

RIVERHEAD PRIVATE PLAN CHANGE, AUCKLAND

Ecological Values Assessment

Report prepared for

Riverhead Landowner Group

Prepared by

RMA Ecology Ltd

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BETTER ECOLOGICAL OUTCOMES

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Ver 2	15 Sept 2022	Updated in response to Auckland Council Clause 23 request for northern wetland to be delineated and shown on maps.
Ver 3	15 Nov 2022	Updated information regarding intermittent streams to change classification of Drain 4 to an intermittent stream
Ver 4	8 Dec 2022	Update to stream names
Ver 5	16 Sept 2023	Updated to revised Precinct area



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Executive Summary

The proposed Riverhead Future Urban Zone development is located west of Riverhead township and south of the extensive Riverhead Forest and is approximately 80 ha.

The proposal includes a Structure Plan and Private Plan Change (PPC). The Structure Plan will set out how the southern part of the Future Urban zone can be developed for urban use, including residential activities and the PPC will involve rezoning the land from Future Urban to Residential – Mixed Housing Suburban and Rural – Mixed Rural.

Riverhead Landowner Group has engaged RMA Ecology Ltd to undertake an assessment of the likely values of the development site in terms of aquatic and terrestrial ecology. This is to support the Structure Plan required by Appendix 1 of the Auckland Unitary Plan, and the PPC.

The approach included survey of terrestrial and freshwater areas. Site visits were undertaken on 11 February 2021, 11 May 2021 and 4 April 2022 to assess the variety of ecosystems and the ecological values present within the PPC footprint.

Most of the site is an active horticultural site, with multiple fields bordered by well-established shelterbelts, some farm buildings and multiple dwellings. Smaller landholdings (especially along Coatesville-Riverhead Highway) have been more intensively managed as lifestyle blocks. The landform on the southern part of the site, and much of the northern part is flat, with an extensive drainage network that has been created to direct surface flow towards established streams adjoining the site or to the only intermittent stream near the northern part of the site. The drain network typically follows field boundary lines or internal roads and are open, unvegetated, sediment-filled drainage channels. Over most of the site, a long history of horticultural use has created established shelterbelts around fields, which act as low impoundment bunds for localised surface flows.

The one intermittent stream on the site receives flow from the northern-central part of the site and directs it to the northern low-lying floodplain/ wetland area. The stream bed and banks have been excavated to form a broad, unnaturally wide channel. The stream has a sediment-filled bed, is shaded in places by exotic vegetation and overall has moderate ecological values. Disturbance of the margins over time has resulted in wetland vegetation establishing and riparian wetlands are prominent along most of its length. The stream discharges from the wetland to the unnamed tributary of the Rangitopuni Stream via an excavated drain, which we understand is considered by Council to be an intermittent stream under the AUP.

The north-west and northern boundaries of the site are framed by the unnamed tributary of the Rangitopuni Stream, whose catchment includes land adjoining the broader western part of the site, as well as parts of Riverhead Forest to the north and north-west of the site. The unnamed tributary of the Rangitopuni Stream is a well-established permanent stream with extensive riparian margin wooded cover, most of which includes native scrub or forest species. This stream is the ultimate receiving environment from land associated with most of the PPC site.

Four wetlands that meet the definition of 'natural inland wetland' in the National Policy Statement for Freshwater 2020 were identified on the site. Two wetlands are small and may have been created or accentuated as part of the recent housing at Te Roera Place to the north-east of the site; both are dominated by a single native wetland plant and are botanically simplistic. The wetland associated with the intermittent stream is likely to have been induced by agricultural practices over time, and supports only common weedy wetland exotic plants. The last and largest wetland comprises an extensive

portion of the northern part of the site, where an old river flood terrace exists. Historic drainage and existing vegetation and hydric soils indicate that this location would have previously been an extensive river margin floodplain wetland. The wetland is currently grazed by stock and is degraded by an extensive drain system, stock access and exotic weeds. This wetland is the receiving environment for drainage arising from central and northern parts of the PPC site.

Horticultural and past farming activities have removed all existence of indigenous vegetation from the site. The few native trees or shrubs that exist have either been self-sown by birds or wind, or have been planted as part of amenity plantings associated with dwellings. There is no vegetation that qualifies as indigenous vegetation and no significant ecological areas mapped on the site. There are eight mature native trees on the site; four kauri and four totara. Most (6) are located in a cluster on one property (306 Riverhead Road) with the others located near dwellings at 328 Riverhead Road and 1186 and 1194 Coatesville-Riverhead Highway.

Native wildlife across the site reflects the long history of modification and comprises a mix of cosmopolitan birds, mostly exotic species with few common natives. Lizards at the site include the exotic plague skink (found throughout all parts of the site) and most probably the native copper skink in the northern parts of site where farming debris provides habitat (as opposed to manicured lifestyle blocks and more intensively-managed horticultural areas). Bats were not surveyed, however there is a low possibility of long-tailed bats being present given the age of some of the shelterbelt and exotic tree stands on the site, and proximity to both the unnamed tributary of the Rangitopuni Stream and to Riverhead Forest, where native bats have been recorded. Bat habitat is considered to be poor quality compared to surrounding mature native and plantation forest areas nearby the site.

Overall, the ecology values for wetlands, watercourses and wildlife reflect a highly modified landform that has lost most of its original indigenous values. Although most native components are absent, and key ecological features such as streams and wetlands are highly degraded, there is substantial opportunity to improve on this and return biodiversity and ecological function to the site.

The Structure Plan identifies these key ecological features and builds on these to provide a more integrated, restored and functioning ecology for the site than is currently present.

The Structure Plan and the PPC:

1. Identifies the streams and wetlands as constraints in the analysis of the features of the PPC area;
2. Formalises the use of the intermittent stream and low-lying wetland areas to the north of the site as integral parts to the overall drainage structure for the site, and in doing so will protect and restore these features;
3. Describes vegetated linkages across the site to provide functional and visual green corridors for wildlife and future residents. Revegetated watercourse margins and green connections will provide habitat and resources for native birds and retain or improve existing wildlife communities; and
4. Water management across the site will focus on improving quality of stormwater and manage the way in which quantity is discharged, so that stream and wetland values are improved.

Overall, the Structure Plan/ Masterplan and the Precinct Provisions provide for the protection and restoration of riparian margins and the establishment of multi-purpose green corridors which will result in a far greater diversity and coverage of native treeland, linkages, and resources for wildlife than is currently present.

In respect to ecological management, the Riverhead Plan Change Precinct includes provisions for environmental protection and enhancement. The provisions provide for stormwater management and enhancement of riparian margins. The PPC will apply these rules to the Riverhead Plan Change area. This is supported in respect to the management of ecosystem values.

The National Environmental Standards for Freshwater (NES-F) and AUP includes a comprehensive set of rules relating to identified features (for example E3 for streams and E15 for vegetation). These are considered to be appropriate to address the potential for adverse effects in the same way they already apply to the area's Future Urban Zone. From an ecological perspective, these rules are appropriate to address relevant effects that may be generated at the time of resource consent.

From an ecological perspective, these PPC provisions in conjunction with other Auckland Unitary Plan provisions and the NES-F are considered to be appropriate to manage the potential effects of residential development within the site.

The overall outcome from the proposed Private Plan Change will be a clear, positive, net-benefit for indigenous biodiversity values and ecological services, and spans waterways, wetlands, wildlife habitat and native revegetation.

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1.0 Introduction

1.1 Background

The proposed Riverhead Future Urban Zone development is located west of Riverhead township and south of the extensive Riverhead Forest and is approximately 80 ha.

The site is proposed to be developed, by the Private Plan Change (PPC) applicant, Riverhead Landowner Group, into predominately residential housing.

The site will eventually be integrated with the adjoining Riverhead township.

Riverhead Future Urban Zone includes the following properties; which together comprise the investigations area ('the site'; Figure 1).

- 1092 Coatesville-Riverhead Highway
- 1140 Coatesville-Riverhead Highway
- 1156 Coatesville-Riverhead Highway
- 1170 Coatesville-Riverhead Highway
- 1186 Coatesville-Riverhead Highway
- 1194 Coatesville-Riverhead Highway
- 298 Riverhead Road
- 306 Riverhead Road
- 307 Riverhead Road
- 325 Riverhead Road
- 328 Riverhead Road
- 340 Riverhead Road
- 30 Cambridge Road
- 22 Duke Street
- 51 Lathrope Road
- Lot 2 DP 164978, Lathrope Road
- Lot 2 DP 64605, Lathrope Road



Figure 1. Aerial photograph of the Plan Change site (within the red boundary).

1.2 Purpose and scope

Riverhead Landowner Group has engaged RMA Ecology Ltd to undertake an assessment of the likely values of the development site in terms of aquatic and terrestrial ecology. This is to support the Structure Plan required by Appendix 1 of the Auckland Unitary Plan, and the PPC.

Current land use is rural and dominated by horticulture activities and rural lifestyle dwellings, with a minor component in stock grazing. The site is held within multiple titles, many of which have an occupied dwelling. Access to all parts of the site was undertaken as part of the assessment process. Our assessment included a desk-top review as well as site-based survey to obtain an accurate assessment of ecological values across the site.

The approach included survey of terrestrial and freshwater areas and provides the following:

- Identification of sites of particular ecological significance (Significant Ecological Areas; (SEA));
- Review of databases to identify the likelihood of species of conservation significance being present, with an emphasis on freshwater fish, native lizards, and plants and birds;
- Walkover survey to identify or validate the presence of native vegetation, especially areas that meet criteria for assessing ecological significance under the Auckland Unitary Plan (AUP);
- Walkover and stream-specific sampling (where access is feasible and flow exists) to:
 - Determine stream values, using qualitative scoring methods along multiple reaches of all accessible, flowing streams;
 - Map the boundaries of stream types (permanent and intermittent);
 - Map wetlands, ponds, and potential barriers to stream functioning (e.g. culverts).

This report contains the following:

- An overview of the methods used to assess the ecological values and the ecological significance of areas potentially affected by the development;
- A description of ecological values within the development footprint and immediate surrounds;
- An assessment of ecological significance of the development footprint and immediate surrounds, based on assessing the ecological values of the development area against:
 - significance criteria in the AUP; and
 - based on the presence of listed Significant Ecological Areas and/or Natural Stream Management Areas (NSMAs) in the AUP;

The next phase of ecology reporting (not reported here) would normally include the following, once resource consent applications are being prepared to enable subdivision and land use development:

- An assessment of the type and magnitude of potential effects associated with the development, construction and operational activities, including potential habitat loss and degradation, and direct mortality or injury of indigenous fauna where the rules of the AUP, for example E3, E15, E16 or E38 are triggered by development; and
- Recommendations to address adverse effects.

2.0 Methods

Desktop analyses and field/site visits were used to determine the ecological values of terrestrial and freshwater areas within and surrounding the development footprint, as well as the significance of those values. This section of the report describes the methods used for desktop and field investigation locations.

2.1 Desktop assessment

A desktop assessment of the development footprint and surrounding area was undertaken to identify sites assessed as potentially having ecological values, as well as sites already listed as being ecologically significant based on a review of the AUP. Legacy District and Regional Plans were reviewed for completeness and to cross-verify against the descriptions and extents of features identified in the AUP.

