

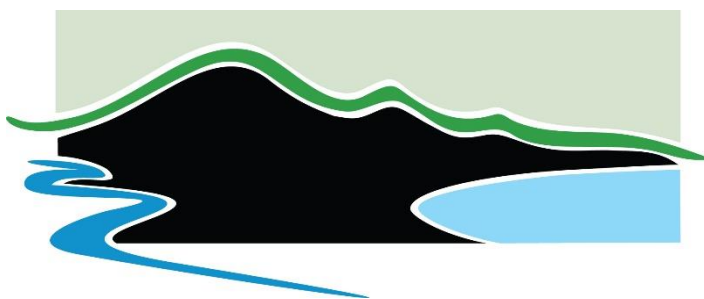


ECOLOGICAL ASSESSMENT PERTAINING TO A PROPOSED SUBDIVISION

at

**443 Kerikeri Rd, Kerikeri
Pt Lot 6 DP 25904**

May 2024



**RURAL
DESIGN** SINCE 1984

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1.0 INTRODUCTION

Quirino Limited ('the Client') proposes to develop at 482–484 Kerikeri Road (Lot 1 DP 154181 & Pt Lot 6 DP 25904), Kerikeri ('the subject site') into an eco-village with a number of small dwellings throughout. Rural Design 1984 Limited (RDL) has been engaged by the Client to undertake an Ecological Assessment to identify and assess existing ecological values of the site, and outline opportunities, constraints and potential mitigation strategies associated with the proposed development proposal.

The site is situated approximately 2.0 km southwest of Kerikeri town centre and accessed from Kerikeri Road (Figure 1). The subject site is approximately 4.3402 ha in size and is zoned as 'Rural Production' under the Far North District Council District Plan (Operative).

The subject site is a horticultural growing unit best described as an orchard, currently with a variety of fruit-producing trees including but not limited to mandarin (*Citrus reticulata*), lemon (*Citrus × limon*), avocado (*Persea americana*) and macadamia (*Macadamia integrifolia*). It is proposed to develop 15 small dwellings and associated accessways, walkways and offsite parking facilities as shown on the proposed Scheme Plan prepared by Reyburn & Bryant dated April 2024 (Figure 2 and Appendix 1).



Figure 1: Showing the subject site in relation to Kerikeri

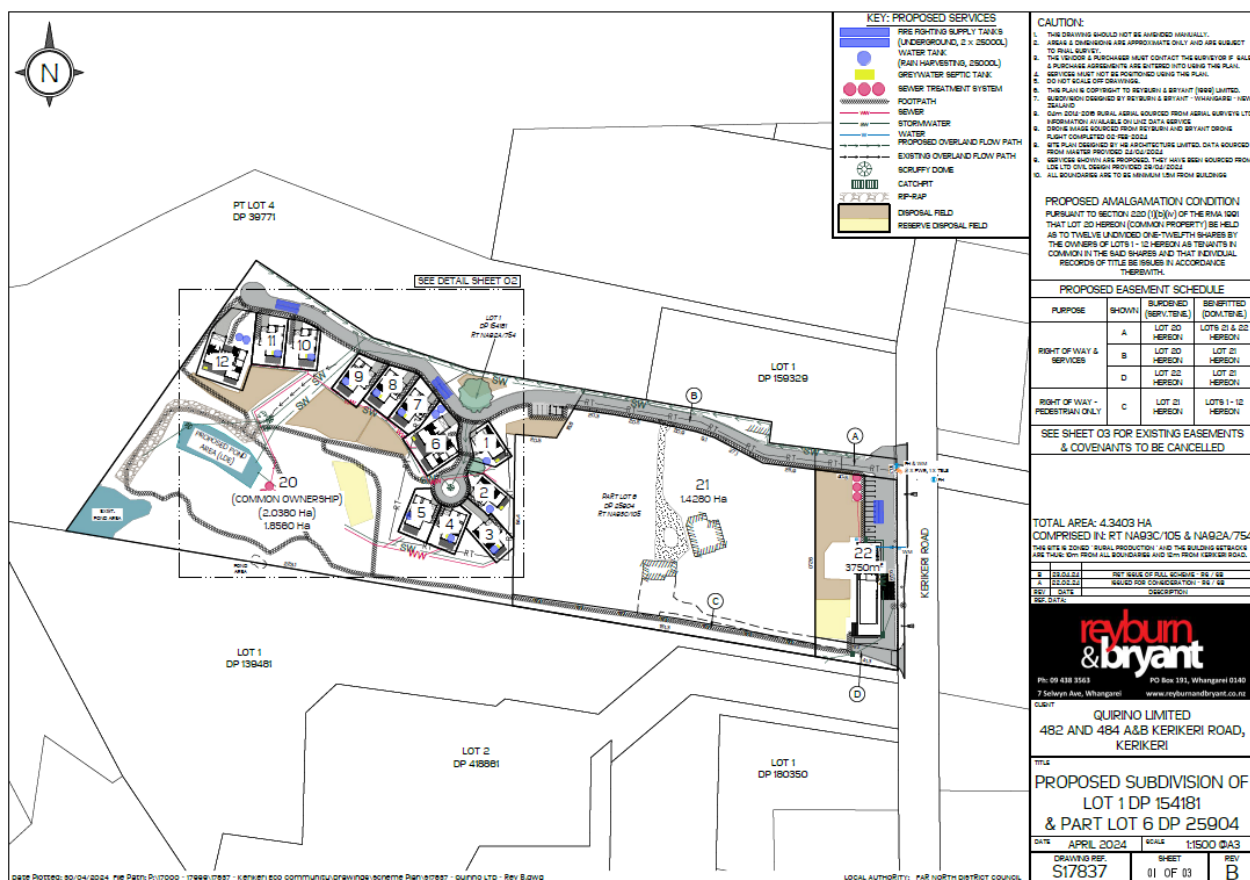


Figure 2: Master Plan for the proposed development at 482-484 Kerikeri Road

2.0 FIELD SURVEY METHODOLOGY

The site and surrounding area were visited on 22nd of January 2024. The recommended areas for protection and natural features have been surveyed by Rural Design using a GPS unit (Trimble TDC600) and the details shall be correlated with the survey plans prepared by Reyburn & Bryant.

Field surveys were undertaken over the entirety of the site. Natural land patterns were observed, and a comprehensive field assessment was conducted, including detailed botanical and avifauna surveys. Manual herpetofauna hand searches were conducted during survey visits, and this data was further supplemented with data from DOC Herpetofauna database, and Kerikeri ED PNA programme report.

An additional 'desktop' review of different data sources was undertaken to further the understanding of the wider ecological patterns and local species of significance, and the connection of these species with recommendations for ecological enhancement of the subject property. Former and current ecosystem types were considered from an ecological context.

2.1 Habitat Survey

The habitat survey consisted of walking throughout the subject site and observing the vegetation types within and around the immediate area of the development footprint. When a distinct vegetation type or ecological feature was observed, GPS points were taken to denote its location and approximate area size. The various observed habitat types are typical of a highly modified pastoral environment are described in Section 4.1 of this report. These vegetation types were then extrapolated to ArcGIS Pro 3.0 where a georeferenced map was then created.

2.1.1 Wetland Assessment

For wetland delineation protocols in the field, the NPS-FM refers to the Ministry for the Environment (MfE) 'Wetland Delineation Protocols' (2020), which are based on the 'Vegetation Tool' for wetland delineation in New Zealand (Clarkson 2013) to determine the status of wetlands. These rely on the presence or absence of hydrophytic vegetation as being the dominant vegetation type (Figure 3). The list of hydrophytes used in this assessment are as per the most recently revised list (Clarkson et al. 2021). In addition, we considered Singers et al. (2017) to determine the ecological value and significance of any wetland area.

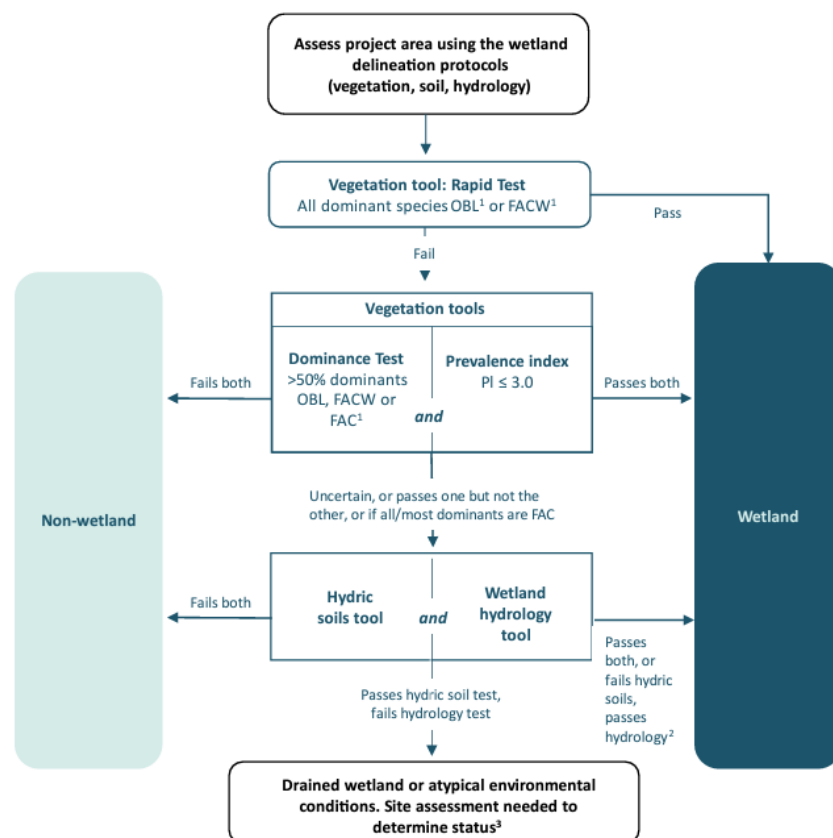


Figure 3: Flow chart for hydrophytic (wetland) vegetation determination. Wetland indicator status abbreviations: FAC=facultative; FACW=facultative wetland; OBL=Obligate wetland

2.2 Fauna Survey

Avifauna, herpetofauna and chiroptera were surveyed as a part of the Ecological Assessment. The weather during the site wide survey was generally warm (22°C) and sunny (0% cloud cover) with light winds (Beaufort Scale 1). No quantitative lizard survey was undertaken although a diurnal herpetofauna search was conducted on site, which involved checking beneath dense vegetation, logs, boulders and man-made objects. Any potential habitat on site that would be viable for herpetofauna to use for breeding, foraging or sheltering was also noted during the site visit. Avifauna species were observed on the subject site via opportunistic observations during the field survey. A passive acoustic was not deployed to capture nocturnal birdcalls. As such, the avifauna survey should be used as indicative only. No qualitative fish survey was carried out during site visits due to insufficient water levels within the permanent stream. The survey was therefore solely reliant on supplementary material including online databases and previous surveys within the wider catchment conducted by RDL during previous projects. During the site walkover, a visual assessment for potential roost sites were undertaken for potential chiroptera habitat. Trees on site were assessed for their potential to support bat roosts which comprised of a ground based visual inspection using binoculars to identify any features potentially suitable for roosting bats. Such features may include holes, frost cracks, deadwood, knot holes and limb wounds. It was deemed that no viable mature trees within the remnant riparian corridor had the potential to currently provide suitable roosting features for bat communities. Furthermore, the quality of the onsite waterbodies does not readily provide for good foraging grounds. Therefore, no presence/absence survey using an Automatic Bat Monitor (ABM) was undertaken. As such, the presence or absence of the species cannot be accurately quantified.

