plots failed these tests but had extensive dead Persicaria centrally; had this assessment been undertaken last month these areas would also have meet the dominance and prevalence criteria because of their waterpepper cover but they did not meet the criteria “today”. These areas have been considered in this assessment as positive tested for natural inland

wetland under dominance. The MfE method does not offer guidance as to how to treat periodic presence. Eight other plots simply do not meet criteria as they have high prevalence scores. A number of affirmed and rejected sites with prevalence scores around 3 require (where dominance is met) hydrology and hydric soil testing. As at the time of the survey (and removing site 1 as it is outside of Welhom's plan change area), 228 m^2 of wetland feature (6 individual hollow features) meet the natural inland wetland condition, and a further 384 m^2 (from 8 features) would have last month (September 2024).

Note	Feature #	Rapid	Dominance	Prevalence	Dominant taxa	Hydric soil	hydrology	NPS Exclusions	Natural wetland	Area (m2)	seasonal wetlands
west access road garden bowl	1	yes	Yes (1)	1.95	water pepper	-	yes	no	Yes	16	
Large, constructed pond (dry)	2	parts	Yes (1)	2	Isolepis	-	yes	Constructed waterbody	No		
old dig site with bricks	3	No				No	No	pasture / artificial	No		
	4 (1)	Yes	Yes (1)	2.57	Juncus	No	No	no	Yes	9	
	4 (2)	No	Yes (0.67)	3.15		No	No	pasture	No		
	5(a)	Yes	Yes (1)	1.95	Juncus	No	No	no	Yes	36	
	5(b)	Yes	Yes (1)	2.38		No	No	no	Yes		
	5(c)	No	No (0.5)	3.2		No	No		No		
	6	Yes	Yes (1)	2.22	Juncus	No	No	No	Yes	35	
80% dead Persicaria leaving bare soil	7	No	No	3		No	No		No (but)		78
95% central dead Persicaria	8	No	No (but)	2.22	creeping bent	No	No	No	No (but)		78
	9(1)	Yes	Yes (1)	2.08	creeping bent	No	No	No	Yes		
	9(2)	Yes	Yes (1)	2.1	creeping bent	No	No	No	Yes	56	
pine hollow, tyres and sheet metal	10	No				No	No		No		
	11	No	Yes (0.67)	3.45	due to Centella	No	No	pasture	No		
	12	Yes	Yes (1)	1.59	Starwort	No	No	Yes	Yes (but)	25	
97% dead Persicaria and bare soil	13	No	No	3		No	No	no	No (but)		12
60% dead Persicaria and bare soil	14	No	No	2		No	No	no	No (but)		36
bare earth central circle	15 (1)	No				No	No	Yes	Yes	27	
outer 2m band	15(2)	Yes	Yes (1)	2.11	Juncus	No	No	no	Yes	40	
connecting swale	15(3)	No	No (0.5)	3.48		No	No	no	No		
second circle (centre dead Persicaria)	15(4)	No	Yes (0.67)	2.99		No	No	no	No (but)		40
	16	No	No	2		No	No	no	No (but)		40
House pond	17	Yes				No	No	Constructed waterbody	No		
	18	No	No	2		No	No	no	No (but)		40
	19	No	No	2		No	No	no	No (but)		40
	20(1)	No	No (0.33)	3.31		No	No		No		
70% dead Persicaria	20(2)	No	No	2.43		No	No		No (but)		20
Total Areas (m^2)										244	384

Table 1. Feature vegetation plot data analysis.