These resources were also used, where available, to provide insight as to the reasons why areas were significant, and the ecological values they comprise. Areas with ecological values that were not identified or which were not listed as ecologically significant in the various reviewed documents, were assessed against the significance criteria of the AUP (Schedule 3 – Significant Ecological Areas: Terrestrial Schedule).

The Auckland Council GIS was reviewed to identify existing vegetation, streams and overland flow paths present on the site and to establish an understanding of the ecological status of the waterways present. Maps of these existing features (streams and overland flow paths (categories 4,000 m² to 3 ha and > 3 ha)) were then ground-truthed, where access was approved to individual properties.

The following documents and databases were reviewed for the ecological assessment:

- New Zealand Freshwater Fish Database;
- NIWA Freshwater Biodiversity Database;
- National Amphibian and Reptile Database System (Herpetofauna) to gather information on lizard species that have been recorded in proximity to the project site; and
- Auckland Unitary Plan.

Any threatened species found were recorded and their threat status checked against the relevant national threatened species classification lists (Hitchmough et al. 2021, Robertson et al. 2021 and Dunn et al. 2018).

2.2 Field assessment

Site visits were undertaken on 11 February 2021, 11 May 2021 and 4 April 2022 to assess the variety of ecosystems and the ecological values present within the PPC footprint.

2.3 Aquatic ecology

All waterways and flow paths were mapped as being permanent or intermittent based on the definitions in the AUP. Photographs were taken and a general description of the waterway was undertaken to note characteristics including riparian species and cover, and connectivity to other waterways. A characterisation assessment of the mapped stream reaches was also undertaken with key ecological features recorded.

Permanent river or stream

The continually flowing reaches of any river or stream.

Intermittent stream

Stream reaches that cease to flow for periods of the year because the bed is periodically above the water table. This category is defined by those stream reaches that do not meet the definition of permanent river or stream and meet at least three of the following criteria:

1. *it has natural pools;*
2. *it has a well-defined channel, such that the bed and banks can be distinguished;*
3. *it contains surface water more than 48 hours after a rain event which results in stream flow;*
4. *rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel;*
5. *organic debris resulting from flood can be seen on the floodplain; or*
6. *there is evidence of substrate sorting process, including scour and deposition.*

All waterways within the site were walked with the first classification being whether the waterway was natural or an artificial farm drainage canal ('drain'). Waterways were classified as farm drains based on GIS and historical aerial photograph and likelihood based on topography and location. If a waterway was deemed to be natural (straightened or not) it was then assessed using the AUP criteria above.

2.4 Wetlands

Wetlands were assessed using the definition within the AUP and the RMA, as follows:

- Wetland: permanently or intermittently wet areas, shallow water, and land/water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions, including within the coastal marine area.

Wetlands on the Property were also assessed based on the definition within the recently released NPS-FM:

- Natural inland wetland: means a wetland (as defined in the Act) that is not:
 - (a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former natural wetland); or
 - (b) a geothermal wetland; or
 - (c) any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain-derived water pooling.

The NPS-FM/ NES-F requires that any effects on natural inland wetlands are avoided, including a restriction on activities within a 10 m buffer around those wetlands, and controls on the level of potential adverse effects (from, for example, discharge of water or diversion of water) within a 100 m buffer around the wetland.

The method applied for the assessment of wetlands at this site was as follows:

1. Apply the Wetland Assessment Protocol cited in the NPS-FM 2020 (Clarkson et al. 2013);
2. Assess soils by applying the criteria outlined in Fraser (2018) for identifying hydric (wetland) soils. This requires the excavation of a core 400 mm deep to assess and photograph soil moisture, topsoil structure, subsoil structure and presence of gleyed soils and mottling (Figure 2); and
3. When analysing data from the field plots, plots with a vegetation community that met the definition of improved pasture and were >50 % exotic pasture species dominant were excluded from being classified as a natural inland wetland under the NPS-FM;
4. The Rapid Test and/or Dominance Test/ Prevalence Test, as described in the Wetland Assessment Protocol, were then applied to assess whether or not a natural inland wetland was present.

Plant species were classified according to wetland status using Clarkson et al. 2013 and Clarkson et al. 2021.

2.5 Terrestrial ecology

Native and exotic vegetation types were mapped across the site with a focus on the presence of indigenous species. Birds identified visually and audibly were recorded across the site, including native and introduced species. Potential food sources and nesting habitat were noted throughout the site for the purpose of estimating the potential loss of resources for native bird species associated with the planned development.

The field survey included identification of habitats potentially occupied by native lizards, and an assessment of potential bat habitat (after Smith et al. 2017).

The ecological investigation used the AUP SEA criteria (Sawyer & Stanley, 2012) to assess the significance of ecology values recorded from the site.

The Greenscene NZ Ltd¹ arboricultural assessment dated June 2022 was also assessed.

2.6 AUP Requirements

Attachment A identifies the most relevant objectives and policies of the AUP, as they relate to terrestrial, aquatic and marine ecosystems.

¹ Greenscene NZ Ltd. June 2022. Riverhead Plan Change: Arboricultural assessment. Version 1.3.

3.0 Results

3.1 Ecological context

The PPC at Riverhead is located within a typical Auckland rural environment. Although the original natural ecology has been heavily modified or removed through past farming and horticultural activities, the general area within the development site still contains some ecological values, albeit mostly freshwater.

The site lies within the northern part of the Tamaki Ecological District (the northern part of which generally encompasses the former North Shore City Council spatial area) which is characterised by lowland hills draining to fertile river flats and floodplains along the upper estuarine system of the western Waitemata Harbour.

Adjoining the extensive horticultural land around Riverhead township is the Riverhead Forest to the north. This ca. 4,800 ha plantation pine forest is state-owned and provides recreational opportunities for visitors, as well as providing a source of extensive forested land for some indigenous biodiversity.

The north-west and northern boundaries of the site are framed by the unnamed tributary of the Rangitopuni Stream, whose catchment includes land adjoining the broader western part of the site, as well as parts of Riverhead Forest to the north and north-west of the site.

There are no Significant Ecological Areas (SEA) within the Riverhead PPC area. The closest SEAs are a terrestrial SEA (SEA_T_6359) along the margins of the nearby estuary 0.5 km to the south-east, and a terrestrial SEA (SEA_T_6540) 1 km to the north-east of the site in the surrounding hill country. Both support extensive stands of old-aged, multi-tiered mature native forest ecosystems (Figure 2).

The site is an active horticultural site, with some farm buildings and multiple dwellings, and divided into multiple orchard blocks by substantial shelterbelts. Smaller landholdings (especially along Coatesville-Riverhead Highway) have been more intensively managed as lifestyle blocks and have no possible wetland or streams present.

Overall, the land within the site has been intensively worked for many years – and all past existence of indigenous vegetation has long since been removed.

The landform on the southern part of the site, and much of the northern part is flat, with very little gradient across it. Where there is flow, surface water has been impeded by the many, mature shelterbelt lines across the site, which have created raised organic debris dams beneath them (accumulated leaves twigs and earth).

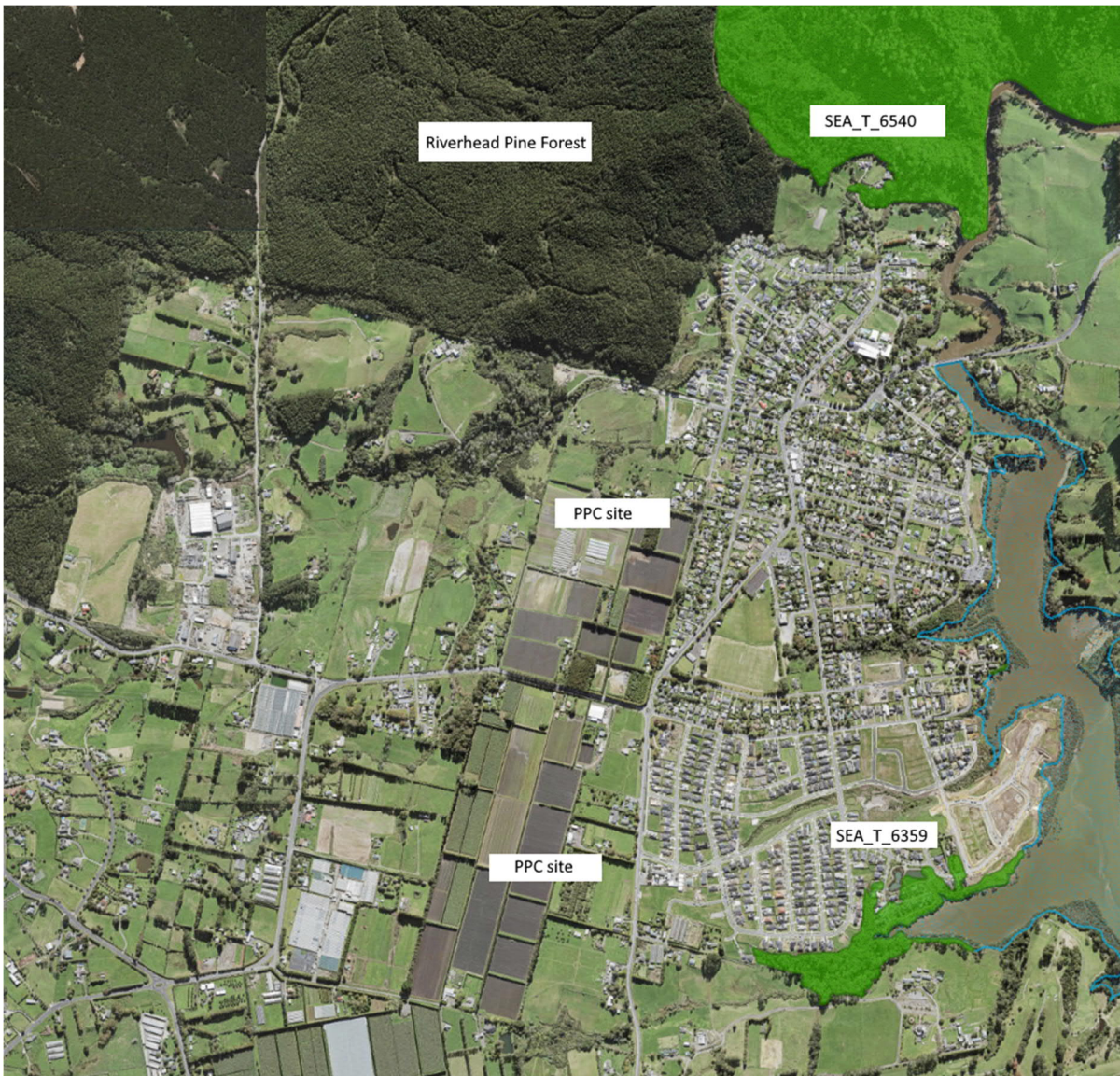


Figure 2. The PPC site in relation to nearby Significant Ecological Areas (green shaded polygons) and the Riverhead Forest (plantation forest - labelled).

3.2 Aquatic ecology

The site can roughly be divided into two separate catchments, bisected by Riverhead Road.

The southern block of the site contains no streams (or wetlands) and is essentially flat. Overland flow is impounded within individual embayments by the substantial shelterbelts, which have gradually formed raised mounds of earth, leaves and debris (ca. 200 mm high) on the boundaries of each block, preventing surface flow from travelling any great distance.