3.0 ECOLOGICAL CONTEXT

3.1 Kerikeri Ecological District

The subject site is situated within the Kerikeri Ecological District (Northland Conservancy) and is abounded by the Whangaroa Ecological District (ED) to the north, the Kaikohe ED to the west, and both the Whangaruru and Tangihua EDs to the south. The Kerikeri ED covers 67,600 hectares centred on the northern and central Bay of Islands in the Far North Region. Kerikeri Ecological District is composed of 21% of natural areas, mainly consisting of forest (31%) and shrubland (52%) habitats with the remaining natural areas consisting of estuarine (7%), freshwater wetlands (4%) and island habitats (6%).

A high degree of fragmentation is a feature of many of the habitats in the Kerikeri ED due to the long history of human occupation and with that the associated modification and degradation

of indigenous habitats. In the past, much of the Kerikeri ED was dominated by broadleaf-podocarp-kauri forest, which has been extensively cleared. The scattered fragments of remnant indigenous vegetation provide an important stepping-stone and corridor habitat both for indigenous flora and fauna. The quality of remaining natural areas and indigenous fauna has also been compromised by agricultural practices, invasion and associated negative impacts of pest plant and animal species.

Transitional ecotone sequences have been severely compromised in the Kerikeri Ecological District. Drainage of wetlands and clearance of indigenous habitat types for the use of pastoral grazing, agricultural intensification and human settlement have severely compromised the distribution of larger transitional ecotone sequences. Wetlands are now a very rare habitat type in the Kerikeri ED. There are so few remaining that all are significant.

3.2 Site Background

The property is located on the fringe of the Kerikeri township. The subject site is predominantly an orchard and contains minimal indigenous vegetation. The site contains a number of extensive bamboo (*Phyllostachys aurea*), Japanese cedar (*Cryptomeria japonica*) and sheoak (*Casuarina* spp) windbreaks outlining (and at times bisecting) the property. There is a permanent stream system which runs along the site's southwestern boundary (Figure 5). It is fed via a small, spring-filled pond and flows in a westerly direction towards another larger pond within the site's southwestern corner. This stream system holds the majority of the significant ecological values on the subject site, though is exceptionally inundated with a surplus of different pest plant species. The stream eventually exits the western-most pond where its size, depth and flow dramatically increases offsite. It eventually discharges into the Puketotara Stream, which in turn flows into the Kerikeri Inlet. It is thought that restoring and rehabilitating the onsite stream system would provide ecosystem services both onsite and to the immediate surrounds – specifically to the offsite permanent stream system which could support a wide variety of native freshwater fish species.

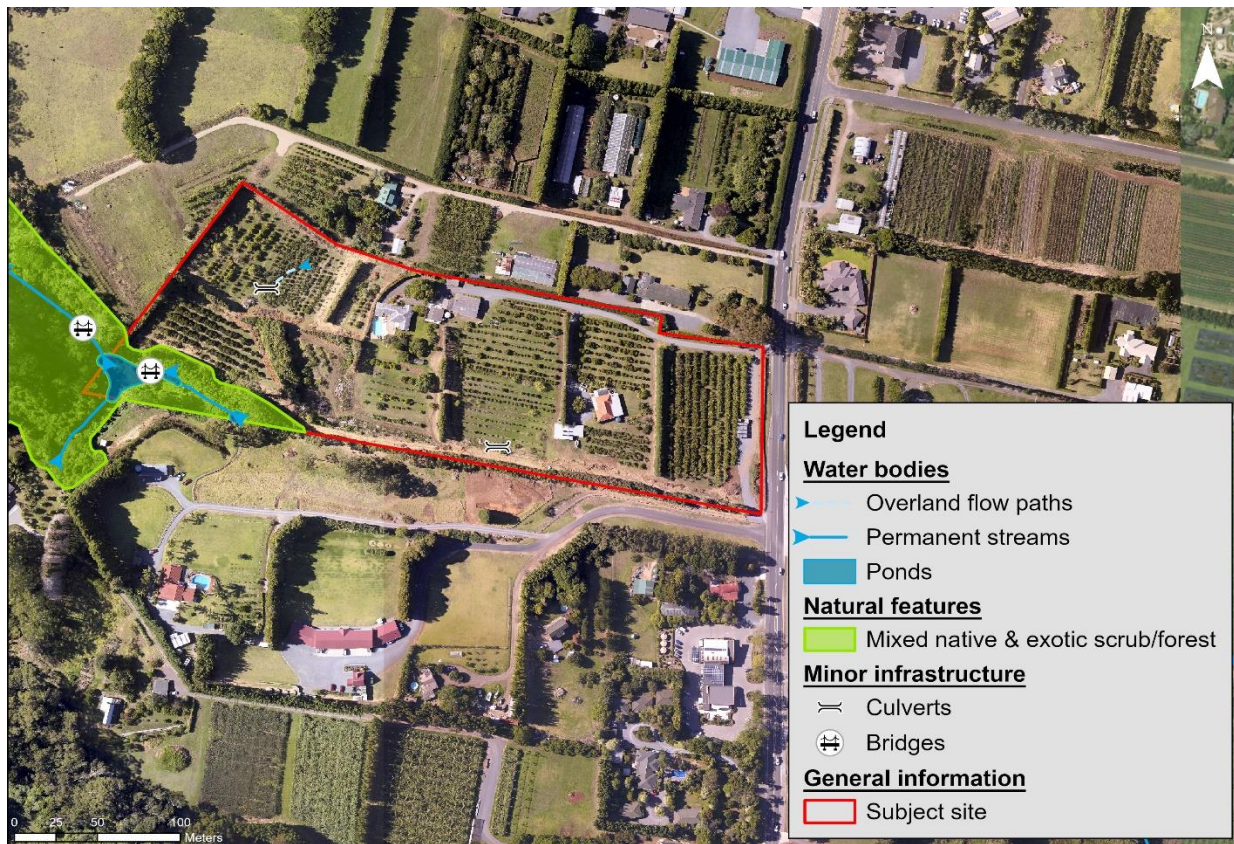


Figure 4: Showing the natural features of the site

The geology of the site is dominated by the “Kerikeri Volcanic Group Late Miocene basalt of Kaikohe – Bay of Islands Volcanic Field” which is composed of basalt lava, volcanic plugs and minor tuff (GNS 2023). The site is composed of orthic oxidic soils which are clayey soils that are dominated by crystalline aluminium and iron oxides. The site is gently undulating in nature with a general slope to the southwest towards the stream system (Figure 5).

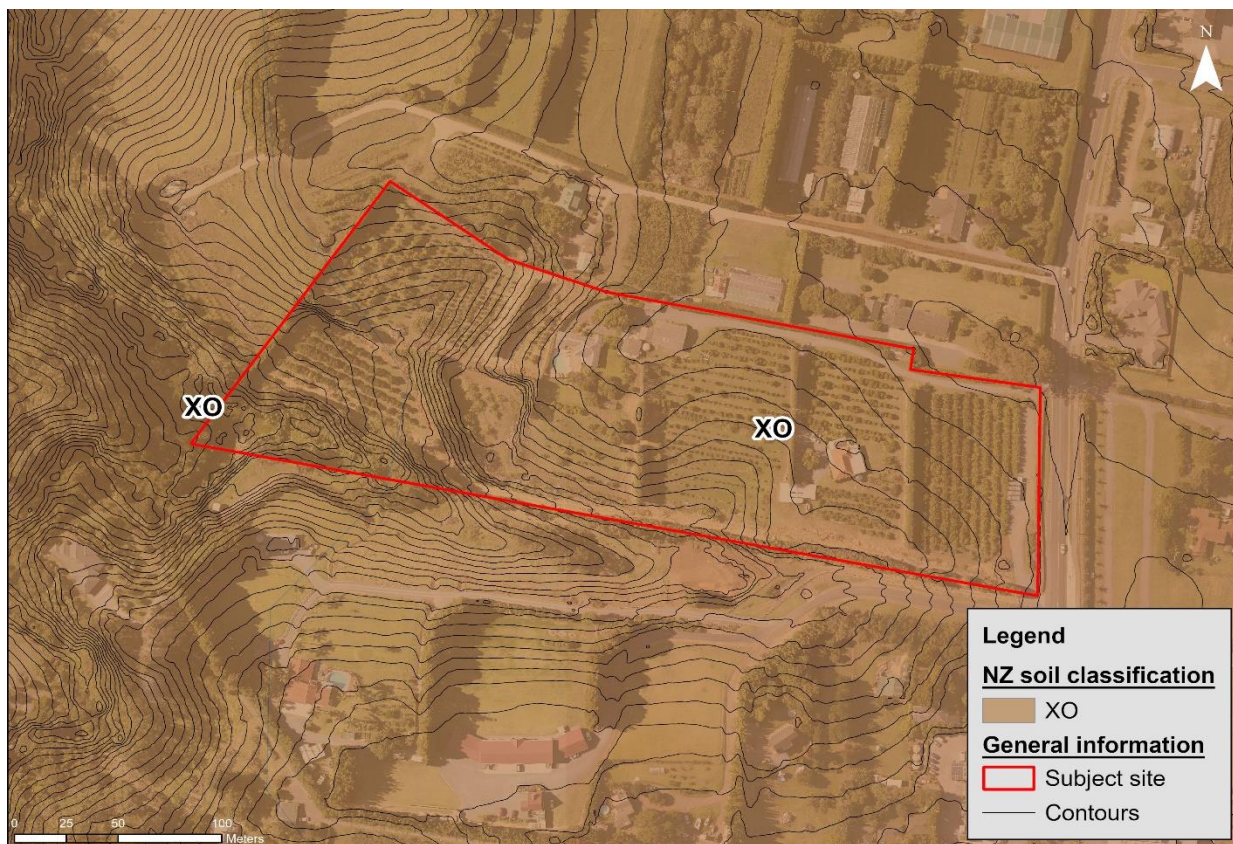


Figure 5: Showing the slope and soil classification of the site

The subject site is composed of a single Threatened Environments Classification Under Land Environments of New Zealand (LENZ) (Figure 6). The site falls within the 'Category 2 Threatened Land Environment', where 10–20% of indigenous cover remains and none is protected as of 2012. It is considered that Indigenous biodiversity in these environments have been severely reduced, and remaining habitats are sparsely distributed in the landscape. This LENZ Classification is reflective of the historic land use of the site. The freshwater ecosystem – although currently highly degraded – has tremendous opportunities for native rehabilitation and represents an opportunity to protect land which has some of the lowest legal protection in the area.

