Tahimana Subdivision, Tasman

Fast Track Substantive Application

Ecological Effects Assessment

Report prepared for

Tahimana Limited

Prepared by

RMA Ecology Ltd

July 2026

BETTER ECOLOGICAL OUTCOMES

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Tahimana Limited

c/ Staig and Smith Ltd

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rma ecology
BETTER ECOLOGICAL OUTCOMES

Contents

1.0 Introduction

1.1 Background

This report provides an assessment of the ecological values and potential ecological effects of a subdivision development and associated earthworks ('the project') proposed for a property on Stagecoach Road, Tasman, legal description Lot 1 DP 450728 and Lot 3 DP 450728 ('the site') (**Figure 1**). It includes an assessment of the project's regionally significant benefit to wetlands.

The project is to subdivide and develop land for the purpose of establishing a residential and rural lifestyle development on approximately 70 hectares of land off Stagecoach Road, Tasman, in the Tasman District (**Figure 2**). The project will include works within Stagecoach Road, Dicker Road and Williams Road reserves.

1.2 Purpose and scope

Tahimana Limited has engaged RMA Ecology Ltd to undertake an assessment of the ecological values of the site, and a subsequent assessment of potential adverse effects on those values arising from the proposed project works[1].

The approach includes survey of freshwater and terrestrial ecological values and provides the following:

- Review of databases to identify the likelihood of species of conservation significance being present, with an emphasis on freshwater fish, lizards, birds, bats, and plants.
- Walkover survey to identify or validate the presence of native vegetation, especially areas that meet the criteria for wetland under the National Policy Statement for Freshwater Management (NPS-FM).
- Wetland-specific assessments to:
    - Determine wetland values, using qualitative scoring methods; and
    - Map the extent of wetlands.
- Watercourse assessments to:
    - Determine the categories of watercourses, according to the Tasman Resource Management Plan (TRMP) criteria (river, modified watercourse, and farm drainage canal or ditch; and
    - Map the extent of watercourses.

1.3 Code of conduct for expert witnesses

The report authors record that they have read and agree to and comply with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. This report is within the authors' area of expertise, except where the report states that the authors rely upon the reports of other experts. Th authors have not omitted to consider any material facts known to them that might alter or detract from the conclusions reached.

[1] This report has been prepared in accordance with our letter of engagement with Tahimana Ltd, formerly Tasman Bay Estates Ltd, dated 13 January 2022.

This report contains the following:

- An overview of the methods used to assess the ecological values of the site and immediate surrounds (**Section 2.0**);
- A description of ecological values within the site and immediate surrounds (**Section 3.0**);
- An assessment of the potential effects associated with the development, construction, and operational activities of the proposed project (**Section 5.0**);
- Recommendations for measures to avoid, remedy or mitigate any identified adverse effects, and therefore ensure no net loss of biodiversity (**Section 6.0**); and
- An assessment of the regionally significant benefits to wetlands of the proposed restoration works (**Section 8.0**).

The report has been prepared with regard to the ecological provisions of the TRMP, the NPS-FM, the National Environmental Standards for Freshwater 2020 (NES-F), and the National Policy Statement for Indigenous Biodiversity (NPS-IB).

Figure 1: Location of the site (turquoise boundary lines). The site comprises two lots, legal descriptions Lot 1 DP 450728 (western lot) and Lot 3 DP 450728 (eastern lot).

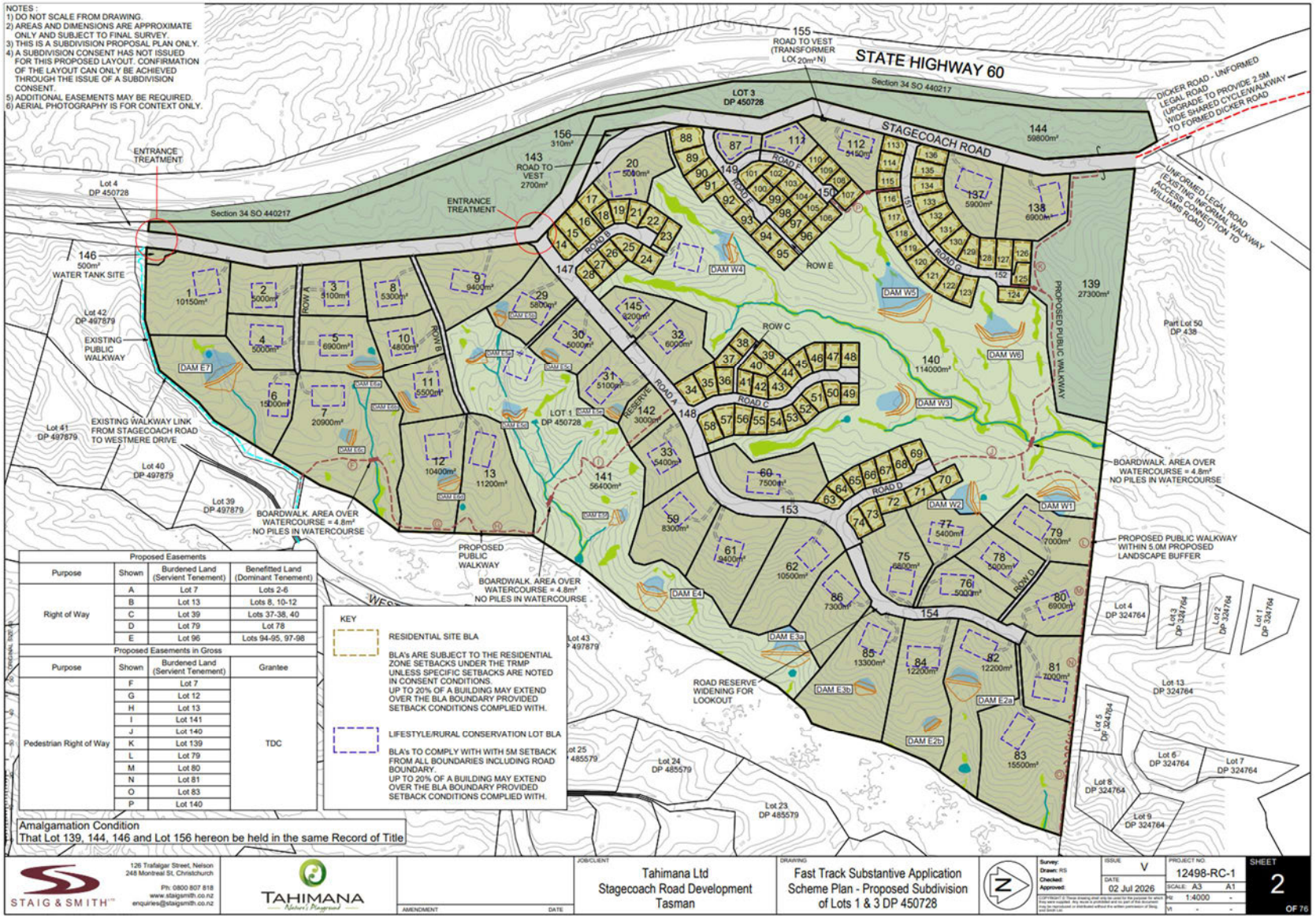


Figure 2: Scheme Plan for the proposed subdivision showing the larger lifestyle lots and smaller residential lots. The proposed walkways are illustrated with a red dashed line. Wetlands are shown in green, and streams and farm ponds are marked in blue.

2.0 Methods

Desktop analyses and site visits were undertaken to assess the ecological values of both aquatic and terrestrial areas within the site and immediate surrounds.

2.1 Desktop assessment

A desktop assessment of the site and surrounding environs was undertaken to identify areas of the site that had potential for supporting ecological values. The following databases and documents were reviewed:

- Land Environments New Zealand (LENZ) and the Threatened Environment Classification (TEC);
- Historic aerial photographs (Tasman District Council: Top of the South Maps);
- Tasman Resource Management Plan (TRMP) maps (Top of the South Maps);
- NIWA New Zealand Freshwater Fish database;
- Department of Conservation National Amphibian and Reptile Database;
- Department of Conservation bat records database; and
- Tasman District Council's wetland mapping project.

The TRMP maps were reviewed to identify existing vegetation and streams present on the site, and to establish an understanding of these features' ecological status. Streams, wetlands, and terrestrial vegetation identified from the maps were then surveyed and assessed on site. Tasman District Council's desktop wetland mapping project provided baseline information regarding wetlands on, and adjacent to, the site.

Data from national fauna databases was analysed to assess the likelihood of their presence on site, or nearby, and their threat status checked under the New Zealand Threat Classification System[2].

2.2 Field assessment

Site visits were undertaken on 1, 2 and 8 February 2022 to assess the ecological values present within the site. Additional site visits (approximately six) were undertaken over late 2022 and 2023 to obtain further information on specific parts of the site, or as part of consultation, during which further site photos and data were opportunistically collected.

A survey of all wetlands and watercourses was undertaken, as were assessments of fauna at the site, including birds, bats, and lizards. Wetlands, watercourses, and any areas of terrestrial fauna habitat recorded were mapped using hand held GPS (accurate to +/ - 4 m). Methods for assessing the ecological features present are described in the following sections, and full details of methods used can be found in **Appendix A**.

[2] www.nztcs.org.nz

2.3 Watercourses

All watercourses were assessed against the Tasman Resource Management Plan definitions for watercourses. Under the TRMP, there are four watercourse categories – river, modified watercourse, artificial watercourse, and farm drainage canal (or ditch) – as described below:

> ***River*** *– means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal).*
>
> ***Modified watercourse*** *- means a river or stream that may have been subject to works or modifications for a variety of purposes and is or has one or more of the following features:*
>
> > *(a) part of a river, stream or creek that has been channelled or diverted;*
> >
> > *(b) part of a wetland or swamp through which water has been channelled or diverted to flow either permanently or intermittently and which connects with other naturally occurring bodies of water;*
> >
> > *(c) a watercourse that has a natural headwater of either a channel or spring and generally follows the path of a historic river or stream or defined drainage channel that functions naturally by providing a connection between surface water and groundwater, and is capable of providing habitat for flora and fauna.*
>
> ***Artificial watercourse*** *- means a constructed watercourse that contains no natural portion from its confluence with a river or stream to its headwaters and includes any:*
>
> > *(a) irrigation canal;*
> >
> > *(b) water supply race;*
> >
> > *(c) canal for the supply of water for electricity power generation;*
> >
> > *(d) roadside drain (or water table or culvert) that is constructed alongside or under roads used by vehicles and has as its primary function the drainage of surface water from the road;*
> >
> > *(e) farm drainage canal.*
>
> ***Farm drainage canal (or ditch)*** *- means an artificial watercourse that:*
>
> > *(a) is entirely constructed for rural land drainage purposes, with no part being a natural or modified watercourse or river; and*
> >
> > *(b) does not incorporate naturally occurring bodies of surface freshwater.*
> >
> > *A farm drainage canal is usually constructed to enhance production from farm land by improving land drainage.*

2.4 Wetlands

Areas of potential wetland were assessed using the definition within the TRMP and the Resource Management Act 1991 (RMA):

- ***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.*

Areas determined to meet the TRMP/ RMA definition of a 'wetland' were then further assessed using the definition of a 'natural inland wetland' within the National Policy Statement for Freshwater Management 2020:

- ***Natural inland wetland*** *means a wetland (as defined in the Act) that is not:*

a) in the coastal marine area; or

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

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

d) a geothermal wetland; or

e) a wetland that:

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

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

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

The NPS-FM technical support documents updated by the Ministry for the Environment (MfE) in January 2023 regarding wetland classification and delineation require that a step-wise assessment of potential wetland areas is undertaken based on vegetation, soils, and hydrology.

Exclusions are then applied based on factors that include the percentage abundance of pasture species, whether the wetland has developed in or around a deliberately constructed water body, an assessment of threatened species habitat use, and then application of three separate vegetation tests (Rapid Test, Dominance Test, and Prevalence Index). Wetland soils and hydrology information can be applied if the results of vegetation community and exotic pasture grass exclusion are inconclusive. Key for the identification of natural inland wetlands at this site is whether any wet areas have developed in or around a deliberately constructed water body, or are dominated by pasture grasses.

We understand that the National Environmental Standards for Freshwater 2020 (NES-F) and NPS-FM require Councils to ensure that the loss of values and extent of 'natural inland wetlands' is avoided in most instances (excluding some activities, including urban development). The NPS-FM/ NES-F also restricts activities within a 10 m buffer around 'natural inland wetlands', and places controls on the level of potential adverse effects (from, for example, discharge of water or diversion of water) within 100 m from a 'natural inland wetland'.

The complete methodology applied for the identification of wetlands at this site is set out in **Appendix A**.

2.5 Terrestrial ecology

Terrestrial vegetation was assessed across the site with a focus on the presence of indigenous species. Areas of predominantly indigenous vegetation were mapped using handheld GPS.

Any potential lizard habitat present on the site was mapped, and casual observations of lizards present during the site visits were recorded. Any potential habitat for bats (e.g., large mature trees with flaking bark, knotholes or cracks) was recorded.

Birds identified visually and audibly during the field visits were recorded across the site, including native and introduced species. Potential food sources and nesting habitat were noted for the purpose of estimating the potential loss of resources associated with the planned development.

3.0 Results

3.1 Ecological context

The site is located within a typical Tasman rural environment. The original natural ecology has been heavily modified or removed through past and current farming activities; however, the site still supports freshwater ecosystems which are of ecological value. Historic photographs indicate that the land has been cleared of native vegetation for many decades for farming and/ or forestry activities (**Figure 3**). The site is currently used for livestock grazing.

The site is situated within the Moutere Ecological District, which is characterised by rolling hills made up of Moutere Gravel. The district would have been originally under forest, predominantly beech, throughout. Tall podocarps (tōtara, mataī, rimu, miro, and kahikatea) would have been the dominant species in the forest that grew in the broad river valleys. Some lowland hardwood forest with podocarps occurred near the coast (tawa, pukatea, tītoki, karaka, māhoe, and tōtara, mataī, and some nīkau).

Today, there are only small remnants of podocarp and hardwood forests, and more frequent larger remnants of beech forest. Large areas of continuous forest remain in the southern uplands of the district.

The Threatened Environments Classification (Walker *et al.* 2015) shows how much native (indigenous) vegetation remains within land environments, and how past vegetation loss and legal protection are distributed across New Zealand's landscape. The site lies within the Threatened Environment class categorised by having less than 10 % of indigenous cover left. In these environments, the loss of habitats for indigenous species has been greatest in the past and little indigenous biodiversity remains.

Land Environments of New Zealand (LENZ) is a quantitatively-based classification of New Zealand's terrestrial environment developed by Landcare Research[3], which has resulted in a number of datasets including the Land Cover Database (LCDB). LCDB v5.0 provides an indication of current land use, and land use change since its inception in 1996. The LCDB shows that the pine plantation on both parts of the site was in existence in 1996, but had been harvested by 2001. By 2008, Lot 3 DP450728 had been returned to pasture and was classified as high producing exotic grassland, whereas Lot 1 DP450728 had been re-planted with pine. In the 2018 classification, both lots retained their 2008 classification.

[3] https://www.landcareresearch.co.nz/tools-and-resources/mapping/lenz/

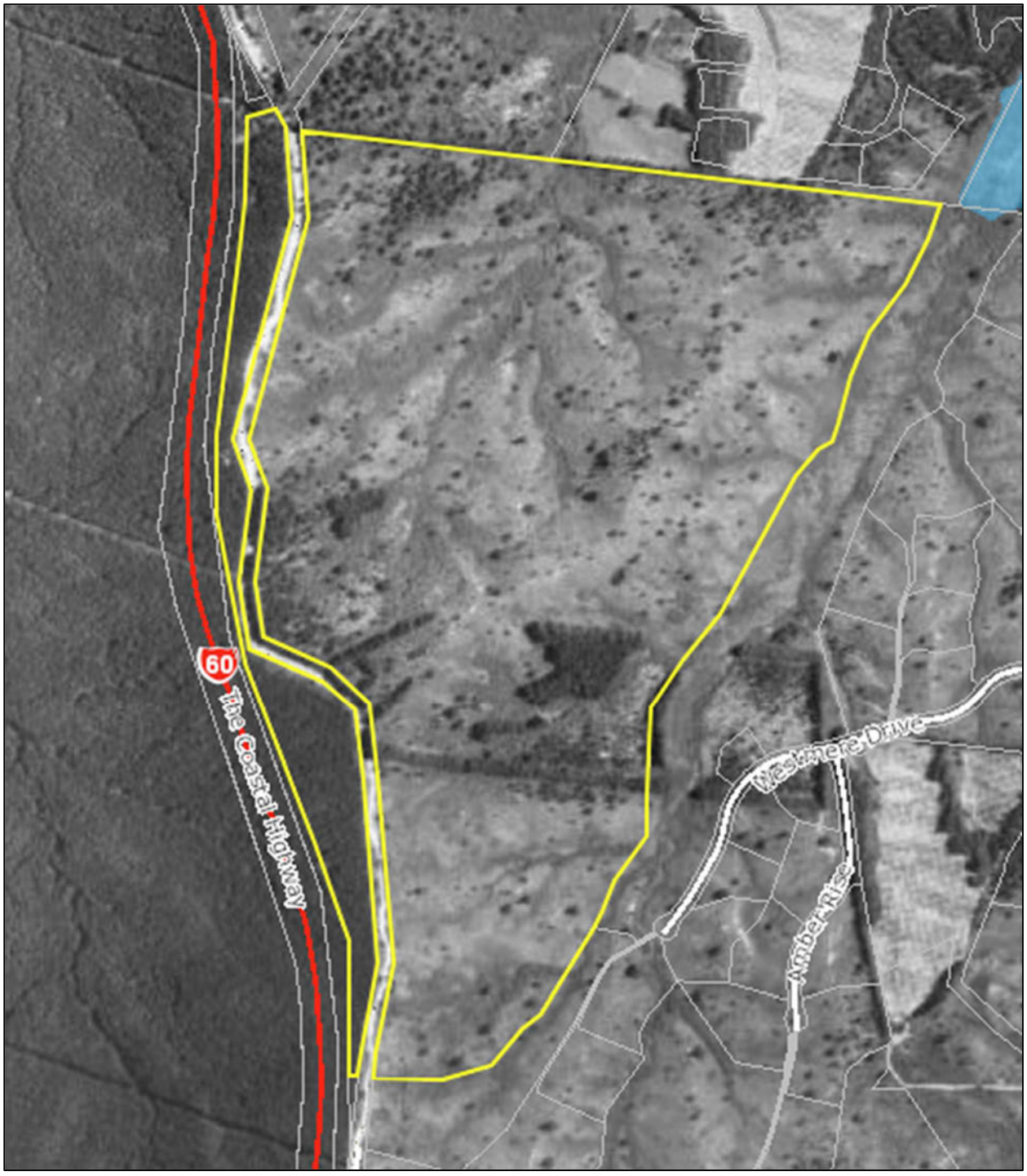


Figure 3: Historic aerial photograph from the 1940s showing the main site (Lot 3 DP450728) cleared of native vegetation and presumably being used for the grazing of stock. Lot 1 DP450728 has been planted in pine. The site boundary is shown in yellow. Aerial imagery from the 1980s shows the main site also under pine plantation. (Source: Tasman District Council – Top of the South Maps).