The north-western part of the southern block (by 306 Riverhead Road) has a single excavated drain along one of the orchard blocks which transfers overland flow to the west to join with the upper section of the unnamed tributary of the Rangitopuni Stream.

The landform on the northern part of the site slopes gradually to the north, where it reaches a scarp formed by an old river floodplain terrace and drops to a river terrace. An extensive drainage network that has been created across the southern part of the site to direct surface flow towards the northern river

terrace area, or towards a horticultural water supply pond located in the central part of the northern part of the site, and from there into the sole intermittent stream on the site (Figures 3-5).

The drains on the site are shallow, unvegetated, sediment-laden channels. They show no signs of operating any time other than during storm events and offer no habitat for freshwater macroinvertebrates for freshwater fish.

Intermittent Stream 1 (I1) receives flow from the northern-central part of the site (originating from near the horticultural water supply pond) and directs it to the northern low-lying floodplain/ wetland area. The stream bed and banks have been excavated to form a broad, unnaturally wide channel. Examination of historic aerial photos shows that this watercourse existed in this location; however, was originally probably a much smaller stream, which has been widened over years of farming and horticultural use of the site.

The stream is 150 m in length, has a sediment-filled bed of 2 m or so wide, is shaded in places by exotic vegetation and overall has moderate ecological values. Macrophytes (mainly water pepper *Persicaria hydropiper*) cover the surface in places where there is poor riparian canopy cover, with exotic wet weeds creeping buttercup (*Ranunculus repens*), Yorkshire fog (*Holcus lanatus*) and soft rush (*Juncus effusus*) forming swards of NPS-FM qualifying wetland vegetation on the margins.

The stream has no visible link to the unnamed tributary of the Rangitopuni Stream – that is, the stream appears impounded by the low-lying wet paddock/ drains to the north. A drain connects the wetland to the unnamed tributary of the Rangitopuni Stream to the west, although the drain is narrow and was dry at the time of our site visits (while the nearby wetland was flooded and its drain system was under water). We understand that, because of the way in which the Unitary Plan considers watercourse classifications, this drain is considered to an intermittent stream for the purposes of the AUP.

Although there is fish habitat within Stream I1, it is unlikely that there is any greater diversity than eels (*Anguilla* spp) present due to significant (natural) impediments to fish passage to the unnamed tributary of the Rangitopuni Stream.

The unnamed tributary of the Rangitopuni Stream is a well-established permanent stream with an extensive riparian margin wooded cover on the true left bank (off this site), and a much less intact riparian margin on the true right bank (within this it) most of which includes native scrub or forest species. This stream is the ultimate receiving environment from land associated with most of the PPC site. The true right margins of the stream are part of the site for a distance of approx. 450 m.

There is an excellent opportunity to prevent stock access to the stream, repair and enhance the riparian margin, and improve overall stream health, as well as adding to the already substantial riparian corridor for this stream system through this site and the adjoining properties.

Representative photos of Stream I1 and its margins are provided in Plates 1 to 6.

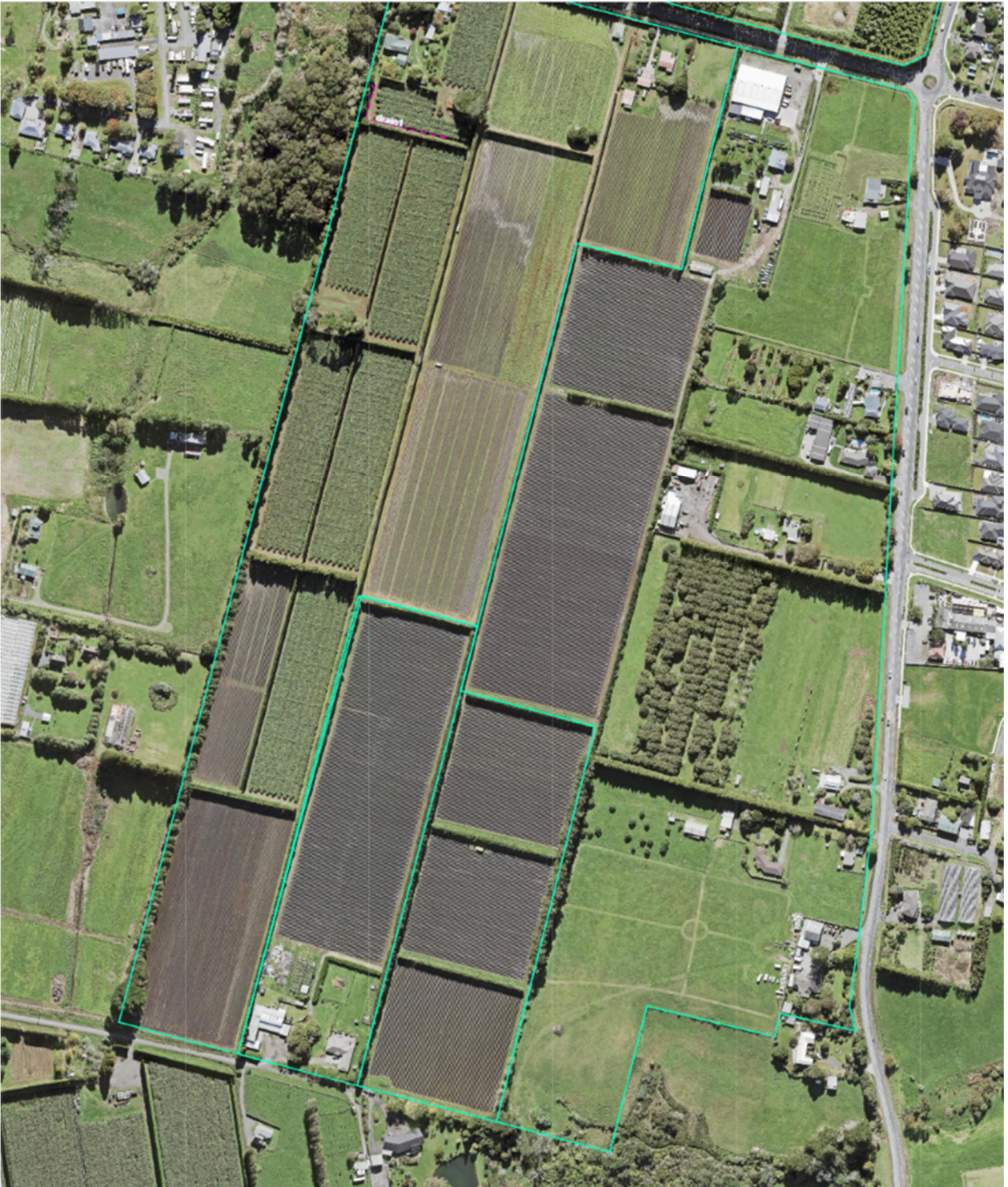


Figure 3. The southern portion of the PPC site (turquoise boundary) south of Riverhead Road. No streams or wetlands are present on this part of the site.



Figure 4. The northern portion of the PPC site (turquoise boundary) north of Riverhead Road. Streams and wetlands are restricted to the northern part of the site where the gently sloping land transitions to a scarp and old river terrace across the most northern part of the site.



Figure 5. The most northern portion of the PPC site (turquoise boundary, showing Stream I1 (dotted blue line), NPS-FM qualifying natural inland wetlands (red shaded polygons) and constructed drains (purple dotted lines). The constructed pond for horticultural water supply is indicated as a blue polygon.



Plates 1-4. Views of intermittent Stream I1, a broad, excavated wide channel which drains most of the central northern portion of the site down to the northern wet/ drained area. The stream is shallow (up to 0.5 m deep), with extensive macrophyte beds and wetland margins. Shade is provided in parts by exotic trees.



Plate 5 & 6. The drain linking the northern wetland with the unnamed tributary of the Rangitopuni Stream. It is linear, has a narrow, excavated channel and does not meet the criteria as a stream; however, we understand that the AUP considers this to be a stream (shown as a continuation of Stream I1 on Figures 4 and 5).



Plates 7-10. Wetland 3 (upper left) and wetland 4 (upper right), and Wetland 2 (lower left and right), Wetland 2 is most likely the remnant of a naturally occurring low-lying floodplain wetland, whilst Wetlands 3 and 4 are most probably constructed or induced as part of previous stormwater or horticultural works on the site.

3.3 Wetlands

Four wetlands that meet the definition of 'natural inland wetland' in the National Policy Statement for Freshwater 2020 were identified on the site.

Wetland 1 is the wet margins of Intermittent stream I1 and comprises creeping buttercup and water celery within the wetland/ watercourse, and willow and pasture weeds on the margins. The wetland is likely to have been induced by years of excavation, flooding and sediment mobilization to form sediment drifts on the stream margin that have been subsequently colonised by exotic, weedy wetland plant species.

Wetland 2 forms a large part of the most low-lying portion of the site – as is clearly indicated by the presence of an extensive constructed drain network, and the presence of areas of thick soft rush, fields of rafted Mercer grass and other strongly wetland plants amongst a network of drains, and pugged, grazed low-lying areas. The low-lying flats are grazed and some of this area is managed as pasture – and is dominated by pasture species in parts. This wetland area and the surrounding low-lying flats are the ultimate receiving environment for water originating from the central and northern parts of the PPC site.

The low-lying area of which Wetland 2 forms a part does not have an obvious outlet to the unnamed tributary of the Rangitopuni Stream and water collected within this part of the site may be naturally impounded below a critical flood level (at which point overland flow into the unnamed tributary of the Rangitopuni Stream occurs, probably along the western boundary of the northern section).

Wetlands 3 and 4 are small and may have been created or accentuated as part of the recent housing at Te Roera Place to the north-east of the site; both wetlands are dominated by a single native wetland plant and are botanically simplistic. Both wetlands are the receiving environments for overland flow from cultivation or roadside drainage areas elsewhere on the site or on adjoining land to the east.

- Wetland 3 – native purei (*Carex virgata*), exotic blackberry (*Rubus fruticosus* agg.) within the wetland, with gorse (*Ulex europaeus*) (5 %), native purei (*Carex secta* – planted?) cocksfoot (*Dactylis glomerata* 2 %) and kikuyu grass (*Cenchrus clandestinus* 93 %) on the margins.
- Wetland 4 – native purei (*Carex virgata*) within the wetland, with gorse, kikuyu grass, blackberry and pasture weeds on the margins.

Representative photos of the wetland areas are provided in Plates 7 to 10 (see Plates 1-4 for photos of Wetland 1).

3.4 Terrestrial ecology

3.4.1 Vegetation

Horticultural and past farming activities have removed all existence of indigenous vegetation from the site. The few native trees or shrubs that exist have either been self-sown by birds or wind, or have been planted as part of amenity plantings associated with dwellings.

There is no vegetation that qualifies as indigenous vegetation, no Threatened or At Risk plant species apart from four planted kauri trees, and no significant ecological areas mapped on the site.

The only area of naturally-occurring native vegetation on the site is located at the north-western corner where the site follows the margins of the unnamed tributary of the Rangitopuni Stream and where mature kanuka forms a band 1-2 trees wide in places along the true right margins within the site (see Plate 19). The kanuka are sparse, young, tall (up to 6 m tall) and well grazed beneath.

There are eight mature native trees on the site; four kauri and four totara. Most (6) are located in a cluster on one property (306 Riverhead Road) with the others located near dwellings at 328 Riverhead Road and 1186 and 1194 Coatesville-Riverhead Highway.