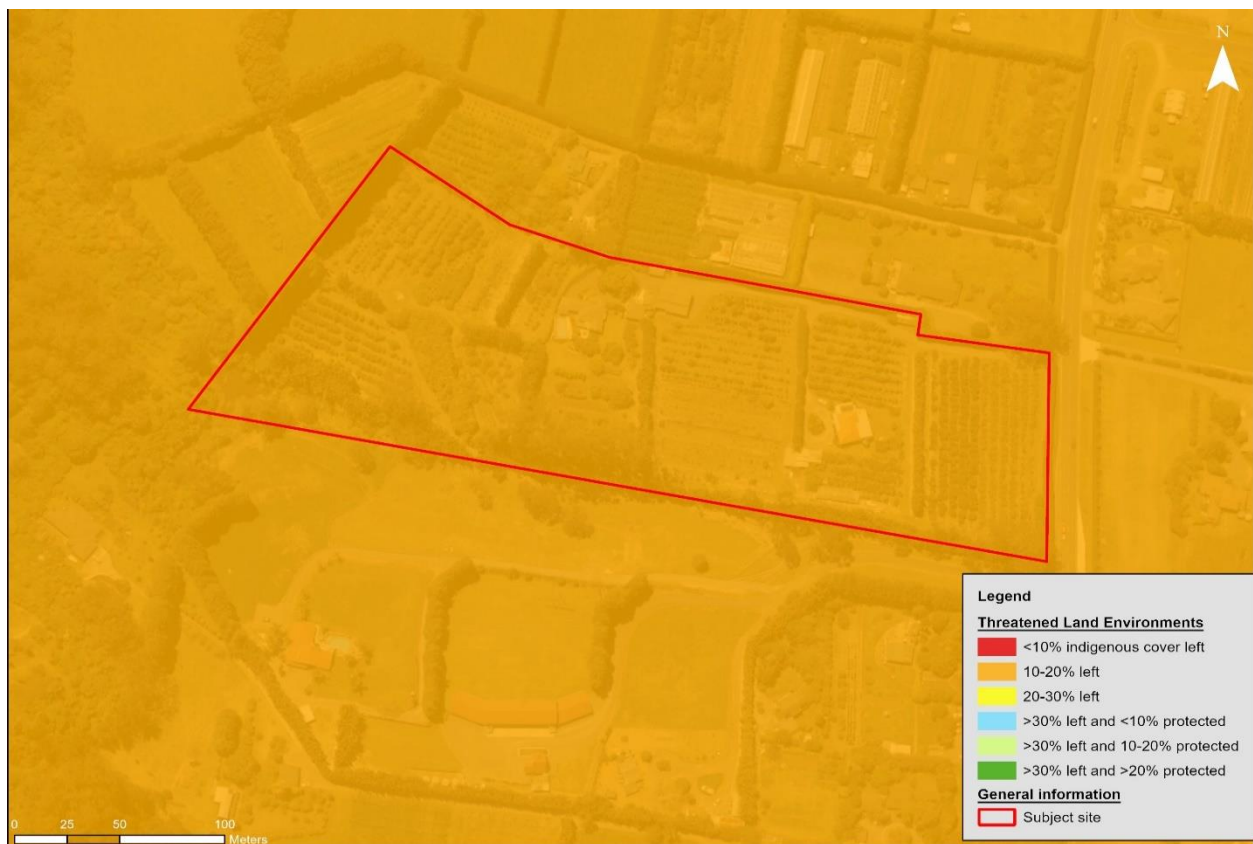


Figure 6: Showing LUC Classes identified on the subject site and surrounds

3.3 Changes in Land Use

The subject site at present day is largely modified from its original ecosystem type. Originally the site would have likely been dominated by an ecosystem type representative of coastal taraire, tawa podocarp forest (WF9) (as defined under Singers *et al.* 2017) (Figure 7). Agricultural activities have dramatically modified the native vegetation and hydrology paths through the removal of trees, channelized drainage, dams and intensive earth moving. The site and its surrounds have in the most part been drained for horticultural purposes and indigenous habitats have been largely reduced to small remnants.



Figure 7: Showing the potential historic ecosystem habitat onsite and surrounds

By analysing historic aerial imagery from Retrolens, it is apparent the subject site and surrounds had already been cleared of native vegetation and converted into horticultural unit/farmland prior to 1963 (Figure 8). A single dwelling is noted as are the exotic windbreaks across the site. Although the present-day ponds are not distinct in the photo, one can note that the southwestern aspect of the subject site has been largely left covered in what may be native vegetation, possibly due to the presence of a pond / undesirable land for orchard trees. By 1979, the large pond in the southwestern corner is much more distinguishable and was likely at least partially artificially shaped to better hold water to be used for irrigation purposes (a water pump shed was noted during the site visit by this pond under the cover of trees) (Figure 9). The southwestern aspect of the site has also been further cleared of scrappy native vegetation at this point. Auxiliary buildings have also been erected at this point. More recent imagery indicates that much has stayed the same onsite, with the addition of another dwelling and auxiliary buildings (Figure 10). During the site visit, it was noted that about half of the lemon trees within the far eastern aspect of the site have been removed to make way for a permanent onsite shop and parking area.

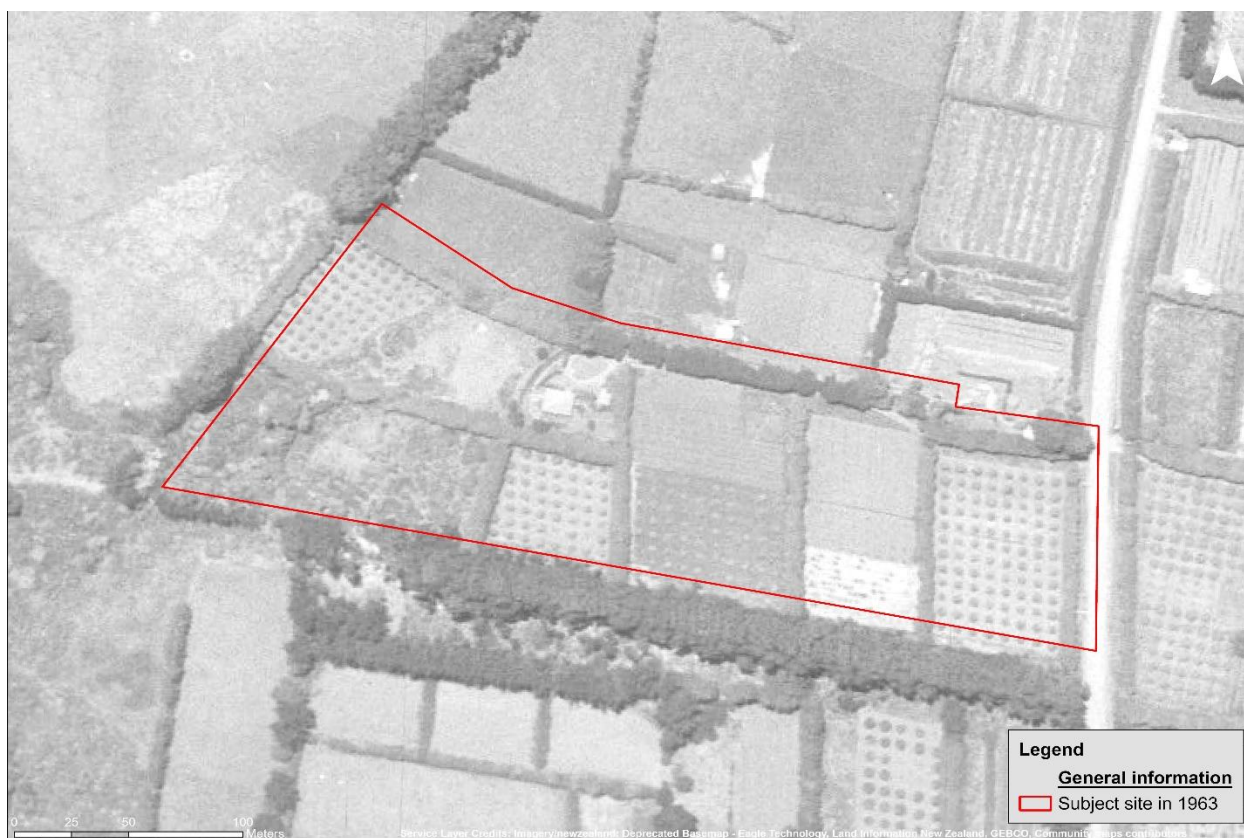


Figure 8: Showing the subject site and surrounds in 1963 (Source: Retrolens)

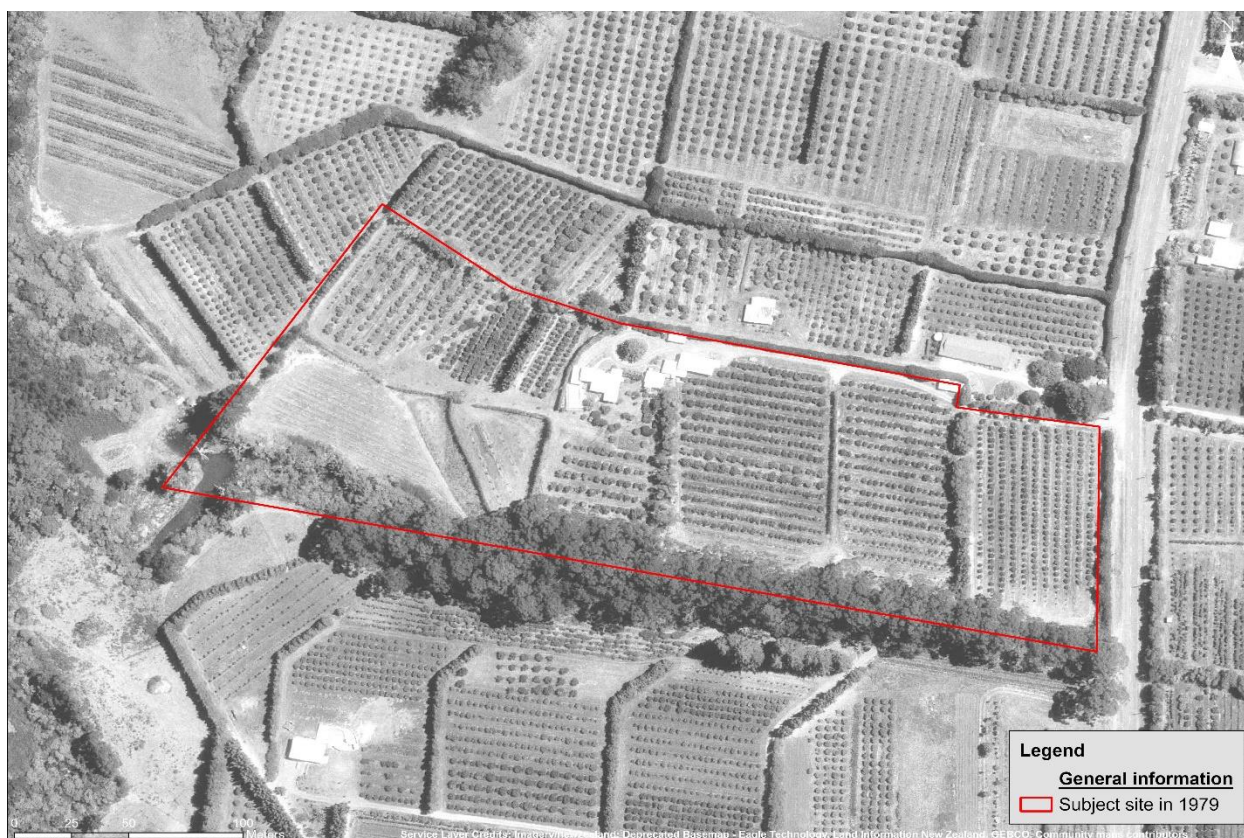


Figure 9: Showing the subject site and surrounds in 1979 (Source: Retrolens)



Figure 10: Showing the subject site and surrounds in the most recent aerial imagery for Northland (Source: NRC)

The site in its current state is dominated by exotic fruit trees, exotic shelterbelt trees and exotic pest plant species. As such, virtually all native bush features were removed pre-1960s and maintained that way for horticultural activities up to present day. Some pockets of indigenous vegetation remain within the small southwestern corner pocket of the subject site, which abound the large pond and permanent stream system. However, these indigenous species are few and far between, and surrounded by exotic plants. As such, this environment cannot be considered a native ecosystem onsite.

