Ecological Impact Assessment

Tamaki Path Stage 2

ReNature

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Basis of Report

This report has been prepared by SLR Consulting New Zealand (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with ReNature (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1.0 Introduction

Auckland Council propose to upgrade the existing track network in Point England Reserve and Wai-o-Taiki Nature Reserve. The proposed work includes upgrading the existing track by realigning and widening certain sections up to 1.5m. It also includes the addition of new portions of concrete track, along with associated bridge and boardwalk structures measuring 2 or 3 metres in width. Part of the existing track traverses through bush areas (**Figure 1**). The full concept plan set of the proposed track upgrade, titled 'Auckland Council Tamaki Pathway Stage 2 Engineering Drawings,' prepared by reNature should be read alongside this report.

SLR Consulting New Zealand Ltd has been engaged by reNature to undertake an ecological assessment for the proposed works. This assessment outlines the existing ecological values of the site and evaluates potential ecological effects of the proposed development on terrestrial and freshwater ecological values, the Significant Ecological Area (SEA), and the riparian yard. Furthermore, the report provides advice for appropriate measures to prevent, minimise and/or mitigate any potential adverse ecological effects.

Figure 1: Proposed Development in relation to Tamaki pathway upgrading (Auckland Council Tamaki Pathway Stage 2 Engineering Drawings, reNature, March 2024).

2.0 Methodology

The methodology for this report is outlined below.

A desktop assessment included a search of the Significant Ecological Areas (SEAs) in the Auckland Unitary Plan (operative in part, 2018), herpetofauna database (supplied by Auckland Council in 2020), bat database (supplied by Department of Conservation in 2022), and the National Freshwater Fish Database (NFFD). The desktop assessment also included checking relevant layers on councils Geomaps to assess any potential wetland areas.

A site walk over was completed by two ecologists for six hours on the 12th of February 2024.This walkover included a visual assessment of the vegetation and terrestrial fauna and flora values within the site. The values were recorded, and notes were made on the quality and extent of vegetation present on site.

Identification of natural wetland within and nearby the works areas were assessed based on a rapid assessment in accordance with the wetland delineation protocols developed by the Ministry for the Environment (MfE, 2020)[1] to support the National Policy Statement for Freshwater Management (NPS-FM, 2023)[2].

Streams within proximity to the works area were identified based on desktop assessment and through visual observations on site.

Fauna habitats assessed were incidental observations of birds and consideration of any potential habitats for birds, indigenous lizards, fish or bats. Based on the highly urbanised location a desktop assessment including database searches as indicated above in addition to incidental observations were considered sufficient for this site to confirm likelihood of species present.

The findings from the desktop and site assessments were used to inform the ecological values assessment of the site.

3.0 Ecological Values

This section describes the ecological features surrounding the existing and proposed tracks and pathways within the works area. It describes the existing environment related to native vegetation, the riparian margins of the open watercourse and terrestrial and freshwater habitats present on the site.

The purpose of this assessment is to characterise the terrestrial values for the ecological impact assessment.

3.1 Ecological context

Point England Reserve and Wai-o-Taiki Nature Reserve, hereafter referred to as "the site", have been designated as Open Space - Informal Recreation Zone, Open Space - Sport and Active Recreation Zone, in the Auckland Unitary Plan (AUP).

The site is situated on the west bank of the Tamaki River. The site is buffered by the coastal area to its east, identified as SEA marine 2 (SEA-M2-49a) in the Auckland Unitary Plan. The current vegetation ecosystems on the intertidal mud flats are classified as SA.1 and SA1.2:

[1] Ministry for the Environment. 2022. Wetland delineation protocols. Wellington: Ministry for the Environment.

[2] Ministry for the Environment. 2023. National Policy Statement for Freshwater Management 2020.

Mangrove Forest and scrub (Not threatened, status “least concern”). See section 3.4 for more details.

The reserve has a continuous strip of vegetation along much of the coastline and stream and gully margins. The majority of the reserve is covered by mown lawn and grassland.

Along the coast on the north part of the site in Wai-o-Taiki Nature Reserve are two contiguous areas of terrestrial SEA, identified as SEA_T_6088, and SEA_T_6089. These areas have been identified by council as meeting the criteria for expected ecosystem diversity (3B), and Migration pathways (4C) against Schedule 3 Significant Ecological Areas – Terrestrial Schedule under AUP. Much of this area however is planted rather than naturally established vegetation.

GeoMaps identify several overland flowpaths. The site includes Omaru Creek, flowing west to east through Point England Reserve flowing westward and ultimately joining the Tamaki River (**Figure 2**). A few short intermittent streams connect to the Omaru Creek or discharge directly to the Tamaki River.