Two woodlot plantings on the northern side of Riverhead Road provide substantial areas of woody maturing trees (with weedy understorey).

Most woody vegetation on the site is in the form of established hedgerow/ shelterbelts between horticultural blocks, and amenity gardens and amenity or production orchards.

Vegetation other than woody vegetation can be divided into three main groups:

1. Crops – mainly strawberry fields, which dominate the southern, central and some of the northern part of the site;
2. Amenity areas – extensive mown lawns/ exotic pasture around lifestyle block dwellings and managed garden areas; and
3. Rough grazed pasture – located at the northern low-lying parts and to the north-west of the site. These areas are unimproved, weedy, rough pasture areas interspersed with gorse, woolly nightshade and wetland plants such as exotic soft rush and pasture weeds.

Overall botanical values of vegetation across the site are very low.

Representative photos of the terrestrial areas are provided in Plates 9 to 12.



Plates 9-12. Vegetation communities in the southern part of the site comprise mostly horticultural fields and shelterbelts (top right and left) with some lifestyle paddock/ amenity garden/ orchard areas. Horticultural areas dominate most of northern part of the site (bottom left and right).



Plates 13-16. Horticultures in the northern block (top right and left), while the most northern part of the site is rough grazed pasture (bottom left). There are several planted woodlots on the site (bottom right; northern block planted area of eucalyptus).



Plates 17-20. Woodlots are present in the central part of the site and comprise young Tasmanian blackwood. A small, young pine woodlot exists in the north-eastern part of the site adjoining the unnamed tributary of the Rangitopuni Stream (top right); native shrubland is sparse and poor quality (bottom left; along the unnamed tributary of the Rangitopuni Stream on site) while vegetation is older and more diverse, adjoining the northern part of the site (bottom right).

3.4.2 Birdlife

Birdlife observed on site reflects the modified state of this rural environment. Of the 20 species recorded on site, 11 are native and are commonly recorded in rural areas of Auckland (and most of the North Island). All of the native species are classified as Not Threatened.

Native birds recorded on site include:

- Silvereeye (*Zosterops lateralis*)
- Fantail (*Rhipidura fuliginosa*)
- Grey Warbler (*Gerygone igata*)
- Tui (*Prothemadera novaeseelandiae*)
- Pukeko (*Porphyrio porphyrio* subsp. *melanotus*)
- Australasian harrier (*Circus approximans*)
- Spur wing plover (*Vanellus miles*)
- White-faced heron (*Egretta novaehollandiae*)
- Kingfisher (*Todiramphus sanctus*)
- Welcome swallow (*Hirundo neoxena neoxena*)
- Paradise shelduck (*Tadorna variegata*)

Exotic birds recorded from the site:

- Common myna (*Acridotheres tristis*)
- Starling (*Sturnus vulgaris*)
- House sparrow (*Passer domesticus*)
- Pheasant (*Phasianus colchicus*)
- California quail (*Callipepla californica*)
- Australian magpie (*Gymnorhina tibicen*)
- Blackbird (*Turdus merula*)
- Gold finch (*Carduelis carduelis*)
- Song thrush (*Turdus philomelos*)

Habitat for native birds is not distributed evenly across the site. Paradise shelduck and kingfisher were recorded in low numbers around the wetter northern part of the site, as would be expected for these species. Wet pasture or boggy areas were also most likely to support heron, plover and pukeko (all of which were recorded in low numbers). Passerines (tui, warbler, fantail, silvereeye) were only recorded where there were concentrations of mature trees (exotic or native).

In terms of nesting habitat and core habitat for native birds, it is very unlikely that any of the pasture areas, horticultural areas, woodlots or amenity areas constitute core local habitat, particularly given the abundance of surrounding farmed areas, amenity ponds, river margins and small wetlands that are also presumably used by these species.

The predominantly large, mature conifers that comprise shelter belts and the scattered amenity trees throughout the site are considered to be of low ecological value (for birds) and do not qualify as being ecologically significant under the AUP ecological criteria. Food resources for birds currently present on

site come largely from mature weeds and scattered exotic amenity trees which do not meet any of the Auckland Council ecological significance criteria.

3.4.3 Lizards

No native lizards were found, despite targeted searches in some potentially favourable sites across the site – including amongst discarded horticultural materials, potting mix areas, felled wood on the margins of woodlot areas, and farm refuse. Although the search was not extensive, it is unlikely that native lizard populations have persisted across most of the site, given the extensive environmental modifications to the original vegetation cover.

Of the original fauna of up to 11 lizard species that would have inhabited indigenous ecosystems prior to human occupation of the Auckland area, it is extremely unlikely that geckos have persisted at the site (given that it has had all original woody vegetation cleared for a long period), and is likely that only copper skink (*Oligosoma aeneum*; At Risk - Declining) may have survived in some areas (see below).

The introduced plague skink (rainbow skink; *Lampropholis delicata*) was found at points across the site and is likely to be present throughout much of the horticultural areas, grassland, dwellings and farm building areas (including the extensive areas of dumped rubble, farm debris and general rubbish associated with the dwellings and sheds in the northern part of the site).

The Department of Conservation's National Herpetofauna Database notes two records from the early 2000s of native copper skink in the area, both of which are at around 1 km from the subject site and have been found in similar modified habitats. The closest records of other native lizards are records for pacific gecko (*Dactylocnemis pacificus*) and forest gecko (*Mokopirirakau granulatus*), both from an extensive block of mature native vegetation some 4 km to the west in 2012.

Copper skinks can be found in a range of urban and rural environments, including those that have been extensively and recently modified. The majority of the site is managed as intensively managed environments (horticultural, mown grassland, amenity gardens); however, there are some areas of rank grassland, planted treeland or less-intensively managed farmland that could support the species.

3.4.1 Bats

Long-tailed bats / pekapeka (*Chalinolobus tuberculatus*, currently classified 'nationally vulnerable' - O'Donnell et al. 2011), require large trees (including standing dead trees) with cavities (e.g. deep knot holes), epiphytes or loose bark for roosting; and typically use linear landscape features such as bush edges, gullies, water courses and roadways to transit between roosting and feeding sites (Borkin and Parsons 2009).

The national bat database records the closest location of bats as 1.5 km to the north within Riverhead State Forest, with multiple records in the State Forest close to the northern part of the site. Bat surveys undertaken to the east of Riverhead have also detected bats, while there are also records of bats to the south (3.5 km distant) (Figure 6).

Although the site does not support any stands of naturally occurring native trees, there are substantial areas of planted exotic vegetation in the form of amenity trees, woodlot areas, and mature shelterbelts. Most of these are distant from the unnamed tributary of the Rangitopuni Stream as the only substantial nearby watercourse, and most are near busy roads and well-lit residential dwellings. However, there are some older trees located at the north-western part of the site which include trees with occlusions, splits

and broken branches and which could offer roosting habitat. Extensive mixed exotic/ native shrubland on the true left bank of the unnamed tributary of the Rangitopuni Stream adjoining the north-west part of the site (but not on the site) also offers potential bat habitat.

We note that almost all of the trees on the site can be felled without requiring resource consent from Auckland Council, and that the survey for bats is matter for the Wildlife Act (DOC), rather than the Resource Management Act.

The Plan Change applicant's intention is to follow the NZTA/ DOC protocols for managing potential adverse effects on bats (Protocol B: Pre-felling procedure 1.4.1 and Protocol C (if bats are confirmed to be present)). These include undertaking a survey for bats immediately prior to felling of trees in the north-western part of the site and within the woodlot areas in the central part of the site - i.e. those areas which support the best opportunities for bats at the site.

Overall, the history of the site with past forest clearance and the low quality of potential habitat currently present suggest that there is a low chance that bats may be present. However, the proximity to known records for bats could also mean that bats utilise parts of the site (especially near to the unnamed tributary of the Rangitopuni Stream) for foraging, and more substantial forested areas adjoining the site for roosting.

The Precinct provisions work in conjunction with the rest of the AUP, which requires survey and assessment of ecology values, and consideration of the values of retaining, removing, mitigating and offsetting (where appropriate) adverse effects (this includes Chapters E12, E15 and E38 of the AUP). These require that these matters are considered in more detail through the consent process.

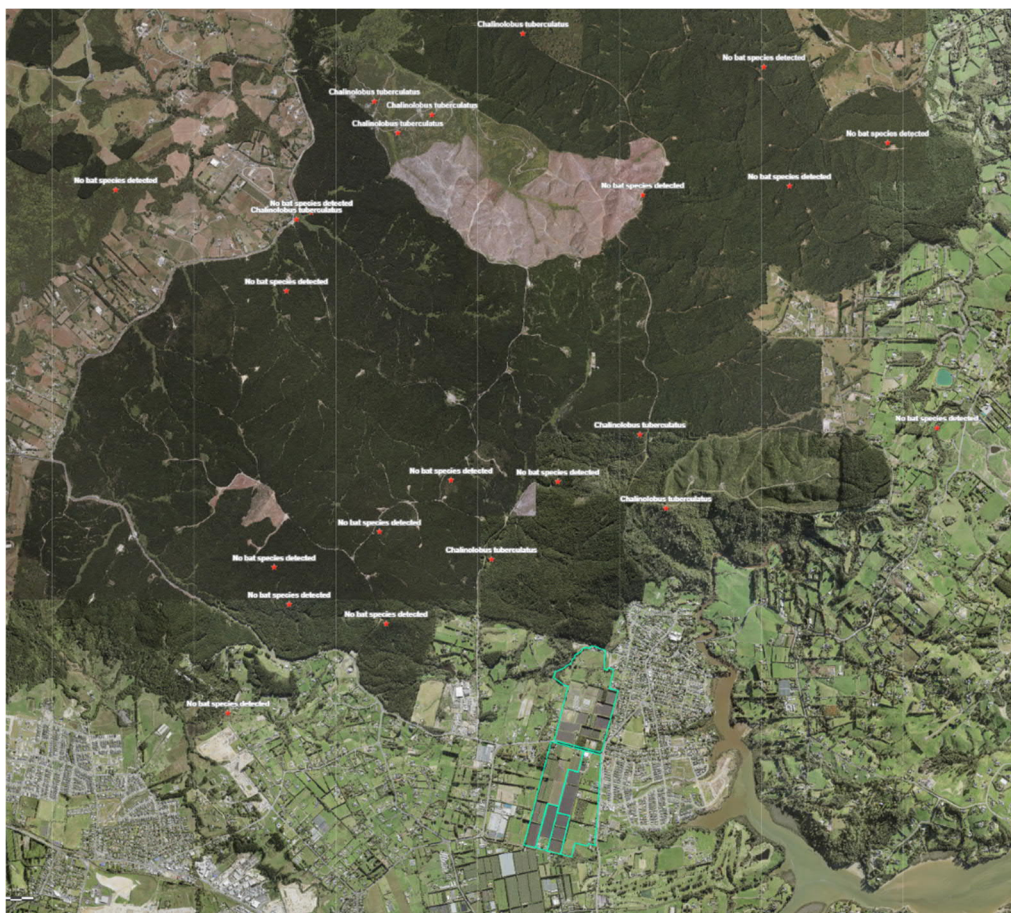


Figure 6. Records of native long-tailed bats near to the site (turquoise boundary), and locations where past surveys have failed to detect bats. The closest sites are approx. 1.5 km to the north of the site.