3.4 Protected Natural Areas

Given the agricultural nature of the subject site and surrounds, very little indigenous vegetation and Protected Natural Areas (PNA's) as designated in the Natural Areas of Kerikeri Ecological District Reconnaissance Survey Report (Conning and Miller 1999) remain within the vicinity of the subject site (Figure 11). The closest designated PNA is Kerikeri River Riparian Remnants (P05/086) which is located approximately 2 km north of the subject site. This PNA is a representative site for manuka (*Leptospermum scoparium*) shrubland, totara (*Podocarpus totara*) forest, totara-kanuka (*Kunzea ericoides*) forest, and one of only two sites of totara-kahikatea (*Dacrydium dacrydioides*) forest in the Ecological District, known to support NI

brown kiwi (*Apteryx mantelli*), kereru (*Hemiphaga novaeseelandiae*), Northland green gecko (*Naultinus grayii*), grey duck (*Anas superciliosa*) and brown teal (*Anas chlorotis*). It should be noted that the water that originates within the spring-fed pond and flows through the site to the west eventually flows through the Kerikeri River Riparian Remnants PNA. Other nearby PNA's include Puketotara Road Alluvial Remnant (P05/090), Kerikeri Airport Gumland (P05/103) and Pukewhau (P05/078).



Figure 11: Map showing the subject site, Protected Natural Areas as identified in Manning 2001 and Significant Natural Areas as proposed by FNDC

4.0 RESULTS

4.1 Habitat Types

The site occurs within the sub-humid macroclimatic zone (Singers & Rogers, 2014), although it has been significantly altered through historic farming practices and currently contains only a handful of representative examples of indigenous species. All vegetation types were ground-truthed using a handheld GPS and mapped using ArcGIS Pro 3.0.

Specifically, the site is largely considered horticultural land with exotic shelterbelts and fruit trees throughout (Figure 12). It contains a stream along its southwestern boundary which is fed via a natural spring. This stream system contains some native hydrophytic vegetation but is largely dominated by exotic pest plant species. Some remnant native tree stands were noted along the riparian margins of the stream, and the onsite dam which it discharges into. Generally, the site is depauperate of native habitat types and provides little in the way of native ecosystem services.

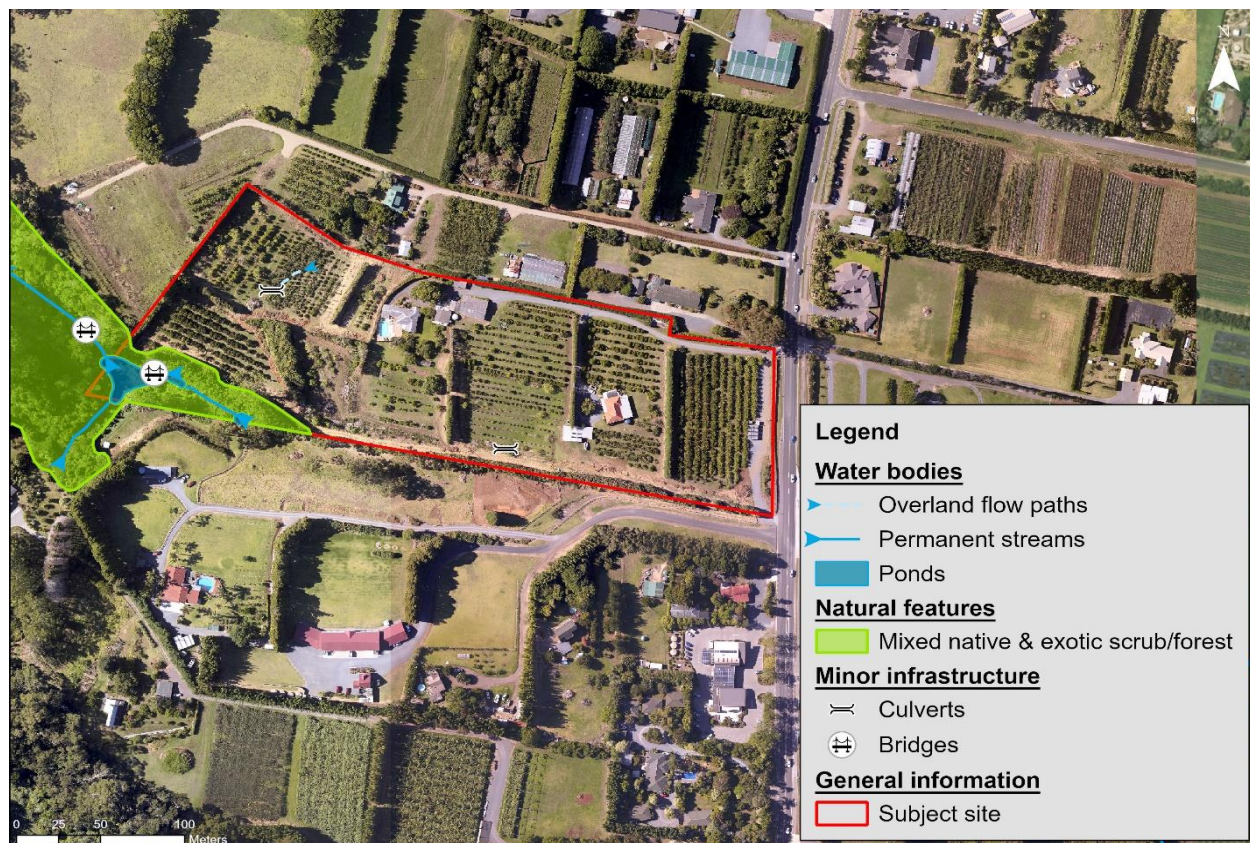


Figure 12: Showing the natural features of the subject site and immediate surrounds

4.1.1 Exotic Vegetation

Very little indigenous vegetation remains on site and at present day most of the site comprises of exotic fruit bearing trees (Figure 13). The site's cadastral boundaries are largely comprised of shelterbelts made up of poplar (*Populus* spp.), gumtree (*Eucalyptus* spp.), bamboo, Japanese cedar, and sheoak. Of note are the number of pest plant species within the confines of the site (Figure 14). This included species such as wild ginger (*Hedychium gardnerianum*), bungalow palm (*Archontophoenix cunninghamiana*), brush wattle (*Paraserianthes lophantha*), monkey apple (*Syzygium smithii*), inkweed (*Phytolacca octandra*), loquat (*Rhaphiolepis bibas*), wandering jew (*Tradescantia fluminensis*), Taiwanese cherry (*Prunus campanulate*), blue morning glory (*Ipomoea indica*), busy lizzy (*Impatiens walleriana*), gorse (*Ulex europaeus*), monstera (*Monstera deliciosa*), olive (*Olea europaea*), montbretia

(*Crocosmia x crocosmiiflora*), arum lily (*Zantedeschia aethiopica*), ludwigia (*Ludwigia palustris*), woolly nightshade (*Solanum mauritianum*) and elephant's ear (*Alocasia brisbanensis*). These species were scattered throughout the site, but large concentrations existed just south of the southern bamboo shelterbelt, near the pond and stream system.



Figure 13: Showing the wider subject site which is a horticultural unit filled with fruit trees and shelterbelts



Figure 14: Showing the onsite stream system completely inundated by exotic pest plant species

4.1.2 Remnant Native Vegetation

As mentioned, some indigenous vegetation exists around the southwestern pond and stream system (Figure 15). This consisted of occasional mature remnant stands of karaka (*Corynocarpus laevigatus*), kohekohe (*Didymocheton spectabilis*) manuka and mahoe (*Melicytus ramiflorus*), sparse mamaku (*Cyathea medullaris*) and cabbage tree (*Cordyline australis*) with some kawakawa (*Macropiper excelsum*), kowhai (*Sophora microphylla*) and ladder fern (*Nephrolepis flexuosa*) within the shrub tier. Swamp sedge (*Carex virgata*) and cutty grass (*Carex lessoniana*) were commonly observed within the riparian margins of the stream system (Figure 16 & Figure 17). No vegetation on site has been designated under the provisions of either the Proposed Regional Plan for Northland or Far North District Plan (Operative). It is important to note that the native vegetation onsite is sparse and incredibly inundated with pest weed species, making it impractical to classify its ecosystem type.



Figure 15: Showing the large western-most pond with some notable native tree species along its northern embankment (right) and ferns in the foreground



Figure 16: Showing some small stands of mamaku onsite



Figure 17: Showing some kawakawa identified onsite

4.3 Freshwater & Marine Ecology

4.3.1 Habitat description

The subject site contains distinctive waterbody features (Figure 18). These habitats were delineated at part using existing data obtained from LINZ and further characterized during the site visit in January 2024, with their status determined in accordance with Proposed Regional Plan for Northland (2021) criteria. No wetland habitats as defined under the Resource Management Act 1991 (RMA) and National Policy Statement for Freshwater Management 2020 (NPS-FM) were identified on site during the field surveys.



Figure 18: Showing the waterbody features present onsite

A small ephemeral stream was noted on the central-western aspect of the site which drains into a culvert. The culvert disappears underground and it is presumed that it exits somewhere downhill and disperses rainwater into a thick shelterbelt which runs along its central-western aspect. This stream likely only flows during rain events, where water naturally collects in this waterway given the underlying topography.

A small, spring-fed pond lays on the southwestern boundary of the subject site (Figure 19). It likely also collects water from the neighbouring site to the south during rain events given the direction and steepness of slope of the land. The riparian margins of this pond were noted to have old ponga buttresses / retaining walls around it, which indicates that the pond may have been deliberately constructed at some stage. The riparian margins are also covered in blue morning glory and montbretia, but also support some native cutty grass and swamp sedge.

This pond slowly drains from its northern embankment into a permanent stream (Figure 20). The permanent stream has low, consistent baseflow, is shallow, and varies in width from 0.25m to 1.5m. The riparian margins of this permanent stream are covered in pest plants including bungalow palm, montbretia, blue morning glory, and elephants ear. It also supports some native vegetation including cutty grass, swamp sedge and mamaku.

This stream flows into a shallow pond which is inundated by ludwigia, with bamboo along its riparian margins (Figure 21). Water discharges from the pond through its western embankment where a permanent stream flows under a bridge and into the main large pond onsite. This pond appears to be quite shallow and covered in ludwigia. Its riparian margins are completely dominated by blue morning glory along its southeastern embankment. Native tree stands were noted along the pond's northern embankment and mixed native and exotic trees were noted along its western embankment. Some sparse swamp sedge was noted at times within the riparian margins of this pond. The pond exits the site along its western boundary where it discharges into a large offsite permanent stream. It should be noted that signs of anthropogenic modifications of the pond's embankments were noticed, and an old water pump shed was located next to the large pond. It is therefore highly likely that this pond was created and/or modified for the purposes of irrigation.



Figure 19: Showing the spring fed pond



Figure 20: Showing part of the permanently flowing stream onsite



Figure 21: Showing the large pond onsite which is inundated with ludwigia

Due to the long history of land drainage and continuously managed nature, it is difficult to assess and characterize the waterbodies noted on site with certainty, as the majority contain very little ‘natural’ sections and have been modified up until present day. The natural drainage patterns have been severely compromised on site; therefore we would argue little natural sections of stream habitats exist on site.