The site and its surrounding areas as identified by Councils Potential ecosystem GeoMaps layer were likely previously enveloped in the forest features of WF7 (Puriri Forest) ecosystem[3].

The site and key features including SEA, stream locations, and the park extent are depicted in **Figure 2**.

[3] Singers, N., Osborne, B., Lovegrove, T., Jamieson, A., Boow, J., Sawyer, J., Hill, K., Andrews, J., Hill, S. and Webb, C. (2016) Indigenous terrestrial and wetland ecosystems of Auckland. Auckland Council.

Figure 2: Point England Reserve and Wai-o-Taiki Nature Reserve along Tamaki River. Image from Auckland Council Geomaps. Omaru Creek, flowing west to east through Point England Reserve where it joins the Tamaki River The orange outlines show the park extent.

3.2 Vegetation

The bush, serving as riparian corridor along the coastline and streams, is predominantly characterised by semi-mature and regenerating native trees generally including māhoe (*Melicytus ramiflorus subsp. ramiflorus*), karamū (*Coprosma robusta*), mapau (Myrsine australis), pōhutukawa (*Metrosideros excelsa*), and mānuka (*Leptospermum scoparium var. scoparium*). Other native species such as kānuka (*Kunzea robusta*), tītoki (*Alectryon excelsus subsp. excelsus*), pūriri (*Vitex lucens*), karaka (*Corynocarpus laevigatus*), taupata (*Coprosma repens*), karo (*Pittosporum crassifolium*), lemonwood (*Pittosporum eugenioides*), tōtara (*Podocarpus totara var. totara*), and kawakawa (*Piper excelsum*) contribute to the canopy and understory although in less quantity (**Photo 1**). In addition, species such as cabbage tree (*Cordyline australis*), harakeke (*Phormium tenax*), oioi (*Apodasmia similis*), and swamp sedge (*Carex virgata*) are also present.

Photo 1: Sample photos of current common native vegetation on site.

Weed trees including hawthorn (*Crataegus monogyna*), tree privet (*Ligustrum lucidum*), Chinese privet (*Ligustrum sinense*), and poplar tree (*Populus deltoides*) contribute to the bush canopy but are also occasionally present as isolated trees.

A small watercourse located within the TP3 alignment, that discharges to the Omaru Stream, is mostly overgrown with bindweed and Chinese privet.

The groundcover in areas outside of the bush areas were dominated by kikuyu (*Cenchrus clandestinus*). Where this was not maintained by mowing, weeds such as climbing bindweed (*Calystegia tuguriorum*), Japanese honeysuckle (*Lonicera japonica*), Montbretia (*Crocosmia × crocosmiiflora*), gorse (*Ulex europaeus*), woolly nightshade (*Solanum mauritianum*), ginger (*Hedychium gardnerianum*), and blue morning glory (*Ipomoea indica*) were observed. Some of these weeds were also present on bush edges (**Photos 2** and **3**).

Photo 2: Weeds such as blue morning glory, bindweed, woolly nightshade, and ginger present among and at the edge of the native vegetation.


Photo 3: Weedy area in section TP1 behind private properties.

3.3 Stream and Wetland

The TP3 alignment crosses over a small stream at approximately chainage 150. It is a small, short tributary to the north of Omaru Creek. The stream was found dry at the time of survey and identified as an intermittent stream.

A small, degraded area classified as exotic wetland of about 5m^2 (2x2.5m) in accordance with the NPS-FM 2020 was located alongside this stream. The wetland comprises of mainly buttercup (*Ranunculus repens*) and willow weed (*Persicaria maculosa*) and lies slightly north and upstream of the proposed bridge alignment on the lower bank of the intermittent stream (**Photo 4**). The bridge alignment will be adjusted so works will not be required within 10m of the wetland so that there will be no NES-FW triggers related to works near wetland for the proposal.

Photo 4: Vegetation along the intermittent stream. The approximate area of the potential wetland at the lower bank is outlined in red.

The Omaru Creek runs alongside the TP2 track alignment and existing track in this location (**Photo 5**).

A stream tributary that discharges directly to Tamaki River is located at the north end of the TP4 alignment in the location of the existing bridge crossing.

Photo 5: The Omaru Creek running alongside the TP2 track alignment and existing track.

3.4 Coastal Fringe

The estuarine area near the subject site along the Omaru Creek and the sites western boundary is designated as a marine Significant Ecological Area (**SEA-M2-49a**) in the Auckland Unitary Plan due to the presence of saltmarsh and mangrove features (**Photo 6**). **SEA-M2-49a** in the Auckland Unitary Plan (AUP) refers to intertidal banks within a large river estuary with extensive intertidal flats and a sand-shell spit near the entrance. Modified to create various habitats, the spit is surrounded by saltmarsh and mangrove areas. The intertidal banks feature significant shellfish beds, serving as a feeding ground for birds, contributing to the overall importance of this regional wildlife habitat.