2.2.1 Hydric soil test

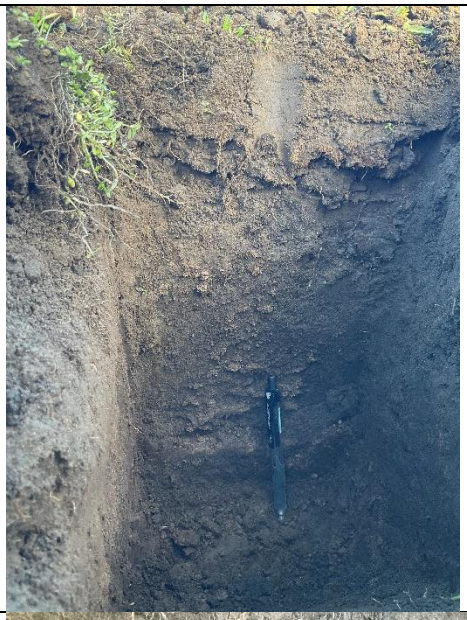
Ratanui Road is characterised by sandy brown soils (NZSC), peat soils are not present but are found south and east around Otaihanga. The sandy brown is a Gley Soil dominated by sand or loamy sand to depth. Water logging either seasonally or more permanently is usually a feature, but where it is more permanent, there is reddish brown moulting from chemical reduction. The indications on site are there is a seasonally high water table but it is well-draining and that the ground water moves through 2-3m each year (Landowner re piezometer installed pers. com).

Four 0.5m deep holes were dug in 4 of the potential wetland hollow depression beds and the results are shown below.

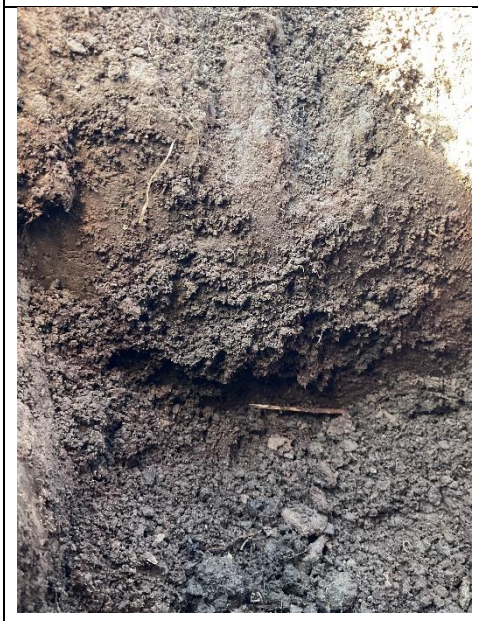
The profiles all showed the same brown sandy loam of fine uniform grains of the same uniform brown colour, with little to no fibre or organics and of no real smell. It is a well-drained soil and no sign of water was evident in the holes not moulting of colours on the sides. Note, due to drying and the camera's ability the rich brown observed by eye is not obvious in the following photographs.

Feature 9

Feature 12



Feature 4



Feature 15

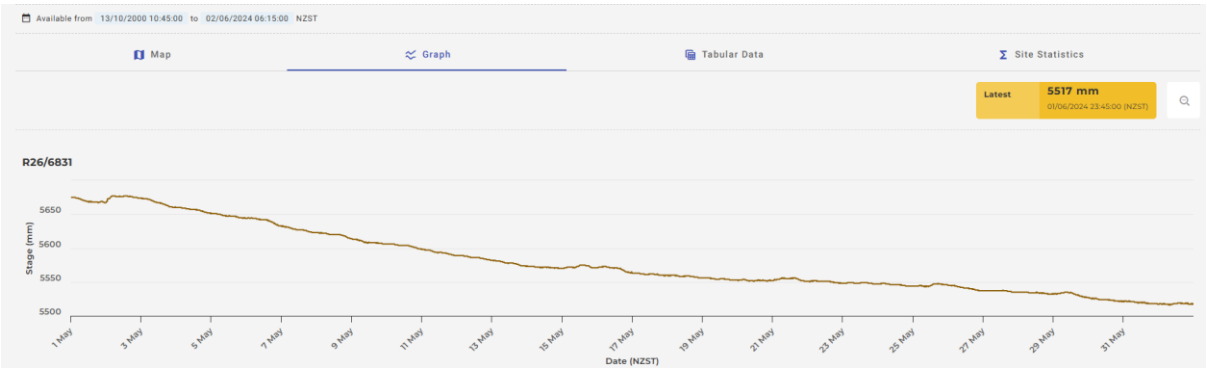
At excavation the colours were most like **Chroma 6, value 5**, not the combinations of hydric soils (Fraser eta l 2018). In terms of the algorithm for determining hydric soil there was no peaty material within 30cm of the surface and there were no pale chromia or value combinations pointing to hydric soils. I note that the photos show a more washed out colour than the vivid brown that was observed by eye prior to the soil surface drying.