Overall, it is deemed that while the site would have originally contained some natural drainage patterns (pre 1950s), these have been heavily, artificially manipulated through anthropogenic actions associated with the management of an intensive horticultural production operation. It was noted that heavy and intensive earthworks are currently being conducted on the adjoining property to the south, where much of the natural bowl of the land is being infilled. This further pontificates that the majority of the aquatic habitats onsite and within the wider area have been heavily modified through changing land use and anthropogenic modification.

4.3.2 Aquatic diversity

A quantitative search of the New Zealand Freshwater Fish Database (NZFFD, accessed February 2024) revealed records of 2 native fish and one native invertebrate species within the Puketotara Stream. These records were quite dated (1966) so a further search of the nearby Wairoa Stream catchment (which also feeds into the Kerikeri River) revealed an additional 6 native fish and 1 native invertebrate (Table 1) being present within the Wairoa Stream.

Table 1: Freshwater fish and invertebrate species recorded within the Puketotara Stream and Wairoa Stream catchment (Source: Niwa 2024)

Scientific name	Common name	Conservation status
<i>Anguilla australis</i>	Shortfin eel	Endemic and Not Threatened
<i>Anguilla dieffenbachia</i> **	Longfin eel	Native & Declining (At risk)
<i>Cheimarrichthys fosteri</i>	Torrentfish	Native & Declining (At risk)
<i>Galaxias fasciatus</i>	Banded kokopu	Endemic and Not Threatened
<i>Gobiomorphus basalis</i>	Cran’s bully	Native and Not Threatened
<i>Gobiomorphus cotidianus</i> **	Common bully	Native and Not Threatened
<i>Gobiomorphus huttoni</i>	Redfin bully	Native and Not Threatened
<i>Paranephrops</i> spp.**	Koura	Native & Declining (At risk)
<i>Paratya curvirostris</i>	Freshwater shrimp	Native and Not Threatened
<i>Retropinna retropinna</i>	Common smelt	Native and Not Threatened

** indicates species within the Puketotara Stream

The records show that two Native & ‘At Risk – Declining’ aquatic fauna species have been previously recorded within the Puketotara Stream, which the onsite stream features directly flow into. Given the characteristics of the waterbodies onsite and subject site’s position is the uppermost catchment for this stream, it’s unlikely that the streams would be inhabited by any

'Threatened' or 'At Risk' aquatic species. To elaborate, the likely channelization of the stream systems does not lend to the natural formation of pools and overhangs which many native New Zealand fish species need for shelter and hunting. Canopy cover is essential for many freshwater fish species such as the banded kokopu, and although some exists in the way of exotic palms and bamboo, much of the wider system is exposed, and very little in the way of native canopy cover exists. The lack thereof means less shelter, shade, food and temperature control for the stream. With that being said, some limited suitable habitat for native ichthyofauna – namely eels – is present on site possibly within the far western reaches of the permanent stream near the bridge, or within the spring-fed pond.

It is thought that the stream system observed on site could potentially support freshwater fish populations given their connectiveness and proximity to the Kerikeri Inlet. However, much in the way of remedial work would be required predominantly in the way of pest weed control and native revegetation of the stream. In its current state, the ecological value for the onsite waterbodies present is considered to be **low**.

4.4 Avifauna

The diversity of birds observed on the subject site was moderate with 6 native/endemic and 9 introduced species (Table 2). These species identified onsite are representative of a highly modified horticultural landscape. No 'Threatened', 'At Risk' or 'Regionally Significant' species was observed onsite, though the abundance of passerine onsite was notable and likely influenced by the exotic vegetation throughout the site. Overall, it was deemed that the site in its present condition provides moderate ecological services for native avifauna (namely because of the abundance of food) but overall, the native species observed represents **low** ecological value.

Table 2: Showing the avifauna species observed onsite during bird surveys in January 2024 – conservation status as per Robertson et al. 2021

Introduced		
Scientific name	Common name	Conservation status
<i>Acridotheres tristis</i>	Common myna	Not threatened
<i>Anas platyrhynchos</i>	Mallard	Not threatened
<i>Callipepla californica</i>	California quail	Not threatened
<i>Carduelis carduelis</i>	European goldfinch	Not threatened
<i>Chloris chloris</i>	European greenfinch	Not threatened
<i>Fringilla coelebs</i>	Chaffinch	Not threatened
<i>Passer domesticus</i>	House sparrow	Not threatened
<i>Turdus merula</i>	Eurasian blackbird	Not threatened

<i>Turdus philomelos</i>	Song thrush	Not threatened
Native/Endemic		
<i>Gerygone igata</i>	Grey warbler	Not threatened
<i>Porphyrio melanotus</i>	Pukeko	Not threatened
<i>Prosthemadera novaeseelandiae</i>	Tui	Not threatened
<i>Rhipidura fuliginosa</i>	New Zealand fantail	Not threatened
<i>Todiramphus sanctus</i>	Sacred kingfisher	Not threatened
<i>Zosterops lateralis</i>	Silvereye	Not threatened

4.5 Herpetofauna

No endemic or native herpetofauna species were observed during the site visit. Conversely, numerous rainbow skinks (*Lampropholis delicata*) were observed predominantly near the bamboo shelterbelt and refuse piles throughout the site. It should be noted that the herpetofauna search would not be considered quantitative and therefore would not be able to definitively determine the presence / absence of native lizard species within the riparian corridor area. No optimal habitat for herpetofauna is present within the subject site or immediate surrounds, which is primarily associated with long history of land clearance and habitat modification.

A further desktop analysis was conducted which examined multiple datasets of herpetofauna records. Records held in the PNAP Report (Conning and Miller 1999) indicate that the only locations where native lizard species including McGregor's skink (*Cyclodina macgregori*), Duvaucel's gecko (*Hoplodactylus duvaucelii*), moko skink (*Oligosoma moko*) and Suter's skink (*Oligosoma suteri*) are present in this Ecological District are on the offshore islands. A search of DOC's BioWeb database returned a single record of Northland green gecko (*Naultinus grayii*) recorded in 2009, within the Kerikeri River basin, approximately 3.5 km north of the subject site (Figure 22). Records from iNaturalist database within 5 km of the site includes observations of rainbow skink but no records of native lizards in the area.

It is likely that the only herpetofauna species present is rainbow skink (*Lampropholis delicata*). Rainbow skinks arrived in New Zealand in the late 1960s, but only became classified as an 'Unwanted Organism' in recent years and removed from the Wildlife Act in 2010 (DOC 2015). Rainbow skinks, once identified, can be trapped and disposed of however no known way to fully eradicate these species has been suggested, while their spread can be prevented by taking extreme care when moving objects, especially potting mix in potted plants (known to be favoured breeding habitat for rainbow skinks) which should be checked for eggs prior to relocation and planting works (Wairepo 2015).

As mentioned, it is unlikely that herpetofauna are utilizing the site given the lack of habitat or continuity within the wider area. Therefore, it is not anticipated that the development would have any impact on native herpetofauna. The current ecological value for native herpetofauna is therefore considered to be **low**. This is associated with a long history of disturbance, land clearance, predation by common pest animals and habitat fragmentation. It is deemed that an integrated pest management plan and revegetation planting will significantly improve the site's potential to support viable herpetofauna populations. Deadwood (both standing and lying) should be retained and building log piles of felled timber, where possible, is advised. To further enhance lizard habitat in the area planting trees and shrubs that flower close to the ground and with that bring insects and flies within the reach of native lizards would be beneficial.

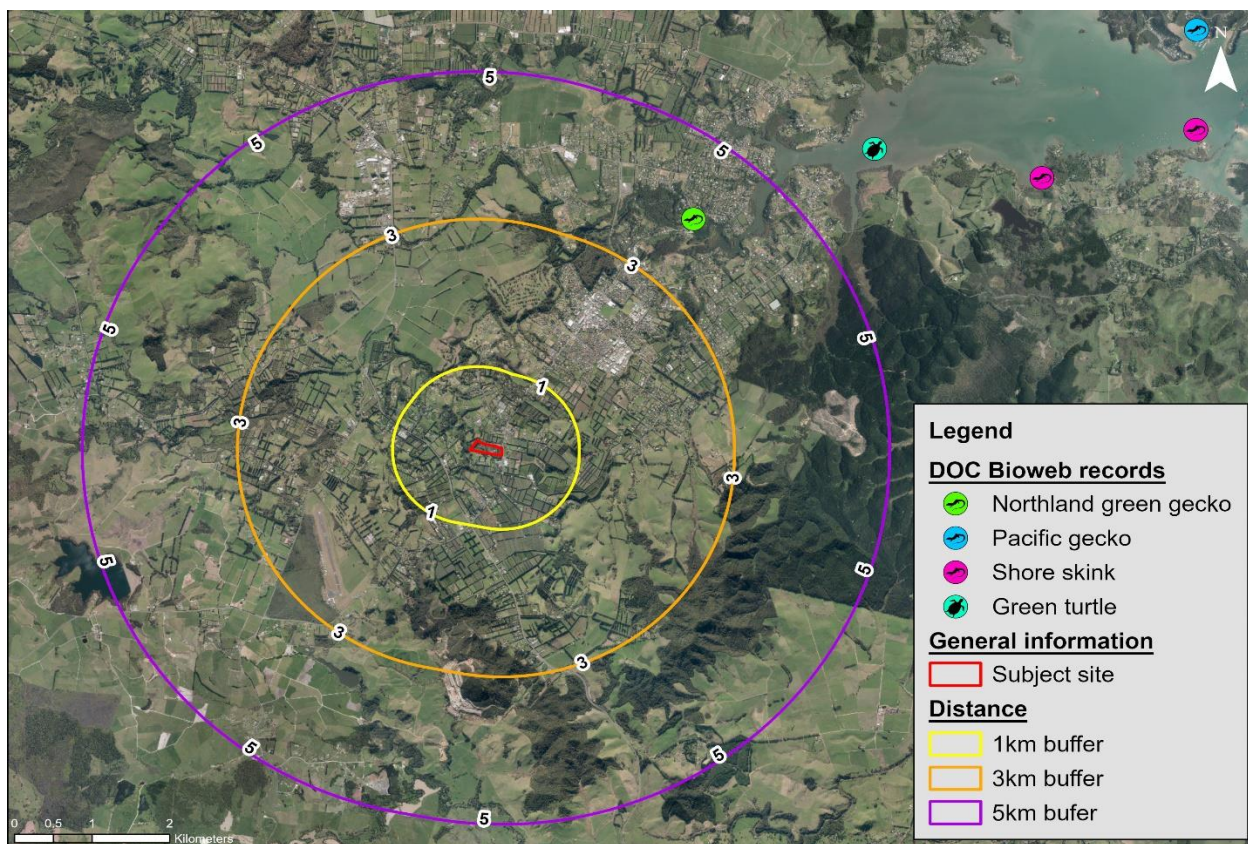


Figure 22: Showing the DOC Bioweb records within 5 km of the site

4.6 Chiroptera (Bats)

New Zealand has two extant native bat species, the long-tailed bat (*Chalinolobus tuberculatus*) and the lesser short-tailed bat (*Mystacina tuberculata*), both of which are endemic microbat species. Long-tailed bats is listed as 'Threatened - Nationally Critical' (Donnell et al. 2017). Native bats are 'absolutely protected' under the Wildlife Act (1953). A

search through the DOC database returned zero sightings of any bat species within a 5 km radius.