The coastal fringe vegetation that borders the mangroves includes karo, cabbage tree, flax, sward fern (*Nephrolepis brownii*), some pohutukawa and a few pine trees (*Pinus sp.*).

No works are proposed in the marine SEA.

Photo 6: Marine SEA along site's southern and western boundary.

3.5 Fauna

3.5.1 Birds

The bush areas in the reserves have the potential to provide suitable habitat for both native and exotic birds. During the site visit, silvereye (*Zosterops lateralis*) and exotic common Myna (*Acridotheres tristis*) were seen and heard in the bush and grassland areas. Pukeko (*Porphyrio melanotus*) was observed foraging in grassy areas or among trees.

Although the bush canopy is not dense and the area consists of many regenerating species, there is potential for other common native bird species such as tui (*Prosthemadera novaeseelandiae*). Exotic birds likely to be found on site include blackbird (*Turdus merula*), chaffinch (*Fringilla coelebs*), house sparrow (*Passer domesticus*), and welcome swallow (*Hirundo neoxena*).

3.5.2 Lizard

A search on the Auckland Council survey of the lizard database community in the surrounding area indicates the absence of any taxa recordings. While there are no recordings, it is possible that the native understorey present on site may provide habitat for lizards. It is considered the most likely lizard to be present is the exotic pest plague skink (*Lampropholis delicata*). There is also the potential that copper skink (*Oligosoma aeneum*) may be present but it is unlikely that they would be present in more than low numbers. The likelihood of native lizards being present is considered low given the highly urbanised nature of the site and lack of mature vegetation. No lizard searches were conducted as part of this investigation and lizards were observed during the site assessment. Overall, the ecological values of the site as they pertain to indigenous lizards, are considered to be low. It is unlikely that lizards will be present in the majority of the track alignment which mostly comprises of mown lawn.

3.5.3 Bats

A search on the Department of Conservation (DoC) bat database indicates the absence of any bat species. The closest bat recording is over 9km away, to the south-east, associated with Point View Reserve, East Tamaki Heights. Most of the vegetation present on site is relatively young and does not include vegetation considered suitable as bat habitat. As such bats are unlikely to be present at the site based on the lack of habitat and monitoring data.

3.5.4 Fish

A search of the New Zealand Freshwater Fish Database (NZFFD) shows records of common bully (*Gobiomorphus cotidianus*) and gambusia (*Gambusia affinis*) within the main Omaru Creek channel on the site. No other species listed as threatened or at-risk have been recorded. Banded kokopu (*Galaxias fasciatus) and* shortfin eel (*Anguilla australis*) have been documented in Omaru Creek although further upstream outside the immediate site boundaries.

4.0 Potential Effects of Track Upgrade

4.1 Vegetation Removal

The proposed vegetation clearance associated with the track upgrade is as indicated in **Table A**. The track upgrade includes sections of new and realigned tracks and/or widening. Track width varies from 1.5 to 3 metres with aggregate tracks in bush areas and concreted tracks elsewhere. Bridges and boardwalks are also proposed for stream crossings, overland

flowpaths or areas of steeper terrain. Realignment of TP1 and TP2 also includes decommissioning of certain portions of the existing track.

Table A: Proposed works, approximate boardwalk and track lengths within each zone, and vegetation type.

Track section/ zone	Proposed works	Work within 10m riparian yard (or SEA)	Vegetation impacted
TP0	28m new 3m wide bridge to connect to new tracks being designed by others. Works required for driving piles. Plus weed control/planting adjacent.	60m^2 + 100m^2 weed control	Poplar, weeds
TP1	216m new 2m wide track with concrete and boardwalk (38m) sections. Includes 34m length retaining wall where track width will decrease to 1.5m for part of length. 160m length and 200m^2 area of track to be decommissioned.	76m^2 (for retaining wall section)	Common natives, weeds, and rank grass
TP2	505m length, 1.5m width aggregate track with side drain in bush; 250 on existing alignment, 220m new alignment, 35m concrete, with 2m wide bridge/boardwalk sections. 220m length and 264m^2 area of track to be decommissioned.	Almost entire track length covering conservative area of up to 800m^2	Mostly common natives in addition to a few weedy hawthorn. Note most bare ground where existing track present being widened.
TP3	250m new 2m wide concrete path including 25m length of bridge/boardwalk. Works required for driving piles. Plus weed control/planting adjacent.	40m^2 + 100m^2 weed control	Mostly mown lawn kikuyu. Chinese privet and other weeds alongside intermittent stream.
TP4	3m wide track over 108m length including 16m bridge and 46m boardwalk with remaining concrete. Works required for driving piles.	60m^2	Common natives mainly young revegetation, weeds, and lawn
TP5 & TP7 & TP8	3m wide concrete path (29m, 5m, 98m length respectively)	n/a	Mown lawn kikuyu
TP6	320m new 3m wide concrete path.	(up to 84m^2 in SEA)	Mainly mown lawn kikuyu plus some common planted natives and pines
TP9	149m new 3m wide track including 36m boardwalk	n/a	Common natives including planted ones OR mown lawn depending on final alignment

TP refers to Tamaki Path as per the proposed plan (Auckland Council Tamaki Pathway Stage 2 Engineering Drawings) by reNature dated March 2024.