No mottles were evident and there were no dark chroma low value colours. Under the Fraser et al (2018) algorithm the result is “other soil” (i.e. non hydric).

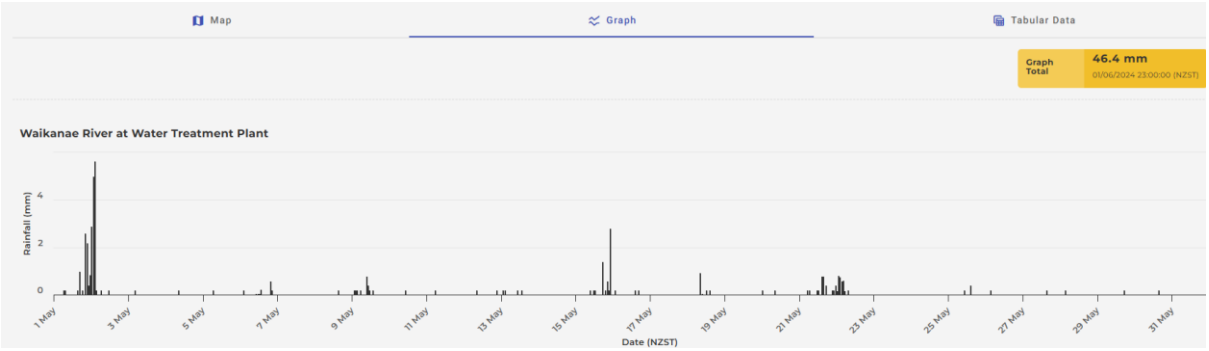
2.2.2 Hydrology

I have no onsite current or historic data with regard to the groundwater or surface water, noting that piezometers have been installed. My 0.5m holes dug in the low points of 4 depressions did not encounter water (30 May 2024).

GWRC have a ground water measure site at the coast (Maclean Park off Marine Parade) and one near Arawhata Road (R26/6831) which shows that over May the ground water (stage height) had been falling all month. May 2024 was the lowest ground water stage for the 2024 year (5514mm).



Rain fall over the month of May was small. GWRC has a rain gauge at the Waikanae River water treatment plant. It shows 6 short rain periods and 46mm in May 2024.



It is reasonable to say that at the time of survey in May 2024, the ground water is likely to have been at or near its annual lowest for the 2023-2024 season at least. That said, rainfall

across the year is generally small and diffuse, i.e. there is no clear monthly higher fall season which means there is unlikely to be an identifiable month or months where there can be certainty about the presence of a high water table and surface inundation of the hollows on the site.

With respect to the hydrology tool (which has an overarching consideration and then a set of primary and secondary group indicators), I cannot say with any certainty if the features identified on properties at 65 and 73 Ratanui Road are inundated for at least seven consecutive days during the growing season (11 August to 13 June (306 days)) but I suspect, given the low lying nature of the possible wetland features and the periods of rain fall that often occur each year they are.

Assuming they do meet the initial criteria (inundated for at least 7 consecutive days a year), no feature meets the Group 1 primary indicators (surface water, groundwater or soil saturation). With respect to Group 2 indicators, one feature (feature 12) on the site has starwort on the ground which might be considered an algae mat (similar to group 2 criteria (2D)) and several features do have sparely vegetated concave surfaces (secondary indicator 2H) (e.g. feature 15).

Under this regime, features 12 and 15(1) show indications of wetland hydrology by way of Group 2 indicators.