3.5 Summary of ecological values

Overall, the ecology values for wetlands, watercourses and wildlife reflect a highly modified landform that has lost most of its original indigenous values. Although most native components are absent, and key ecological features such as streams and wetlands are highly degraded, there is substantial opportunity to improve on this and return biodiversity and ecological function to the site.

There is no remnant or secondary regenerating native forest on this site, no significant ecological areas on the site, and no areas that qualify as indigenous vegetation.

Habitat for wildlife is poor throughout due to many decades of horticultural and pastoral grazing. At most, the site may offer habitat in parts of copper skink and bats; however, it is very unlikely to constitute core or important habitat for these species.

Key ecological features present on the site are listed below. Streams and wetland should form part of the protection layer to inform planning for the site masterplan; values such as lizards and bats require confirmation regarding distribution, abundance and habitat associations on the site as part of habitat restoration/ planting planned for the site, and for informing wildlife management during development of the site where habitat and populations will be removed and relocated.

- Intermittent Stream I1 and its margins (10 m wide either side);
- The margin of the unnamed tributary of the Rangitopuni Stream where it adjoins and is within the site (20 m margin on the true right bank);
- Wetlands, including all of the low-lying floodplain area in the northern part of the site;
- Probable copper skinks in some parts of the site; and
- Possible bats in the northern part of the site near unnamed tributary of the Rangitopuni Stream or where habitat exists.

Enhancements to the ecology for the site should focus on:

1. Improving connectivity between ecological systems - especially by using the existing stream and wetland areas to manage, treat and control stormwater on the site. The general overall improvement in water quality that is likely to arise from ceasing agricultural/ horticultural activities on the site also offers opportunities to plan for the restoration of the stream and wetland areas to support an improved, native biodiversity and to provide habitats for aquatic fauna (such as waterfowl, fish, eels, and macroinvertebrate communities).
2. Enhancing food and habitat resources for native wildlife – by planning streetscapes and open areas to support native nectar and fruit-producing plant species as part of a site-wide strategy to create green corridors, provide improved food and roosting/ nesting habitat resources for native birds, and to restore ecological areas (stream margins, wetlands, multi-use amenity/water management areas with wildlife and wildlife habitat in mind).

4.0 Proposed Provisions and Masterplan

The Masterplan incorporates ecological considerations through several key design drivers, including:

- Strengthening water management systems;
- Bridging connections to outside the site;
- Connectivity within the site; and
- Restoring and improving ecological functions and energy flows

These are expressed in the Structure Plan/ Masterplan as:

1. A central south-north, multi-purpose green corridor which will provide a central focal point, connectivity and integration of ecological services through stormwater management, conveyance, and treatment, as well as opportunities for functional streetscape tree corridors, nodal open space resource plantings and connections with lateral connections to constructed watercourses and green connections to the east and west;
2. Improve habitat, function and biodiversity values as a natural outcome of the re-design of water conveyance systems across the site. In particular, the management of waterways and waterbodies provides opportunities to provide for fish passage, in-stream habitat, riparian margin revegetation and improvements to water quality, both within the site, as a consequence, improvements to the northern receiving area and the unnamed tributary of the Rangitopuni Stream;
3. Formalises the use of the intermittent stream and low-lying wetland areas to the north of the site as integral parts to the overall drainage structure for the site, and in doing so will protect and restore these features; and
4. In respect of ecological management, the Riverhead Plan Change Precinct includes provisions for environmental protection and enhancement. The provisions provide for the enhancement of riparian margins. Where riparian enhancement is included, this provides opportunities for not only revegetation planting, but also including created habitat for lizards, bats and invertebrates (for example, by including logs, refuge stacks, and including specific forest trees within riparian margin management).

The above ecological protection and restoration initiatives are reflected in the draft Precinct Provisions, which include specific objectives to protect, restore and enhance ecological features on the site, and polices that require the planting of stream margins, the use of native plants in restoration areas, and the consideration of improvements to water quality.

Overall, the Structure Plan/ Masterplan and the Precinct Provisions provide for the protection and restoration of riparian margins and the establishment of multi-purpose green corridors which will result in a far greater diversity and coverage of native treeland, linkages, and resources for wildlife than is currently present.

The identification of the features identified in this report will assist in their recognition at the time of future resource consent applications. The NES-F and the AUP include a comprehensive set of rules relating to identified features (for example E3 for streams and E15 for vegetation). These are considered to be appropriate to address the potential for adverse effects in the same way they already apply to the area's Future Urban Zone. From an ecological perspective, these rules are appropriate to address relevant effects that may be generated at the time of resource consent.

In respect to ecological management, the Riverhead Plan Change Precinct includes provisions for environmental protection and enhancement. The provisions provide for stormwater management and enhancement of riparian margins. The PPC will apply these provisions to the Riverhead Plan Change area. This is supported in respect to the management of ecosystem values.

From an ecological perspective, these rules are considered to be appropriate to manage the potential effects of residential development within the site.

The overall outcome from the proposed Private Plan Change will be a clear, positive, net-benefit for indigenous biodiversity values and ecological services, and spans waterways, wetlands, wildlife habitat and native revegetation.

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Attachment A

Relevant objectives and policies of the AUP as they relate to terrestrial and aquatic ecosystems within the Riverhead PPC site.

Chapter B – Regional Policy Statement

B2 Tāhuhu whakaruruhau ā-taone - Urban growth and form

B2.4. Residential growth

B2.4.1. Objectives

(1) Residential intensification supports a quality compact urban form.

B2.4.2. Policies

(4) Provide for lower residential intensity in areas:

(a) that are not close to centres and public transport;

(b) that are subject to high environmental constraints;

(c) where there are natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character; and

(d) where there is a suburban area with an existing neighbourhood character.

(5) Avoid intensification in areas:

(a) where there are natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage or special character; or

(b) that are subject to significant natural hazard risks; where such intensification is inconsistent with the protection of the scheduled natural or physical resources or with the avoidance or mitigation of the natural hazard risks.

B7. Toitū te whenua, toitū te taiao – Natural resources

B7.2. Indigenous biodiversity

B7.2.1. Objectives

(1) Areas of significant indigenous biodiversity value in terrestrial, freshwater, and coastal marine areas are protected from the adverse effects of subdivision use and development.

(2) Indigenous biodiversity is maintained through protection, restoration and enhancement in areas where ecological values are degraded, or where development is occurring.

B7.2.2. Policies

(5) Avoid adverse effects on areas listed in the Schedule 3 of Significant Ecological Areas – Terrestrial Schedule and Schedule 4 Significant Ecological Areas – Marine Schedule.

B7.3. Freshwater systems

B7.3.1. Objectives

(1) Degraded freshwater systems are enhanced.

(2) Loss of freshwater systems is minimised.

(3) The adverse effects of changes in land use on freshwater are avoided, remedied or mitigated.

B7.3.2. Policies

(1) Integrate the management of subdivision, use and development and freshwater systems by undertaking all of the following:

(a) ensuring water supply, stormwater and wastewater infrastructure is adequately provided for in areas of new growth or intensification;

(b) ensuring catchment management plans form part of the structure planning process;

(c) controlling the use of land and discharges to minimise the adverse effects of runoff on freshwater systems and progressively reduce existing adverse effects where those systems or water are degraded; and

(d) avoiding development where it will significantly increase adverse effects on freshwater systems, unless these adverse effects can be adequately mitigated.

(2) Identify degraded freshwater systems.

(3) Promote the enhancement of freshwater systems identified as being degraded to progressively reduce adverse effects.

(4) Avoid the permanent loss and significant modification or diversion of lakes, rivers, streams (excluding ephemeral streams), and wetlands and their margins, unless all of the following apply:

(a) it is necessary to provide for:

- (i) the health and safety of communities; or
- (ii) the enhancement and restoration of freshwater systems and values; or
- (iii) the sustainable use of land and resources to provide for growth and development; or
- (iv) infrastructure;

(b) no practicable alternative exists;

(c) mitigation measures are implemented to address the adverse effects arising from the loss in freshwater system functions and values; and

(d) where adverse effects cannot be adequately mitigated, environmental benefits including on-site or off-site works are provided.

(5) Manage subdivision, use, development, including discharges and activities in the beds of lakes, rivers streams, and in wetlands, to do all of the following:

(a) protect identified Natural Lake Management Areas, Natural Stream Management Areas, and Wetland Management Areas;

(b) minimise erosion and modification of beds and banks of lakes, rivers, streams and wetlands;

(c) limit the establishment of structures within the beds of lakes, rivers and streams and in wetlands to those that have a functional need or operational requirement to be located there; and

(d) maintain or where appropriate enhance:

(i) freshwater systems not protected under Policy B7.3.2(5)(a);

(ii) navigation along rivers and public access to and along lakes, rivers and streams;

(iii) existing riparian vegetation located on the margins of lakes, rivers, streams and wetlands; and

(iv) areas of significant indigenous biodiversity.

(6) Restore and enhance freshwater systems where practicable when development, change of land use, and subdivision occur.

B7.4. Coastal water, freshwater and geothermal water

B7.4.1. Objectives

(2) The quality of freshwater and coastal water is maintained where it is excellent or good and progressively improved over time where it is degraded.

(4) The adverse effects of point and non-point discharges, in particular stormwater runoff and wastewater discharges, on coastal waters, freshwater and geothermal water are minimised and existing adverse effects are progressively reduced.

(5) The adverse effects from changes in or intensification of land use on coastal water and freshwater quality are avoided, remedied or mitigated

(6) Mana Whenua values, mātauranga and tikanga associated with coastal water, freshwater and geothermal water are recognised and provided for, including their traditional and cultural uses and values.

B7.4.2. Policies

(1) Integrate the management of subdivision, use, development and coastal water and freshwater, by:

(a) ensuring water supply, stormwater and wastewater infrastructure is adequately provided for in areas of growth; and

(b) requiring catchment management planning as part of structure planning;

(c) controlling the use of land and discharges to minimise the adverse effects of runoff on water and progressively reduce existing adverse effects where those water are degraded; and

(d) avoiding development where it will significantly increase adverse effects on water, unless these adverse effects can be adequately mitigated.

(4) Identify areas of coastal water and freshwater bodies that have been degraded by human activities.

(5) Engage with Mana Whenua to:

(a) identify areas of degraded coastal water where they have a particular interest; and

(b) remedy or, where remediation is not practicable, mitigate adverse effects on these degraded areas and values.

(6) Progressively improve water quality in areas identified as having degraded water quality through managing subdivision, use, development and discharges.

(7) Manage the discharges of contaminants into water from subdivision, use and development to avoid where practicable, and otherwise minimise, all of the following:

(a) significant bacterial contamination of freshwater and coastal water;

(b) adverse effects on the quality of freshwater and coastal water;

(c) adverse effects from contaminants, including nutrients generated on or applied to land, and the potential for these to enter freshwater and coastal water from both point and non-point sources;

(d) adverse effects on Mana Whenua values associated with coastal water, freshwater and geothermal water, including wāhi tapu, wāhi taonga and mahinga kai; and

(e) adverse effects on the water quality of catchments and aquifers that provide water for domestic and municipal supply.

(8) Minimise the loss of sediment from subdivision, use and development, and manage the discharge of sediment into freshwater and coastal water, by:

- (a) promoting the use of soil conservation and management measures to retain soil and sediment on land; and
- (b) requiring land disturbing activities to use industry best practice and standards appropriate to the nature and scale of the land disturbing activity and the sensitivity of the receiving environment.