3.2 Watercourses

The site visit and assessment identified 13 watercourses on Lot 1 DP450728 that meet the definition of 'river' in the TRMP (**Table 1**). There are no watercourses on Lot 3 DP450728.

The definition of a 'river' in the TRMP uses the legal definition stated in the Resource Management Act 1991, which is:

> *A continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal).*

Table 1 provides a summary of the characteristics and condition of the streams within the site. See footnotes for an explanation of the qualitative assessments.

An overview map of the stream and wetland network across the site is presented in **Figure 4**, and detailed map sections are available in **Appendix B.**

All the streams are in poor to very poor condition as a result of past and present land uses, including for grazing of livestock. Stock continues to have access to all the streams, and trampling of the stream beds and grazing of riparian vegetation is in evidence throughout the site. Despite their degraded condition, the streams are part of a network of watercourse and wetland habitat, and will contribute towards ecosystem services such as a stormwater attenuation.

Water quality was not tested; however, it is very likely that stock access to the wetlands and watercourses has resulted in elevated suspended sediments, elevated faecal coliform counts and degraded water quality overall within the site, and because this is a headwater system, will be a contributor to degraded water quality in downstream catchment areas as well.

Detailed descriptions of the streams follow in **Sections 3.2.1 to 3.2.5.**

Table 1: Watercourses identified at the site, including tributaries, their lengths and a summary of their characteristics and condition.

Stream	Type	Watercourse classification	Length (m)	Riparian diversity[1]	Channel shade[2]	In stream habitat[3]	Bed characteristics[4]	Overall condition[5]
R1	Intermittent upper reaches; permanent lower reaches	River/ stream	326	Moderate	Moderate	Poor	Poor	Poor
R1.1	Intermittent	River/ stream	41	Poor	Poor	Very poor	Poor	Poor
R1.2	Intermittent	River/ stream	56	Moderate	Moderate	Poor	Poor	Poor
R1.3	Intermittent	River/ stream	88	Moderate	Moderate	Poor	Poor	Poor
R1.4	Intermittent	River/ stream	21	Poor	Moderate	Very poor	Poor	Poor
R2	Intermittent	River/ stream	38	Moderate	Moderate	Poor	Poor	Poor
R2.1	Intermittent	River/ stream	169	Moderate	Moderate	Poor	Poor	Poor
R3	Intermittent	River/ stream	80	Moderate	Moderate	Poor	Poor	Poor
R4	Intermittent	River/ stream	50	Poor	Poor	Poor	Very poor	Poor
R5	Intermittent upper reaches; permanent lower reaches	River/ stream	527	Very poor	Very poor	Very poor	Very poor	Very poor
R5.1	Intermittent	River/ stream	108	Very poor	Very poor	Very poor	Very poor	Very poor
R5.2	Intermittent	River/ stream	39	Very poor	Very poor	Very poor	Very poor	Very poor
R5.3	Intermittent	River/ stream	81	Very poor	Very poor	Very poor	Very poor	Very poor

Notes:

1. Riparian diversity assessed as: no vegetation (very poor), pasture or grass or monoculture of low weeds (poor), several woody plant species either native or exotic (moderate), many woody plant species; mixed exotic/ native/ successional species (good); highly diverse range of native plant species forming a mature or maturing canopy with understorey and ground tiers (very good).
2. Channel shade assessed as: fully open; lack of canopy cover (very poor); <20 % water surface shaded (poor); 20 – 60 % water surface shaded; mostly open with shaded patches (moderate); 60 – 80 % water surface shaded; mostly shaded with some open patches (good); > 80 % water surface shaded; full canopy (very good).
3. In stream habitat assessed as: favourable habitats (woody debris, rooted aquatic vegetation, leaf packs, undercut banks, root mats, stable habitat) limited and coverage <10 % channel (very poor); favourable habitat diversity limited to 1-2 types; woody debris rare, coverage 10 – 30 % of channel (poor); moderate variety of habitat types (3-4 types) covering 30 – 50 % channel (moderate); most habitat types present, covering 50 – 75 % channel (good); all habitat types present covering >75 % of channel (very good).
4. Bed characteristics assessed as: Very high loading of un-natural silt and uniform hydrologic conditions (very poor); un-natural siltation with limited variety of hydrological conditions (poor); mostly natural bed substrates with moderate variety of hydrologic conditions (moderate); natural bed substrates with a good variety of pools, runs, riffles (good); natural bed substrates with the full range of hydrologic conditions present (deep and shallow pools, chutes, runs, riffles) (very good).
5. Overall condition assessed as a combination of the four key characteristics with scores all or predominately of 'poor' returning an overall poor condition or very poor, scores predominantly or mostly of 'moderate' returning an overall moderate condition, and scores all or predominately of 'good' returning an overall good condition.

Figure 4: Map of the stream (blue lines) and wetland (green polygons) network. Farm ponds are shown as turquoise polygons. The site boundary is marked by turquoise lines. Detailed maps of the streams and wetlands can be found in Appendix B.

3.2.1 Stream R1 and tributaries

Stream R1 is the second longest stream at the site at approximately 300 m in length. Stream R1 is in the central-eastern part of the site, and drains north-eastward to the site boundary. There are four tributaries that flow into Stream R1 – Streams R1.1, R1.2, R1.3 and R1.4.

Stream R1 flows intermittently in its upper reaches, through a clearly defined channel that is lined for most of its length by a mix of native and exotic trees and shrubs (**Plate 1**), providing a moderate degree of shade. Approximately half way along its reach, Stream R1 dissipates into the ground and a channel is no longer in evidence. The lower third of the channel is more permanently wet, and flows through a narrow band of wetland vegetation including *Carex* sedge species, with no woody riparian vegetation along the banks (**Plate 2**). The channel is fairly uniform in shape, with little variation in hydrological conditions, and provides limited habitat for fish and aquatic invertebrates e.g. leaf mats and overhanging vegetation. The channel substrate consists of fine sediment, with unnaturally high loads, particularly in the downstream reach.

Tributaries R1.1 to R1.4 flow intermittently. Their banks are lined with varying densities of native and exotic trees and pasture grass, providing limited to moderate shade. In-stream habitat is limited to over-hanging riparian vegetation, leaf mats and occasional woody debris, with little variation in hydrological conditions. The channel substrate consists of fine sediment, with unnaturally high loads, particularly in downstream reaches.

3.2.2 Stream R2 and R2.1

Stream R2.1 is 169 m in length and flows intermittently, in an easterly direction towards the eastern property boundary. There is a small farm pond at its head, and the lower third of the stream flows through a narrow band of wetland vegetation including sedges (*Carex* spp.) and rushes (*Juncus* spp.) (**Plate 3**). The upper reaches of the stream flow under a copy of pine trees and scattered native shrubs including mahoe (*Melicytus ramiflorus*) and karamu (*Coprosma robusta*). The riparian vegetation provides moderate levels of shade.

Stream R2 is a short tributary that joins R2.1 at its upstream end. It flows intermittently, and flows beneath a canopy of pine trees and scattered native shrubs (**Plate 4**) which provides moderate levels of shade.

In-stream habitat in both R2.1 and R2 is limited to leaf mats and occasional woody debris, with limited variation in hydrological conditions. The channels of both streams consist of fine sediment.

3.2.3 Stream R3

Stream R3 is a short length of intermittent stream (80 m) in the southern end of the site that flows north-east and then east towards the site boundary (**Plate 5**). Much of its bank is lined by native shrubs including mahoe, marbleleaf (*Carpodetus serratus*) and five finger (*Pseudopanax arboreus*) and/ or pine trees, which provide moderate levels of shade. Scattered sedges including *Carex virgata* are present along the edges of the channel. In-stream habitat is limited to leaf mats and occasional woody debris, with limited variation in hydrological conditions. The channel substrate consists of fine sediment.

3.2.4 Stream R4

Stream R4 is a short length (50 m) of intermittent stream in the north eastern corner of the site that flows in an easterly direction towards the site boundary (**Plate 6**). There are a few native shrubs and pine trees along

the stream banks, but the majority of the stream flows through pasture grasses with no woody riparian vegetation. The lower half of the stream flows through a narrow band of wetland vegetation including *Carex* species. The levels of shading are low, and there is limited in-stream habitat, with limited variation in hydrological conditions. The channel substrate consists of fine sediment, with unnaturally high loads, particularly at the downstream end.

3.2.5 Stream R5 and tributaries

Stream R5 is the longest stream at the site, at 527 m in length and drains the largest catchment at the site. Stream R5 is located in the western-most valley and drains to the north. There are three tributaries that flow into Stream R5 – Streams R5.1, R5.2 and R5.3.

Stream R5 is intermittent in its upper reaches (**Plate 7**), and becomes more permanent towards its downstream end (**Plate 8**). There are only a few scattered pine trees along the length of Stream R5 – the remaining riparian vegetation consists of pasture grasses or a narrow band of wetland vegetation including *Carex* and *Juncus* species (Wetlands W70 and W34). The headwaters of Stream R5 flow out of another wetland (Wetland W32).

Tributaries R5.1 to R5.3 flow intermittently through pasture grass and a few scattered pine trees. The lower end of R5.1 flows through Wetland W35, and R5.2 flows through Wetland W33.

The level of shading along Stream R5 and its tributaries is very low, and there is very limited in-stream habitat. The channel substrate consists of fine sediment, with unnaturally high loads, particularly in the lower reaches of the streams.

Plate 1: Upper reaches of Stream R1 that flow intermittently through a clearly defined channel. The channel is lined with woody vegetation, which is predominantly native, such as māhoe, with scattered exotic pine trees.

Plate 2: The lower reaches of Stream R1 flow through a narrow band of wetland vegetation including sedges and rushes. There is no woody riparian vegetation along the lower reach of the stream.

Plate 3: Lower reach of Stream R2.1 which flows through a narrow band of wetland vegetation including sedge and rush species after emerging from the canopy of pine trees and scattered native shrubs in the upper reaches.

Plate 4: Upper reaches of the tributary Stream R2, which flows intermittently and was dry at the time of the site visit in summer (February 2022).

Plate 5: Stream R3 showing scattered *Carex virgata* and the narrow band of native shrubs that line much of the length of the stream.

Plate 6: Lower reaches of Stream R4 marked by the narrow band of wetland vegetation, including *Carex* species.

Plate 7: The incised upper reaches of Stream R5 flow intermittently and were predominantly dry at the time of the site visits in summer (February 2022). Previous and current land uses have resulted in the loss of riparian vegetation and exacerbated severe erosion of stream banks.

Plate 8: Lower quarter of Stream R5 which is flows more permanently than the intermittent upper reaches. Wetland vegetation including *Carex* species and *Juncus* species is present in the lower reaches and there is almost no woody riparian vegetation present. Stock have access to the stream along its full length; the effects of stock trampling, pugging and browse are obvious in the photograph.

3.3 Wetlands

Fifty-four (54) natural inland wetlands have been identified on the main section of the site (Lot 1 DP450728) from the field surveys. These wetlands meet the criteria of a natural inland wetland as defined in the NPS-FM. The wetlands cover a total combined area of 1.25 ha. The wetlands have been grouped by similar characteristics such as hydrology, vegetation, and soils, and the groups are briefly described in **Table 2** below. Representative photographs of a range of wetlands are illustrated in **Plates 9 to 12**.

The wetlands are a combination of seepage zones in catchment heads, and riparian margin wetlands. The seepage zones would have most likely not been visible at the ground surface when pine forest was present, but are now visible with pasture cover. These wetlands have not been identified in Tasman District Council's desktop wetland mapping project, as a desktop method was unlikely to have picked up the fine detail of these small catchment head and seep wetlands.

The riparian margin wetlands are most probably a mix of induced wetland margins through stock trampling and pugging of stream margins, as well as localised intersection where larger seepage heads meet overland flow or stream channels.

Lot 3 DP450728 does not support any wetlands.

All the wetlands on Lot 1 DP450728 are degraded as a result of decades of previous land uses, including forestry and farming, and the current use of the land for livestock grazing. They are of poor ecological quality, supporting only a low diversity of common wetland plant species, both native and exotic. The

wetlands are unlikely to provide much habitat for native fish species, other than in areas where wetland connects with a stream and where standing water is present year-round. In such areas, the only likely species to be present is longfin eel *Anguilla dieffenbachii* and/ or shortfin eel *Anguilla australis*.

Common native bird species such as pukeko and paradise shelduck are known to use the wetlands for foraging, and possibly nesting. However, despite their degraded nature, the wetlands will still provide important ecosystem services including stormwater and sediment filtering and retention.

3.4 Farm ponds

A number of ponds exist on the site that have clearly been deliberately excavated, presumably to provide water for livestock. They are within existing gullies or areas of natural seeps or springs, and collect water from existing catchments. They support little in the way of vegetation other than pasture species around the margins. Ponds that are within the stream and wetland network may support small numbers of native longfin and/ or shortfin eel.

Table 2: Summary description of the 54 natural inland wetlands present on the site.

Label	Geodetic area (m²)	Description
W12	267	Valley floor wetland. Dominated by *Juncus acuminatus*. Other species include *Isolepis prolifera, Erythranthe moschata, Carex maorica, Epilobium ciliatum, Holcus lanatus, Juncus effusus*.
W14	101	Seep wetland dominated by *Holcus lanatus* and *Juncus effusus*. Other species include *Isolepis prolifera, Trifolium repens, Anthoxanthum odoratum, Agrostis capillaris*, and *Epilobium ciliatum*.
W15	70	Seep wetland dominated by *Isolepis prolifera*. Other species include *Juncus effusus, Holcus lanatus, Lotus pedunculatus, Plantago lanceolata, Trifolium repens*.
W16	95	Proximal wetlands grouped together based on similar hydrology and vegetation characteristics. Generally dominated by *Juncus effusus*. Other species include *Plantago lanceolata, Trifolium repens, Leontodon saxatilis, Isolepis prolifera, Holcus lanatus, Agrostis capillaris*.
W18	24	
W19	42	
W20	126	
W21	27	
W91	84	
W57	69	
W58	23	
W22	295	Seep wetland dominated by *Juncus acuminatus*. Other species include *Juncus effusus, Holcus lanatus, Isolepis prolifera, Myosotis laxa* subsp. *caespitosa, Epilobium ciliatum, Anthoxanthum odoratum.*
W24	169	Mosaic wetland at gully head. Patches of dry soil and upland veg, but clear wetland areas. Dominant wetland plant species include *Eleocharis acuta* and *Juncus effusus*. 20 % *Plantago lanceolata*. Other species include *Juncus acuminatus, Isolepis prolifera, Holcus lanatus, Hypochaeris radicata, Isolepis cernua*, and *Anthoxanthum odoratum*.
W26	67	Dominated by *Isolepis prolifera, Juncus effusus, Juncus acuminatus*. Passes rapid wetland test.
W27	405	Dominated by *Carex maorica, Carex virgata, Carex secta*. Other species include *Isolepis prolifera* and *Juncus acuminatus*.
W28	24	Nearby wetlands grouped together based on similar hydrology and vegetation characteristics. All are seep wetlands. Generally dominated by *Juncus acuminatus*, *Juncus effusus*, *Juncus sarophorus*. Also present are *Holcus lanatus* among other species.
W29	18	
W80	35	
W3	77	Dominated by *Juncus effusus* and *Holcus lanatus*.
W32	1030	Nearby wetlands grouped together based on similar hydrology and vegetation characteristics. All are valley floor wetlands fed by overland runoff and seeps at gully heads and on valley floors. Dominant plants include *Isolepis prolifera*, *Carex virgata*, *Juncus acuminatus*, *Juncus effusus*, *Persicaria maculosa*, *Holcus lanatus*, and *Erythranthe moschata.*
W33	163	
W34	280	
W35	92	
W36	749	
W62	319	
W63	215	
W48	126	

Label	Geodetic area (m²)	Description
W49	220	
W60	934	
W61	609	
W70	2486	
W39	303	Dominated by *Holcus lanatus* and *Lotus pedunculatus*, with *Juncus effusus*. Soils are hydric.
W65	53	
W4	452	Valley floor, riparian wetland dominated by *Isolepis prolifera* and *Carex maorica*. Other notable species are *Erythranthe moschata, Juncus effusus*, and *Persicaria maculosa*.
W40	59	Nearby wetlands grouped together based on similar hydrology and vegetation characteristics. All are valley floor wetlands fed by overland runoff and seeps at gully heads and on valley floors. Dominant plants include *Juncus acuminatus, Juncus effusus, Holcus lanatus*. Other species include *Lotus pedunculatus, Ranunculus repens, Plantago lanceolata, Hypochaeris radicata, Erythranthe moschata*.
W41	36	
W42	100	
W43	402	
W45	210	
W46	289	
W47	159	
W64	74	
W52	65	Dominated by *Juncus sarophorus, Holcus lanatus, Ranunculus repens*.
W5	48	Dominated by *Juncus effusus* (80%). Other species include *Holcus lanatus, Plantago lanceolata, Juncus prismatocarpus, Leontodon saxitilis, Lotus pedunculatus, Trifolium repens.*
W59	133	Dominated by *Isolepis prolifera, Juncus effusus, Juncus acuminatus*. Other species include *Lotus pedunculatus, Holcus lanatus, Ranunculus repens*.
W50	384	Dominated by *Juncus effusus* and *Juncus sarophorus*, with patches of *Persicaria hydropiper*.
W56	28	Seep wetland dominated by *Juncus sarophorus* and *Lolium perenne*. Other species include *Juncus effusus, Paspalum dilatatum, Plantago lanceolata, Holcus lanatus, Agrostis capillaris, Anthoxanthum odoratum, Trifolium repens*.
W83	56	
W85	67	Dominated by *Carex virgata*. Other species include *Erythranthe moschata, Isolepis prolifera*, *Juncus effusus, Juncus sarophorus, Persicaria maculosa*.
W88	32	
W86	139	Dominated by *Juncus effusus, Carex virgata, Isolepis prolifera*.
W87	74	Passes rapid test. Dominated by *Juncus effusus* and *Typha orientalis*.
W9	21	Seep wetland dominated by *Holcus lanatus, Isolepis prolifera*, and *Juncus effusus*.
W84	30	Dominated by *Juncus effusus*.