2.2.3 Wetland Fauna

A note with regard to wet adapted animals and the NPS-FM and RMA definition of wetland. The requirement under the definition is for there to be both plants and animals adapted to wet conditions. A recent workshop by a national suite of fauna and wetland experts has concluded that where the plant and hydrology factors meet the wetland test criteria (dominance, prevalence and hydrology tests) then the probability that there are at the very least wet adapted soil invertebrates is near 100%. It was concluded by that working group (with which I agree) that while there is increased doubt as the hydrology of the site tends to dryness (such as in sand dune and gum land systems), there is, at the very least, sufficient seasonal high ground water that there will virtually always be wet adapted mesio-fauna in the soil at some point through each year, and that is sufficient to meet the RMA / NPS-FM wet adapted animal component of the definition. Therefore, and on that basis I do not exclude any wetland because of an absence of wet adapted fauna.

2.3 Waterways

There is one east to west running channel crossed by three culvert bridges and fenced in the southern third of the site. The channel is notable on the Retrolens 1942 aerial but does not appear to have a source (it may be a spring, but that is under rural development now).

There is however, hardly any flow even when water is present as the gradient is very flat. The GWRC watercourse map (online Regional Highly Modified Streams (arcgis.com)) shows the channel as being a highly modified stream ending in the middle of residential dwellings westward (Figure 4). What is does not show is that the stream connects to the Mazengarb (and so Waikanae River) through pipes. The waterway is not classified as an artificial watercourse.

Figure 4. GWRC designated natural and highly modified streams and rivers. Pink lines are highly modified rivers or streams and blue are natural rivers or streams.

It is however, regularly (I am told by landowners) without surface water and was seen on the day of the site visit as a damp soil, puggedbed with predominantly terrestrial grasses and herbs (dandelion, hawksbeard, clover, chickweed) and few wetland species (creeping buttercup, starwort), suggesting it is dry often and for long periods. The bed itself is soils and muds, no gravels or rock. The banks are covered in pasture grasses including tall fescue, occasional Juncus and scattered *Carex virgata*.

There were no aquatic values at the time of the site visit, and it is highly unlikely the channel is habitat for fish or macroinvertebrates other than those that rapidly colonise temporal aquatic habitats because of the absence often of surface water, and cover for fish when water is present and stable aquatic food resources (related to the absence of water and good substrates or macrophyte).

3.0 Ecological Values

There are no at risk or threatened species recorded on the site, either plant or animal.

There are no terrestrial indigenous ecological values associated with the site. While a small range of animal species is present, some indigenous birds use the trees and various pasture areas and the constructed pond for resources. These are common species that utilise all of the wider landscape in the area including house gardens, fruit trees, lifestyle block wet areas, paddocks etc. It is possible that northern grass skink (not a threatened species) are present on the site, but more likely in the farm yards and house lots under debris than in the pasture areas.

3.1 Wetlands

The below figure (Figure 5) marks those areas that classify under the NPS-FM delineation process as natural inland wetlands (14 green areas).