Flora and vegetation removal on each track section is discussed as below.

Section TP0

A bridge is proposed for the Concord Place Development at TP0. The bridge is to be aligned between two pohutukawa trees on the upper west bank that will be retained (**Photo 7**) and

crosses the stream at the location of a fallen poplar over the channel. Minor pruning of pohutukawa canopy would be required.

Works will be required in the riparian yard including vegetation removal and earthworks for the bridge footings. The vegetation to be removed comprises native regenerating species like karamu, mahoe, and kanuka, along with poplar trees and grey sedge (*Carex divulsa*). *Tradescantia fluminensis* is also present within the riparian zone.

Photo 7: TP0. Two pohutukawa trees at Concord Place Development (left). Right photo represents of the weedy area and fallen poplar within this section.

Section TP1

While most of TP1 extends along the upper edges of the reserve, near the boundary with private properties, part of the proposed new path will require some earthworks and vegetation removal in the riparian yard.

TP1 predominantly features common native plants alongside weeds and rank grasses (**Photo 9 and 9**). Among the native species likely requiring removal or pruning are primarily māhoe, karamū, mapau and kawakawa. Two karaka will also require pruning (tree 19 in arborist report). Additionally, the construction of the proposed retaining wall within the west half of this alignment will require the removal of a mature ash tree (tree 18 in arborist report). Continuing to the east, the alignment traverses past a semi-mature titoki (arborist report tree 21) which will be outside of the final alignment. However, two small puriri trees (tree 21 and another further east) will require removal.

The prevalent weeds at this section consist mainly of annual and/or rank grass and pasture varieties. Exotic poplar saplings are also present that will be removed from the track alignment.

Photo 8: Common native species (left image) and one of the puriri (left image) within alignment to be removed.

Photo 9: Weeds and rank grasses within TP1 along the boundary of private properties.

Section TP2

The majority of planned activities in TP2 are focused within the riparian yard. which traverses along relatively dense native and exotic vegetation. While most of TP2 is associated with the existing track alignment which will be widened part is being realigned upslope. Native plant species such as mahoe, karamu, karaka, kanuka, and manuka are present, along with occasional occurrences of puriri, totara, and pohutukawa. The representative vegetation feature and the totara are shown in **Photo 10** and **Photo 11**.

The final alignment however should only require removal of common native understorey species and avoid the removal of larger native trees.

A large fallen Macrocarpa near the proposed boardwalk alignment needs removal (**Photo 12** left image). Hawthorn trees along the current and proposed track are recommended to be removed including those outside of the alignment (**Photo 12** right image). The impact of the required clearance is expected to be minimal.

Photo 10: Common vegetation feature within section TP2 (left) and the totara tree at ~ch450 (right)

Photo 11: The existing track within section TP2 with common native vegetation at both sides (left) and the karaka tree north of ~ch0 (right)

Photo 12: A fallen macrocarpa will need to be removed while hawthorn are also proposed for removal.

Section TP3

The alignment for the new proposed TP3 path, is covered mainly by lawn and pasture (

Photo 13). None of this track section is in SEA and the majority is also outside of the riparian yard. Before reaching the boardwalk, at around chainage 80 the path extends into the vicinity of a mature gum and a willow tree. The canopy of the tree hangs low, suggesting that pruning may be required.

Additionally, work is required in the riparian yard of the intermittent stream at ~ch250. The proposed bridge located within this track section will cross through an area predominantly occupied by exotic privet, with occasional occurrences of mapau that extends along the intermittent watercourse. Removal of these species is necessary, with minor ecological impact anticipated.

The proposed bridge alignment on the lower bank of the identified intermittent stream in this section is situated to the south of the identified wetland on site. The proposed bridge alignment will be adjusted to avoid works within 10 metres of the wetland. However, given the size of the wetland and its degraded condition, no adverse effects are expected from works in close proximity to it should this be unavoidable (**Figure 3**).

Photo 13: The location at TP3 appointed for the proposed 2-metre concrete pathway.

Figure 3: The proposed bridge alignment (blue line) will be adjusted so works will be located at least 10m from the wetland (approximate location shown by red outline). Image sourced from Google Earth.