Plate 9: Wetland W70 – a valley floor wetland fed by overland runoff and seeps at gully heads and on valley floors. Dominant plants include *Isolepis prolifera*, *Carex virgata*, *Juncus effusus*, and *Holcus lanatus.*

Plate 10: Wetland W26 – a valley side seep wetland dominated by *Isolepis prolifera, Juncus effusus, Juncus acuminatus*. Passes the wetland Rapid Test.

Plate 11: Wetland W22 – a valley side seep wetland dominated by *Juncus acuminatus*. Other species include *Juncus effusus, Holcus lanatus, Isolepis prolifera, Myosotis laxa, Epilobium ciliatum, Anthoxanthum odoratum.*

Plate 12: Wetland W45 – a valley floor wetland fed by overland runoff and seeps at gully heads. Dominant plants include *Juncus acuminatus, Juncus effusus, Holcus lanatus*. Other species include *Lotus pedunculatus, Ranunculus repens, Plantago lanceolata, Erythranthe moschata.*

3.5 Fish

Fish habitat in the streams and wetlands on the site is limited to in-stream/ wetland vegetation and some reaches which have undercut banks or leaf litter, and occasional woody debris. Limited fish (eel) habitat is also provided by the farm ponds that are within the stream and wetland network. There is limited riparian vegetation to provide shade, which is required to keep water temperatures low, particularly in the streams and wetlands in the western catchment. The streams in the eastern catchment support some woody riparian vegetation, which provides moderate levels of shade. There is limited hydrologic variation (in the form of pools, riffles, chutes and runs). As most of the stream reaches are intermittent, much of the stream network on the site would only be used by fish during times of regular flow.

The New Zealand Freshwater Fish Database[4] has a number of records of fish for the wider catchment, which are an indication of the species which could potentially use the streams on the site. A report by independent consultant Fish and Wildlife Services Ltd[5], prepared for a different site within the same catchment, provides additional fish records for the streams and wetlands nearby to the site, including for the tributary stream/ wetland off Awa Awa Road and the wetland off Horton Road (which lies to the north of the site). The full list of species (a summary of the results for the Moutere Inlet catchment) can be found in **Table 3**.

NIWA's NZ River Maps[6] provide a prediction of the presence or absence of fish species. This model was calibrated using data collected using electric fishing methods and represents a species potential range across New Zealand. The River Maps for the streams on the site predict the following species to be present: banded kokopu and inanga. Both of these species have been recorded in nearby streams and wetlands, but not at the site itself.

Given the degraded nature of the streams on site, including the lack of shade and variety of habitat, it is very unlikely that banded kokopu and inanga are present. The species that are most likely to be present on site, if any fish species are, are the two eel species – longfin eel (At Risk – Declining[7]) and shortfin eel (Not Threatened), as these species are tolerant of a range of environmental conditions, and can travel in very low flows or across land if vegetation is wet.

[4] https://nzffdms.niwa.co.nz/download

[5] Fish and Wildlife Services Ltd. Report for Landmark Lile Ltd dated 23 March 2015.

[6] https://shiny.niwa.co.nz/nzrivermaps/

[7] New Zealand Threat Classification System: Dunn *et al.* 2025. *Conservation status of New Zealand freshwater fishes, 2023.* New Zealand Threat Classification Series 46. Department of Conservation, Wellington.

Table 3: Fish species recorded in the catchment of the Moutere Inlet – most recent records from the NIWA New Zealand Freshwater Fish Database (NZFFD) and Fish and Wildlife Services Ltd (F&WS) report.

Species	Common name	Waterbody name	Date	Source
Anguilla australis	Shortfin eel	Wetlands/ streams off Awa Awa Road and Horton Road	2008	F&WS
		Unnamed tributary, Moutere inlet	2014	NZFFD
Anguilla dieffenbachia	Longfin eel	Unnamed tributary, Moutere inlet	2014	NZFFD
		Wetland/ stream off Awa Awa Road	2008	F&WS
Galaxias argenteus	Giant kōkopu	Wetland off Horton Road	2006	F&WS
		Wetland/ stream off Awa Awa Road	2007	F&WS
Galaxias fasciatus	Banded kōkopu	Wetlands/ streams off Awa Awa Road and Horton Road	2008	F&WS
		Unnamed tributary, Moutere inlet	2014	NZFFD
Galaxias maculatus	Inanga	Wetland off Awa Awa Road	2008	F&WS
		Unnamed tributary, Moutere inlet	2014	NZFFD
Gobiomorphus cotidianus	Common bully	Unnamed tributary, Moutere inlet	2014	NZFFD
Gobiomorphus gobioides	Giant bully	Unnamed tributary, Moutere inlet	2014	NZFFD
Gobiomorphus huttoni	Redfin bully	Unnamed tributary, Moutere inlet	2014	NZFFD
Paranephrops sp.	Koura	Unnamed tributary, Moutere inlet	2014	NZFFD
Paratya curvirostris	Freshwater shrimp	Wetland off Horton Road	2008	F&WS
		Unnamed tributary, Moutere inlet	2014	NZFFD
Retropinna retropinna	Common smelt	Unnamed tributary, Moutere inlet	2014	NZFFD

3.6 Terrestrial ecology

3.6.1 Vegetation

The ridges and valley sides of Lot 1 DP450728 have been planted with plantain (*Plantago* sp.) and the valley bottoms support a mix of pasture grasses and wetland vegetation (as discussed in **Section 3.3**). The whole site, at the time of the site visits, was used for sheep grazing (**Plate 13**). The north western catchment supports only scattered pine trees, pasture grasses/ plantain, and wetland vegetation; there are no native shrub or tree species in this part of the site.

There are a few very small patches of common native tree and shrub species in some of the gullies in the south eastern catchment, including karamū (*Coprosma robusta*), māhoe (*Melicytus ramiflorus*), five finger (*Pseudopanax arboreus*), tōtara (*Podocarpus totara*), tree fuchsia (*Fuchsia excorticata*), cabbage tree (*Cordyline australis*) and marbleleaf (*Carpodetus serratus*) (**Plate 14**). The scrambling vine pōhuehue (*Muehlenbeckia australis*) is present in the two gullies in the north eastern corner of the site. The gully of Stream R1 supports the most continuous canopy of native trees. **Figure 5** illustrates the location of the native vegetation patches. This vegetation is natural regenerative growth, following complete clearance of the land for farming and/ or forestry practice, and does not consist of any original, old-growth remnant forest.

The understorey beneath the shrub canopy is mostly absent as a result of livestock grazing. There are occasional occurrences of native gully fern (*Pakau pennigera*) along the stream banks amongst scattered native *Carex* sedge species. Scattered pine trees (*Pinus* sp.) also make up some of the canopy in the gullies, and there are scattered pine trees throughout the site, more commonly along the slopes of the south eastern catchment. There are a few exotic weed species present in the gullies, including Japanese honeysuckle (*Lonicera japonica*), Himalayan honeysuckle (*Leycesteria formosa*) and blackberry (*Rubus fruticosus* agg.).

Lot 3 DP450728 was under pine plantation until late 2021 – the pines had been felled at the time of the site visits in February 2022. The site has since been cleared of remaining slash and has been colonised by common exotic grass and herbaceous weed species; a low sward is maintained via spraying and/ or mowing on a regular basis (**Plate 15**).

No plant species listed as At Risk or Threatened (as classified under the New Zealand Threat Classification System) have been recorded during the multiple site visits, and none are expected to be present on the site, given the intensive modification and use of the site for forestry and farming.

The native vegetation on the site does not meet any of the criteria for a Significant Natural Area as specified in the NPS-IB. The areas of native vegetation are very small in area, are isolated from other areas of native vegetation, do not include any rare species, or provide habitat for any rare species, and do not represent an intact ecosystem as they predominantly consist of a canopy layer only, as the sub-canopy and ground layers have been grazed out.

Plate 13: View to the north over Wetland W32 and the headwaters of Stream R5, showing the valley sides planted with plantain and the mix of pasture grasses grading into wetland vegetation in the valley bottom.

Plate 14: Gully vegetation along Stream R1 including marbleleaf, mahoe and gully fern. Scattered pine trees also make up the canopy. The ground layer is limited or non-existent as a result of livestock grazing.

Plate 15: Lot 3 DP450728, which is proposed for the communal wastewater disposal field. Pines were cleared in late 2021 and emerging exotic grasses and wilding pines are maintained regularly via mowing and/ or spraying.

Figure 5: Southern end of the eastern catchment (left hand image) and the northern end of the eastern catchment (right hand image) showing the location of the patches of native tree and shrub vegetation, with scattered pines in the canopy (orange polygons). Wetlands (green polygons), farm ponds (turquoise

polygons) and streams (blue lines) are also illustrated. Single pines trees can be seen scattered across the site amongst pasture.

3.6.2 Native lizards

There are no records of native lizards from the site, according to the Department of Conservation Herpetofauna Database; however, northern grass skink (*Oligosoma polychroma* – Not Threatened) and common gecko (*Woodworthia maculata* – Not Threatened) (Hitchmough *et al.* 2026) have been recorded in the wider area around the site.

During the course of the wetland assessment surveys, potential lizard habitat was noted. There are a number of areas of long grass and decaying logs at the site that could provide habitat for northern grass skink. These areas are all located within the riparian margins of streams and watercourses on the site. There is no habitat present on the site that is suitable for common gecko.

3.6.3 Birds

Bird species seen and heard during the course of the wetland assessment surveys were noted. Seven native bird species, and four exotic species were observed at the site, as detailed in **Table 4**.

The species present are all common and classified as Not Threatened, and are typical of the open, rural characteristics of the area. The network of streams and wetlands on the site support kingfisher, paradise shelduck and pukeko.

There are no species of birds classified as At Risk or Threatened that are expected to utilise the site.

Table 4: Birds recorded at the site during the site surveys in February 2022

Scientific name	Common name	Origin and Threat Status (Robertson *et al.* 2021)
Tadorna variegata	Paradise shelduck	Endemic – Not Threatened
Rhipidura fuliginosa	Fantail	Endemic – Not Threatened
Circus approximans	Australasian harrier	Native – Not Threatened
Porphyrio melanotus	Pukeko	Native – Not Threatened
Hirundo neoxena	Welcome swallow	Native – Not Threatened
Todiramphus sanctus	Kingfisher	Native – Not Threatened
Vanellus miles	Spur-winged plover	Native – Not Threatened
Fringilla coelebs	Chaffinch	Exotic
Carduelis carduelis	Goldfinch	Exotic
Turdus merula	Blackbird	Exotic
Alauda arvensis	Skylark	Exotic

3.6.4 Bats

Long-tailed bats/ pekapeka (*Chalinolobus tuberculatus*), are currently classified as Threatened – Nationally Critical (O'Donnell *et al.*, 2022). Long-tailed bats require large trees (including standing dead trees) with cavities (e.g., deep knot holes), epiphytes, or loose bark for roosting. They 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).

There are no records of bats at the site, or within the local area, according to the national bat database held by DOC (database update 17 September 2025). The nearest records of bats are 27 km to the south east of the site, where there are records of long-tailed bat in Aniseed Valley, 34 km to the south west in Motueka Valley, and 29 km to the south east in Richmond Forest Park near the Maitai Dam. Surveys for bats have been undertaken in potential areas of habitat within 12 km of the site, in the hills around Ngatimoti, but no signs of bats were recorded. Bat surveys undertaken in the hills in the Mt Arthur Range to the north-west of the site, within the Barnicote and Richmond Ranges to the south-east of the site, and within areas of potential habitat in Todds Valley, 24 km to the east of the site have all recorded no sign of bat presence.

There is no suitable roosting habitat for bats on the site, and while nearby pine plantations may provide suitable roosting habitat, the distance of bat records to the site suggest that it is highly unlikely that bats use the site for foraging or transiting across.

3.7 Summary of ecological values

- **Watercourses:** There are 13 watercourses on the site that meet the definition of 'river' in the TRMP. The majority of the watercourses are intermittent in flow, and of poor ecological quality due to limited or absent riparian vegetation, and trampling and grazing by livestock. Despite their low ecological quality, the streams are part of a network of aquatic habitat that provides foraging for common native bird species such as kingfisher, pukeko and paradise shelduck, and may support small numbers of **longfin and/ or shortfin eel**. The streams will also contribute towards ecosystem services such as storm water attenuation.
- **Wetlands:** There are 51 wetlands on the site, which have formed along the narrow valley bottoms throughout the site, or at valley-side seeps where groundwater emerges. They are all in poor ecological condition having been degraded through past and current land uses, including forestry and livestock grazing. They support a low diversity of native and exotic wetland plant species including *Carex* and *Isolepis* sedge species and *Juncus* rush species. Despite their low ecological quality, the wetlands are part of a network of aquatic habitat that, along with the streams, provides foraging, and potentially, nesting sites, for common native bird species such as pukeko and paradise shelduck. The wetlands will also contribute towards ecosystem services such as storm water attenuation and sediment filtering.
- **Limited native terrestrial vegetation:** The eastern catchment gullies support small patches of native tree and shrub species including māhoe, marbleleaf, five finger, tree fuchsia, tōtara and karamū. There is little or no understorey vegetation beneath the canopy as it has been grazed by livestock. The ecological value of this vegetation is very low, providing habitat for a small number of common native bird species such as fantail.
- **Common native bird species:** Seven species recorded, that are typical of open, rural habitat, and/ or degraded stream and wetland habitat. No species classified as At Risk or Threatened are expected to utilise the site.
- **Native northern grass skink habitat:** There are few patches of suitable native lizard habitat on the site, such as decaying logs and areas of rank grass/ weeds, where livestock have not grazed, or where the weeds are not palatable to livestock. Records from the national herpetological database, together with habitat assessment on site, indicate that northern grass skink *Oligosoma polychroma* is likely to be present on site in areas of suitable habitat.

4.0 Development proposals

4.1 Summary of development proposals

The project is to subdivide and develop land for the purpose of establishing a residential and rural lifestyle development on approximately 70 hectares of land off Stagecoach Road, Tasman, in the Tasman District. The project will include works within the Stagecoach Road, Dicker Road and William Road reserves.

The project will include:

(a) Subdivision to create approximately 145 allotments, including 4 allotments for reserve, roading and services, and enable construction of approximately 141 residential units across a range of densities;

(b) Development of an open space network including a public reserve and walkways, and upgrades to shared pathways;

(c) Landscape planting and restoration and enhancement of waterways and wetlands; and

(d) Associated infrastructure including three waters services and transport (including external road upgrade works).

The Concept Plan is illustrated in **Figure 2**.

4.2 Design process

The design of the proposed development has been an iterative process to ensure the design is in accordance with the TRMP Design Guide for Subdivision and Development[8]. With respect to ecological values, the following sections of the Design Guide have been considered:

- Section 3.3 Fresh Water Resources and the Coastline; and
- Section 3.12 Vegetation.

The design process has involved the identification of constraints in relation to national policy for freshwater and biodiversity (National Policy Statement for Freshwater Management, National Environmental Standards for Freshwater and National Policy Statement for Indigenous Biodiversity) and the refinement of the proposals so that developable areas were identified outside of those constraints. A range of development layout options were assessed. With respect to ecological values, the constraints identified were the streams and wetlands, and the development design was adjusted in order to avoid adverse effects on these values.

4.3 Earthworks

Plans illustrating the extent of the earthworks are provided in the Plan Set by Staig and Smith. The earthworks will involve both cut and fill, to create appropriate levels for the upgrade of Stagecoach Road, the creation of local roads and driveways servicing the housing lots, the building platforms within each lot, the construction of the communal wastewater treatment system, and the construction of the stormwater basins.

The development will generally be restricted to areas just below hilltops, ridges and spurs to minimise disturbance to the wetlands within the gullies. As such, all earthworks will lie outside of the streams and

[8] Tasman Resource Management Plan, Part II, Appendix 3: *Design Guide for Subdivision and Development in the Coastal Tasman Area, Tasman District*. September 2009.

wetlands, and outside of a 10 m setback from all streams and wetlands. The exception is the minor piling required for boardwalks for the walkway – the piling will take place within 10 m of streams and wetlands, but not within the streams and wetlands themselves.

Construction of Dams E3a and W2 for stormwater basins will result in the removal of existing farm ponds.

4.4 Stormwater management

There are two main catchments on the site. The western catchment is the larger, and drains to the north into an unnamed tributary. The eastern catchment drains to the east, into a large wetland on the adjacent property, before joining the western catchment tributary approximately 2 km to the north of the site. The stream then discharges to the Moutere Inlet, approximately 3.6 km north of the site.

The proposed development of housing, roading network, and other associated impervious surfaces will result in a change to the pattern and rate at which stormwater enters the surface water and ground water networks, as detailed in the hydrogeology report[9]. Pre-development and post-development catchments are illustrated in the application Plan Set by Staig & Smith.

To manage stormwater arising from the impervious surfaces of the development, and to avoid or minimise the associated potential adverse effects of sediment runoff, erosion, flooding downstream and changes in hydrological regime of the wetlands and streams, a number of engineering solutions are proposed, as discussed in the following sections.