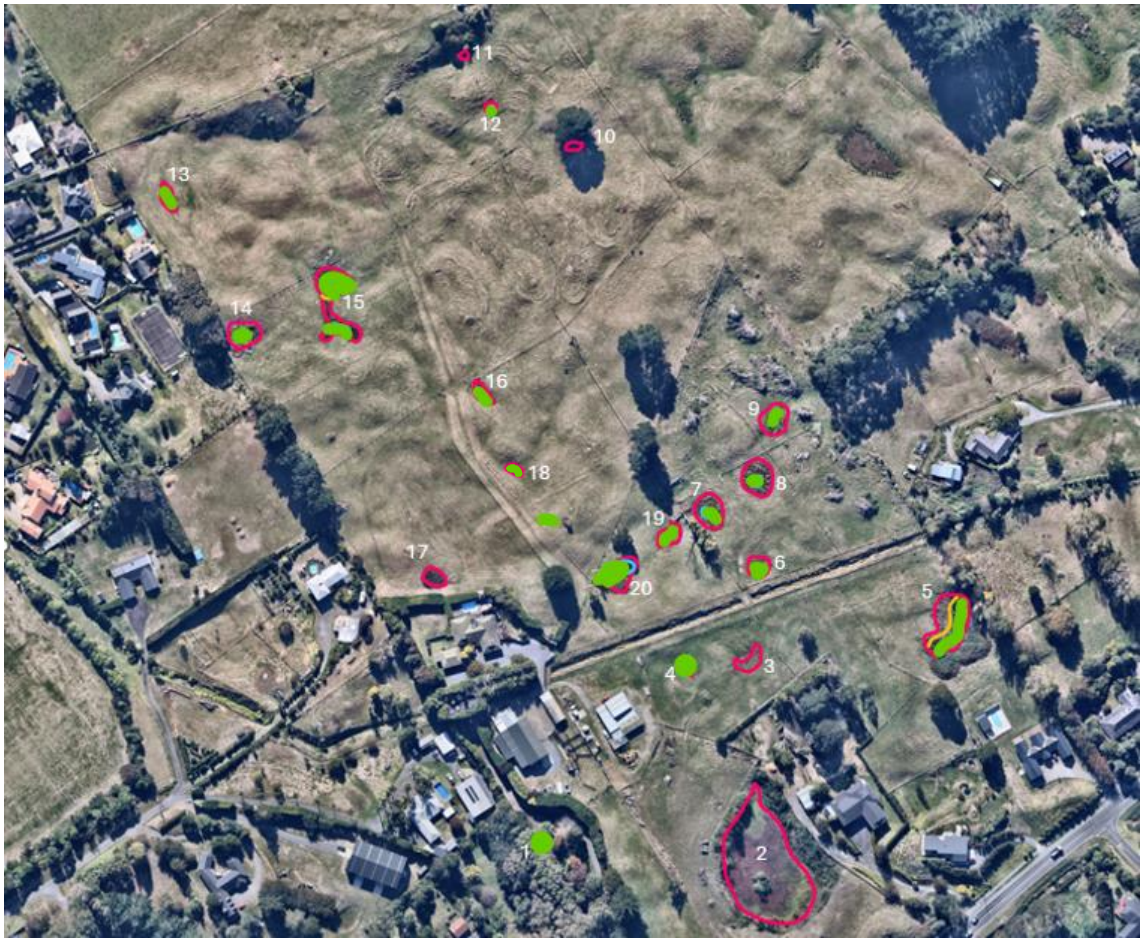


Figure 5. Features that qualify as natural inland wetland are filled green.

The EIANZ (2018) provides ecological guidance as to how to assess ecological value which is outlined in the following table. Although there are some 14 features on the site, each feature is very similar and of the same species composition and of a similar size in a similar setting. I therefore did not test each feature individually but considered all the features as being the same and tested the average type of feature against the following guidance with the outcome applying to all. This is a standard approach under the NPS-FM protocol and EIANZ guidance.

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

Matters	Attributes to be considered
Representativeness	Criteria for representative vegetation and aquatic habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting nationally Threatened or At Risk species, or locally[19] uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and Pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	• Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy

3.1.1 Representativeness

The swamps of Kāpiti on the lowland plains between dunes are Podocarp, broadleaved forest of abundant kahikatea, with occasional to abundant prevalence of pukatea, kiekie, supplejack, and local rimu, tawa and swamp maire, particularly on organic and gley soils with a high water table (Singers et al 2018). On the dunes including the small dune hollows, there was a uniform cover predominantly of Podocarp, broadleaved forest of mosaics of kānuka, red māpou, korokia and akeake on very recent soils, grading into ngaio, tītoki, kōwhai, tōtara, matai, rewarewa, maire species, māhoe, lancewood and kaikōmako as well as kohekohe on older dune soils.

There are few examples of these ecosystems remaining in the Kapiti area (Foxton Ecological District) (such as Tini bush (RAP 4, Ravene 1992). The majority of swamp or marsh in these now largely farmed landscapes are harakeke-raupo swamps with occasional remnant kahikatea, pukatea and swamp maire or manuka fens.