Bats are a highly mobile species, however given the lack of contiguous forest, the current poor water quality onsite, the presence of exotic mammalian predators on site, the lack of suitable trees for roosting, the presence of many pest plant species and the generally small habitat availability on site, it is highly unlikely that long-tailed bats use the property for roosting or foraging. Therefore, it is considered that the current ecological value for chiroptera on site is **low**. It is possible that, over time, the subject site could provide for suitable habitat for bat populations via the protection, enhancement and restoration of the freshwater waterbodies found on site, which would promote emergent aquatic insect prey for foraging, freshwater for drinking, and provide linear landscape corridors for movement and navigation to the wider area.

5.0 PROPOSED ECOLOGICAL ENHANCEMENT AREA

As part of the site development works, it is proposed that the site's waterbody features and what remains of its indigenous vegetation are legally protected and appropriately enhanced (Figure 23). Enhancement should take place in the form of weedy species removal and replacement with appropriate native species. It has been mapped using a GPS and analysed using ArcGIS Pro 3.0. This area is proposed to have continued pedestrian access to it, and as such its environmental design and form of legal protection must be carefully considered.

It is proposed to protect this area via Consent Notice protection which should stipulate that ongoing pest plant and pest animal control be conducted alongside native revegetation planting. The riparian enhancement zones will form part of the wider landscape/amenity enhancement plantings which are further described under the Landscape Assessment Report prepared by Simon Cocker Landscape Architecture.

It should be noted that the brunt of the environmental restoration work onsite comes in the way of pest plant management, and as such it is recommended that an Ecological Management Plan be developed as a condition of consent. This will ensure that pest animals and plants are appropriately managed both initially and in perpetuity. The proposed plantings seek to protect, expand and enhance the existing forest remnant area on the subject site through the reduction of edge effects and increased connectivity with the surrounding forested areas, PNAs and stream system offsite.

Plant species, grade, spacing and numbers shall be confirmed within an Ecological Management Plan as a condition of Resource Consent. The species selected should be mixture of pioneer nursery crop and species that provide food for native fauna within the proposed

consent notice protection planting area. Plant species selection should also consider the relevant type of vegetation that formerly existed and is on and adjacent to the site, with an ecological trajectory towards a WF9 taraire, tawa podocarp forest. These forest types typically include (but are not limited to) taraire, tawa, totara, towai, karaka, kohekohe and puriri and should be included in the revegetation planting regime. The immediate riparian margins of the stream and onsite pond should be planted with native hydrophytic vegetation such as *Carex lessoniana*, *Carex virgata*, *Machaerina articulata*, and possibly raupō. Given the rich volcanic soils, pioneer crop species are not necessary. The proposed plant species list for the revegetation planting will focus on introducing a high proportion of flower and fruit bearing species to enhance the overall ecological significance of the plantings and provide all-year-round food supply for a number of species, but in particular, avifauna and herpetofauna.



Figure 23: Showing the proposed ecological protection area

It is expected to achieve native canopy closure in approximately 4-5 years' time. Ensuring canopy closure as quickly as possible is vital. Canopy closure will allow for pest plant suppression and a closed canopy is more likely to attract seed eating birds that nest and roost in trees and therefore will increase the ecological value of the revegetation plantings. It is expected that within 4-5 years' time the buffer and connectivity planting will provide for significant benefits including reducing edge effects of the riparian remnants, allowing for a

more structurally complex core area to develop, and enhancing ecological corridor connectivity between remnant riparian areas.

Riparian buffer planting will encompass the permanent stream system on site. Planting here will provide for bank retention, water filtration and canopy cover of the stream system thus creating more viable habitat for freshwater species found downstream.

Total Proposed Consent Notice Area – 3,406 m²

- Riparian Buffer Planting – 2,722 m²

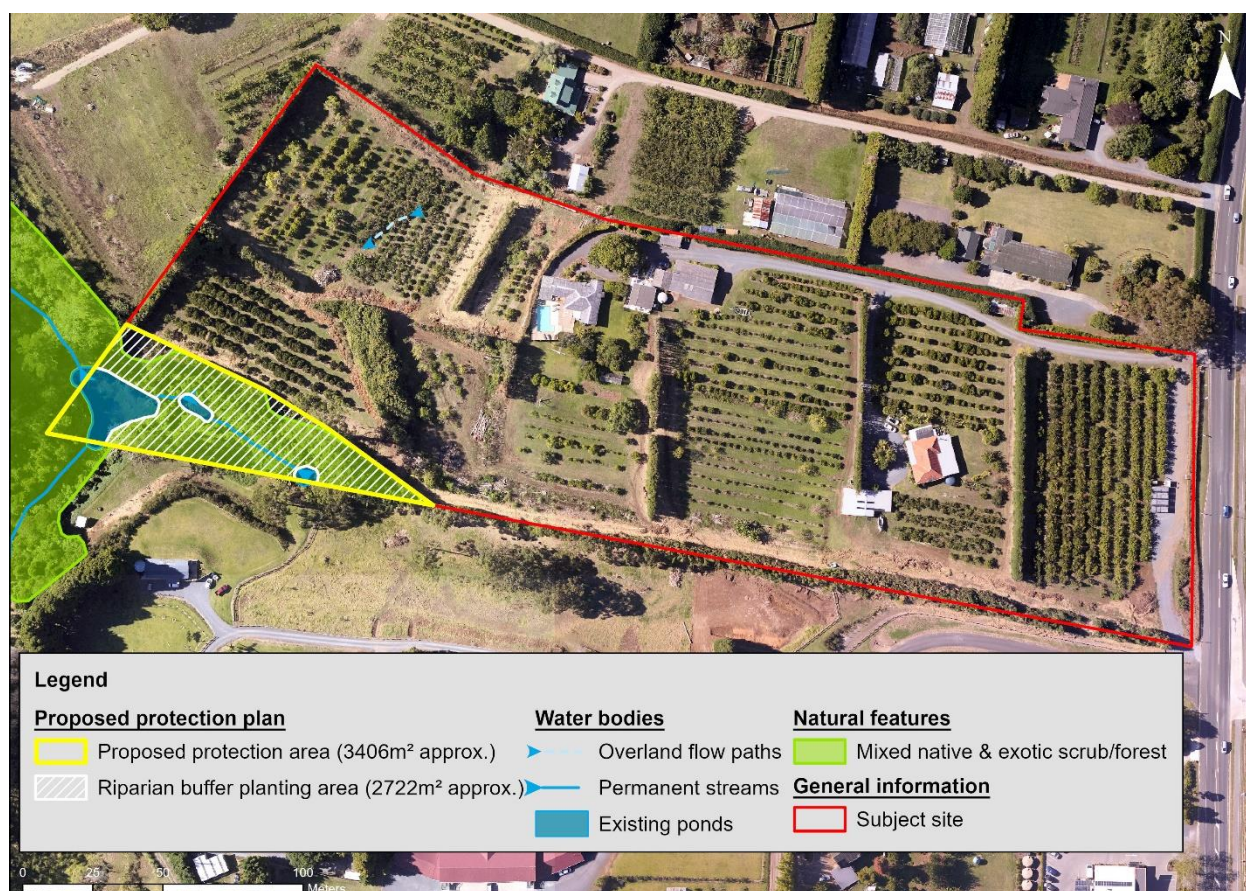


Figure 24: Riparian buffer planting throughout the consent notice protection area

5.1 Riparian Buffer Planting – 2,722 m²

Riparian buffer planting will consist of 2,722 m² of planting along stream banks contained within the subject site. The primary aim of planting in these wet areas is to restore the riparian margins of the stream system, which flows into the Puketotara Stream. The delineated planting zone within the proposed Consent Notice area is currently dominated by invasive exotic pest plant species which shall be removed. Planting in these areas will undertake functions including but not limiting to stabilizing the stream banks, filtering sediments, preventing runoff, generally

improve water quality and to provide a buffer between the proposed development area and the stream habitat on site. The planting will in effect replace noxious weeds found on site and help to restore the natural characteristics of the onsite stream system. This will also have beneficial impacts to the lower catchments and tributaries that this system feeds into off-site by filtering water and suppressing exotic pest plant seed dispersal downstream.

Plant spacing will vary, where areas that already contain native tree stands can be more widely spaced and infilled, and areas that do not contain native vegetation should be more tightly clustered. Note that the area in the far southwestern corner of the consent notice protection area is dominated by mature native tree stands and does not require additional planting. In general, hydrophytic vegetation proposed to be planted around the waterways should be tightly clustered. Tight spacing encourages quicker canopy closure which will suppress weeds.

The proposed plant species list for the revegetation planting will focus on introducing a high proportion of flower and fruit bearing species to enhance the overall ecological significance of the plantings and provide all-year-round food supply for native fauna. The plant numbers, species selection, spacing, etc. will be confirmed post consent within an Ecological Management Plan written for the site as a condition of consent.

6.0 ANIMAL PEST MANAGEMENT & WEED CONTROL

6.1 Pest Animal Management

Although not observed during site visits, it is likely that common mammalian pest species are present on the site, including Norway rat (*Rattus norvegicus*), possums (*Trichosurus vulpeca*), ship rat (*Rattus rattus*), brown hare (*Lepus europaeus occidentalis*), European rabbit (*Oryctolagus cuniculus*), mustelids (*Mustela* spp.), wild cat (*Felis catus*) and hedgehog (*Erinaceus europaeus*). A thorough monitoring program can be developed with the Ecological Management Plan as a condition of consent for the identification, control and monitoring of pest animals over time.

A control programme including a combination of trapping and poisoning should be enforced on the subject site. The programme will target key pests that threaten these values:

- a. Stoats (and rats, hedgehogs) with DOC 200 traps
- b. Possums with traps
- c. Rats through toxins
- d. Rabbits through toxins
- e. Feral cats with traps

The tools that should be used will be to accepted NZ best practice standards but will also include an adaptive management approach (also best practice) to take account of knowledge learnt while doing the work and the changing use of the property i.e. replacement of grazed pasture with native revegetation.

Possums and rodents disrupt ecological processes therefore can impact entire forest ecosystems (Cowan, 2001). Possums are selective feeders and deplete species like pohutukawa (*Metrosideros excelsa*), rata (*Metrosideros robusta*) and kohekohe (*Dysoxylum spectabile*) and interfere with flowering and fruiting periods. This subsequently can have negative impacts on seed dispersers such as New Zealand pigeon. Meanwhile rodents can have severe negative impact on populations of invertebrates, lizards, some birds. Possums and rodents also feed on seeds and seedlings on the ground, therefore depleting food availability for native fauna.

Goats, pigs, rabbits, hares, and grazing livestock can impact on native plant assemblages and native regeneration generally. Where livestock are allowed to graze in forest remnants and riparian areas, it results in the destruction of vegetation preventing regeneration as well as negatively impacting riparian and aquatic habitats.

Mustelids (ferret, stoat, and weasel), cats and uncontrolled dogs can have severe negative impacts on a variety of native species. For ground nesting birds to breed successfully, effective control of mustelids and rats is key.

Introduced lizards, such as rainbow skink recorded on site during a manual habitat search, could have adverse effects on indigenous fauna but their impacts are generally less known than those of introduced mammals.

6.2 Pest Plant Management

Weeds identified under the National Pest Accord or those known to pose a potential invasive threat were recorded. As mentioned, the proposed ecological enhancement area in its current state is engulfed in exotic specimen plants many of which are considered 'Sustained Control' noxious weeds under the NRC, including (but not limited to) wild ginger, brush wattle and woolly nightshade. Currently, landowners are not required to control these pest plants, however this can/will be made mandatory as a condition of consent when applying the proposed Consent Notice protection around the permanent stream feature.