4.4.1 Stormwater detention basins

A network of stormwater detention basins will be constructed. The locations of the detention basins are illustrated in the Plan Set.

The detention basins will be constructed through the formation of earth bunds or dams, and excavation, where required, to create the required volume of detention behind the dams. The earth dams and the areas of basin excavation will be located outside of wetlands and streams, and outside of a 10 m setback from wetlands and streams.

At four dams – Dams E7, W4, W5 and W6 – the maximum level of water detention will extend into wetlands – Wetlands W24, W36, W40 and W41, and W45 respectively – and into the 10 m setback of Wetland W43. This is the maximum fill level, which is only expected to be reached during heavy rain events (or if there is a blockage in the outlet pipe – blockages will be managed under the direction of a Stormwater Detention Management and Maintenance Plan). Detention in these areas will be within the existing landform, and excavation will not be undertaken within these wetlands or within 10 m of these wetlands.

Maximum fill of the detention basins, and therefore ponding within the wetlands, will be temporary and will not exceed a 12-hour time period. For example, the project's stormwater report[10] notes that the longest inundation period is approximately 11.5 hours at Dam W5 during a 24-hour 1 % AEP rainfall event, and 6 hours at Dam W6 during the same event.

The basins will be planted with wetland species and will be designed to detain stormwater for a matter of hours, slowly releasing the stormwater downstream via a pipe culvert. The streams and wetlands

[9] Pattle Delamore Partners Limited. July 2026. *Tahimana Subdivision: Fast Track Hydrogeology Assessment*, Report prepared for Tahimana Limited.

[10] *Stormwater, Wastewater and Water Servicing Assessment: Tahimana Limited.* July 2026. Envirolink.

downstream of the detention basins will therefore continue to receive inputs of water from upstream at similar (or higher – see **Section 6.1.3**) levels as to that prior to the development.

4.4.2 Clean water diversion

Clean water arising from the roofs of properties adjacent to gully head wetlands in the western catchment will be collected and directed (via swale drains, or diffusely), to discharge to the ground around the gully heads. The discharge point will be armoured with rock rip rap to prevent erosion, and will be located within private lots, outside of a 10 m set-back from the wetlands. These discharge points will assist with groundwater recharge at the heads of gully wetlands, rather than directing all stormwater downstream to the stormwater detention ponds.

Clean water arising from the roofs of properties on larger lots (mostly within the eastern catchment) will be collected and stored for domestic use, before being discharged via on-site treatment systems.

4.4.3 Soak-pits

Ten soak-pits will be installed in the western catchment as part of the stormwater management system, to further ensure the recharge of groundwater, and thus the recharge of wetlands upstream of the stormwater detention basins. Stormwater arising from roads and driveways, and roofs where not already collected via swale drains, will be directed to soak pits, which will be designed to allow for the infiltration of water both vertically and horizontally into the surrounding substrate.

4.5 Wastewater management

Wastewater management is described in detail in the project's Stormwater and Wastewater Servicing Assessment[11]. Information relevant to potential ecological impacts on the site are summarised here.

Wastewater from the two Rural Conservation allotments and lifestyle lots (typically5,000 m² to 2ha in area) will be managed on individual lots. Wastewater from the residential lots (typically less than 1,000 m² in area) will be managed with a communal wastewater treatment and disposal system.

Wastewater from the individual lifestyle lots will be treated and applied to land onsite. All disposal fields are to be a minimum of 20 m from streams and wetlands, or 10 m from gullies that are 'normally dry' (ephemeral streams/ overland flow paths). Primary and secondary treatment of effluent will be required, before the treated water is released to groundwater.

For the residential lots, wastewater will be conveyed to a central treatment system and distributed over the area to the west of the site (existing Lot 3 DP450728 – 6.98 ha) (**Figure 6**). Proposed Lot 139 is allocated as a reserve wastewater site should it be required.

Existing Lot 3 DP450728 was cleared of pine plantation in late 2021, and will require further clearance of regenerating exotic vegetation and any remaining slash, and grading for preparation as use for a disposal field. Proposed Lot 139 supports pasture species and a few scattered pine trees, and grading will be undertaken to prepare it for use as a back-up disposal field. The proposed disposal fields do not support any watercourses, wetlands, or other features of ecological value.

[11] *Stormwater and Wastewater Servicing Assessment: Tahimana subdivision*. Envirolink. July 2026.

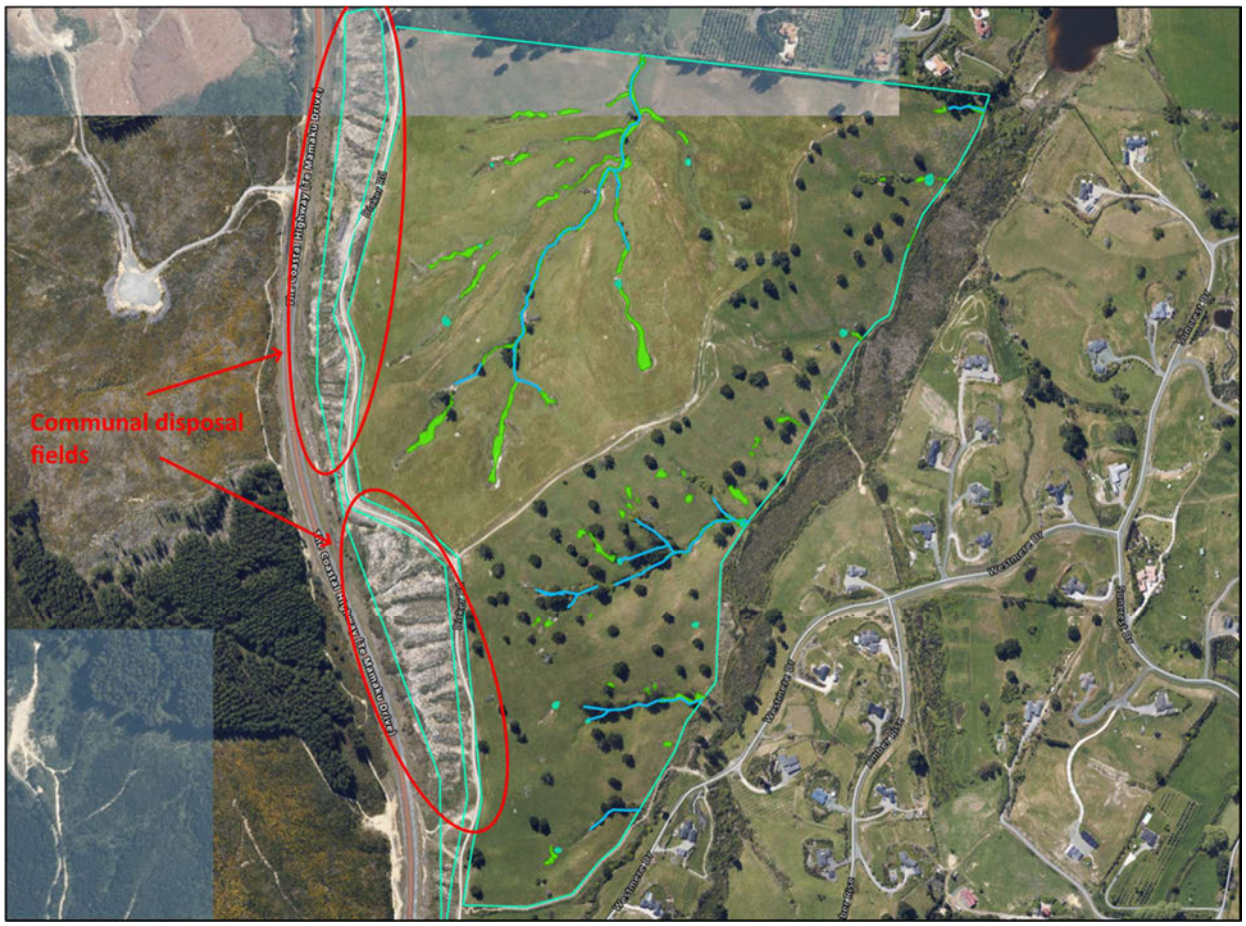


Figure 6: Proposed communal wastewater disposal areas – circled in red. This imagery dates from after the felling of the pines but before the lines of slash had been cleared.

4.6 Public access

Public access tracks are proposed to allow pedestrian and cycle access through the site from Stagecoach Road at the northern end of the site to the existing access track towards the southern end of the site, that leads to Westmere Drive and back to Stagecoach Road.

The track will cross Wetland W70 at its narrowest point at the downstream end, Stream R1 and Wetland W4, and Stream R2.1. Boardwalks will be constructed at stream and wetland crossing points. The boardwalks will be located at the narrowest points of stream channels and wetlands and will have a span of approximately 3 m to ensure piling occurs outside of stream channels and wetlands. Boardwalks will be 1.6 m wide, meaning that the overall coverage of streams and wetlands will be approximately 4.8 m².

The route of the access tracks and location of boardwalks are illustrated in the Concept Plan provided by Staig & Smith, and reproduced in **Figure 2**. Boardwalk design drawings are provided in **Figure 7**.

4.7 Landscaping and ecological planting

As the development progresses, stock will be removed from the site, and native species will be planted along the lengths of the streams (to a width of 10 m along both banks) and within and around each wetland (to a distance of 10 m from the wetland edge). The extensive planting will enhance the ecological and visual value of the stream and wetland network.

Planting is also proposed to provide for visual amenity, such as street trees, and for visual mitigation, including screening of the wastewater treatment areas and of buildings. A Landscape Master Plan (Error!

Reference source not found.) has been provided by the project's landscape architects Rough Milne Mitchell Landscape Architects, and further details regarding the ecological planting are provided in the Ecological Planting Plan[12].

Species recommended in the Landscape Plan and the Ecological Planting Plan for ecological planting and landscape mitigation planting are all native, occur naturally within the Tasman district, and have been selected to suit the local environment and conditions.

[12] RMA Ecology Ltd. July 2026. *Tahimana subdivision, Tasman: Tahimana Substantive Application Ecological Planting Plan*. Prepared for Tahimana Ltd.

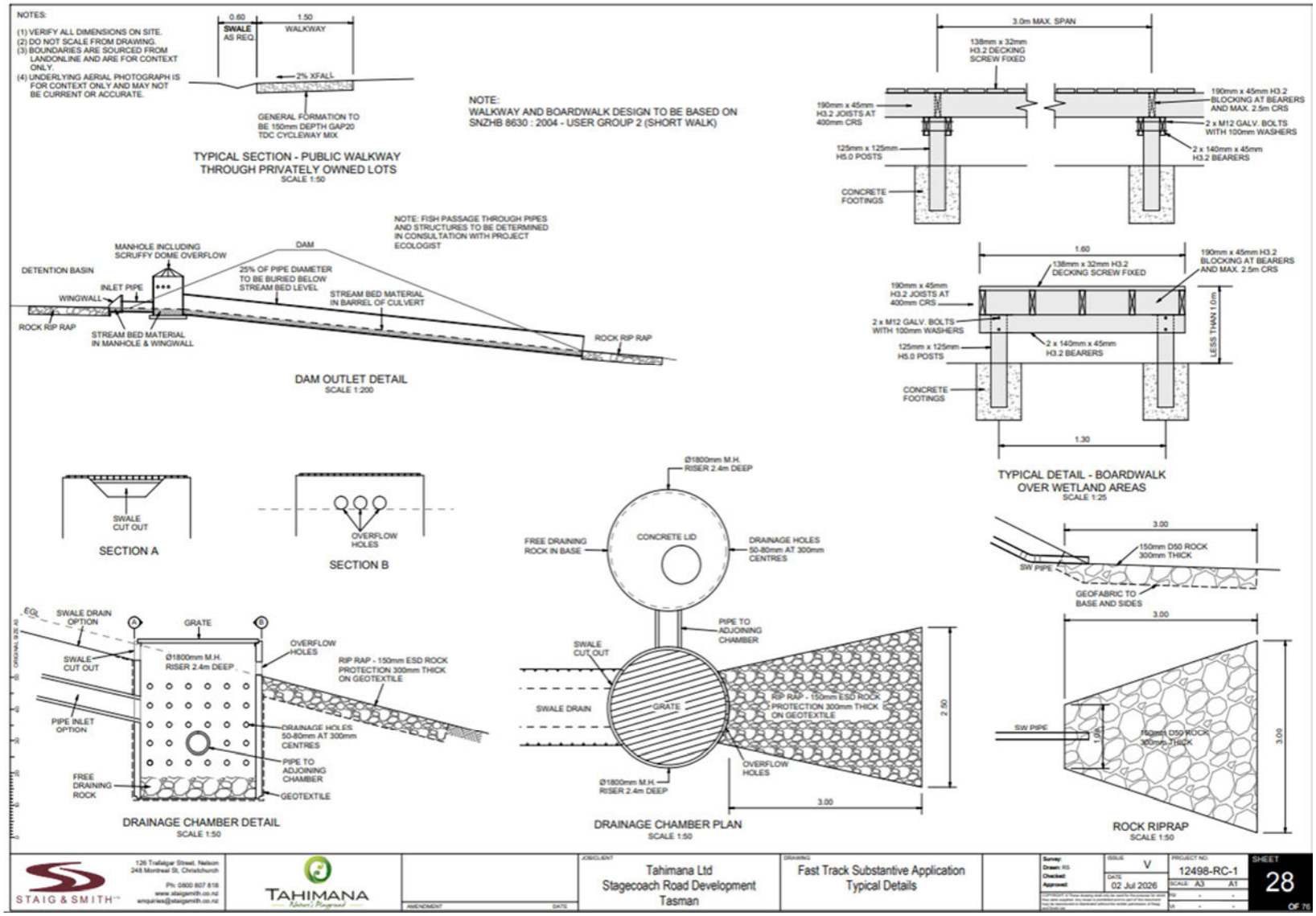


Figure 7: Boardwalk design drawings.

Figure 8: Landscape Master Plan.

5.0 Actual and potential adverse effects on ecology values

Actual and potential adverse effects on the ecological values of the site are discussed in the following sections and summarised in **Table 6**, **page 46**.

A description of the construction methods, magnitude of potential ecological loss, and overall level of effects is provided in **Section 6.0** along with proposals to avoid, minimise or mitigate any adverse ecological effects.

5.1 Wetlands

As detailed in the hydrogeology report[13], the proposed subdivision development may result in changes to the hydrology of the site including:

- Interception of groundwater via excavations such as cuts and trenches, which may divert groundwater recharge from wetlands; and
- A reduction in the recharge of groundwater that sustains wetlands as a result of increased impervious surfaces and stormwater management systems.

As a result, there is potential for wetlands to be adversely affected by 'de-watering' via a loss of groundwater recharge.

Other potential adverse effects on wetlands have also been identified:

- Sediment discharge into wetlands during construction.
- Stormwater discharge into wetlands and resultant erosion or discharge of sediment and/ or contaminants.
- Discharge of effluent from private and communal disposal fields into wetlands.
- Damage to wetland vegetation during construction, and shading of vegetation post-construction, of boardwalks over Wetlands W4 and W70.
- Inundation of wetlands, or portion of wetland, within the stormwater detention areas of Dams E7, W4, W5 and W6.

5.2 Streams

A number of potential adverse effects of the proposed development on the stream network have been identified:

- Sediment discharge into streams during construction.
- Stormwater discharge into streams and resultant erosion or discharge of sediment and/ or contaminants.
- Discharge of effluent from private and communal disposal fields into streams.

[13] Pattle Delamore Partners Limited. July 2026. *Tahimana Subdivision: Fast Track Hydrogeology Assessment*, Report prepared for Tahimana Limited.

- Damage to riparian vegetation during construction, and shading of vegetation post-construction, of boardwalks over Streams R1, R5 and R2.1.
- Loss of surface water and groundwater inputs to upper catchment stream reaches as a result of increased impervious surfaces and diversion of stormwater via stormwater management system.

5.3 Farm ponds

The existing farm ponds provide potential habitat for native fish, although they have little other ecological value. They have been excavated to provide water to livestock and support little or no native vegetation. The ponds have been dug in areas with a naturally high water table and therefore are located near or adjacent to wetlands or streams (**Figure 4**).

Four of the ponds (ponds near Dams E3a, E6a, E7 and W2) may be directly affected by the construction of stormwater detention basins, either for the construction of the earth dam, or for the excavation of the basin.

Bund construction and basin excavation are likely to require the removal of the four ponds, and thus the removal of potential fish habitat and resultant potential harm to, or death of, any native fish that are present.

5.4 Fish passage

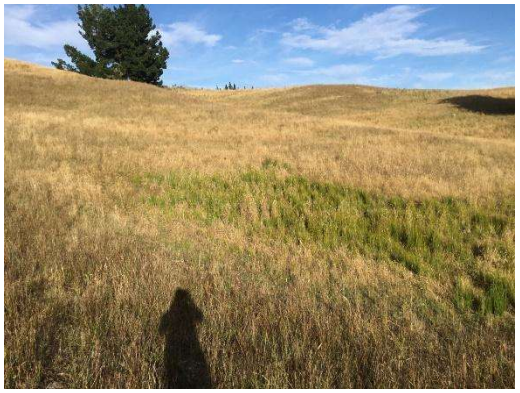
The proposed stormwater detention basins will require the construction of earth bund dams, with a piped outlet that will restrict the rate at which water leaves the basin, thus reducing the likelihood of flooding downstream.

The proposed locations of the stormwater detention basins are shown in the Concept Plan (**Figure 2**). The dams are all located outside of wetlands and outside of streams. However, three dams (Dam E7, Dam E5a and Dam W4) are located downstream of wetlands where there may be a connection for fish (eels) between a stream and the wetland via overland flow during rainfall events, and one dam (Dam E5d) is located in between sections of Stream R1.

Dam E5d has the potential to present a barrier to fish (eels) moving between the lower and upper sections of Stream R1 (water flowing in the upper reach of Stream R1 dissipates into the ground for a length of ca. 30 m before re-emerging and forming a channel downstream).