Section TP4

Tracks within zone TP4 are intended for mainly proposed concrete path with boardwalks leading up to the bridge along with existing bridge which will be replaced and realigned over the tidal stream inlet. The boardwalk is to replace the steep section of existing track. The new realigned bridge and boardwalks for track section TP4 require work in the riparian yard.

Photo 14: Photos of vegetation requiring removal either side of the existing bridge.

To create a connection between the realigned bridge and the existing pathway, a small amount of semi-mature and regenerating vegetation will require clearance. These include a pohutukawa tree under the bridge and a totara tree to the south. In the southwest of the bridge lies a small area recognised as a revegetated zone, predominantly featuring cabbage tree, karamu, and mahoe plantings (**Photo 15**). Other smaller plants such as cabbage tree, karamu, and regenerating pohutukawa on the upper slopes of the southern region require clearance. The impact of clearing these plants will be no more than minor.

Photo 15: Viewing northward from the slope at the southern side of the proposed bridge for realignment (left photo), and the revegetated area to the southwest of the bridge (right photo).

Section TP5-TP9

TP6 is predominantly mown lawn with some planted common shrubs and flax needing pruning or removal within the first 100 metres at its western end (**Photo 16**) to allow for a 3m width concrete path.

Photo 16: The vegetation within the initial 100 meters of TP6 needing pruning or removal.

A small clump of natives including flax, mahoe, karamu, manuka, karaka and pūriri, is located within the proposed alignment if straight track proposed (**Photo 16**). Seven mature pines stand near the coastal bank along the proposed alignment within TP6 which require removal as recommended by the arborist due to declining condition. The track may be aligned to follow the location of these pines which would remove the need to remove the smaller clump of native vegetation (**Photo 17**). This short section of the track alignment is within the SEA overlay.

Photo 17: The small native vegetation patch will be able to be retained if the track is aligned east to where the pines will be removed.

TP5, TP7, and TP8 are mostly covered in mown lawn and are situated alongside the terrestrial SEAs found to the north of the site within Wai-O-Taiki Reserve.

Photo 18: Overview of the proposed concrete path intersection in mown kikuyu area within section TP5.

Most of TP9 track length is in areas currently comprised of mown lawn. Two possible alignments are proposed at its northern end either side of the playground. Native revegetation, planting including cabbage tree, karamu, Carex species is present on the west boundary of the playground that would require removal should the alignment be located here. A short section of the track is also close to existing bush vegetation near the basketball half court where some pruning may be required on the vegetation edge (**Photo 19**).

Photo 19: The edge of native vegetation near the basketball half court will likely require pruning (left). Native planting at the northern end of TP9 at the eastern boundary of the playground (right).

Overall, the ecological impact of the proposed development on vegetation on site is likely to be low to negligible contingent on the mitigation management, as detailed in **Section 5**.

4.2 Fauna Impact

4.2.1 Birds

Based on the site survey, it is possible that observed or potential terrestrial birds nest in this area particularly in the regenerating bush area where track widening, and realignment is proposed. The terrestrial vegetation provides habitat that native birds could use for resting, nesting, and foraging. Clearing vegetation could potentially harm birds present within the project footprint. However, given the presence of more suitable habitat in other parts of the reserve, it's probable that any birds currently utilising this vegetation will relocate to neighbouring areas. The most significant impact on resident birds would occur if there were active nests in any of the trees being removed at the time of clearance. Cautionary recommendations are included as conservative measures in Section 5.1. If the recommendations are followed, then the ecological effects on terrestrial bird species are likely to be low.

4.2.2 Lizard

Lizards are unlikely to be present in mown lawn areas of the track however potentially may be in the bush areas of the track. Most of the bush areas are along the existing track alignment however some new sections of track in bush are proposed associated with track realignment.

The potential impact of clearance in bush areas could involve:

- Fatality or injury to individuals residing in the targeted vegetation.
- Habitat and food source depletion for lizards inhabiting or adjacent to the cleared area.

Consequently, the planned vegetation clearance should be conducted with sensitivity to the potential presence of lizards. Vegetation removal in the bush area will be limited to what is necessary to create the new track alignment and/or widen the existing track. Cut vegetation will be retained on site where possible and in ‘eco-stacks’ to provide alternative habitat for any potential lizards that may be present or disturbed. Regeneration and infill planting of native vegetation will be promoted in track sections to be decommissioned.

By limiting the works area, retaining cut vegetation and allowing for regeneration potential impacts on lizards and their habitat can be appropriately managed.

4.2.3 Fish

No work is planned within the watercourse and as such fish species are unlikely to be affected by the proposed works. However, there is the potential risk of sedimentation reaching the watercourse during earthworks (refer Section 4.3).