(9) Manage stormwater by all of the following:

(a) requiring subdivision, use and development to:

- (i) minimise the generation and discharge of contaminants; and
- (ii) minimise adverse effects on freshwater and coastal water and the capacity of the stormwater network;
- (b) adopting the best practicable option for every stormwater diversion and discharge; and
- (c) controlling the diversion and discharge of stormwater outside of areas serviced by a public stormwater network.

(10) Manage the adverse effects of wastewater discharges to freshwater and coastal water by all of the following:

(a) ensuring that new development is supported by wastewater infrastructure with sufficient capacity to serve the development;

(b) progressively reducing existing network overflows and associated adverse effects by all of the following:

- (i) making receiving environments that are sensitive to the adverse effects of wastewater discharges a priority;
- (ii) adopting the best practicable option for preventing or minimising the adverse effects of discharges from wastewater networks including works to reduce overflow frequencies and volumes;
- (iii) ensuring plans are in place for the effective operation and maintenance of the wastewater network and to minimise dry weather overflow discharges;
- (iv) ensuring processes are in place to mitigate the adverse effects of overflows on public health and safety and the environment where the overflows occur;

(c) adopting the best practicable option for minimising the adverse effects of discharges from wastewater treatment plants; and

(d) ensuring on-site wastewater systems avoid significant adverse effects on freshwater and coastal water.

B8. Toitū te taiwhenua - Coastal environment

B8.3. Subdivision, use and development

B8.3.1. Objectives

(1) Subdivision, use and development in the coastal environment are located in appropriate places and are of an appropriate form and within appropriate limits, taking into account the range of uses and values of the coastal environment.

(2) The adverse effects of subdivision, use and development on the values of the coastal environment are avoided, remedied or mitigated.

(3) The natural and physical resources of the coastal environment are used efficiently and activities that depend on the use of the natural and physical resources of the coastal environment are provided for in appropriate locations.

B8.3.2. Policies

(1) Recognise the contribution that use and development of the coastal environment make to the social, economic and cultural well-being of people and communities.

(2) Avoid or mitigate sprawling or sporadic patterns of subdivision, use and development in the coastal environment by all of the following:

(a) concentrating subdivision, use and development within areas already characterised by development and where natural character values are already compromised;

(b) avoiding urban activities in areas with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal, historic heritage and special character; and

(c) ensuring that subdivision, use or development involving land above and below the mean high water springs can provide for any associated facilities or infrastructure in an integrated manner.

(3) Provide for use and development in the coastal marine area that:

(a) have a functional need which requires the use of the natural and physical resources of the coastal marine area;

(b) are for the public benefit or public recreation that cannot practicably be located outside the coastal marine area;

(c) have an operational need making a location in the coastal marine area appropriate and that cannot practicably be located outside the coastal marine area; or

(d) enable the use of the coastal marine area by Mana Whenua for Māori cultural activities and customary uses.

(4) Require subdivision, use and development in the coastal environment to avoid, remedy or mitigate the adverse effects of activities above and below the mean high water springs, including the effects on existing uses and on the coastal receiving environment.

(5) Adopt a precautionary approach towards proposed activities whose effects on the coastal environment are

uncertain, unknown or little understood, but could be significantly adverse.

(6) Consider the purposes for which land or water in the coastal environment is held or managed under any enactment for conservation or protection purposes and:

- (a) avoid adverse effects that are significant in relation to those purposes; and*
- (b) avoid, remedy or mitigate other adverse effects in relation to those purposes.*

B8.4. Public access and open space

B8.4.1. Objectives

(1) Public access to and along the coastal marine area is maintained and enhanced, except where it is appropriate to restrict that access, in a manner that is sensitive to the use and values of an area.

(2) Public access is restricted only where necessary to ensure health or safety, for security reasons, for the efficient and safe operation of activities, or to protect the value of areas that are sensitive to disturbance.

B8.4.2. Policies

(3) Restrict public access to and along the coastal marine area, particularly walking access, only where it is necessary to do any of the following:

- (a) protect public health and safety;*
- (b) provide for defence, port or airport purposes;*
- (c) protect areas with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal, historic heritage and special character;*
- (d) protect threatened indigenous species;*
- (e) protect dunes, estuaries and other sensitive natural areas or habitats;*
- (f) have a level of security necessary to carry out an activity or function that has been established or provided for;*
- (g) provide for exclusive use of an area to carry out an activity granted an occupation consent under section 12 of the Resource Management Act 1991;*
- (h) enable a temporary activity or special event; or*
- (i) in other exceptional circumstances, sufficient to justify the restriction.*

Chapter D - Overlays

D9 Significant Ecological Areas Overlay

D9.2. Objectives [rcp/rp/dp]

(1) Areas of significant indigenous biodiversity value in terrestrial, freshwater, and coastal marine areas are protected from the adverse effects of subdivision, use and development.

(2) Indigenous biodiversity values of significant ecological areas are enhanced.

(3) The relationship of Mana Whenua and their customs and traditions with indigenous vegetation and fauna is recognised and provided for.

D9.3. Policies [rcp/rp/dp]

(1) Manage the effects of activities on the indigenous biodiversity values of areas identified as significant ecological areas by:

- (a) avoiding adverse effects as far as practicable, and where avoidance is not practicable, minimising adverse effects on the identified values;*
- (b) remedying adverse effects on the identified values where they cannot be avoided;*
- (c) mitigating adverse effects on the identified values where they cannot be avoided or remediated; and*
- (d) considering the appropriateness of offsetting any residual adverse effects that are significant and where they have not been able to be mitigated, through protection, restoration and enhancement measures, having regard to Appendix 8 Biodiversity offsetting.*

(2) Adverse effects on indigenous biodiversity values in significant ecological areas that are required to be avoided, remedied, mitigated or offset may include, but are not limited to, any of the following:

- (a) fragmentation of, or a reduction in the size and extent of, indigenous ecosystems and the habitats of indigenous species;*
- (b) fragmentation or disruption of connections between ecosystems or habitats;*
- (c) changes which result in increased threats from pests on indigenous biodiversity and ecosystems;*
- (d) loss of buffering of indigenous ecosystems;*
- (e) loss of a rare or threatened individual, species population or habitat;*
- (f) loss or degradation of originally rare ecosystems including wetlands, dune systems, lava forests, coastal forests;*
- (g) a reduction in the abundance of individuals within a population, or natural diversity of indigenous vegetation and habitats of indigenous fauna;*
- (h) loss of ecosystem services;*
- (i) effects which contribute to a cumulative loss or degradation of habitats, species populations and ecosystems;*
- (j) impacts on species or ecosystems that interact with other activities, or impacts that exacerbate or cause adverse effects in synergistic ways;*

- (k) loss of, or damage to, ecological mosaics, sequences, processes, or integrity;
- (l) downstream effects on wetlands, rivers, streams, and lakes from hydrological changes further up the catchment;
- (m) a modification of the viability or value of indigenous vegetation and habitats of indigenous fauna as a result of the use or development of other land, freshwater, or coastal resources;
- (n) a reduction in the historical, cultural, and spiritual association held by Mana Whenua or the wider community;
- (o) the destruction of, or significant reduction in, educational, scientific, amenity, historical, cultural, landscape, or natural character values;
- (p) disturbance to indigenous fauna that is likely or known to increase threats, disturbance or pressures on indigenous fauna; or
- (q) increases in the extinction probability of a species.
- (3) Enhance indigenous biodiversity values in significant ecological areas through any of the following:
- (a) restoration, protection and enhancement of threatened ecosystems and habitats for rare or threatened indigenous species;
- (b) control, and where possible, eradication of plant and animal pests;
- (c) fencing of significant ecological areas to protect them from stock impacts;
- (d) legal protection of significant ecological areas through covenants or similar mechanisms;
- (e) development and implementation of management plans to address adverse effects;
- (f) re-vegetating areas using, where possible, indigenous species sourced from naturally growing plants in the vicinity with the same climactic and environmental conditions; or
- (g) providing for the role of Mana Whenua as kaitiaki and for the practical exercise of kaitiakitanga in restoring, protecting and enhancing areas.
- (4) Enable activities which enhance the ecological integrity and functioning of significant ecological areas including:
- (a) the management and control of pest species that threaten indigenous biodiversity; and
- (b) managing works in the vicinity of kauri, such as deadwood removal or earthworks, to control kauri dieback disease by preventing the spread of soil and kauri plant material.
- (5) Enable the following vegetation management activities in significant ecological areas to provide for the reasonable use and management of land:
- (a) trimming of vegetation;
- (b) vegetation removal to maintain existing open areas, including tracks;
- (c) vegetation removal to establish and maintain a reasonable cleared area around a building;
- (d) vegetation removal required to maintain lawfully established activities, structures and buildings;
- (e) vegetation removal necessary to provide for a dwelling on a site;
- (f) vegetation removal necessary to provide for marae and papakainga on Māori land;
- (g) vegetation removal in areas of high wildfire risk to manage this risk; and
- (h) vegetation removal necessary to provide access and exit for emergency service vehicles.
- (6) Avoid as far as practicable the removal of vegetation and loss of biodiversity in significant ecological areas from the construction of building platforms, access ways or infrastructure, through:
- (a) using any existing cleared areas on a site to accommodate new development in the first instance;
- (b) assessing any practicable alternative locations and/or methods that would reduce the need for vegetation removal or land disturbance;
- (c) retaining indigenous vegetation and natural features which contribute to the ecological significance of a site, taking into account any loss that may be unavoidable to create a single building platform for a dwelling and associated services, access and car parking on a site;
- (d) designing and locating dwellings and other structures to reduce future demands to clear or damage areas of significant indigenous biodiversity, for example to provide sunlight or protect property;
- (e) avoiding as far as practicable any changes in hydrology which could adversely affect indigenous biodiversity values;
- (f) implementing measures to maintain existing water quality and not increase the amount of sediment entering natural waterways, wetlands and groundwater; and
- (g) using techniques that minimise the effects of construction and development on vegetation and biodiversity and the introduction and spread of animal and plant pests.
- (7) Provide for the role of Mana Whenua as kaitiaki in managing biodiversity, particularly in Treaty Settlement areas, and for cultural practices and cultural harvesting in significant ecological areas where the mauri of the resource is sustained.
- (8) Manage the adverse effects from the use, maintenance, upgrade and development of infrastructure in accordance with the policies above, recognising that it is not always practicable to locate and design infrastructure to avoid significant ecological areas.
- (9) Avoid, subdivision, use and development in the coastal environment where it will result in any of the following:
- (a) the permanent use or occupation of the foreshore and seabed to the extent that the values, function or processes associated with any Significant Ecological Area – Marine is significantly reduced;
- (b) any change to physical processes that would destroy, modify, or damage any natural feature or values identified

for a Significant Ecological Area – Marine in more than a minor way; or

(c) fragmentation of the values of a Significant Ecological Area – Marine to the extent that its physical integrity is lost.