Wetlands W24, W3 and W5, and W36, located respectively above Dams E7, E5a and W4 have been assessed for suitable fish habitat, including the presence of wetland plant species and the height of the water table, as detailed in **Table 5**. Wetlands W24, W3 and W5 have been assessed as not suitable habitat for native eels, whereas Wetland W36 may potentially provide suitable eel habitat. Dam W4, therefore, may present a barrier to fish movement between Wetland W36 and Stream R5.1.

Table 5: Assessment of wetlands located above proposed stormwater detention basins and their suitability as fish habitat.

SRP dam reference	Wetland label	Description including vegetation/ habitat/ water table	Suitable as fish habitat (yes/ no)	Representative photograph of the wetland
Dam E7	W24	Mosaic wetland. Patches of dry soil and upland vegetation, but clear wetland areas. In the wetland patches, the dominant wetland plant species include *Eleocharis acuta* and *Juncus effusus*. Other species include rushes, sedges, plantain, and pasture grasses.	No – although there are patches of wetland that may be suitable, they are within areas of dry soil and pasture grasses that will be prohibitive to the movement of fish.	
Dam E5a	W3 and W5	Two small patches of wetland dominated by *Juncus effusus* along with *Holcus lanatus* and pasture species.	No – Wetlands W3 (ca. 75 m²) and W5 (48 m²) are very small areas of wet-adapted vegetation comprising plant species that also cope well with periods of drought. Areas of dry pasture species lie between the wetlands and the upstream end of the stream that will be prohibitive to the movement of fish.	

SRP dam reference	Wetland label	Description including vegetation/ habitat/ water table	Suitable as fish habitat (yes/ no)	Representative photograph of the wetland
Dam W4	W36	Valley floor wetland supporting wet-adapted sedges (*Carex virgata*, *Isolepis prolifera)* and rushes (*Juncus acuminatus, J. effusus*). The ground was wet underfoot at the time of the site surveys and the soil core taken was saturated.	Yes – Wetland W36 is ca. 750 m² in area and supports a suite of wetland species including rushes and sedges. Stream R5.1 begins ca. 15 m downstream of Wetland W36. It is possible that fish (eels) can move between the stream and the wetland via overland flow during periods of wet weather.	

5.6 Lizards

Habitat suitable for native lizards is restricted to scattered areas of long grasses and/ or decaying logs, located in gullies adjacent to streams or wetlands. These areas are proposed for ecological restoration and protection. There is no suitable native lizard habitat within the earthworks footprint.

The level of effect on native lizards is considered to be nil.

The restoration planting of the stream and wetland network will create a large area of good quality habitat suitable for native lizards and will be a net gain for biodiversity.

5.7 Birds

The proposed development will result in the loss of open farmland habitat, comprising grazed pasture species and scattered pine trees. Three native bird species have been recorded using this habitat for foraging – welcome swallow, Australasian harrier, and spur-winged plover.

These three species are all common and are classified as 'Not Threatened'. The habitat provided by the pasture and pine trees is of low quality, and its loss will have a negligible effect on the native birds present given the abundance of other habitats of far better quality in the local environment. The ecological restoration of the wetland and stream network on site will increase the value of the site for native bird species.

5.8 Terrestrial vegetation

The small patches of terrestrial vegetation present on site are all outside of the earthworks footprint. They are all within the gullies of the eastern catchment, and will be enhanced as part of the package of ecological restoration and protection (stock removal) proposed for the riparian areas.

Table 6: Summary of actual and potential effects of the proposed development on the ecological values of the site.

Ecology value	Development impact	Adverse effect
Wetlands	During construction	
	Interception of groundwater via excavations such as cuts and trenches.	Potential effect: Diversion of groundwater from wetlands.
	Construction of boardwalk over Wetlands W4 and W70.	Actual effect: Damage to wetland vegetation, release of sediment, shading of wetland vegetation.
	Discharge of sediment during construction.	Potential effect: Sediment clogs up wetlands, and damages vegetation and aquatic habitat.
	Post-construction	
	Increase in impervious surfaces generating an increase in surface water flow and a decrease in groundwater recharge.	Potential effect: Increase in rates of surface flow through wetlands and a decrease in groundwater availability, resulting in erosion and/ or change in wetland hydrology.
	Inundation of wetlands, or portion of wetland, within stormwater detention areas of Dams E7, W4, W5 and W6.	Potential effect: Considerable change in hydrological regime of wetlands resulting in change in vegetation composition.
	Discharge of stormwater from roads and house sites.	Potential effect: Increase of surface water flows, erosion and sedimentation, inputs of contaminated water.
	Discharge of effluent from private and communal disposal fields.	Potential effect: Release of additional nutrients and pathogens into the wetlands.
	Restoration planting and removal of stock from wetlands	Actual effect: Considerable enhancement of wetland habitat.
Streams	During construction	
	Sediment discharge during construction	Potential effect: Damage to aquatic habitats, smothering of aquatic invertebrates,

Ecology value	Development impact	Adverse effect
	Construction of boardwalks over Streams R1, R5 and R2.1	Potential effect: Damage to stream bank and riparian vegetation, shading of riparian vegetation.
	Post-construction	
	Discharge of stormwater from roads and house sites.	Potential effect: Increase of surface water flows, erosion and sedimentation, discharge of sediment and contaminants.
	Discharge of effluent from private and communal disposal fields.	Potential effect: Release of nutrients and pathogens into the streams.
	Restoration planting and removal of stock from streams.	Actual effect: Considerable enhancement of in-stream and riparian habitat.
Fish	During construction	
	Removal/ alteration of farm ponds for stormwater detention basins or bunds (near Dams E3a, E6a, E7 and W2).	Actual effect: Loss of potential fish habitat. Potential effect: Harm to/ death of fish.
	Post-construction	
	Construction of Dam E5d in between sections of Stream R1.	Potential effect: Loss of fish passage between sections of Stream R1 via overland flow during periods of wet weather.
	Construction of Dam W4 in between Wetland W36 and Stream R5.1.	Potential effect: Loss of fish passage between Wetland W36 and Stream R5.1 via overland flow during periods of wet weather.
	Restoration planting and removal of stock from streams and wetlands.	Actual effect: Considerable enhancement of in-stream and riparian habitat.
Birds	During construction	

Ecology value	Development impact	Adverse effect
	Removal of grassland habitat within the earthworks footprint; removal of existing pine trees; removal of small area of native shrubs during construction of Dam E5d.	Actual effect: Loss of foraging and roosting habitat for common native and exotic bird species. Potential effect: Harm to/ death of nesting birds, eggs, or nestlings.
	Post-construction	
	Restoration planting and removal of stock from streams and wetlands.	Actual effect: Considerable enhancement of stream, wetland and riparian habitat.
Terrestrial vegetation	During construction	
	Removal of small area (495 m²) of common native shrubs during construction of Dam E5d.	Actual effect: Loss of ca. 495 m² of common Not Threatened native shrub species.
	Post-construction	
	Restoration planting and protection of wetlands and streams.	Actual effect: Considerable enhancement of native riparian buffer habitat.

6.0 Management of adverse effects

A number of actual and potential adverse effects on the ecological values of the site have been identified. These have been analysed following the EIANZ methods[14] to determine the magnitude and overall level of the effects, as detailed in the following sections. A summary of the results of the EIANZ effects matrix analysis is presented in **Table 7** (page 57).

The values considered in the significance assessment are those that are indigenous in nature, or which provide habitat and resources to support indigenous species.

In relation to **Table 7** scoring:

- Whilst all the wetlands are highly degraded as a result of current and past land uses, they have been scored as having a moderate value as natural wetland ecosystems have been greatly reduced in extent and quality both regionally and nationally.

- The streams have been scored as having low value as they are heavily degraded as a result of stock trampling, and grazing of riparian vegetation. There is a lack of riparian vegetation along most of the stream network. Z

- Fish have been scored as having high value as longfin eel is classified as At Risk – Declining.

6.1 Wetlands

6.1.1 Earthworks

The development footprint and earthworks extent have been designed to avoid wetlands ensuring that all activity will lie outside of a 10 m setback from all wetlands, with the exception of the boardwalk crossings over Wetlands W70 and W4. In these locations, piles for the boardwalk will be located outside of the wetlands but within a 10 m setback of the wetlands (see **Section 6.1.2** for further details).

All proposed excavations including trenching for services, cuts to create roading corridors, cuts for site levelling, and cuts to increase the area available for some of the stormwater detention basins, will take place outside of a 10 m setback from all wetlands. The majority of the excavations, and the deepest, will take place on higher ground, below ridgelines and spurs, where the level of groundwater is likely to be below the level of the cuts. The project's hydrogeology report states that excavations at the site are unlikely to result in the diversion or inception of ground water, and therefore the inputs of groundwater into wetlands are unlikely to be affected by earthwork cuts.

Erosion and Sediment Controls will be implemented during each phase of the earthwork and construction process, to protect wetlands from erosion and sediment discharge during rainfall events.

[14] As contained within the EIANZ EciA guidelines. Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition

The level of effect on wetlands by the proposed earthworks is **very low**.

6.1.2 Walkway

The route of the proposed walkway has been designed to avoid wetlands and streams where possible, with the result that just two wetlands, Wetlands W4 and W70, will be crossed by the walkway. The crossing points will be at the wetlands' narrowest points (less than 2.5 m wide). The crossings will be via a boardwalk to minimise the area of wetland impacted, and to avoid trampling of vegetation. The span of the boardwalk will be 3 m, at least 0.5 m wider than the wetlands, thus allowing for the piles to be sunk outside of the wetlands themselves.

The boardwalk will be 1.6 m wide, creating an overall area of boardwalk over each wetland of 4.8 m². The area of wetland that will be affected by shading by the boardwalk is only 0.19 % of the overall area of Wetland W70 (2,486 m²), and 1 % of the overall area of Wetland W4 (452 m²) meaning that the level of effect on each wetland is very low.

The effects will be minimised during construction by carrying out piling outside of the wetland itself and employing erosion and sediment control measures. On completion of the works, the area of wetland affected will be restored through planting with native species.

The level of effect of the boardwalk construction at Wetlands W4 and W70 will be **very low**. Planting the affected area following construction, and the wider programme of restoration planting throughout the wetlands and within a 10 m buffer of each wetland and will result in a **net gain** for biodiversity.

6.1.3 Increase in impervious surfaces and discharge of stormwater

The proposed development will result in a change to the hydrology of the eastern and western catchments (refer to the project's hydrogeology report for details). There are currently no impervious surfaces in either catchment, and the development will result in the creation of impervious surfaces in the form of roads, driveways and houses. The western catchment will see a greater increase in impervious surfaces than the eastern catchment, as the proposed housing here is mostly of a higher density over residential lots compared to the lifestyle lots proposed in the eastern catchment. Post-development, the total impervious area will be around 23 % of the western catchment, and around 10 % of the eastern catchment.

The increase in impervious surfaces will generate an increase in stormwater runoff i.e., surface water, and a resultant decrease in the volumes of water infiltrating the ground and re-charging groundwater. Initial development designs directed all stormwater arising from impervious surfaces into a stormwater management system that comprised solely of the network of downstream detention basins. This raised concerns regarding the level of effect on gully head wetlands and streams upgradient of the detention basins, particularly in the western catchment, which would be by-passed by the stormwater runoff and thus receive less surface runoff and groundwater recharge than pre-development.

To address these concerns, additional stormwater management solutions have been included in the development design:

- Direction of 'clean' stormwater from residential roofs in the western catchment directly to the heads of gullies, where discharge will be diffuse and will contribute directly to both surface water and groundwater recharge (see the stormwater plans in the Plan Set for the location of discharge points);

- Installation of ten soak pits, distributed throughout the western catchment at locations upgradient of the wetlands. The soak pits will be designed to allow the infiltration of stormwater both vertically and horizontally into surrounding substrate, thus encouraging groundwater recharge/ interflow to downgradient wetlands. Further detail regarding the location and design of the soak pits is provided by the Hydrogeology Report (PDP Ltd, 2026) and in the stormwater plans in the Plan Set.
- Direction of overflow from the rainwater harvesting at individual lifestyle lots in both the eastern and western catchments to overland flow (swales) discharging upstream/ upgradient of wetlands located at gully heads.

Note, that within the eastern catchment, the lifestyle lots will all harvest rainwater for domestic use, which will ultimately recharge groundwater via irrigation of lawns and gardens, and dripline irrigation of treated wastewater within private disposal fields. Within the western catchment, 15 lots will be lifestyle lots with the same system of rainwater harvesting and disposal as described above for the eastern catchment.

The hydrogeological report details the methods used to model the potential change in surface water and groundwater flows for the eastern and western catchments. The modelling shows that in the post-development scenario, there would be a small reduction (about 8 %) in groundwater recharge within the western catchment, which is equivalent to an average annual change in groundwater recharge of -0.2 L/s. The hydrogeological report notes that a change of this magnitude is unlikely to be measurable as a change in groundwater levels, and is, therefore, not expected to have an adverse effect on the western catchment wetlands.

The modelling indicates that there is likely to be an overall increase in surface water outflows in the western catchment as a result of the development, but the actual magnitude of this increase is relatively small – in the order of 1 l/ s at the downstream extent of the western catchment. The network of stormwater detention ponds will detain peak discharges arising from the development during storm events.

Within the eastern catchment, the modelling shows a similar pattern to that within the western catchment, with a small annual average increase in surface water outflows, in the order of 0.7 L/s, and a small decrease in the annual average groundwater recharge by around 0.2 L/s. As noted above, these small changes are not likely to be measurable as a change in groundwater levels and are likely to be within the range of natural seasonal fluctuations. They are not expected to have an adverse effect on the eastern catchment wetlands, nor on the established large wetland that lies immediately to the east of the eastern catchment boundary. Any possible effects of an increase in surface water flows at the downstream end of the catchments will be ameliorated by the detention of peak flows within the network of stormwater detention basins.

Note that the modelling has included the groundwater recharge component provided by the ten soak pits, but has conservatively excluded the seepage losses to ground through the base of the stormwater basins, the discharge of stormwater from roofs located near to heads of gullies and/ or upstream of wetlands located higher in the catchment and upstream of stormwater basins, and the groundwater recharge of onsite disposal of treated wastewater and the irrigation of lawns/ gardens.

The level of effect on the wetlands of the increase in impervious surfaces is considered to be **very low**.

The level of effect on the wetlands of the discharge of stormwater via the various methods is considered to be **very low**.

6.1.4 Operation of stormwater detention basins and changes to water level range in wetlands

Five stormwater detention basins will have a maximum fill level that will extend into nearby wetlands – Dam E7: Wetland W24, Dam W4: Wetland W36, Dam W5: Wetlands W40, W41 and W43, and Dam W6: Wetland W45.

The maximum fill level of the detention basins will only be reached during significant storm events, or if the outlet pipe becomes blocked. The project's stormwater report notes that the longest ponding duration will occur at Dam W5, where the wetland will be partially inundated for approximately 11.5 hours during a 24-hour 1 % AEP rainfall event. The wetland upstream of Dam W6 will be partially inundated for approximately 6 hours during the same event. Blockages of detention basin will be managed under the direction of a Stormwater Detention Maintenance and Management Plan.

The flooding of these wetlands by the maximum filling of the detention basins will result in a slight increase in the upper water level range of the wetlands, however, the flooding will be temporary and is not expected to have an adverse effect on the health of the wetlands. Wetlands naturally occur in areas that are subject to periodic flooding, and wetland vegetation is adapted to these conditions. The species present in the wetlands currently, and which will be planted as part of the programme of ecological restoration, are hardy and tolerant of a range of hydrological regimes.

The level of effect of infrequent, temporary increases in water levels in wetlands is considered to be **very low**.

6.1.5 Discharge of effluent from wastewater disposal fields

The project's Stormwater and Wastewater Servicing Assessment[15] states that the rates of effluent disposal across the site, from both the individual lots and from the communal system, are very low, and therefore the risk of discharge to surface water or ground water is very low. The risk of coliform contamination is also mitigated through the low rate of land application, and therefore further mitigation such as UV disinfection is not considered necessary. It is therefore considered very unlikely that the wastewater disposal fields will be a source of contamination for the site's wetlands.

The level of effect on wetlands of effluent discharge from the wastewater disposal fields is considered to be **nil**.

6.1.6 Restoration planting and protection of wetlands

The current condition of the wetlands is poor as a result of past and current land uses. They support a low diversity of common, mostly exotic wetland plants species, and are heavily trampled and grazed by stock. The proposed ecological planting and protection of the wetlands will considerably enhance their ecological value. Planting native wetland species will create habitat that is more suitable for native birds and invertebrates. Planting a wetland buffer will result in increased shade for the wetlands, reducing water temperatures, and thus improving conditions for aquatic invertebrates and potentially fish.

The level of effect of the restoration planting will be a **net gain** for biodiversity.

[15] Envirolink, July 2026.

6.2 Streams

6.2.1 Earthworks

As for wetlands, the development footprint and earthworks extent have been designed to avoid streams so that all activity will lie outside of streams, and outside of a 10 m setback from all streams, with the exception of minor piling required for the boardwalks crossing Streams R1, R2.1 and R5 (see **Section 6.2.2**).

Erosion and Sediment Controls will be implemented during each phase of the earthwork and construction process, to protect streams from erosion and discharges of sediment during rainfall events.

The level of effect on streams of the proposed earthworks is considered to be **very low**.

6.2.2 Walkway

The route of the proposed walkway has been designed to avoid wetlands and streams where possible, with the result that three streams will be crossed by the walkway – Streams R1, R2.1 and R5. The crossings will be via a boardwalk to minimise impact on the stream bed, and to prevent trampling of vegetation.

The piles for the boardwalks will be sunk on the stream banks, away from the stream bed. Small areas of bankside vegetation may be removed to make way for the boardwalk. The area of the boardwalk will be small, at 4.8 m² (3 m long x 1.6 m wide). See **Figure 7** for details of the boardwalk design.

The effects will be minimised by keeping all piling outside of the stream bed, and by employing erosion and sediment control measures. On completion of the works, the area of stream bed and bank affected will be restored through planting with native species.

The level of effect on Streams R1, R2.1 and R5 will be **very low**.