4.3 Earthwork and track development Impact

Earthworks associated with the construction of the tracks are set back from the coast, reducing the potential for sediment discharge into the coastal environment. However, works will be required in the riparian yard alongside Omaru Creek and the intermittent stream for tracks TP2 and TP3). Earthworks are required for building new concrete paths, bridges, and widening and realigning existing paths. The earthworks area has not been quantified however will be limited to minor earthworks where levelling is required for the track and any new track edging and for installation of the piles for new bridge and boardwalk structures proposed.

It should be noted that some of these areas are currently covered by lawn or pasture. It is important to implement appropriate measures to control potential erosion and sediment runoff from the site during earthworks. Works will adhere to Auckland Council's GD05 document for erosion and sediment control. By following the guidelines outlined in Auckland Council's GD05, the potential adverse effects of the proposed development resulting from earthworks are expected to be minimal.

5.0 Management and Mitigation Proposed

The actions below are recommended in order to minimise the ecological impact of the proposed track development.

5.1 Vegetation

The vegetation clearance footprint is to be limited to the area required to allow for track widening, track decommissioning, bridge realignment, and new path construction.

5.1.1 Vegetation clearance

The removal of terrestrial vegetation and the associated construction activities, as outlined in the preceding sections, must adhere to the recommendations outlined in the arborist report where in the vicinity of adjacent vegetation to be retained and particularly where works are required in tree rootzones. Supervision and tree protection measures outlined by the project arborist will aid in protecting of the surrounding vegetation from potential adverse impacts.

5.1.2 Track decommissioning

In the context of track realignment, some sections of the old tracks will be decommissioned. Parts of TP2 and TP4 will be relocated upslope and a length of approximately 380 metres, covering an area of approximately 380m^2, of the old track will be decommissioned. The entrances of the old track alignments will be disguised through the placement of strategically placed cut vegetation, locally sourced forest duff or installation of barriers. The tracks where overly compacted will be scarified to assist with enabling native vegetation to regenerate. Some old sections of the track may be partially planted as indicated in Section 5.1.3 below.

5.1.3 Weed Control

To mitigate for vegetation removal within the riparian yard and to ensure weeds do not invade any construction clearance areas or sections of track to be disestablished weed control is proposed within specific areas of the site associated with the track upgrade. These areas are associated with currently vegetated areas. Where the track alignment is to be located mostly in mown lawn no weed control is required alongside those alignments (e.g. TP 5-9).

Weed control locations and species within each proposed for control are listed in **Table B**. Where few weeds are currently present any invading weeds should be controlled as part of plant maintenance for any areas subject to revegetation after construction vegetation clearance and within track sections to be disestablished. See **Figure 4** for the approximate location of the proposed areas for weed control.

Table B: Proposed weed control locations and target weed species.

Track Section	Location	Target Weed Species
TP0	Directly within and 2.5m either side of the proposed Concord bridge alignment.	Poplar, Tradescantia (*T. fluminensis*), palm lily (*Yucca gloriosa*, phoenix palm (*Phoenix canariensis*), woolly nightshade
TP1	Alongside the new path in section TP1, situated behind private properties	Palm lily, tradescantia, canna lily, elephants ear, inkweed, hawthorn, bindweed, montbretia, gorse, Japanese honeysuckle.
TP2	Within the disestablished track alignment area and where close to new path alignment. Weedy hawthorn alongside the current and proposed track at TP2. Track generally well maintained with few weeds.	Hawthorn (*Cratagaes monogaena*).
TP3	Vegetation clearance area within bridge alignment and 2.5m either side of ~Ch150. It is recommended the western end of TP3 is managed with mowing extended into this area.	Chinese privet (*Ligustrum sinense*), montbretia, Japanese honeysuckle, brush wattle.
TP4	Directly within and 2.5m either side of the new bridge alignment. Track generally well maintained with few weeds.	No weed species currently noted.

Figure 4: Weedy areas proposed for clearance are outlined by red rectangles.

5.1.4 Mitigation Planting

Due to vegetation removal in the riparian yard, revegetation within vegetation clearance areas primarily located along parts of the watercourse and around the bridge alignments is recommended in addition to along part of the TP2 disestablished track as indicated below and outlined in **Figure 5**.

- TP0 - At the Concord Place development, 2.5m on either side of the new 3m wide bridge alignment on both sides of the stream and small amount of stream edge planting beneath the new bridge, covering an estimated area of up to 72m^2.
- TP2 - for the track identified for decommissioning between ch320-420 which is close to the new alignment to ensure the old alignment does not continue to be used. The existing track is less than 1m wide for most of its length so a conservative area of up to 100m^2 is proposed for regeneration. Part of this will be covered with locally sourced forest duff such that the entire length will not require revegetation. As regeneration should occur following track scarification, planting in this area will be more spread out as it is to help speed up regeneration and canopy closure in this area.
- TP3 - around the proposed bridge location in the riparian yard of the intermittent stream ~ch150 to replace vegetation removed to allow for bridge construction covering an estimated area of up to 70m^2 to allow for 2m width bridge and up to 2.5m construction clearance area either side of bride alignment.
- TP4 – at northern end of TP2 within construction vegetation clearance area of up to 2.5m on either side of the new 3m wide bridge/boardwalk alignment on both sides of the stream covering a conservative estimated area of up to 170m^2.