It is expected that an Ecological Management Plan is drawn up and addresses these matters in more detail as a condition of consent. This plan will include the identification of weeds,

control techniques and ongoing monitoring to ensure total eradication of weed species over the entire subject property.

7.0 POTENTIAL EFFECTS

Based on the site visit and desktop research conducted, the site's overall ecological values are assessed as **low**. The site is completely dominated by exotic vegetation (including pest plant species), with a sparse mixture of indigenous vegetation confined to the southwestern aspect of the site. The vegetation overall is of very low ecological quality, and the fauna species utilising the site are highly mobile, mostly exotic and common. Currently, no suitable habitat is present on site or for any 'At Risk' or 'Threatened' avifauna, herpetofauna, ichthyofauna or chiroptera.

The main ecological features on site are associated with the waterbodies. The streams themselves are unlikely to be inhabited by any 'Threatened' or 'At Risk' aquatic species, though climbers such as longfin eel may occasionally be present within the wider stream system. The riparian vegetation values are of low quality given the dominance of exotic pest plants, however there is good potential to enhance these areas through weed control and appropriate revegetation.

Given the site does contain some susceptible waterbodies, consideration needs to be given to the potential adverse effects associated with the development of the site. It is thought that these impacts can be appropriately avoided or mitigated through comprehensive planning controls, appropriate setbacks and the creation of an integrated development proposal which focuses on the protection and enhancement of natural features on site and surrounds (Figure 25).



Figure 25: Showing the appropriate setbacks from stream systems

Generally, the potential adverse effects can be divided into negative effects resulting from:

- Direct effects – resulting from physical development of the application area including land clearance, earthworks, construction, stormwater, etc.
- Secondary effects – resulting from increased activities and habitat modifications within the application area and the surrounding area, following proposed development.
- Cumulative effects – resulting from future development that might occur, and additional to the effects that can be expected to have already occurred as a result of development of the wider area which will also increase in the future.

During the construction phase of the proposed works, the adverse impacts of the development will comprise habitat loss and potential disturbance of the existing habitats on site. It is understood that the new dwellings as a result of the development of this site will occur over horticultural land. The species that utilize this habitat (e.g. pukeko, finches, tui) are highly mobile and common. During the operational phase of the proposed works, adverse impacts will comprise potential increased levels of disturbance through increased levels of lighting, noise and human presence. Restoring the waterbodies onsite with pest plant control and revegetation planting will more than offset the operational phase of the works.

When addressing cumulative effects, there are a number of practical and policy barriers to be considered. It is difficult to predict and assess cumulative effects with a high degree of certainty due to complex ecological interactions, the lack of environmental baseline data, and the scale and timeframes at which District Council's plan. However, consideration of existing and reasonably foreseeable activities must be given to ensure that standalone effects of the proposal will not result in 'tipping the balance' in the wider ecological context.

7.1 Increased Human Disturbance

The proposal is reflective of the surrounding land use which has become increasingly developed since the early 2000's. Additional people in the area could potentially have an impact on the wildlife in the area through disturbance of feeding, breeding and nesting areas for birds, unless appropriate management measures and controls are put in place. The subject site itself is not thought to provide significant breeding or nesting habitat for any 'Threatened' avifauna, due to significant anthropogenic modification and disturbance by current land use activities. This may change through the protection and rehabilitation of remnant indigenous vegetation and associated riparian habitats.

Given that the proposed new lots are situated within a horticultural unit, the expected impacts of increased human disturbance of any native nesting or breeding birds protected under the Wildlife Act 1984 is assessed as negligible. It should be noted that the proposed Consent Notice protection area is to be open access for joint landowner access, and this has the potential to disturb nesting or breeding birds within the bush block. That being said, as mentioned in section 4.4, no 'Threatened', 'At-Risk' or 'Regionally Significant' species were noted to be onsite, with a vast majority of avifauna noted onsite being introduced. Nonetheless ongoing monitoring of the proposed Ecological Enhancement area should ensure that if any 'Threatened' or 'At Risk' fauna is noted within, appropriate actions are taken to protect these species, including (but not limited to) closing access to parts of the track till the nest has failed or successfully fledged.

7.2 Predation by Domestic Pets

Domestic pets are some of the main predators for native fauna species, in particular avifauna and herpetofauna. Other more uncommon domestic pets include mustelids (e.g., stoats and ferrets) which are known predators of indigenous herpetofauna as well as birds and their eggs. Wild mustelids, while common within the area, are prohibited from being kept as pets in New Zealand, therefore an increased abundance of mustelids as a part of the subdivision process poses a lower risk. Given that the proposal is for an 'Eco Village', it is recommended to put strict bans on certain pet animals. To reduce the potential impacts of domestic pet predation of susceptible native fauna, it is proposed that the keeping of cats, mustelids (ferret, stoat,

weasel) and other species potentially regarded as threats to the existing biodiversity values (e.g., pet rabbits, rats, aquatic turtles and pet fish) is prohibited for the new development, while dogs can be managed through appropriate controls (secured containment). Cat exclusion is strongly recommended for the subject site, and dogs should be ideally excluded as well, and/or contained securely.

In addition, as a part of the enhancement proposal, establishment of a comprehensive animal pest control programme within the subject site is proposed. While pest animals are likely to be present within the wider area, pest animal control on site will have positive flow on effects on the protection of native avifauna. All the above will ensure the effects of increased disturbance pressure are at least partly offset.

7.3 Increased Invasion of Pest Species

Whilst the subject site and surrounds contains some invasive pest plant species, the proposed development could become another source of pest weeds through planting of exotic plants within garden areas or as screen planting. Dumping of garden waste is also an aspect which should be considered. It is believed that this can be addressed through appropriate controls such as prohibiting the cultivation of invasive weed species listed under the National Pest Plant Accord (NPPA) and Northland Regional Pest Management Strategy (NRPMS).

7.4 Earthworks & Sedimentation

It is understood that a level of earthworks will be required to form accessways, walkways, overflow parking, a stormwater retention pond and building platforms within the proposed development area.

From an ecological perspective, earthworks associated with the development of the site have the potential to result in sediment runoff into the identified onsite waterbodies. Earthworks, where they are to occur in close proximity to the onsite watercourses, will have to abide by strict sediment control measures to avoid adverse ecological effects. All earthworks are outside of the relevant NRC and FNDC setbacks. The addition of fine sediment to stream environments during construction phase of the development has the potential to alter water chemistry, increase turbidity and decrease light penetration that affects primary production and feeding for some fish species. The deposition of sediment can also smother instream surfaces and decrease the amount of suitable habitat available for benthic invertebrates.

Based on the Scheme Plan and relevant specialist reports provided by Land Development & Engineering (LDE), no earthworks appear to be within close proximity to any identified watercourses, and sediment retention fencing is to be erected when constructing the

stormwater retention pond, which is the proposed earthworks closest to the permanent stream feature. It is proposed that all earthworks on site are carried out in accordance with best practice erosion and sediment control plans. The proposed controls are to be constructed and maintained in accordance with Auckland Council's GD05/2016 document (superseding TP90) which Northland Regional Council deems to be applicable in the Northland region. Appropriate setbacks from waterways should ensure that any sediment/erosion related effects on water quality and habitat in the downstream-receiving environment will be negligible (i.e., minimal sediment mobilization). With the implementation of appropriate silt controls during the construction phase, the effects of earthworks on water quality in the receiving environment during construction will be avoided and the overall level of effect is assessed as **less than minor**.

7.5 Wastewater Management

The Civil Infrastructure report and associated Scheme Plan indicate that a number of onsite wastewater treatment systems will be utilized as a part of the development. An existing wastewater disposal field exists onsite and will continue to be utilized for Lot 21. Lot 20 and 22 will have separate systems and separate wastewater disposal fields. It is noted that these fields have been placed with the appropriately considered NRC setback requirements. The report also indicates wastewater demand volumes and relevant requirement guidelines for each propose dwelling, and that a tertiary treatment system will be specifically designed during the building consent state for each of the lots which can accommodate effluent volumes. These wastewater treatment and disposal systems will be in accordance with Auckland Council's GD-06 document.

It is proposed that the wastewater disposal fields setback distance from onsite watercourses on site and immediate surrounds will be compliant with PRPN provisions. It is understood that all wastewater management and wastewater discharge quality are to meet Far North District Council's required standards. If wastewater management and quality are to meet industry standards and follow appropriate setbacks from waterbodies, wastewater related effects are expected to be **less than minor** to the receiving environment.

7.6 Stormwater Management

Discharges of contaminants to freshwater environments can severely impact ecosystem health values through acute (short-term) effects and chronic (long-term) effects. The cumulative effects of multiple contaminants being discharged to an aquatic environment may also be highly significant; some contaminants discharged in isolation may have little influence

on ecosystem health but when discharge alongside other contaminants, can have serious consequences.

The Civil Infrastructure Report provided by LDE (dated April 2024) indicates that stormwater flow will be directed to the existing pond via onsite overland flow paths which are to be rerouted as a part of the stormwater design layout. As new impervious areas will be created with this development which will undoubtedly increase the rate of runoff downstream, LDE proposes to manage this using attenuation devices including the development of a stormwater treatment pond. This pond is to be developed near the existing pond, but outside of any relevant riparian setbacks.

Having reviewed the Civil Infrastructure Report and associated subdivision Scheme Plan, it is deemed that an integrated stormwater management is proposed within the application site to manage any potential negative environmental effects (both source and cumulative). Stormwater management on site will utilise a number of methods to manage surface water in a holistic way which aims to mimic nature and typically manage rainfall close to where it falls. The stormwater network for the development has been designed to transport surface water, slow runoff down before it enters watercourses, and treat water before being discharged into watercourses.

All of the stormwater networks will be appropriately integrated within the wider landscaping proposal. In addition, the proposed landscape enhancement plantings on site will provide further reduction in the total runoff from the site entering the permanent stream channel to the west of the site.

It is understood that stormwater infrastructure will be designed in accordance with relevant Far North District Council's and NZ engineering standards including discharge rates, water quality and clearance setbacks. Any works near the waterbodies (or their margins) identified within the body of this report will have to abide by strict sediment controls to ensure that the release of fine sediment into the stream during construction phase is minimised. Therefore, the potential for adverse effects relating to the implementation of the proposed stormwater network are deemed **less than minor**.

7.7 Noise

Increases of anthropogenic noise has the potential to negatively affect bird fitness as it may interfere with communication and for instance, decrease predator detection or breeding activity. Regular exposure to high levels of anthropogenic noise may cause changes in bird communities and influence local distribution patterns. There are extremely limited number of studies investigating the impacts of changes in anthropogenic noise on bird fitness and

breeding success in New Zealand. Factors that should be taken into consideration when assessing likely impacts of anthropogenic noise on bird species should be directly related to the nature of the proposed development project. It is thought that anthropogenic pressures will be minimised long-term with the removal of stock and the revegetation planting of riparian margins, which will offset any increased noise levels from new dwellings – especially considering the revegetation buffer planting proposed which will act as a natural noise barrier. Therefore the proposed development is likely to contribute to increased noise levels in the consent notice area to a **'negligible'** level.