Recommended Area for Protection (RAP) 3 (Ravene 1992) "Andrews pond" (not far south of the site) shows a manuka/Isolepis/sphagnum shrubland on a dune hollow system. Manuka is dominant with a sphagnum ground cover as well as Isolepis prolifera and *Baumea* (now Machaerina) *teretifolia* with some *Carex secta*. This is perhaps, the most likely assemblage that should be expected on the site if its was representative of the natural wetland as it once was.

The current wetland cover bears no resemblance to the historic pre-modification state of the site, or even of the remnant swamp and march indigenous systems recognised in the

PNAP etc. Indeed, the hollows on site are so small that it was unlikely they were wet when the dune area was under forest.

The features are in no way representative of natural formed indigenous wetlands, be they historic swamps or current day regenerated features of sedgeland marsh. Therefore, I consider the appropriate ranking for their representativeness under the EIANZ guidelines to be very low.

3.1.2 Rarity / Distinctiveness

While indigenous wetlands are rare (Ca. 2.8% of the historic extent) in the Wellington region (Ausseil et al 2008), the features measured that derive that value were pre-human wetland extent. It is these prehuman and indigenous representative wetlands, which show true wetland hydrology that are now rare, not the hydrology of wetland. The greatest loss has been swamps and the principal areas of their historic existence (in the Wellington region) and loss was in the Wairarapa and Kāapiti coast areas in particular.

Features that are common today throughout the Wellington region and on the Kāpiti dunelands and in the Foxton Ecological District (as classified by DOC) include waterpepper, juncus and exotic wet grasses. The features on the site are not indigenous nor representative of the rare indigenous wetlands identified by Aussiel et al (2008), therefore I do not consider they need to be checked for the rarity component of the values assessment.

As already noted above, the features present on the site do not fit the profile of a naturally uncommon dune deflation hollow (Wiser et al 2013) which are naturally uncommon ecosystems. Those systems referenced are indigenous vegetation associated with sands and wetlands, and these features are not indigenous or representative of indigenous dune deflation hollow habitats so they rank as very low rarity under the EIANZ guidelines. Nor are the features distinctive in any positive way.

3.1.3 Diversity / Pattern

Diversity is a measure of the number of different types of species or habitat types that exist in a given area and is relevant to an Ecological District (here the Foxton Ecological District). The small hollow features have low species diversity, and all are of similar character without gradients other than a variable groundwater depth which has not induced diversity in abiotic components. The scattered small features are largely uniform in type and character and species, and all relate to shallow inter dune deflations.
As a comparison, the NZ plant conservation network holds species lists from surveys. There are few lowland plains nor forest wetland systems in the Foxton Ecological District but one example that may have similarities to the past condition of the site is the swamp at 226-234 Te Hapua Road (which is a farmed but very wet property). The Wellington Botanical Group recorded three shrub species, two ferns, 1 orchid, 15 sedges, 3 rushes, 19 other herbaceous species and 1 moss. 44 taxa were recorded in total as compared to 5-6 in any one feature or 18 across the entire plan change site, 2 rushes, no shrubs, no orchid, no fern, no sedges and no mosses.
Therefore, I rank this criterion as very low under the diversity/pattern criterion of the EIANZ guidelines.

3.1.4 Ecological Context

This considers the site's role in ecosystem functioning through its relationship with its surroundings, including the role of maintenance of indigenous biodiversity, the function of resource and liveable space related to the size and shape of the feature/s, how buffered/buffering the feature is, how important the feature is in terms of faunal resources and passage through the landscape, and the role it has in abiotic factors, e.g. water filtration, detention etc.
The dune hollow wetland features identified on the site have a range of features (or lack of features) that do not give them any ecological contextual value of importance, these include:

- very small,
- isolated,
- simple in structure,
- comprised largely of exotic species,
- situated in a rural peri-urban setting (long period of modification),
- are not connect to a waterway or other natural feature,
- are too small to regulate or temper ground and surface water,
- do not filter surface flows and
- are not with resources of fauna, or large enough to be shelter or to buffer any other more important feature.

On the whole the contextual value of these features, singularly or as a whole, I regard as very low value under the EIANZ guidelines.