The required planting area and thus number of plants required will depend on the vegetation clearance area undertaken at the time of construction with final plant selection and numbers to be confirmed at that time.

Planting should be undertaken in accordance with Auckland Councils' streamside planting guide[4]. For all revegetation areas common native revegetation species suitable for stream banks should be used including species such as cabbage tree, karamu, mahoe and mapau. For all revegetation areas planting should be at approximately 1m spacing apart from along the old track area of TP2 where plantings will be between 2-3m spacing alongside the placement of forest duff and/or cut vegetation. Planting should be undertaken within the planting season from May-September as soon as possible after completion of construction activities.

It is proposed for the planting plan to be prepared as a condition of consent allowing for confirmation of species and plant numbers that are suitable for and reflect the actual construction clearance areas for the bridges and track area indicated above.

[4] Riparian Facts - Streamside Planting Guide (aucklandcouncil.govt.nz)

Figure 5: Approximate location of proposed revegetation areas along the watercourse and bridge alignments are outlined by green rectangles (not to scale).

5.2 Birds

To mitigate the potential impact of the planned vegetation clearance on the indigenous terrestrial bird population, clearance activities within the terrestrial tree canopy or subcanopy should be conducted outside the primary native bird nesting season, which spans from September to January. This approach aims to avoid the breeding season, thereby eliminating the risk of encountering an active nest in any of the felled trees. Alternatively, if tree felling becomes necessary during the breeding season, a thorough visual inspection of the trees identified for felling should be carried out to identify any active nests. In the event an active nest is detected, the tree clearance should be postponed until after the nest has undergone fledging.

It is anticipated that Council will impose the standard condition to the consent to avoid bird nesting season or ensure no active nests at time of vegetation clearance should the bird nesting season be unable to be avoided.

5.3 Lizard

While no lizard taxa are recorded within the site or its surrounding area based on the Council's herpetofauna database, caution should be exercised during terrestrial vegetation removal. It is essential to conduct the clearance in a manner that minimises the likelihood of impacting potential native lizards residing in the native understorey on-site.

To mitigate the impact of the proposed clearance on potential resident lizard populations, all wood from trees or understorey vegetation within the terrestrial SEA area should be hand cleared from the proposed and realigned track areas and left on-site where possible. This approach provides an opportunity for arboreal species such as geckos to escape to neighbouring trees. The cleared vegetation should be permanently retained on-site in 'eco-

stacks' to naturally decompose, creating refuges and habitat opportunities for ground-dwelling lizards and invertebrates.

For any pruned or felled vegetation that must be removed from the site, it is advised to leave it on-site for a minimum of three days. This timeframe allows ample opportunity for any herpetofauna to escape before the vegetation is either taken offsite or mulched. This approach aims to protect the local lizard populations during the clearance process.

5.4 Sediment and Erosion Control

To protect the site from erosion and prevent sedimentation from the site, it is essential to set up erosion and sediment controls following the guidelines provided in Auckland Council Technical Publication GD05, the guide for controlling erosion and sediment during land-disturbing activities in the Auckland Region.

6.0 Summary

The upgrade of the track network in Point England Reserve and Wai-o-Taiki Nature Reserves will require the removal and pruning shrubs and trees on the edge of the alignment. This includes vegetation clearance in the riparian yard and small clearance areas on the edge of the SEA. While most of the alignment comprises mown lawn, the vegetation for removal also comprises common native vegetation including planted and regenerating species as well as weedy and exotic trees such as hawthorn. This reduction in vegetation cover is not anticipated to substantially impact the ecological value of the site nor cause significant adverse effects on native flora and fauna.

The effects that will result from the proposed vegetation clearance have been described in this report. Recommendations to avoid, remedy or mitigate potential impacts have been proposed.