(10) Manage the adverse effects of use and development on the values of Significant Ecological Areas – Marine, in addition to the policies above, taking into account all of the following:

(a) the extent to which existing use and development already, and in combination with any proposal, impacts on the habitat, or impedes the operation of ecological and physical processes;

(b) the extent to which there are similar habitat types within other Significant Ecological Areas – Marine in the same harbour or estuary or, where the significant ecological area - marine is located on open coast, within the same vicinity; and

(c) whether the viability of habitats of regionally or nationally threatened plants or animals is adversely affected, including the impact on the species population and location.

(11) Avoid structures in Significant Ecological Areas – Marine 1 (SEA-M1) except where a structure is necessary for any of the following purposes:

(a) scientific and research purposes, or for public education, and will enhance the understanding and long-term protection of the significant ecological area;

(b) navigation and safety;

(c) habitat maintenance and enhancement; or

(d) to benefit the regional and national community, including structures for significant infrastructure where there is no reasonable or practicable alternative location on land, or elsewhere in the coastal marine area outside of a Significant Ecological Area – Marine 1(SEA-M1).

Chapter E – Auckland Wide

E1 Water Quality and Integrated Management

E1.2. Objectives [rp]

(1) Freshwater and sediment quality is maintained where it is excellent or good and progressively improved over time in degraded areas.

(3) Stormwater and wastewater networks are managed to protect public health and safety and to prevent or minimise adverse effects of contaminants on freshwater and coastal water quality.

E1.3. Policies [rp/dp]

(1) Manage discharges, until such time as objectives and limits are established in accordance with Policy E1.3(7), having regard to:

(a) the National Policy Statement for Freshwater Management National Bottom Lines;

(b) the Macroinvertebrate Community Index as a guideline for freshwater ecosystem health associated with different land uses within catchments in accordance with Policy E1.3(2); or

(c) other indicators of water quality and ecosystem health.

(2) Manage discharges, subdivision, use, and development that affect freshwater systems to:

(a) maintain or enhance water quality, flows, stream channels and their margins and other freshwater values, where the current condition is above National Policy Statement for Freshwater Management National Bottom Lines and the relevant Macroinvertebrate Community Index guideline in Table E1.3.1 below; or

(b) enhance water quality, flows, stream channels and their margins and other freshwater values where the current condition is below national bottom lines or the relevant Macroinvertebrate Community Index guideline in Table E1.3.1 below.

Table E1.3.1 Macroinvertebrate Community Index guideline for Auckland rivers and streams

Land use	Macroinvertebrate Community Index guideline
Native forest	123
Exotic forest	111
Rural areas	94
Urban areas	68

(3) Require freshwater systems to be enhanced unless existing intensive land use and development has irreversibly modified them such that it practicably precludes enhancement.

(4) When considering any application for a discharge, the Council must have regard to the following matters:

(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of freshwater including on any ecosystem associated with freshwater; and

(b) the extent to which it is feasible and dependable that any more than a minor adverse effect on freshwater, and on any ecosystem associated with freshwater, resulting from the discharge would be avoided.

(6) Policies E1.3(4) and (5) apply to the following discharges (including a diffuse discharge by any person or animal):

(a) new discharge; or

(b) a change or increase in any discharge of any contaminant into freshwater, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant,

any other contaminant) entering freshwater.

(8) Avoid as far as practicable, or otherwise minimise or mitigate, adverse effects of stormwater runoff from greenfield development on freshwater systems, freshwater and coastal water by:

- (a) taking an integrated stormwater management approach (refer to Policy E1.3.10);
- (b) minimising the generation and discharge of contaminants, particularly from high contaminant generating car parks and high use roads and into sensitive receiving environments;
- (c) minimising or mitigating changes in hydrology, including loss of infiltration, to:
 - (i) minimise erosion and associated effects on stream health and values;
 - (ii) maintain stream baseflows; and
 - (iii) support groundwater recharge;
- (d) where practicable, minimising or mitigating the effects on freshwater systems arising from changes in water temperature caused by stormwater discharges; and
- (e) providing for the management of gross stormwater pollutants, such as litter, in areas where the generation of these may be an issue.

(9) Minimise or mitigate new adverse effects of stormwater runoff, and where practicable progressively reduce existing adverse effects of stormwater runoff, on freshwater systems, freshwater and coastal waters during intensification and redevelopment of existing urban areas by all of the following:

- (a) requiring measures to reduce contaminants, particularly from high contaminant-generating car parks and high-use roads;
- (b) requiring measures to reduce the discharge of gross stormwater pollutants;
- (c) requiring measures to be adopted to reduce the peak flow rate and the volume of stormwater flows:
 - (i) within sites identified in the Stormwater Management Area – Flow 1 and Flow 2 Control (as shown on the planning maps);
 - (ii) where development exceeds the maximum impervious area for the relevant zone; or
 - (iii) from areas of impervious surface where discharges may give rise to flooding or adversely affect rivers and streams;
- (d) taking an integrated stormwater management approach for large-scale and comprehensive redevelopment and intensification (refer to Policy E1.3.10 below) and encourage the restoration of freshwater systems where practicable; and
- (e) ensuring intensification is supported by appropriate stormwater infrastructure, including natural assets that are utilised for stormwater conveyance and overland flow paths.

(10) In taking an integrated stormwater management approach have regard to all of the following:

- (a) the nature and scale of the development and practical and cost considerations, recognising:
 - (i) greenfield and comprehensive brownfield development generally offer greater opportunity than intensification and small-scale redevelopment of existing areas;
 - (ii) intensive land uses such as high-intensity residential, business, industrial and roads generally have greater constraints; and
 - (iii) site operational and use requirements may preclude the use of an integrated stormwater management approach.
- (b) the location, design, capacity, intensity and integration of sites/development and infrastructure, including roads and reserves, to protect significant site features and hydrology and minimise adverse effects on receiving environments;
- (c) the nature and sensitivity of receiving environments to the adverse effects of development, including fragmentation and loss of connectivity of rivers and streams, hydrological effects and contaminant discharges and how these can be minimised and mitigated, including opportunities to enhance degraded environments;
- (d) reducing stormwater flows and contaminants at source prior to the consideration of mitigation measures and the optimisation of on-site and larger communal devices where these are required; and
- (e) the use and enhancement of natural hydrological features and green infrastructure for stormwater management where practicable.

(11) Avoid as far as practicable, or otherwise minimise or mitigate adverse effects of stormwater diversions and discharges, having particular regard to:

- (a) the nature, quality, volume and peak flow of the stormwater runoff;
- (b) the sensitivity of freshwater systems and coastal waters, including the Hauraki Gulf Marine Park;
- (c) the potential for the diversion and discharge to create or exacerbate flood risks;
- (d) options to manage stormwater on-site or the use of communal stormwater management measures;
- (e) practical limitations in respect of the measures that can be applied; and
- (f) the current state of receiving environments.

(12) Manage contaminants in stormwater runoff from high contaminant generating car parks and high use roads to minimise new adverse effects and progressively reduce existing adverse effects on water and sediment quality in freshwater systems, freshwater and coastal waters.

(13) Require stormwater quality or flow management to be achieved on-site unless there is a downstream communal device or facility designed to cater for the site's stormwater runoff.

- (14) Adopt the best practicable option to minimise the adverse effects of stormwater discharges from stormwater network and infrastructure including road, and rail having regard to all of the following:
- (a) the best practicable option criteria as set out in section 2 of the Resource Management Act 1991;
 - (b) the reasonable timeframes over which adverse effects can be avoided as far as practicable, or otherwise minimised or mitigated;
 - (c) the scale and significance of the adverse effects;
 - (d) infrastructure investment priorities and the consequences of delaying infrastructural improvements in other areas;
 - (e) the ability to prevent or minimise existing adverse effects having regard to the effectiveness and timeframes of other feasible methods, including land use controls;
 - (f) opportunities to integrate with other major infrastructure projects or works;
 - (g) the need to maintain and optimise existing stormwater networks and provide for planned land use and development; and
 - (h) operational requirements and space limitations.
- (15) Utilise stormwater discharge to ground soakage in areas underlain by shallow or highly permeable aquifers provided that:
- (a) ground soakage is available;
 - (b) any risk to people and property from land instability or flooding is avoided;
 - (c) stormwater quality treatment is implemented to minimise effects on the capacity and water quality of the underlying aquifer system; and
 - (d) discharge to ground soakage is the most effective and sustainable option.
- (16) Require land use development and drainage systems within areas underlain by peat soils to provide for stormwater discharge to ground soakage that maintains underlying water levels and the geotechnical stability of the peat soils.
- (17) Avoid the discharge of wastewater to the coastal marine area and to freshwater, unless:
- (a) alternative methods, sites and routes for the discharge have been considered and are not the best practicable option;
 - (b) Mana Whenua have been consulted in accordance with tikanga Māori and due weight has been given to section 6, section 7 and section 8 of the Resource Management Act 1991;
 - (c) the affected community has been consulted regarding the suitability of the treatment and disposal system to address any environmental effects;
 - (d) the extent to which adverse effects have been avoided, remedied or mitigated on areas of:
 - (i) high recreational use, or that are used for fishing or shellfish gathering;
 - (ii) areas of maintenance dredging;
 - (iii) commercial or residential waterfront development;
 - (iv) high ecological value; and
 - (v) marine farms.
- (19) Ensure wastewater networks are designed and operated to minimise wet weather overflows by:
- (a) requiring wastewater networks to be designed and constructed in accordance with recognised industry standards, including being sized to cater for the maximum probable development level of the area to be serviced;
 - (b) requiring the management of connections to the wastewater network;
 - (c) requiring wastewater networks to be managed in accordance with a network operations plan including an overflow mitigation plan with clear requirements and timeframes; and
 - (d) designing and locating overflow points to minimise nuisance, damage, public health risk and adverse ecological effects.
- (20) Require land use and development in areas serviced by a combined sewer network to:
- (a) avoid increasing stormwater flows to the combined sewer network, unless any increase is minor and there is no practicable alternative;
 - (b) where practicable, reduce stormwater flows from existing impervious areas to the combined sewer network at the time of urban intensification, redevelopment or subdivision; and
 - (c) discharge stormwater from new impervious areas and existing impervious areas to a separated stormwater system, or a suitable alternative, where one of those options is available.
- (21) Progressively minimise the adverse effects of wet weather overflows from wastewater networks by:
- (a) adopting the best practicable option to reduce wet weather overflows to an average of no more than two events per discharge location per year in areas serviced by a separated wastewater network with priority for:
 - (i) receiving environments that are used for public and contact recreation activities;
 - (ii) receiving environments that are sensitive to the adverse effects of wastewater overflows;
 - (iii) areas significant to Mana Whenua; or
 - (iv) adopting the best practicable option to reduce wet weather overflows from the combined sewer network.
 - (b) requiring the development and implementation of a network operations plan; as part of any network discharge consent; and

(c) adopting wastewater overflow response procedures.

(22) Minimise the adverse effects of dry weather overflows by:

(a) ensuring wastewater networks and combined sewer networks are operated and maintained to minimise the likelihood of dry weather overflows occurring; and

(b) adopting wastewater overflow response procedures to minimise adverse effects and risks to public health and safety and the environment.

(26) Prevent or minimise the adverse effects from construction, maintenance, investigation and other activities on the quality of freshwater and coastal water by:

(a) adopting best management practices and establishing minimum standards for the discharges; or

(b) where Policy E1.3(26)(a) is not practicable, have regard to the following:

(i) the nature, volume and concentration of the contaminants in the discharge;

(ii) the sensitivity of the receiving environment to the contaminants in the discharge;

(iii) other practicable options for the discharge, including reuse or discharge to the trade sewer; and

(iv) practicable measures to reduce contaminant concentrations prior to discharge or otherwise mitigate adverse effects.