3.1.5 Wetland Summary

Criterion	**Outcome**
Representativeness	Very low
Rarity and distinctiveness	Very low
Diversity and pattern	Very low
Context	Very low
Outcome	Negligible ecological value

This value is representative of the level of the values identified in the NPS-FM which are not to be reduced, i.e. the feature is less able to provide for: ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values and amenity value.

Currently there is limited to no indigenous biodiversity value and under the current land use and rules that value will not increase and so there is no greater potential value. Similarly for ecosystem health and hydrological function, neither are effectively present. I cannot address Māori values, but not there are no mahinga kai species I know of, and I suggest that there is little by way of amenity value of any feature.

3.2 Waterway

The highly modified stream (GWRC Web data) which bisects the site in an east to west direction and divides the properties (Figure 3) has been used as a drain for over 60 years and is not considered to have a permanent flow or retain water generally. The substrate is soft muds and soils with terrestrial vegetation, but it is still an active bed. The ecological aquatic values of the system are very low, and it will only be temporary aquatic habitat for a small set of rapid colonising macroinvertebrate and potentially used when in flow by short fin eel which are able to manage the variances in water quality as a food resource when present. That said, the channel system is only very poorly connected to the Waikanae River and therefore may never have any fish. While (as with the terrestrial value system) the EIANZ has a set of criteria for evaluating a stream / waterway, this channel is clearly very low in all considered categories and offers **negligible ecological value**.

3.3 Significance

Policy 23 of the RPS has a set of criteria not dissimilar to the EIANZ values set. Policy 42 suggests that all natural wetlands are automatically significant by default of meeting representativeness and rarity. However, under the MfE (2020) delineation protocol, "exotic" is not differentiated from "indigenous" and representativeness or rarity is not a factor. Many features that classify as natural inland wetland are fully exotic and cannot in anyway be said to be “representative”, especially where the intended focus (as prescribed in the Policy 23 significance criteria) is on indigenous biodiversity.

The wetland features on the site, being neither representative or rare, and which do not meet either the diversity or context criteria[2], cannot in any way be found to be significant as that relates to section 6(c) of the RMA or Policy 23 of the RPS criteria.

4.0 Constraints and Opportunities

The development of the site for residential purposes will require vegetation removal and land morphology change. There are no terrestrial ecological constraints and few terrestrial opportunities. While none of the identified natural wetlands are of a particular representative value and are all small and non-viable without management, they nevertheless meet the NPS-FM classification. It may be perceived that constraints exist around removal of these wetlands and any impacts to the extent and value of the highly modified waterway as well (as directed by the NPS-FM).

However, a better ecological outcome on the site through this plan change would be the recognition of the potential to create a centralised indigenous wetland that is part of the hydrology management of the site (so as to maintain wetland hydrology). To this end, a stormwater management system that included a substantive indigenous wetland

[2] I cannot speak to the final criterion: Tangata whenua values

component would be feasible in and about the waterway, such that the end result of the development of the site is the creation of an integrated wetland and stormwater system with improved waterway riparian conditions.

A similar approach was taken in a Todd subdivision in the upper Duck Creek (Whitby, Porirua) where earthworks SRP's were converted to dual stormwater and wetland habitat (Figure 6). In that scenario, a smaller forebay was constructed to collect the sediments and any urban runoff contaminants and be the place of management. This divested its water into the wetland proper which was vegetated in indigenous species and connected to the Duck Creek which allowed fish access to the wetland. The wetland success was measured and found to have caused successful wetland habitat with aquatic fauna and a natural assemblage of wetland species, while still functioning as a retention device.

2014	2022

Figure 6. Todd Upper Duck Creek stormwater conversion post construction to wetland.

4.1.1 Marsh concept

I consider that a similar approach on the plan change site would be very successful with a series of wetland types associated with retention of several of the existing features, a forebay to manage contaminants, and use of the site's stormwater to support the wetlands. These wetlands will in turn support the adjacent waterway.

The first flush area should have a deeper pond to enable raupo and *Eleocharis spathulata, Schoenoplectus Validu*s to be established.