These include undertaking vegetation clearance in a way that is sensitive to the impact on native wildlife and mitigating through weed control and planting alongside decommissioning part of the existing track. Given the ecological mitigation proposed, the ecological impact of the proposed track upgrade on site is small in magnitude and mostly temporary around the time of construction. The ecological impact is minimal because:

- the track alignment for both new and widened sections of track have been carefully chosen to avoid the requirement to remove trees as far as is practicable.
- the alignments allow parts of the existing tracks to be decommissioned.
- a project arborist will be engaged to ensure that the appropriate methodology is adopted for works near any trees to be retained.
- the method of construction does not require clearance outside of the final footprint of the boardwalk apart from minor battering where track and boardwalks meet.
- the potential impact of the boardwalk on birds on site can be minimised by removing trees outside of the breeding season or ensuring there are no active nests present if tree removal is proposed within this period.
- hand clearing and retaining cut vegetation on site in bush areas where possible will allow for any potentially disturbed lizards to relocate and will provide additional lizard and invertebrate habitat.
- no works will be required within 10m of wetland.

Therefore, considering the scale of clearance associated with works, and the overall mitigation package proposed, the ecological effects of proposed work will be very low or negligible.

Sincerely,

SLR Consulting New Zealand

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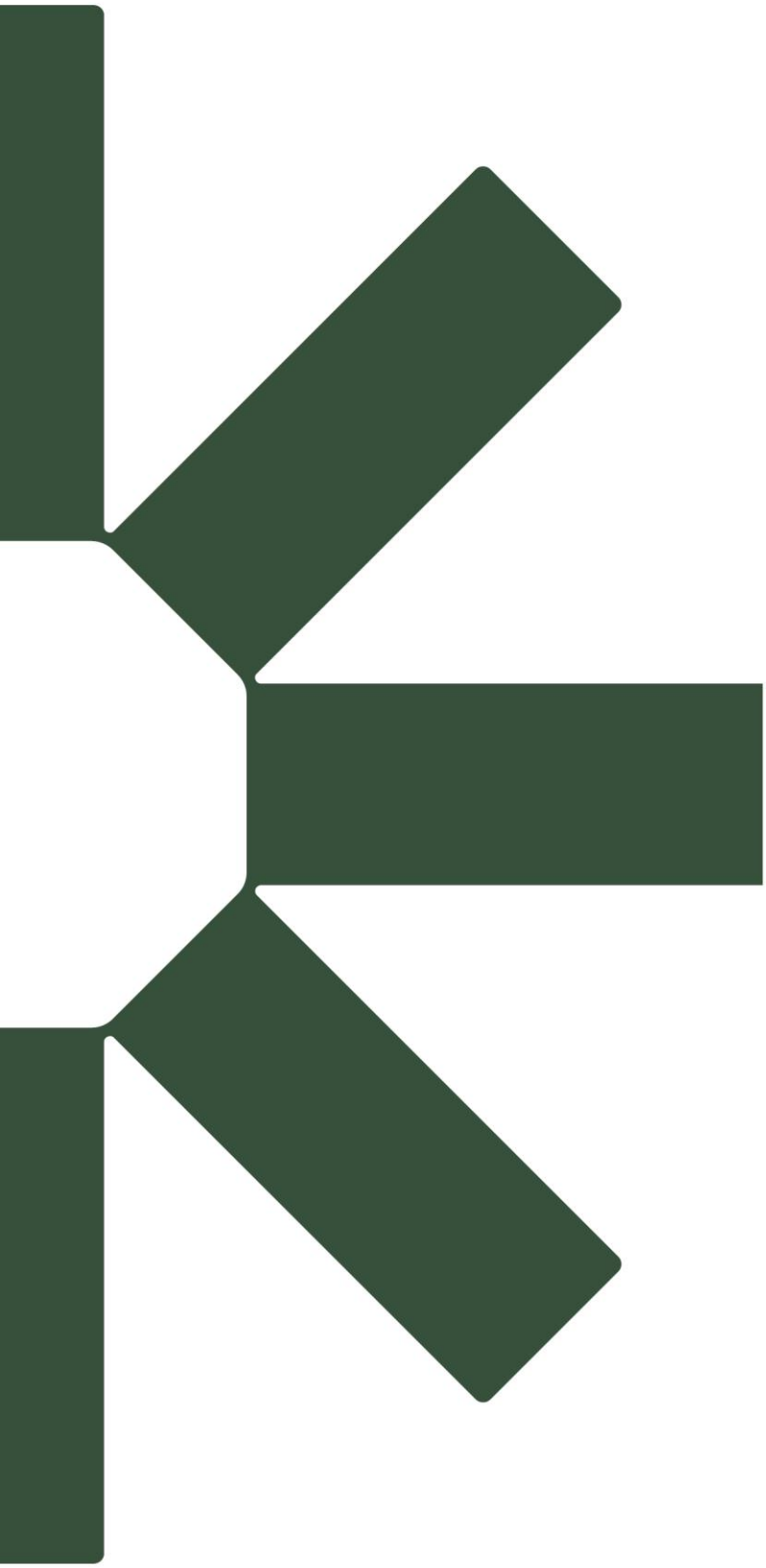
7.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our Charity Partner - Lifeline, for every completed form.



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