E2 Water quantity, allocation and use

E3. Lakes, rivers, streams and wetlands

E3.2. Objectives [rp]

(1) Auckland's lakes, rivers, streams and wetlands with high natural values are protected from degradation and permanent loss.

(2) Auckland's lakes, rivers, streams and wetlands are restored, maintained or enhanced.

(3) Significant residual adverse effects on lakes, rivers, streams or wetlands that cannot be avoided, remedied or mitigated are offset where this will promote the purpose of the Resource Management Act 1991.

(4) Structures in, on, under or over the bed of a lake, river, stream or wetland are provided for where there are functional or operational needs for the structure to be in that location, or traverse that area.

(5) Activities in, on, under or over the bed of a lake, river, stream and wetland are managed to minimise adverse effects on the lake, river, stream or wetland.

(6) Reclamation and drainage of the bed of a lake, river, stream and wetland is avoided, unless there is no practicable alternative.

E3.3. Policies [rp]

(1) Avoid significant adverse effects, and avoid where practicable or otherwise remedy or mitigate other adverse effects of activities in, on, under or over the beds of lakes, rivers, streams or wetlands within the following overlays:

(a) Natural Stream Management Areas Overlay;

(b) Natural Lake Management Areas Overlay;

(c) Urban Lake Management Areas Overlay;

(d) Significant Ecological Areas Overlay; and

(e) Wetland Management Areas Overlay.

(2) Manage the effects of activities in, on, under or over the beds of lakes, rivers, streams or wetlands outside the overlays identified in Policy E3.3(1) by:

(a) avoiding where practicable or otherwise remedying or mitigating any adverse effects on lakes, rivers, streams or wetlands; and

(b) where appropriate, restoring and enhancing the lake, river, stream or wetland.

(3) Enable the enhancement, maintenance and restoration of lakes, rivers, streams or wetlands.

(4) Restoration and enhancement actions, which may form part of an offsetting proposal, for a specific activity should:

(a) be located as close as possible to the subject site;

(b) be 'like-for-like' in terms of the type of freshwater system affected;

(c) preferably achieve no net loss or a net gain in the natural values including ecological function of lakes, rivers, streams or wetlands; and

(d) consider the use of biodiversity offsetting as outlined in Appendix 8 Biodiversity offsetting.

(5) Avoid significant adverse effects, and avoid, remedy or mitigate other adverse effects of activities in, on, under or over the beds of lakes, rivers, streams or wetlands on:

(a) the mauri of the freshwater environment; and

(b) Mana Whenua values in relation to the freshwater environment.

(6) Manage the adverse effects on Mana Whenua cultural heritage that is identified prior to, or discovered during, subdivision, use and development by:

- (a) complying with the protocol for the accidental discovery of kōiwi, archaeology and artefacts of Māori origin;
- (b) undertaking appropriate actions in accordance with mātauranga and tikanga Māori; and
- (c) undertaking appropriate measures to avoid adverse effects, or where adverse effects cannot be avoided, effects are remedied or mitigated.

(10) Enable the planting of any plant, excluding pest species, in, on, or under the bed of a lake, river, stream or wetland where it is suitable for habitat establishment, restoration or enhancement, the maintenance and enhancement of amenity values, flood or erosion protection or stormwater runoff control provided it does not create or exacerbate flooding.

(11) Encourage the planting of plants that are native to the area.

(12) Encourage the incorporation of Mana Whenua mātauranga, values and tikanga in any planting in, on, or under the bed of a lake, river, stream or wetland.

(13) Avoid the reclamation and drainage of the bed of lakes, rivers, streams and wetlands, including any extension to existing reclamations or drained areas unless all of the following apply:

- (a) there is no practicable alternative method for undertaking the activity outside the lake, river, stream or wetland;
- (b) for lakes, permanent rivers and streams, and wetlands the activity is required for any of the following:
 - (i) as part of an activity designed to restore or enhance the natural values of any lake, river, stream or wetland, any adjacent area of indigenous vegetation or habitats of indigenous fauna;
 - (ii) for the operation, use, maintenance, repair, development or upgrade of infrastructure; or
 - (iii) to undertake mineral extraction activities; and

(c) the activity avoids significant adverse effects and avoids, remedies or mitigates other adverse effects on Mana Whenua values associated with freshwater resources, including wāhi tapu, wāhi taonga and mahinga kai.

(15) Protect the riparian margins of lakes, rivers, streams, and wetlands from inappropriate use and development and promote their enhancement to through all of the following:

- (a) safeguard habitats for fish, plant and other aquatic species, particularly in rivers and streams with high ecological values;
- (b) safeguard their aesthetic, landscape and natural character values;
- (c) safeguard the contribution of natural freshwater systems to the biodiversity, resilience and integrity of ecosystems; and
- (d) avoid or mitigate the effects of flooding, surface erosion, stormwater contamination, bank erosion and increased surface water temperature.

(16) Protect land alongside streams for public access through the use of esplanade reserves and esplanade strips, marginal strips, drainage reserves, easements or covenants where appropriate and for water quality, ecological and landscape protection purposes.

E11 Land disturbance – Regional

E11.2. Objectives [rp]

- (1) Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment.
- (2) Sediment generation from land disturbance is minimised.

E11.3. Policies [rp]

(1) Avoid where practicable, and otherwise mitigate, or where appropriate, remedy adverse effects on areas where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character.

(7) Require any land disturbance that will likely result in the discharge of sediment laden water to a surface water body or to coastal water to demonstrate that sediment discharge has been minimised to the extent practicable, having regard to the quality of the environment; with:

- (a) any significant adverse effects avoided, and other effects avoided, remedied or mitigated, particularly in areas where there is:
 - (i) high recreational use;
 - (ii) relevant initiatives by Mana Whenua, established under regulations relating to the conservation or management of fisheries, including taiōpure, rōhui or whakatupu areas;
 - (iii) the collection of fish and shellfish for consumption;
 - (iv) maintenance dredging; or
 - (v) a downstream receiving environment that is sensitive to sediment accumulation;
 - (b) adverse effects avoided as far as practicable within areas identified as sensitive because of their ecological values, including terrestrial, freshwater and coastal ecological values; and
 - (c) the receiving environments ability to assimilate the discharged sediment being taken into account.
- (8) Monitor the quality of fresh and coastal water bodies across the region and the effects of land disturbance on water quality and receiving environments.

E12 Land disturbance – District

E12.2. Objectives

(1) Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment.

E12.3. Policies

(1) Avoid where practicable, and otherwise, mitigate, or where appropriate, remedy adverse effects of land disturbance on areas where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character.

E15 Vegetation management and biodiversity

E15.2. Objectives [rcp/rp/dp]

(1) *Ecosystem services and indigenous biological diversity values, particularly in sensitive environments, and areas of contiguous indigenous vegetation cover, are maintained or enhanced while providing for appropriate subdivision, use and development.*

(2) *Indigenous biodiversity is restored and enhanced in areas where ecological values are degraded, or where development is occurring.*

E15.3. Policies [rcp/rp/dp]

(1) *Protect areas of contiguous indigenous vegetation cover and vegetation in sensitive environments including the coastal environment, riparian margins, wetlands, and areas prone to natural hazards.*

(2) *Manage the effects of activities to avoid significant adverse effects on biodiversity values as far as practicable, minimise significant adverse effects where avoidance is not practicable, and avoid, remedy or mitigate any other adverse effects on indigenous biological diversity and ecosystem services, including soil conservation, water quality and quantity management, and the mitigation of natural hazards.*

(3) *Encourage the offsetting of any significant residual adverse effects on indigenous vegetation and biodiversity values that cannot be avoided, remedied or mitigated, through protection, restoration and enhancement measures, having regard to Policy E15.3(4) below and Appendix 8 Biodiversity offsetting.*

(4) *Protect, restore, and enhance biodiversity when undertaking new use and development through any of the following:*

(a) *using transferable rural site subdivision to protect areas in Schedule 3 Significant Ecological Areas -Terrestrial Schedule;*

(b) *requiring legal protection, ecological restoration and active management techniques in areas set aside for the purposes of mitigating or offsetting adverse effects on indigenous biodiversity; or*

(c) *linking biodiversity outcomes to other aspects of the development such as the provision of infrastructure and open space.*

(9) *Avoid activities in the coastal environment where they will result in any of the following:*

(a) *non-transitory or more than minor adverse effects on:*

(i) *threatened or at risk indigenous species (including Maui's Dolphin and Bryde's Whale);*

(ii) *the habitats of species that are at the limit of their natural range or which are naturally rare;*

(iii) *threatened or rare ecosystems, including naturally rare ecosystems;*

(iv) *areas containing nationally significant examples of indigenous ecosystems or indigenous community types; or*

(v) *areas set aside for full or partial protection of indigenous biodiversity under other legislation, including the West Coast North Island Marine Mammal Sanctuary.*

(b) *any regular or sustained disturbance of migratory bird roosting, nesting and feeding areas that is likely to noticeably reduce the level of use of an area for these purposes, or result in permanent abandonment of an area;*

(c) *the deposition of material at levels which would adversely affect the natural ecological functioning of the area; or*

(d) *fragmentation of the values of the area to the extent that its physical integrity is lost.*

(10) *Avoid (while giving effect to Policy E15(8) above) activities in the coastal environment which result in significant adverse effects, and avoid, remedy or mitigate other adverse effects of activities, on:*

(a) *areas of predominantly indigenous vegetation;*

(b) *habitats that are important during the vulnerable life stages of indigenous species;*

(c) *indigenous ecosystems and habitats that are found only in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, intertidal zones, rocky reef systems and saltmarsh;*

(d) *habitats of indigenous species that are important for recreational, commercial, traditional or cultural purposes including fish spawning, pupping and nursery areas;*

(e) *habitats, including areas and routes, important to migratory species;*

- (f) ecological corridors, and areas important for linking or maintaining biological values; or*
- (g) water quality such that the natural ecological functioning of the area is adversely affected.*

Chapter E – Auckland-Wide

E38 Subdivision - Urban

E38.2. Objectives

(1) Land is subdivided to achieve the objectives of the residential zones, business zones, open space zones, special purpose zones, coastal zones, relevant overlays and Auckland-wide provisions.

E38.3. Policies

(5) Provide for subdivision of residential zoned sites containing indigenous vegetation scheduled in the D9 Significant Ecological Areas Overlay where the significant ecological area is to be protected, and enable the same or a similar number of sites to be created as would be enabled if the site did not contain a significant ecological area.

(14) Encourage the design of subdivision to incorporate and enhance land forms, natural features, and indigenous trees and vegetation.

(22) Require subdivision to be designed to manage stormwater:

(a) in accordance with any approved stormwater discharge consent or network discharge consent;

(b) in a manner consistent with stormwater management policies in E1 Water quality and integrated management;

(c) by applying an integrated stormwater management approach to the planning and design of development in accordance with stormwater management policies in E1 Water quality and integrated management;

(d) to protect natural streams and maintain the conveyance function of overland flow paths;

(e) to maintain, or progressively improve, water quality;

(f) to integrate drainage reserves and infrastructure with surrounding development and open space networks; and

(g) in an integrated and cost-effective way.