- raised areas *of Coprosma propinqua, Cordyline australis*, *Olearia virgata, Carex virgata.*
- lower areas of *Carex geminata, Carex maorica, Cyperus ustulatus, Coprosma propinqua, Cordyline australis* outer, and
- wettest areas of: *Juncus edgariae, J. sarcophagus*, J. *planifolis*, *Leptocarpus similis*, *Carex secta*, water pepper.

But species should be determined after the final hydrology is understood.

5.0 Conclusion

No indigenous terrestrial habitats or values are present or required to be lost as a result of development on the site.

No Indigenous fauna of note is likely to be resident on the site. Northern grass skink may be present in very low numbers in farmyards and under wood slash piles.

No threatened or At Risk taxa have been recorded on the site.

All the wetland features are small, exotic dominated and are simple assemblages which are a result of forest clearance and past land use for farming. These features are not representative indigenous examples of "natural" plants and animal dune wetland assemblages, so are not those features referenced as naturally rare (Wiser et al 2013) or those features that form the basis of the 2.8% remaining wetlands in the Wellington region (Ausseil et al 2008).

There are, despite this, 14 features on the site that meet the delineation protocol of the NPS-FM (2020). Works in and around those wetlands will require consideration in relation to the NES-F and NPS-FM at the time of any subsequent resource consent.

The ecological values of all these features are negligible. The features are not significant in terms of section 6(c) of the RMA and are not viable in the absence of further ecological management.

The highly modified stream that runs through the property offers some form of connection to the wider landscape but is often surface dry and is a poor aquatic habitat and this connectivity is more because there is a differently used linear corridor than because there is a perennial waterway. The introduction of riparian re-vegetation could see low levels of gain in the function of this waterway, although the existing condition and values instream are sufficiently negligible that no gains are likely to instream fauna communities.

The net ecological outcome for natural wetlands for development enabled under the plan change could be one of significant gain compared to the potential under the current land use. That is there could be the retention of several of the current natural wetlands but more importantly the plan change could be the mechanism to cause significant indigenous marsh wetland creation through offset such that a substantive sized, hydrologically more stable, indigenous species marsh could result and be associated with the highly modified stream (which could also be enhanced). In the absence of a plan change and development it is difficult to see how any of the wetland features or stream on the site would be restored or even sustained long term. Even if each individual feature was improved by the current landowner and despite the farm activities, given their small sizes, the gain would arguably be near zero.

6.0 References

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Appendix 1: Plant species recorded in potential wetland features.

taxa	*Common name*	
Juncus edgariae	*Wīwī*	*Indigenous*
Juncus effusus	*Leafless Rush*	*Exotic*
Persicaria hydropiper	*Water Pepper*	*Exotic*
Ranunculus repens	*Creeping Buttercup*	*Exotic*
Lolium perenne	*Perennial Rye Grass*	*Exotic*
Crepis capillaris	*Hawksbeard*	*Exotic*
Plantago major	*Broad-leaved Plantain*	*Exotic*
Holcus lanatus	*Yorkshire Fog*	*Exotic*
Agrostis stolonifera	*Creeping Bent*	*Exotic*
Trifolium pratense	*Red Clover*	*Exotic*
Lotus pedunculatus	*Lotus*	*Exotic*
Rumex crispus	*Curled Dock*	*Exotic*
Paspalum distichum	*Mercer Grass*	*Exotic*
Paspalum dilatatum	*Paspalum*	*Exotic*
Centella uniflora	*Centella*	*Indigenous*
Callitriche stagnalis	*Water Starwort*	*Exotic*
Cerastium glomeratum	*Annual Mouse-ear Chickweed*	*Exotic*

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About BlueGreen

Over the last 20 years I have gathered a high level of knowledge and expertise working on a number of large scale projects of national significance, right from pre-consenting investigations through to Environment Court and Board of Inquiry Hearings. As such I are able to offer our clients proven expertise to assist with a range of ecological challenges, both simple and complex, across various ecosystems.

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