6.2.3 Increase in impervious surfaces and discharge of stormwater

The change in the hydrology of the eastern and western catchments has the potential to affect the stream network in a similar manner as the wetlands. The increase in surface water flow and decrease in groundwater recharge will result in stormwater reaching the stream network more quickly and at higher volumes during rainfall events, with subsequent potential for erosion and flooding downstream. Streams in the upper sub-catchments, already seasonal and intermittent in their flow regimes, may lose inputs of surface flow as a result of the diversion of stormwater from impervious surfaces to the downstream stormwater detention basins, and groundwater inputs through loss of groundwater recharge in areas of impervious surfaces.

As discussed above, the stormwater management system will include a number of measures to mitigate the effects of an increase in impervious surfaces, including a network of stormwater detention basins in the eastern and western catchments, the diversion of clean roof water from residential properties to the heads of gullies, and the diversion of stormwater arising from roads and driveways into soak pits to ensure infiltration of stormwater to groundwater. In addition, lifestyle lots will harvest rainwater for domestic use, which will ultimately discharge to groundwater via irrigation of lawns/ gardens and dripline irrigation of treated wastewater into private disposal fields. Lifestyle lots will also divert overflow harvested rainwater to grass swales that will discharge to the heads of gullies. Discharge points will be diffuse to prevent the risk of erosion.

The level of effect on streams of the increase in impervious surfaces is considered to be **very low**.

The level of effect of the discharge of stormwater via a variety of methods is considered to be **very low**.

6.2.4 Discharge of effluent from wastewater disposal fields

As noted above in **Section 6.1.4**, the rate of effluent application to the wastewater disposal fields will be low, and therefore the risk of untreated discharge from the disposal fields to surface water or ground water is very low. The risk of coliform contamination is also mitigated through the low rate of land application.

The level of effect on streams of effluent discharge from the wastewater disposal fields is considered to be nil.

6.2.5 Restoration planting and protection of streams

The current condition of the streams is poor as a result of past and current land uses. The streams have been trampled and grazed by stock, and there is very limited riparian vegetation remaining, particularly in the western catchment. The proposed ecological planting and protection of the streams will considerably enhance their ecological value. Planting native riparian species will create habitat that is more suitable for native birds, and will create increased shade for the streams, reducing water temperatures and thus improving conditions for aquatic invertebrates and fish.

The level of effect of the restoration planting will be a **net gain** for biodiversity.

6.3 Fish

6.3.1 Farm ponds

A fish survey has not been conducted at the site; however, surveys at nearby sites within the Moutere Inlet catchment have recorded several native fish species. It is possible that native fish are present on the site within the stream network, and the existing farm ponds that have a reasonable connection (via overland flow paths) to streams and wetlands.

Four farm ponds are likely to be removed or altered to make way for the construction of stormwater detention basins and/ or dams (Dams E3a, E6a, E7 and W2). Removal or alteration of the ponds will result in the loss of potential fish habitat, and, if fish are present, the potential injury or death of fish.

To minimise the impact on fish, a fish salvage operation is recommended prior to earthworks. If fish are found to be present, they should be removed and relocated to a suitable location on site.

Provided a fish salvage operation is undertaken, the level of effect on fish of the removal/ alteration of four ponds will be **very low**.

6.3.2 Fish passage

The construction of Dam E5d may create a barrier to fish movement between two sections of Stream R1, and the construction of Dam W4 may create a barrier to fish movement between Stream R5.1 and Wetland W36. Whilst the likelihood of fish being present in these streams and wetland is low, it is possible, particularly longfin and shortfin eels, which are tolerant of a range of environmental conditions and which

are capable of moving in very low stream flows and even over terrestrial areas when the ground or vegetation is wet.

The detention basins will be designed to detain water temporarily – water will be released from the basin via a pipe culvert of a diameter that will restrict the flow of water, thus slowing the rate at which stormwater passes through the stream network.

To comply with the permitted activity criteria for culverts in the NES-F, fish passage will be provided for in the culverts through Dams E5d and W4. The culverts will be designed to comply with the conditions stated in Regulation 70 of the NES-F, including 25 % embedment, and use of flexible baffles where it is not possible to include natural bed substrate along the length of the culvert. An example of a suitable pipe culvert design is illustrated in **Figure 8** and **Plate 16**.

Provided an appropriate design is used for the culverts through Dams E5d and W4, the level of effect on fish passage will be **very low**.

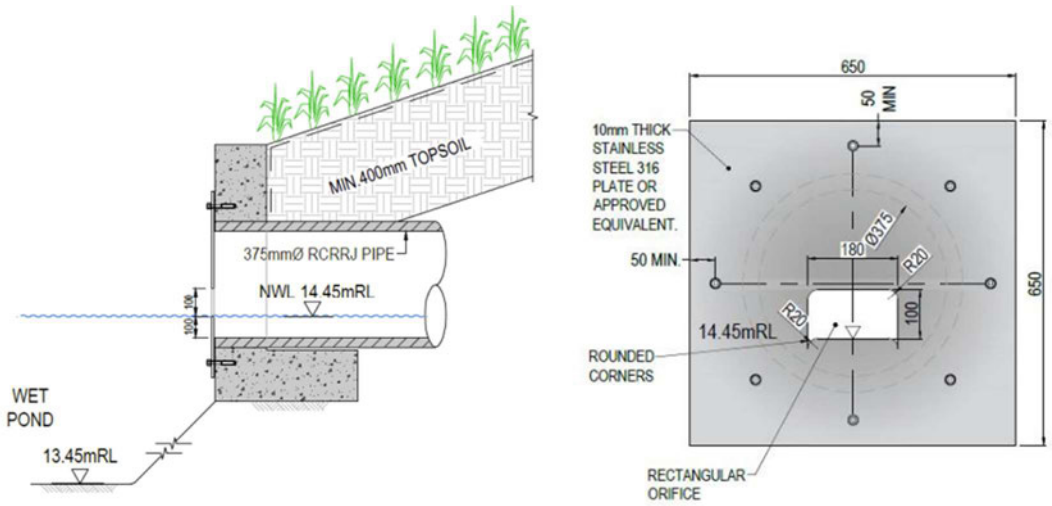


Figure 8: Example of a suitable pipe culvert design that allows for fish passage whilst also allowing for the desired slowing of stormwater velocities. The outlet pipe has an inlet structure that comprises of an orifice plate to control flow rates and provide fish passage. The orifice plate sits above the base of the pipe, and the pipe is laid at a flat longitudinal grade to allow ponding within the culvert. Source: Fish *Passage design for ecological connectivity to a stormwater facility*. Presentation by Ho *et* al. to Water New Zealand's 2018 Stormwater Conference.

Plate 16: Example of a culvert with flexible baffles installed. The baffles alter the flow while providing rest areas for species travelling upstream.

6.4 Birds

The proposed development will result in the loss of open grassland habitat and scattered pine trees, that are utilised by a low number of common native bird species for foraging and possibly nesting.

To minimise any potential impact on native birds, tree felling is recommended to take place outside of the breeding season, or that the vegetation is surveyed for nesting activity immediately prior to felling by a suitably qualified ecologist. If nesting activity is detected, an exclusion zone will be marked off around the nest until nesting activity has ceased/ the nestlings have fledged. This will ensure a **very low** level of effect on nesting native birds.

The restoration planting of the stream and wetland network will create a large area of good quality habitat suitable for native birds and will be a **net gain** for biodiversity.

6.5 Terrestrial vegetation

The majority of the proposed development will not affect the small patches of existing native terrestrial vegetation as they lie outside of the earthworks extent.

There is one small area of existing native vegetation that will be removed, at least in part, to make way for the construction of Dam E5d and associated stormwater detention pond. This vegetation includes common native shrubs such as karamū *Coprosma robusta* and māhoe *Melicytus ramiflorus*. No plant species that are classified as At Risk or Threatened have been observed or are expected to occur in this area. A maximum area of 495 m² of this vegetation will be affected. On completion of the dam and detention basin construction, the detention basin and surrounds will be planted with native riparian species.

The level of effect on native terrestrial vegetation will be **very low.**

The proposed programme of restoration planting across the site will result in a considerable **net gain** for biodiversity.

Table 7: Assessment of significance of ecological effects using the EIANZ matrix method.

Factor	Value of resource[a]	Magnitude of effect[b] (without mitigation)	Level of effect[c] (without mitigation)	Mitigation that will be applied	Magnitude of effect (after mitigation)	Level of effect[c] (after mitigation)
Wetlands: Interception of groundwater via excavations such as cuts and trenches	Moderate	Moderate	Moderate	**Avoid** All proposed excavations are outside of a 10 m setback from wetlands; the majority and the deepest excavations will take place on higher ground where the depth to ground water levels are highest, and there are no nearby wetlands, as confirmed in the hydrogeology report. **Minimise** Stormwater management system that includes measures to ensure surface flows and groundwater recharge are maintained: diversion of roof water to gully heads that contain wetlands, diversion of stormwater to soak pits at gully heads, diversion of overflow water from rainwater harvesting to gully heads.	Negligible	Very low
Wetlands: Construction of boardwalk over Wetlands W4 and W70	Moderate	Low	Low	**Minimise** No piles to be constructed within the wetland. Very short length and width of boardwalk over wetland. Construction area to be kept to a minimum. Erosion and Sediment Controls. **Remedy** Plant affected area of wetland following construction.	Negligible Positive	Very low Net gain
Wetlands: Discharge of sediment during construction	Moderate	Moderate	Moderate	**Minimise** Erosion and Sediment Controls.	Negligible	Very low

Factor	Value of resource[a]	Magnitude of effect[b] (without mitigation)	Level of effect[c] (without mitigation)	Mitigation that will be applied	Magnitude of effect (after mitigation)	Level of effect[c] (after mitigation)
Wetlands: Increase of impervious surfaces generating an increase in surface water flow and a decrease in groundwater recharge.	Moderate	Moderate	Moderate	**Minimise** Stormwater management system that includes measures to ensure surface flows and groundwater recharge are maintained: diversion of roof water to gully heads that contain wetlands, diversion of stormwater to soak pits at gully heads, diversion of overflow water from rainwater harvesting to gully heads.	Negligible	Very low
Wetlands: Inundation of, or portions of Wetlands W24, W36, W40, W41, W43 and W45, within stormwater water detention areas of Dams E7, W4, W5 and W6.	Moderate	Low	Low	**Minimise** Detention basins designed so that maximum fill level will be reached only during storm events and detention at maximum fill level will last for no longer than 12 hours.	Negligible	Very low
Wetlands: Discharge of stormwater from roads and house sites – erosion and/ or discharge of contaminants.	Moderate	Low	Low	**Minimise** 'Clean' stormwater from roofs will be collected, filtered, and discharged via swales and rock riprap outflows to gully heads. Stormwater from driveways and roads will be collected, filtered, and discharged via stormwater detention basins, or soak pits which will slow the rate of flow and provide additional filtering/ settling of contaminants and sediment. Discharge points will be diffuse to reduce flow rates and therefore the risk of erosion.	Negligible	Very low
Wetlands: Discharge of effluent from wastewater disposal fields	Moderate	Moderate	Moderate	**Avoid** Very low rates of effluent disposal will mean the risk of discharge to surface or ground water is negligible.	Negligible	Very low
Wetlands: Restoration planting and removal of stock	Moderate	Positive	Net gain	N/A	-	-

Factor	Value of resource[a]	Magnitude of effect[b] (without mitigation)	Level of effect[c] (without mitigation)	Mitigation that will be applied	Magnitude of effect (after mitigation)	Level of effect[c] (after mitigation)
Streams: Discharge of sediment during construction	Low	Moderate	Moderate	**Minimise** Erosion and Sediment Controls	Negligible	Very low
Streams: Construction of boardwalk over Streams R1, R2.1 and R5.	Low	Low	Low	**Minimise** No piles to be constructed within the stream bed. Very short length and width of boardwalk over streams. Construction area to be kept to a minimum. Erosion and Sediment Controls. **Remedy** Plant affected area of stream margin after construction.	Negligible	Very low
Streams: Discharge of stormwater from roads and house sites – erosion and/ or contamination of streams	Low	Moderate	Low	**Avoid** ''Clean' stormwater from roofs will be collected, filtered, and discharged via swales and rock riprap outflows to gully heads. Stormwater from driveways and roads will be collected, filtered, and discharged via stormwater detention basins, or soak pits which will slow the rate of flow and provide additional filtering/ settling of contaminants and sediment. Discharge points will be diffuse to reduce flow rates and therefore the risk of erosion.	Negligible	Very low
Streams: Discharge of effluent from wastewater disposal fields	Low	Moderate	Low	**Avoid** Very low rates of effluent disposal will mean the risk of discharge to surface or ground water is negligible.	Negligible	Very low
Streams: Restoration planting and removal of stock	Low	Positive	Net gain	N/A	-	-

Factor	Value of resource[a]	Magnitude of effect[b] (without mitigation)	Level of effect[c] (without mitigation)	Mitigation that will be applied	Magnitude of effect (after mitigation)	Level of effect[c] (after mitigation)
Fish: Removal/ alteration of farm ponds near Dams E3a, E6a, E7 and W2.	High	High	Very high	**Minimise** Fish salvage prior to commencement of works	Negligible	Very low
Fish: Loss of passage between two sections of Stream R1 (Dam E5d) and between Stream R5.1 and Wetland W36 (Dam W4).	High	Low	Low	**Minimise** Outlet culverts through the dams to be designed to allow for fish passage, as per Regulation 70 in the NES-F.	Negligible	Very low
Birds: Loss of habitat; injury/ death of nesting birds	Low	Low	Very low	**Remedy** The extensive restoration planting and protection of open land around the streams and wetlands will create better quality habitat than that lost. **Minimise** Fell trees/ shrubs outside of the native bird breeding season, or ensure the vegetation is surveyed for nesting activity prior to felling by a suitably qualified ecologist.	Positive Negligible	Net gain Very low
Vegetation: Clearance of ca. 495 m² of terrestrial vegetation to make way for Dam E5d	Low	Negligible	Very low	**Remedy** Planting of native species in and around the detention basin, and throughout the site will considerably increase the area of native vegetation and create better quality habitat than that lost.	Positive	Net gain

[a] *EIANZ matrix tables 5 and 6.*

[b] *EIANZ matrix table 8; measured in the context of the catchment (streams) or District (terrestrial values).*

[c] *EIANZ matrix table10.*

7.0 Application of national policy for freshwater

The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F) and the National Policy Statement for Freshwater Management 2020 (NPS-FM) apply to the wetlands and streams on the site. An assessment and the application of the relevant sections of these policies is presented below in **Table 8** (NES-F) and **Table 9** (NPS-FM).

Table 8: Assessment and application of the National Environmental Standards for Freshwater

Part 3: Standards for other activities that relate to freshwater	
Subpart 1 – Natural inland wetlands	
Restoration, wetland maintenance, and biosecurity of natural inland wetlands	
Clause	**Development proposal and comment**
38. Vegetation clearance within, or within a 10 m setback from, a natural inland wetland	Only very limited vegetation clearance is likely to be required for the restoration of the wetlands (less than 500 m² or 10 % of the total area of wetland, as specified in the Conditions). The existing wetland vegetation is sparse, heavily grazed, and comprises of almost entirely exotic species. Vegetation clearance will be addressed in the Wetland Restoration Plan, as directed by Reg 38(5) and (6) and will comply with the general conditions in regulation 55 and address the matters in Schedule 2 of the NES-F.
39. Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland	No earthworks are required for the restoration of the wetlands.
40. The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural inland wetland	Not required for the restoration of the wetlands.
Construction of wetland utility structures	
Clause	**Development proposal and comment**
42. (1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland	A *wetland utility structure* includes boardwalks. Two boardwalks are proposed to allow the public access track to cross Wetland W4 and Wetland W70. A very small area of vegetation clearance may be required within the wetland and/ or within the 10 m setback, to enable to construction of the boardwalks, depending on the nature of the vegetation at the time. The wetland is currently accessed by livestock and there is only very low-lying vegetation present. The boardwalks will cover an area of approximately 4.8 m² at each wetland.
42. (2) Earthworks or land disturbance within, or	A very small degree of land disturbance will be required to sink the piles for the boardwalks. The piles will be located outside of the wetlands themselves, but within

within a 10 m setback from, a natural inland wetland	the 10 m setback. Four piles will be sunk at each wetland, to support a boardwalk 3 m long and 1.6 m wide.
42 (3) and (4) relating to the taking, use, damming, or diversion within, or discharge of water into, a natural inland wetland or within or into a 100 m setback	Not required for the construction of the boardwalk.
Construction of specified infrastructure	
Clause	**Development proposal and comment**
45. (1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland	*Specified infrastructure* includes any water storage infrastructure. It is not clear whether water storage infrastructure covers water that is temporarily detained in a stormwater detention basin, therefore this regulation has been addressed in case it is considered to be relevant to the stormwater detention basins. The proposed locations for the twelve stormwater detention basins, including the dams, are all outside of wetlands, and outside of a 10 m setback of wetlands. Vegetation will not be cleared within, or within a 10 m setback from, any wetlands for the purposes of the stormwater detention basins. No drainage or partial drainage of a natural inland wetland will occur and for this reason Regulation 45(1) is not triggered.
45. (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland	The proposed locations for the twelve stormwater detention basins, including the dams, are all outside of wetlands, and outside of a 10 m setback of wetland. Any earthworks required for formation of the basins and bunds will therefore not trigger Regulation 45(2).
45. (3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland, resulting, or likely to result, in the complete or partial drainage of all or part of the natural inland wetland.	Earthworks are required outside of a 10 m, but within a 100 m, setback from natural inland wetlands, for the construction of the stormwater detention basins. The project's hydrology report states that excavations at the site are unlikely to result in the diversion or inception of ground water, and therefore the inputs of groundwater into wetlands are unlikely to be affected by earthwork cuts. Partial or complete drainage of wetlands is not likely to result from the earthworks, so Regulation 45(3) does not apply.
45. (4) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland where it is likely to change the water level range or hydrological function of the wetland.	The stormwater detention ponds will result in the temporary damming of water within 100 m of wetlands. The ponds are designed to detain the water over a matter of hours only, with water draining from the pond via a pipe culvert downstream. The water level range in six wetlands may change slightly when the water levels in adjacent detention basins reach the maximum fill level. At the maximum fill level, detained water will extend into these wetlands, thus increasing water levels. This change will be infrequent and temporary, with inundation occurring for approximately 11.5 hours during a 1 % AEP rainfall event in basin W5, and for approximately 6 hours in basin W6. The hydrological function of the wetland is not expected to change. The stormwater detention basins will also result in the diversion of water within a 100 m setback from wetlands, as stormwater from the development (other than roofs) will be collected and diverted directly into the detention basins rather than