7.8 Light

The potential adverse effects from light on the surrounding habitats and species using these areas should be considered. Many New Zealand avifauna, herpetofauna and insects are fully or partially nocturnal. Introduction of increased unrestricted light levels within the area are likely to disrupt species movements. Impacts may relate to changes in flight patterns, extension of “day-light” hours through introduction of streetlights which has been shown to affect timing of mating behaviours and reproduction in birds. Invertebrates may also be negatively affected through disorientation, and thus may cause changes in species movements within the wider landscape. The potential impacts of the effects of artificial lighting can be significantly minimised through the use of using appropriate lighting with longer wavelengths, at the orange-red end of spectrum. Given the size of the proposed development, the increase in daylight hours through introduction of artificial light is **'negligible'** and will not affect the main areas proposed for consent notice protection on site due to the distance between the development footprint and consent notice area.

7.9 Fire

Fire risk must be considered when introducing dwellings into rural areas due to the presence of highly flammable species such as gorse. If any landscape plantings are proposed to be carried out within the new lots, it is proposed that only low flammability species are planted where they occur within a 10 m radius from the house footprint to reduce fire risk. It is understood that no vegetation is proposed to be located within 10 m of any house footprint therefore the effects of increased likelihood of fire events are expected to be **'negligible'** to the receiving environment.

8.0 NATIONAL POLICY STATEMENTS

8.1 National Policy Statement for Freshwater Management (NPS- FM)

New Zealand has historically lost most of its wetland extent. Those remaining are rare and valuable ecosystems. The Essential Freshwater package, including the National Environmental Standards for Freshwater (NES-F), Freshwater National Policy Statement for Freshwater Management (NPS-FM) and Stock Exclusion Regulations, that came into force in September 2020 introduced strong new policies and regulations to protect natural wetlands on a national scale.

The NPS-FM sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The NPS-FM directs Regional Councils, in consultation with their communities to set objectives for the state of freshwater bodies in their regions and to set limits on resource use to meet these objectives. The core intent of the policies in the NPS-FM is to provide stronger protection for freshwater bodies and wetlands. It also places a statutory responsibility on territorial and consenting authorities to give effect to Te Mana o te Wai by prioritizing the health and wellbeing of our waterways. With respect to Te Mana o te Wai, the hierarchy of obligations for consenting authorities are; first, to prioritise the health and well-being of water bodies and freshwater ecosystems; second, the health needs of people (such as drinking water); and third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

Based on our field work and observations during the site visits, it was deemed that the site does not contain any freshwater habitats considered to be representative of natural inland wetlands as per the definition outlined by the NPS-FM (2020).

The core intent of the policies in the new NPS-FM is to provide stronger protection for freshwater bodies and wetlands. The NPS-FM sets out 15 policies for the management of freshwater in New Zealand. While all the policies are relevant, we draw attention to the following relating to this proposal:

Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

The proposal involves protection and enhancement of terrestrial and aquatic ecosystems within the boundaries of the subject site. It also provides protection and enhancement of habitat for instream fauna. Pest plant management will allow for natural regeneration to take place once more, and with that enhance canopy cover for

the streams. This will help to moderate water temperatures, act as an important food source by increasing invertebrate for instream organisms, reduce sedimentation, and form an important buffer for diffuse pollution from the surrounding landscape.

Policy 5: Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.

Currently the stream flowing through the subject site and the wider upper catchment area of the Puketotara Stream are subject to diffuse pollution sources notably from farming practices with enhanced levels of sediment and nutrient run-off. The protection of upper catchments by way of pest plant and animal management are example of insuring that the health and well-being of the degraded waterbodies identified onsite are improved.

Policy 9: The habitats of indigenous freshwater species are protected.

The proposal involves protection of freshwater ecosystems within the riparian corridor area on the subject site, and with that the protection of any freshwater species contained within these habitats. The proposal seeks pest plant and animal control, which will result in increased habitat quality indigenous freshwater species.

In relation to the proposed development of the subject site, we consider that full effect has been given to NPS-FM through seeking to protect and enhance the aquatic features identified within the boundaries of the site. Any potential adverse effects on freshwater environments as part of site development works can be appropriately avoided, minimised or mitigated. RDL does not consider that site development works would adversely affect the freshwater quantity and quality both on site and within the wider Puketotara Stream catchment if best practice integrated design principles, erosion and sediment control guidelines are followed.

8.2 National Policy Statement for Indigenous Biodiversity (NPS-IB)

The National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023) is a policy framework designed to address the conservation and protection of the country's unique indigenous biodiversity, including native species, ecosystems, and habitats. The primary aim of NPS-IB is to halt the loss of indigenous biodiversity across NZ. While all the policies are relevant, we draw attention to the following relating to this proposal:

Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity.

The proposal provides for the protection, restoration and enhancement of the site's most ecologically significant features. This includes revegetation planting and most notably pest plant control. It has been assessed that any potential adverse effects of the subdivision proposal can be sufficiently avoided/mitigated through mitigation measures and ecological design principles described within this report as well as appropriate planning and development controls.

Policy 7: SNAs are protected by avoiding or managing adverse effects from new subdivision, use and development.

No indigenous vegetation clearance is proposed as part of the subdivision proposal and all indigenous biodiversity values on site will be maintained or enhanced and protected in perpetuity. No loss of indigenous biodiversity within the subject site is anticipated as part of this subdivision application.

Policy 13: Restoration of indigenous biodiversity is promoted and provided for.

The proposal provides for the protection of existing areas of ecological significance and enhancing these features and offering permanent protection through consent notice provisions as part of the subdivision proposal.

In conclusion it is considered that the application gives full effect to the policies and objective of the relevant National Policy Statements.

9.0 CONCLUSION

Based on a site survey visit conducted on January 22nd, 2024, it was considered that the subject site contains a series of aquatic habitats that have likely been historically anthropogenically modified. A stream assessment was carried out to classify the onsite watercourses in accordance with criteria outlined in the Proposed Regional Plan for Northland, with waterbodies representative of overland flow paths, dams and permanent streams observed on the subject site. A wetland delineation assessment was carried out during a site visit, and according to MfE (2020) protocols, no area on the subject site was determined to be representative of a 'natural inland wetland' as defined under the NPS-FM (2020). Therefore, there are no consenting obligations associated with the development of the site in respect to 'natural inland wetlands' as defined by the NPS-FM and NES-F.

Nevertheless, given the presence of a natural spring and permanent streams noted on southwestern aspect of the subject site, strict earthworks and sediment controls will have to be utilized as a part of the site development works to ensure that they do not impact on the stream features. In addition, consideration will have to be given to the rules relating to setbacks of onsite wastewater treatment system from waterbodies as identified under Rule C.6.1.3 of the Proposed Regional Plan for Northland.

As a part of the site development works, it is proposed that the permanent streams noted on the subject site, and the associated natural springs at their headwaters are protected and enhanced as a part of the landscaping and amenity planting associated with the subdivision proposal. This will enhance and protect the upper stream catchment through appropriate pest weed control and native revegetation planting. It is thought that this will sufficiently protect the headwaters and associated spring catchment on site, and thus protect the existing ecological values noted on site and immediate surrounds, noting the significant stream feature just offsite of which the site's stream system feeds into.

In conclusion, it is considered that any potential adverse effects of the subdivision proposal can be secured through mitigation measures and design principles described in this report and associated specialist reporting prepared for the development proposal, as well as appropriate planning and development controls. Provided that they are implemented successfully, development of the site would be in conformity with relevant planning policy and would result in protection and enhancement of the riparian areas identified on site.

Report Prepared by:

Jack Warden
Senior Ecologist
BAppSci – Maj Biodiversity Management
Rural Design 1984 Ltd

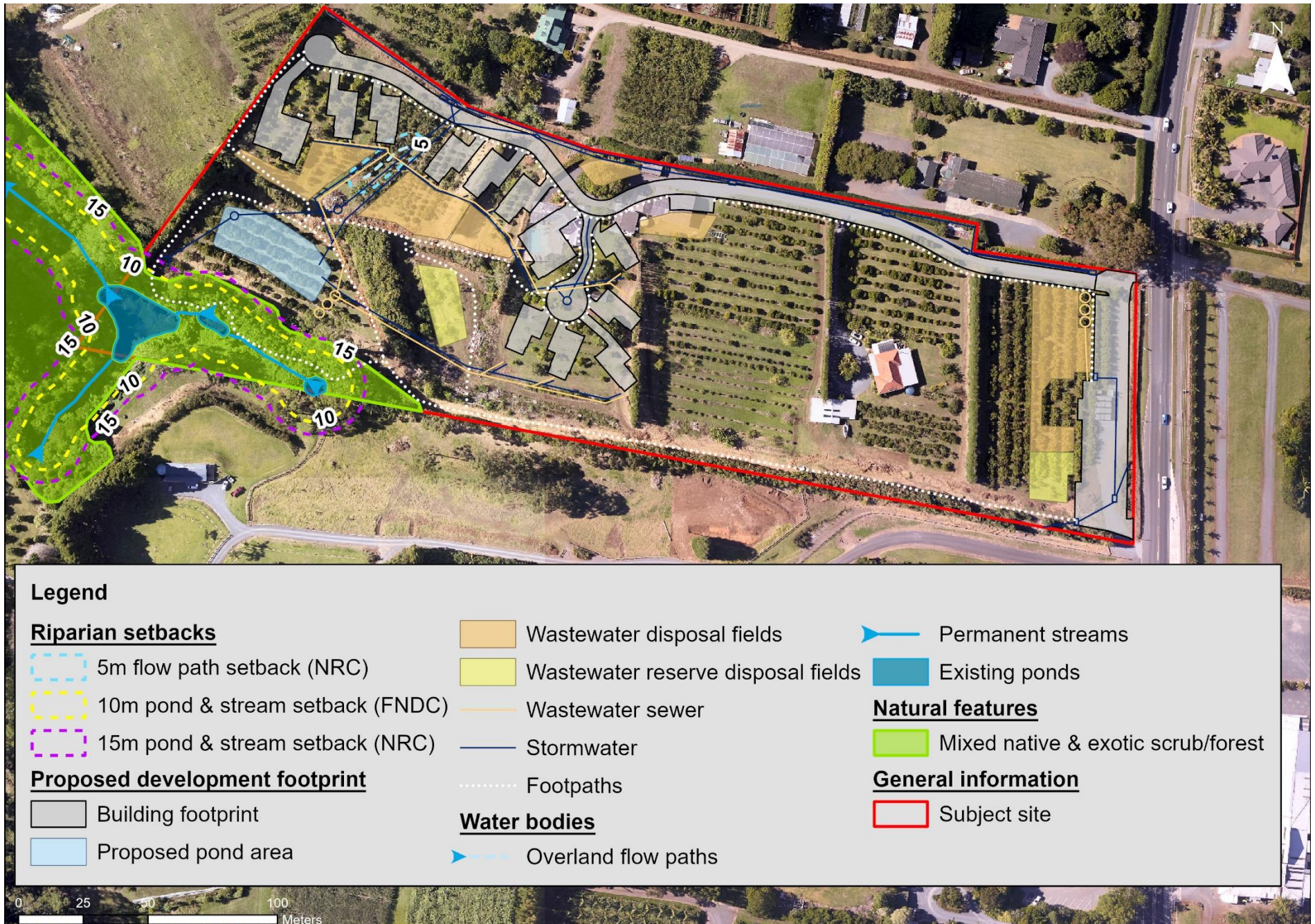
Christine Evans
Ecologist
PhD, BSc (Hons) Behavioural Ecology
Rural Design 1984 Ltd

Kyle Sutherland
Ecologist
MSc, BSc (Hons) Ecology and Conservation
Rural Design 1984 Ltd

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APPENDIX 1 – DEVELOPMENT FOOTPRINT & ASSOCIATED SETBACKS



APPENDIX 2 – PROTECTION & PLANTING PLAN