	flowing over ground or entering the groundwater system as it does presently. To reduce the effects of stormwater diversion, including both via surface flows and recharge of groundwater, a number of measures will be implemented as part of the stormwater management system, as discussed in **Section 6.0** of this report.
45. (5) The discharge of water into water within, or within a 100 m setback from, a natural inland wetland	Water will be discharged within a 100 m setback to wetlands for the express purpose of maintaining water supply levels to wetlands, particularly those wetlands upgradient of stormwater detention ponds. Stormwater from impervious surfaces will be directed via numerous methods towards gully head wetlands, including via surface flow and through groundwater recharge. Water will not be discharged directly into a wetland, and all discharge points will be diffuse/ include scour protection.
Drainage of natural inland wetlands	
Clause	**Development proposal and comment**
52. (1) Earthworks outside, but within a 100 m setback from, a natural inland wetland	Earthworks will take place outside, but within a 100 m setback from, natural inland wetlands. The project's hydrology report states that excavations at the site are unlikely to result in the diversion or inception of ground water, and therefore the inputs of groundwater into wetlands are unlikely to be affected by earthwork cuts. Partial or complete drainage of wetlands is unlikely to result from the earthworks.
52. (2) The taking, use, damming, or diversion of water outside, but within a 100 m setback from, a natural inland wetland.	The stormwater detention ponds will result in the temporary damming of water within 100 m of wetlands. The ponds are designed to detain the water over a matter of hours only, and are not likely to result in the complete or partial drainage of a wetland downstream of the ponds. The earthworks for the proposed new lots and roading will take place along the ridges where the water table is below the level of excavation, so these earthworks are not likely to result in the complete or partial drainage of all or part of a natural wetland. Wetlands upgradient of stormwater detention basins will continue to receive inputs of stormwater from impervious surfaces via swale drains (surface water inputs) and soak pits (groundwater recharge).
Other activities	
Clause	**Development proposal and comment**
54. (a) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland.	No vegetation clearance is proposed for any activity other than those already addressed above
54. (b) Earthworks within, or within a 10 m setback from, a natural inland wetland.	No earthworks are proposed to take place within, or within a 10 m setback from, a natural inland wetland other than for the boardwalk but this is dealt with under Regulation 42 and therefore not required to be considered under this regulation.
54. (c) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland.	If the stormwater detention basins are not considered to be *specified infrastructure* as per Regulation 45, then Regulation 54 (c) applies. The stormwater detention basins will result in the damming of water within a 100 m setback from wetlands. The basins are likely to have a hydrological connection to nearby wetlands, both upstream and downstream. The majority of the basins are unlikely to change the water level range or hydrological function of wetlands as they will continue to release water downstream, and the detained water will not extend into any wetlands. Four basins may result in a slight increase in water level range during storm events when the maximum fill level may be reached and ponding may

	extend into nearby upstream wetlands. This increase in water levels will be infrequent and temporary, with inundation occurring for approximately 11.5 hours during a 1 % AEP rainfall event in basin W5, and for approximately 6 hours in basin W6 during the same event. These events are not expected to change the hydrological function of the wetlands. Water will be diverted within a 100 m setback of wetlands as stormwater will be collected from the development (including from roads and driveways) and diverted into the stormwater detention basins. Wetlands in the heads of gullies will be bypassed by this stormwater system. There will be a hydrological connection between the diverted water and the gully-head wetlands. To avoid change to the water level range or hydrological function of the gully-head wetlands, stormwater from roofs will be collected and diverted into the gully heads, and stormwater from other impervious surfaces will be diverted to soak pits to facilitate the recharge of groundwater upgradient of gully-head wetlands. See comments for Regulation 54 (d) regarding the discharge of water into a wetland.
54. (d) The discharge of water into water within, or within a 100 m setback from, a natural inland wetland.	Stormwater is proposed to be discharged within a 100 m setback from wetlands. There will be a hydrological connection between the discharge and the wetlands, and the discharge will enter the wetlands. This is a deliberate design to ensure continued input of water to gully-head wetlands so that the water level range and hydrological function of the wetlands remains similar to the pre-development state. Water from roofs will be discharged via grass swales and rock riprap and infiltrate to groundwater or disperse overland before entering a wetland. Water from other impervious surfaces will be collected and diverted to soak pits, to facilitate groundwater recharge. Water will also be discharged from stormwater detention basins within 100 m of wetlands. As the water is to be only temporarily detained, the water level range and hydrological function of wetlands downstream of the basins is not likely to change.
Culverts	
Clause	**Development proposal and comment**
70. The placement, use, alteration, extension, or reconstruction of a culvert in, on, over, or under the bed of any river or connected area is a permitted activity if it complies with the conditions.	Culverts will be installed through stormwater detention dams to allow for the continued, but curtailed, passage of water downstream of the detention basins. The locations of the stormwater detention basins have been assessed for the requirement of fish passage through the culverts (see **Section 5.4**). Two culverts will be required to provide fish passage – at Dams E5d and W4. The design of the culverts through the dams will comply with the Conditions stated in Clause 70(2) (see **Section 6.3.2** for details).

Table 9: Assessment and application of the National Policy Statement for Freshwater Management – policies relevant to this project.

2.2 Policies
Policy 5
Freshwater is managed… to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved
The wetlands and streams on the site are all degraded and have been assessed as being in poor or very poor condition. The proposed development includes an extensive programme of native planting along the stream and wetland network, including a 10 m buffer from each stream and wetland. Stock will be excluded from accessing the streams, wetland, and their planted buffers. The health and wellbeing of the streams and wetlands on the site will be significantly enhanced.
Policy 6
There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.
The proposed development will result in a nil loss of extent of natural inland wetland. No earthworks or other development is proposed to take place within, or within a 10 m setback of, a natural wetland, other than for the construction of two boardwalks. The boardwalks will cover approximately 4.8 m² of each wetland which may affect the degree to which wetland plants can grow beneath it, but the functionality of the wetland will not be affected. The piles for the boardwalk will be placed outside of the wetland. The wetland, along with a 10 m buffer, will be planted with native plants, and its ecological values therefore considerably enhanced.
Policy 7
The loss of river extent and values is avoided to the extent practicable.
The development has been designed so as to avoid the streams on site.
Policy 8
The significant values of outstanding water bodies are protected.
There are no outstanding water bodies present on the site.
Policy 9
The habitats of indigenous freshwater species are protected.
The wetlands and streams on the site provide limited, poor-quality habitat for a low number of common native bird species such as pukeko, and are likely to support low densities of common aquatic invertebrates. It is possible that the streams support the native longfin and/ or shortfin eel during times of regular flow. The whole network of wetland and stream habitat on site is proposed for protection. Where farm ponds are to be removed/ altered, a fish salvage operation will be required. The details of the fish salvage and relocation will be addressed in a Native Freshwater Fish Relocation Plan.
Policy 13
The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.
To be addressed in the Wetland Monitoring Plan (see **Section 8.0**).

Policy 14
Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.
To be addressed in the Wetland Monitoring Plan.

8.0 Regional benefit of the proposed wetland restoration

Freshwater wetlands are one of the most depleted ecosystem types in New Zealand, with 90 % having been lost nationwide[16]. While the Tasman region supports nationally and internationally important wetlands including Farewell Spit, Mangarākau Swamp, Waimea Inlet and Te Waikoropupū Springs, which are protected as public land, wetlands on private land have been severely depleted, now covering only about 5 % of their former area[17].

Wetlands are important for many reasons including:

- Provision of habitat for a wide range of indigenous species including aquatic invertebrates, fish, and birds;
- Filtration of water and sediment, thus improving water quality;
- Water storage and flood mitigation; and
- Maintaining water flow in streams in dry periods – fish abundance and diversity is almost always better in wetland-fed streams[4].

According to research by Denyer and Peters (2020), the Tasman region supported 3,557 ha of freshwater wetland in 2018. This area is spread over more than 800 wetlands, meaning that the majority of these wetlands are small, of less than 10 ha in area[18]. Freshwater wetlands are still being lost, primarily for the conversion of land to high-producing grassland. Between 1996 and 2018, almost 5,400 ha of freshwater wetland was removed nationwide[3].

This extent and continuing rate of loss of freshwater wetlands illustrates the very great need for the retention and enhancement of freshwater wetlands, particularly on private land. The wetlands at Tahimana cover a total area of 1.25 ha. The wetland on the adjacent property on Westmere Drive covers an area of approximately 5 ha. Combined, these areas of wetland contribute 0.17 % of Tasman's total freshwater wetland resource. At the Ecological District scale, this represents 9.3 % of freshwater wetlands in the northern sector of the Moutere Ecological District[19].

The proposed development at Tahimana will include the protection and restoration of all the wetlands on the site. The wetlands will be protected from stock and planted with native wetland plant species along with a 10 m buffer of native shrubs and trees. This will create a considerable area of restored native wetland and buffering native forest habitats. Removing stock will allow the wetlands to recover from trampling and grazing. The restoration planting will create habitat for aquatic invertebrates as well as terrestrial fauna, and will improve the habitat quality in the streams for native fish by providing shade and inputs of woody debris.

The restoration of the wetlands and streams will also have a considerable benefit for the wider catchment, including the large wetland on the adjacent property, through the improved filtering capacity of the wetlands. The increase in area of dense native vegetation in and around the wetlands and streams will

[16] Denyer, K and Peters, M. 2020. *The root causes of wetland loss in New Zealand: An analysis of public policies and processes*. National Wetland Trust.

[17] https://www.tasman.govt.nz/my-region/environment/environmental-management/land/wetlands/

[18] https://www.wetlandtrust.org.nz/wp-content/uploads/2019/10/Tasman_Marlborough_TDC_revised-Oct-2019.pdf

[19] North, M. 2015. Ecological District Reports. *Report 2A: Moutere Ecological District – Northern Sector*. Tasman District Council.

improve the capacity of the wetlands to filter nutrients and sediment. Stormwater flow rates will also be reduced by the planted vegetation, reducing the rate at which stormwater enters the wider system, and reducing the potential for flooding and erosion downstream.

By improving the filtration of sediments and nutrients, reducing rates of stormwater flow, and creating shade, the restoration of the site's wetlands and streams will contribute to improved water quality in the wider catchment, including in the Moutere Inlet, which has significant ecological value. The Moutere Inlet is recognised as being nationally significant for shore birds and wading birds including the white heron[20] (Nationally Critical[21]) and as a valuable nursery area for marine and freshwater fish[22].

In summary, the proposed development at Tahimana will provide a significant regional benefit to Tasman's wetlands. It will create an overall net benefit for wetland and stream health though the removal of stock and the planting of wetlands and riparian margins. The proposed ecological planting will also increase the area of good quality habitat on the site for refuge, foraging, and nesting, benefitting a range of native terrestrial fauna species, including birds and skinks, as well as aquatic invertebrates and fish. Overall, the project will be of profound ecological benefit to the site. Wetlands, streams and their terrestrial margins will be enhanced and protected, with resultant improvements in the environmental resilience of adjacent local wetlands and the Moutere estuary, and considerable enhancement of local resources for indigenous biodiversity.

9.0 Residual adverse effects and management plans

The level of effect on the ecology values of the site after proposed mitigation is **very low** or a **net gain**. There are no residual adverse effects, therefore offsetting or compensation measures are not required.

The proposed development will create an overall net benefit to wetland and stream health through the removal of stock and the planting of wetlands and riparian margins. The ecological planting will also increase the area of good quality habitat on the site, for refuge, foraging, and nesting, benefitting a range of terrestrial fauna species as well as aquatic invertebrates and fish. The net benefit to wetlands is considered to be locally and regionally significant.

To ensure the proposed mitigation is undertaken thoroughly and according to national or regional policy requirements, the following plans are recommended and have been prepared and are either:

(a) Attached to this report as **Appendices C, D and E**:

1. **Native Freshwater Fish Relocation Plan** – that outlines the approach for salvage from those areas of stream and farm pond that are to be affected by the construction of stormwater detention basins.

[20] Davidson, R J, Starks, J E, Preece, J R, Lawless, P F, and Clarke, I E. 1993. *Internationally and nationally important coastal areas from Kahurangi Point to Waimea Inlet, Nelson, New Zealand: recommendations for protection.* Department of Conservation, Nelson/ Marlborough Conservancy. Occasional Publication No. 14, 121 p.

[21] Robertson *et al*. 2021. *Conservation status of birds in Aotearoa New Zealand, 2021.* New Zealand Threat Classification Series 36. Department of Conservation.

[22] Schuckard, R and Melville, D S. 2013. *Shorebirds of Farewell Spit, Golden Bay and Tasman Bay*. Prepared for Nelson City Council and Tasman District Council.

The plan will also detail the location of where salvaged fish will be released. The salvage of fish will be undertaken by a qualified expert and in accordance with this plan.

2. **Ecological Planting Plan** – to guide the planting and restoration of the wetlands and riparian margins throughout the stream and wetland network. This plan will be based on the project's Landscape Plan, and in addition, will address Schedule 2 of the National Environmental Standards for Freshwater, where relevant.
3. **Wetland Monitoring Plan** – to provide assurance of no effects on wetlands from the earthworks programme and stormwater discharges. The monitoring plan should include methodologies to provide baseline and ongoing monitoring measures to sufficiently measure the potential changes in ecological and hydrological function of the wetlands on the site.

Or,

(b) Provided by others as part of the substantive application:

4. **Erosion and Sediment Control Plan** – in accordance with Council's design guidelines to prevent the mobilisation of sediments into waterways and wetlands within the site;
5. **Stormwater Detention Maintenance and Management Plan** – to ensure the stormwater detention basins maintain their correct function in reducing the impacts of stormwater flow through the catchment as well as maintaining the health of the wetlands within the maximum fill level of the basins.

10.0 Conclusion and recommendations

The Tahimana development proposes a subdivision and associated earthworks for the construction of roading, house platforms, wastewater disposal fields, and a network of stormwater detention basins. The development will also protect and restore the streams and wetlands in the two catchments on the site, through removal of stock and extensive wetland and riparian planting.

The site has been surveyed and assessed for its ecological values. There are 13 watercourses on the site that meet the definition of 'river' in the TRMP. The majority of the watercourses are intermittent in their flow, and of poor ecological quality. There are 51 wetlands on the site, which are all in poor ecological condition having been degraded through past and current land uses.

The wetlands and streams, while in poor condition, nevertheless provide habitat for a low number of native bird species, including paradise shelduck, kingfisher and spur-winged plover. The wetland and stream network also contribute towards ecosystem services such as stormwater attenuation and sediment filtering.

There are only a few very small patches of low quality, native terrestrial vegetation, which provides habitat for a low number of native species such as fantail. Other common bird species, including Australasian harrier and welcome swallow, utilise the open grassland habitat for foraging.

The site provides some limited habitat that may be suitable for native lizards, in areas of long grass and/ or decaying logs, in scattered locations within gullies. There is no suitable lizard habitat within the earthworks footprint.

The development and earthworks footprint lie outside of a 10 m setback from streams and wetlands, other than for the specified boardwalks, therefore avoiding significant impacts on the ecological values. A number of actual and potential effects have been identified, and proposals to avoid or minimise these effects have been proposed. The relevant policies and clauses in the NES-F and the NPS-FM have been addressed with respect to the management and protection of the streams and natural inland wetlands present on the site.

Provided the proposed mitigation measures are implemented, it is considered that the development will have a negligible or nil effect on the ecological values of the site. The proposals for protection and restoration of the stream and wetland network will have a very positive impact on the ecological values, increasing the area and quality of habitat for terrestrial and aquatic organisms.

Overall, it is considered that the proposed development will provide a net gain for biodiversity, particularly for the benefit of wetlands locally and regionally.

Recommendations:

1. Provision of a **Native Freshwater Fish Relocation Plan**, that outlines the approach for salvage from those areas of stream and farm pond that are to be affected by the construction of stormwater detention basins. The plan will also detail the location of where salvaged fish will be released. The salvage of fish will be undertaken by a qualified expert and in accordance with this plan.
2. Provision of a **Wetland Monitoring Plan** to monitor the restoration planting until at least 80 % canopy cover has been reached, and to provide assurance of no effects on wetlands from the earthworks programme and stormwater discharges. The management and monitoring plan should cover details such as:

a. Methodologies to provide baseline and ongoing monitoring measures to sufficiently measure the potential changes in ecological and hydrological function of the wetlands on the site;

b. Methodologies for monitoring progress of the restoration planting, including monitoring of plant health, plant survival, and percentage canopy cover, until canopy cover has reached at least 80 %;

c. Provision for monitoring to take place over the operation of the earthworks and for a period of no less than 5 years upon completion of each stage; and

d. Provision for pre-works monitoring to establish baseline condition in sufficient detail that changes can be measured.

The monitoring plan should be developed in general accordance with the '*Handbook for monitoring wetland condition*', Clarkson, BR, Sorrell, B, Reeves, P, Champion, P, Partridge T, and Clarkson BD (2004).

3. Provision of an **Ecological Planting Plan** to guide the planting and restoration of the wetlands and riparian margins throughout the site's stream and wetland network. It is recommended that this plan be based on the project's Landscape Plan, and that is should address Schedule 2 of the National Environmental Standards for Freshwater.

4. Development and implementation an **Erosion and Sediment Control Plan** in accordance with Council's design guidelines to prevent the mobilisation of sediments into waterways and wetlands within the site.

5. Provision of a **Stormwater Detention Maintenance and Management Plan** to ensure the correct functioning of the stormwater detention basins.

11.0 References

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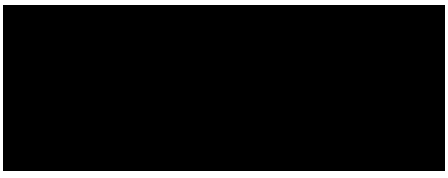
Report prepared by:



Senior Ecologist

Principal Ecologist

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Appendix A: Wetland assessment methods

Areas of a site that are considered to be a potential wetland, based on an initial, visual assessment of vegetation and hydrological conditions, are then further assessed, following the steps detailed below:

- Visual assessment as to whether the potential wetland area could support a threatened species;
- Visual assessment as to whether the potential wetland and surrounding area is clearly dominated by pasture grass species (the Rapid Pasture Test) or whether the potential wetland is clearly dominated by wetland species (the Rapid Wetland Test);
- Visual assessment of areas where the vegetation composition includes species that are scored as wetland obligate, facultative wetland, or facultative (e.g., rushes, wet pasture or 'wetland-type' vegetation) as determined by Clarkson *et al.*[23] (following the Pasture Exclusion Test, and Wetland Delineation Protocols as laid out in the Pasture Exclusion Assessment Methodology[24]);
- Where these compositions of wetland vegetation exist, a further assessment of vegetation, soils, and hydrology is required according to the Pasture Exclusion Assessment Methodology:
    - Vegetation is assessed through plant identification and percentage cover estimates (as per the method described by Clarkson[25]) of 2 m x 2 m plot areas within each potential wetland area;
    - Soils are assessed by applying the criteria outlined in Fraser[26] for identifying hydric (wetland) soils – which involves excavation and examination of a soil core to determine the presence of hydric soil properties including gley characteristics, mottling, peat, and level of soil moisture; and
    - Hydrology is assessed by applying the criteria outlined in the Ministry for the Environment tool[27].
- The boundaries of potential wetland areas are delineated by carrying out the above assessments and through professional judgement.

Figure A1 below outlines the steps taken to determine the presence of a wetland.

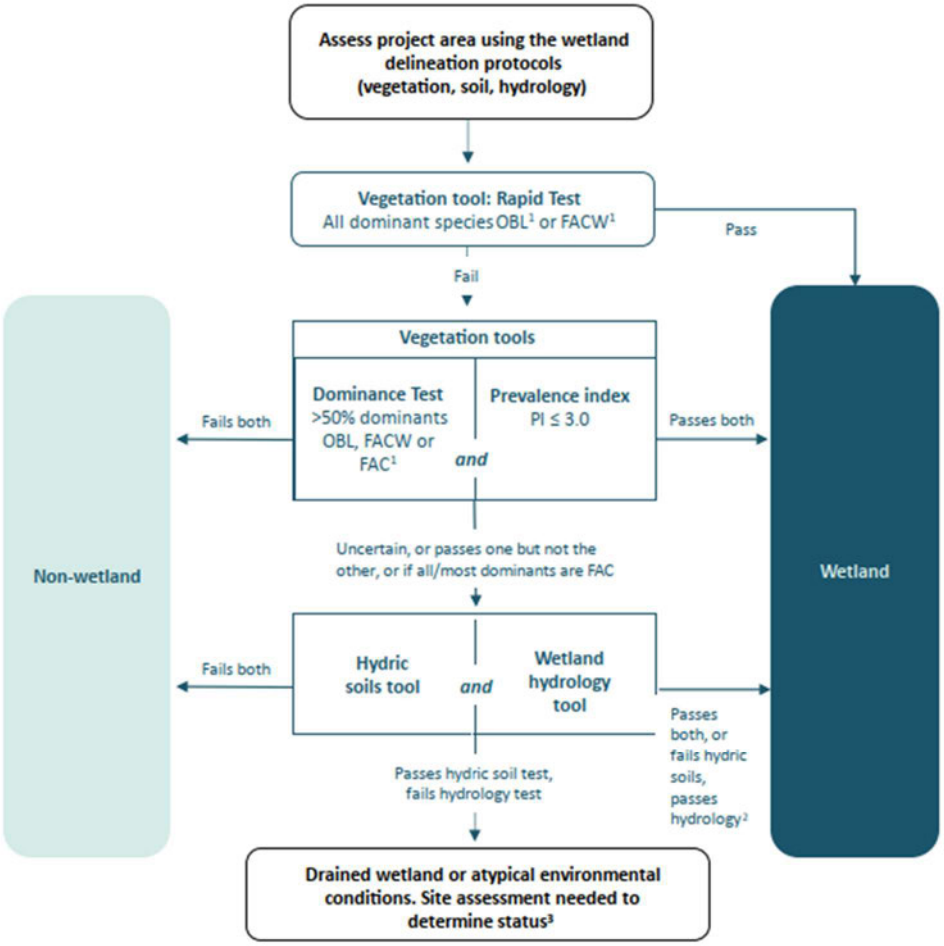
[23] Clarkson B. R., Fitzgerald N. B., Champion P. D., Forester L., Rance B. D. (2021). *New Zealand wetland plant indicator status ratings 2021: Data associated with Manaaki Whenua - Landcare Research contract report LC3975* for Hawke's Bay Regional Council.

[24] Ministry for the Environment. 2022. *Pasture exclusion assessment methodology*. Wellington: Ministry for the Environment.

[25] Clarkson, B. (2013). *A vegetation tool for wetland delineation in New Zealand*. Report prepared for Meridian Energy Limited by Landcare Research.

[26] Fraser S., Singleton P., Clarkson B. (2018). *Hydric soils – field identification guide*. Envirolink Tools Contract C09X1702. Manaaki Whenua – Landcare Research Contract Report LC3233 for Tasman District Council.

[27] Ministry for the Environment. (2022). *Wetland delineation hydrology tool for Aotearoa New Zealand*. Wellington: Ministry for the Environment.



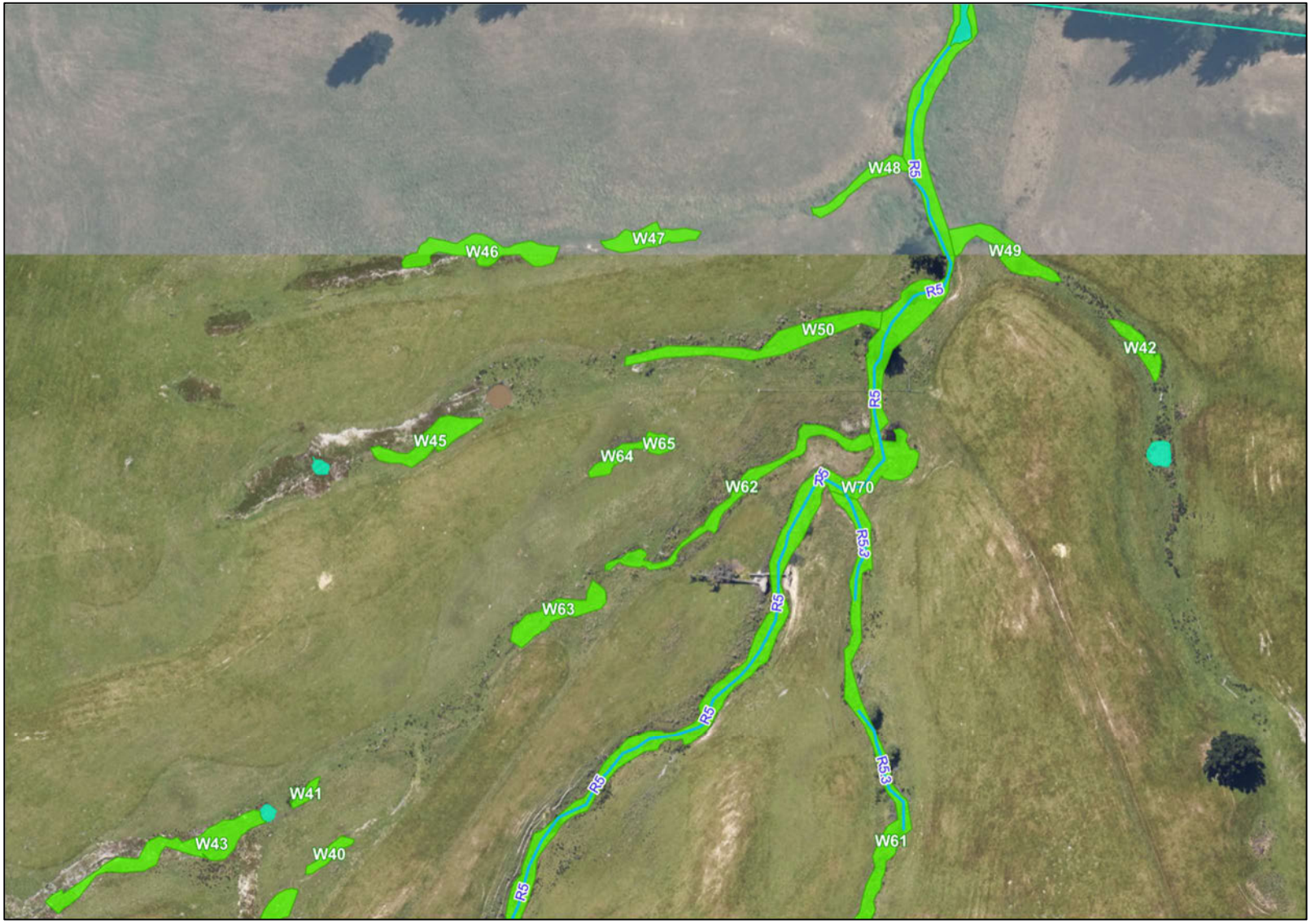
Footnotes:
[1] Wetland indicator status abbreviations: FAC = facultative, FACW = facultative wetland, OBL = obligate wetland.
[2] For example, recent wetland.
[3] The US procedures for atypical or problematic situations are recommended.

Figure A1: Flow chart of steps for wetland vegetation determination (from the Wetland Delineation Protocols[28]). Wetland indicator status abbreviations: FAC = facultative (equally likely to occur in wetlands or non-wetlands – estimated probability 34-66 %); FACW = facultative wetland (occurs usually in wetlands – 67-99 %); OBL = obligate wetland (occurs almost always in wetlands >99 %).

[28] Ministry for the Environment, 2022. *Wetland Delineation Protocols*. Wellington: Ministry for the Environment.

Appendix B: Detailed maps of the stream and wetland network

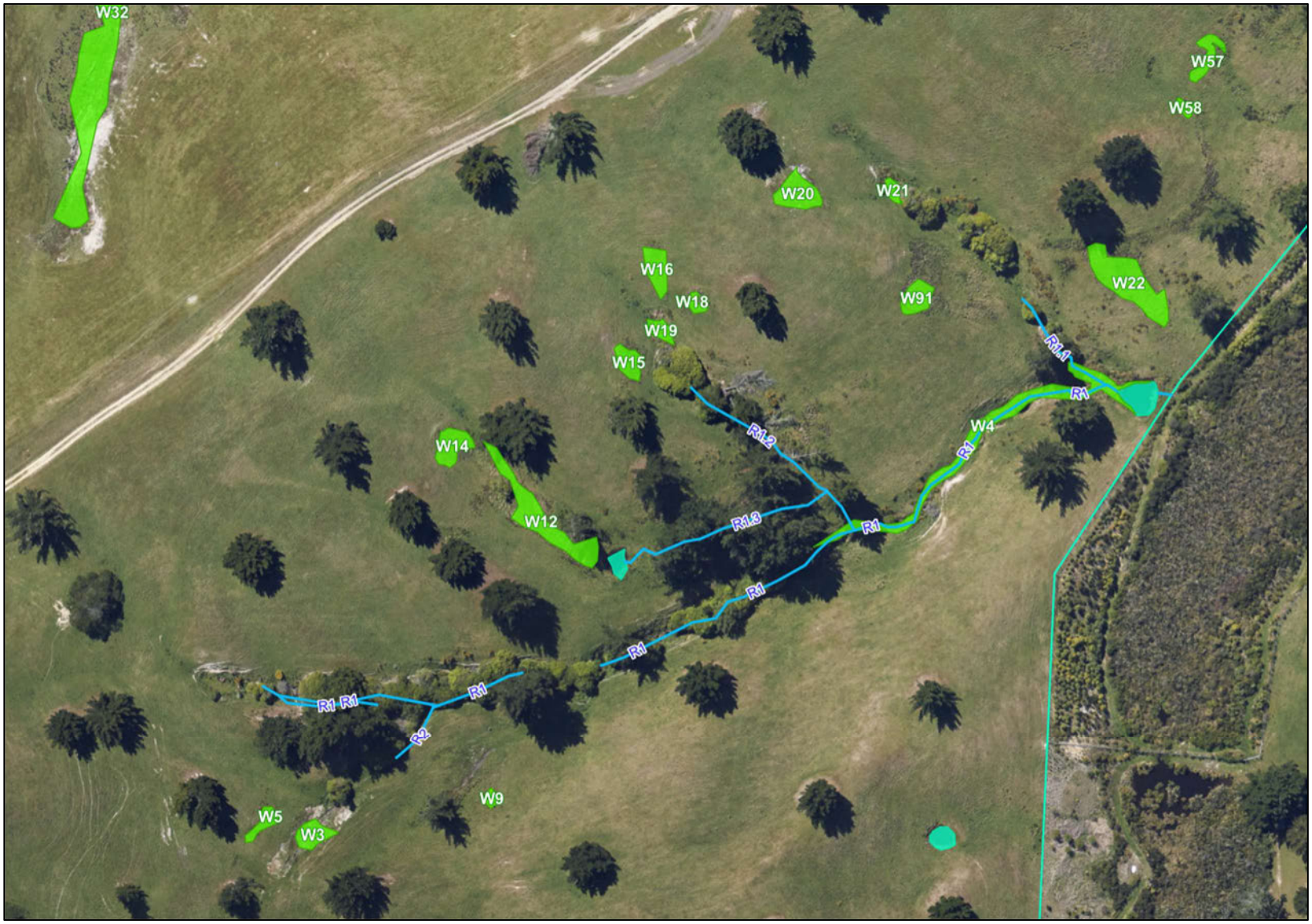
Map 1: North-west section of site – wetlands (green polygons), streams (blue lines), farm ponds (turquoise polygons), site boundary (turquoise line).



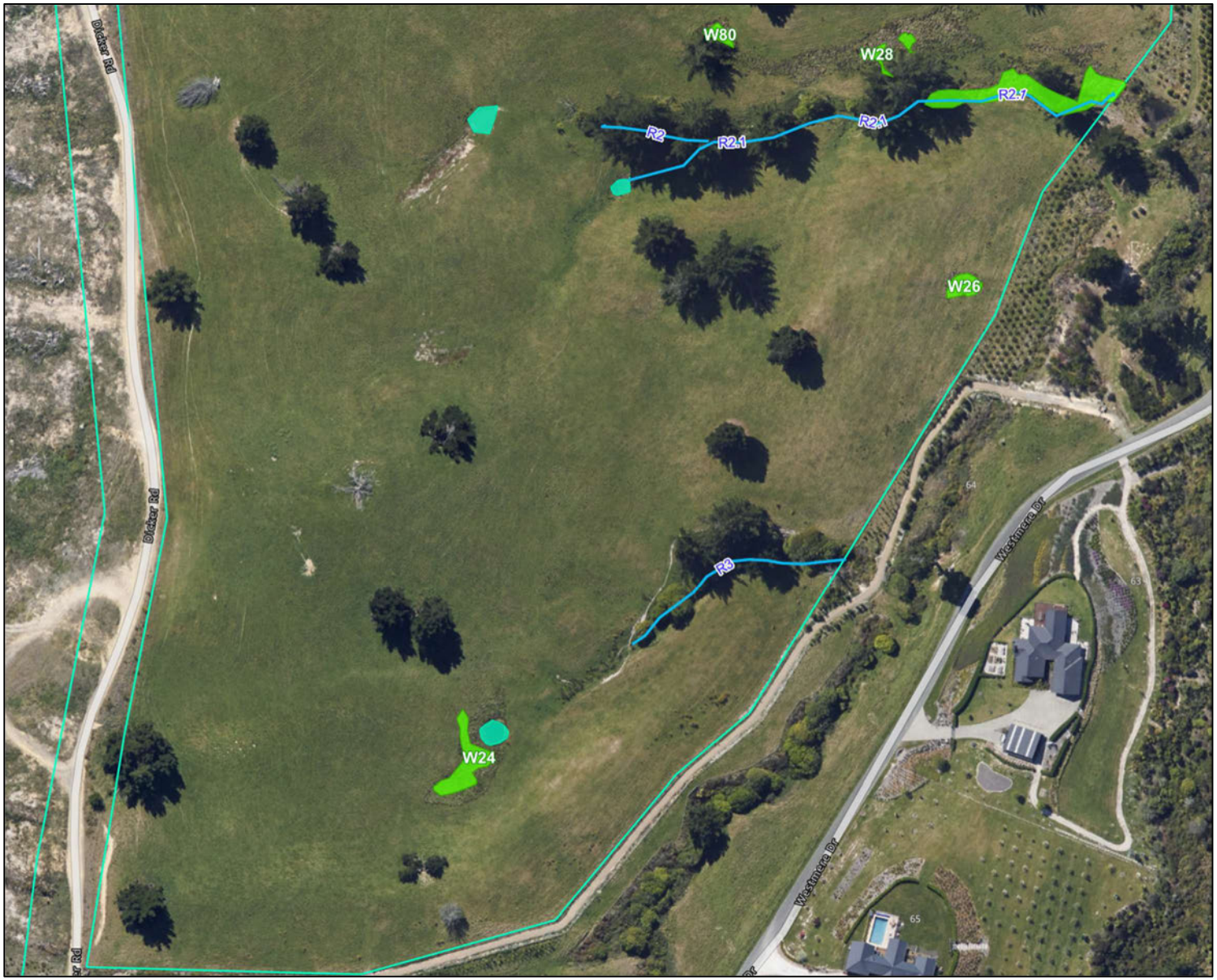
Map 5: North east corner of site

Map 2: Central section of site

Map 3: Central south section of site



Map 4: Southern end of site



Appendix C: Native Fish Capture and Relocation Plan

See separate document.

Appendix D: Ecological Planting Plan

See separate document.

Appendix E: Wetland Monitoring Plan

See separate document.