VIRIDIS
Environmental Consultants

Auckland Surf Park Community - Stage 2 Development

Ecological Impact Assessment

Prepared for: AW Holdings 2021 Ltd

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Author(s)	
	Mark Delaney
	Lead Ecologist
Reviewer(s)	
	Annabelle Coates
	Senior Ecologist

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Cover photo: Accessway for 89 Lascelles Drive Dairy Flat.

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STATEMENT OF QUALIFICATIONS AND EXPERIENCE

Mark Delaney (Author)

I am a Director and Lead Ecologist at Viridis Limited (Viridis). Viridis is a small consultancy specialising in ecology and environmental science. I have been employed at Viridis since December 2022.

I hold the qualification of a Master of Science in Ecology and Conservation from Massey University, which I completed in 2007. I am a full member of the Environmental Institute of Australia and New Zealand and the New Zealand Freshwater Sciences Society.

I have 15 years of professional experience in the field of ecology, including roles such as Senior Ecologist at Bioresearches Group Limited and Ecology Research Technician at Massey University. My experience includes conducting freshwater and terrestrial ecological impact assessments for both urban and rural developments, as well as ecological restoration and monitoring. I have served as the lead project ecologist for several approved projects under the COVID-19 Recovery (Fast-track Consenting) Act 2020, including the Auckland Surf Park Community, Beachlands housing development, Botanic Riverhead development, Brickfields Scott Road development, Melia Place development, Unitec Residential Development – Wairaka Stage 1, and the Te Whenua Haa Ora, Wellsford North, Verran Mews development, Delmore and Milldale - Stages 4C and 10 to 13. Additionally, I am involved in projects currently going through Fast Track Approvals Act consenting.

I confirm that, in my capacity as author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Annabelle Coates (Reviewer)

I am a Senior Ecologist at Viridis. Viridis is a small consultancy specialising in ecology and environmental science. I have been employed at Viridis since February 2023.

I hold the qualifications of Bachelor of Science, which I completed in 2010 and a Master of Science in Environmental Science from the University of Canterbury, which I completed in 2013. I am a full member of the Environmental Institute of Australia and New Zealand and am a Certified Environmental Practitioner (CEnvP).

I have more than 12 years of professional experience in the ecological consulting field, including roles such as ecologist roles at Bioresearches Group Limited and Opus International Consultants Limited (now WSP New Zealand Limited). My experience includes conducting freshwater, terrestrial and coastal ecological impact assessments for both urban and rural developments, as well as ecological restoration and monitoring. I have provided ecological input, such as reporting and reviewing, for projects approved under the COVID-19 Recovery (Fast-track Consenting) Act 2020, and for projects currently undergoing assessment under the Fast Track Approvals Act (2024) Additionally, I have been involved in reporting and reviewing for various land development projects spanning Otago, West Coast, Canterbury, Wellington, Hawke's Bay, Waikato, Auckland and Northland.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

1 INTRODUCTION AND EXECUTIVE SUMMARY

This Ecological Impact Assessment (EcIA) has been prepared on behalf of AW Holdings 2021 Limited (AWHL) in support of a substantive Stage 2 application for the Auckland Surf Park project. The application is made to the Environmental Protection Authority (EPA) under the Fast-track Approvals Act 2024 (FTAA).

The Auckland Surf Park project relates to land at 1320 and 1350 Dairy Flat Highway, 89 and 105 Lascelles Drive, and 237 and 253 Postman Road, Dairy Flat, Auckland (the "site"). The site location is shown in Figure 1 and the site extent is shown in Figure 2. Stage 1 of the project was granted resource consent under the Covid-19 Recovery (Fast-track Consenting) Act, authorising a surf park and ancillary activities, visitor accommodation, a data centre, a solar farm and associated civil, infrastructure, landscaping and ecological restoration works (BUN60429155).

The current Stage 2 application is being progressed under the FTAA and comprises:

- **Section 127 variations** to parts of the existing Stage 1 resource consent, to amend the previously consented surf park and ancillary activities, visitor accommodation, data centre, solar farm, and associated civil, infrastructure, landscaping and ecological restoration works; and
- **A new Stage 2 resource consent** to authorise expansion of the project to include a hyperscale artificial intelligence data centre campus, three residential neighbourhoods, a village centre, live/work areas, Stage 5A Vacant Lot Subdivision, a solar farm extension, and associated civil, infrastructure, landscaping and ecological restoration.

The Stage 2 proposal builds upon Stage 1, incorporates additional land, and refines the Stage 1 layout to provide an integrated and coordinated framework for the wider "Auckland Surf Park Community".

AWHL has engaged Viridis Limited (Viridis) to undertake this EcIA for Stage 2 of the Auckland Surf Park project in Dairy Flat. The site, which is approximately 54 hectares in area, is zoned Future Urban under the Auckland Unitary Plan (Operative in Part) (AUP-OP). To enable the development, AWHL proposes to undertake earthworks, vegetation removal, and the construction of associated stormwater and wastewater infrastructure, as well as landscaping and ecological restoration.

This report has been prepared to support the substantive FTAA application and assesses the actual and potential ecological effects of the proposal. Where appropriate, it provides recommendations to avoid, minimise and remedy adverse effects, and identifies positive ecological outcomes. The assessment is informed by relevant statutory and regulatory documents, including the AUP-OP, the National Policy Statement for Freshwater Management 2020 (NPS-FM), the National Environmental Standards for Freshwater 2020 (NES-F), and the National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB).

An ecological assessment of the site and neighbouring environment identified the presence of a highly modified pastoral landscape dominated by exotic pasture, scattered exotic trees, shelterbelts and degraded riparian margins, with only small, isolated patches of low-value native planting. Three highly modified streams support a low-diversity fish community, and terrestrial fauna values are also low, with only common native birds observed, no native lizards detected, no bats recorded during acoustic monitoring, and limited suitable habitat due to fragmented vegetation and poor landscape connectivity. Provided the recommended mitigation, stormwater management, and extensive riparian and native restoration planting are implemented, the development is expected to achieve long-term ecological enhancement and positive outcomes for freshwater and terrestrial ecological values within the site and downstream.

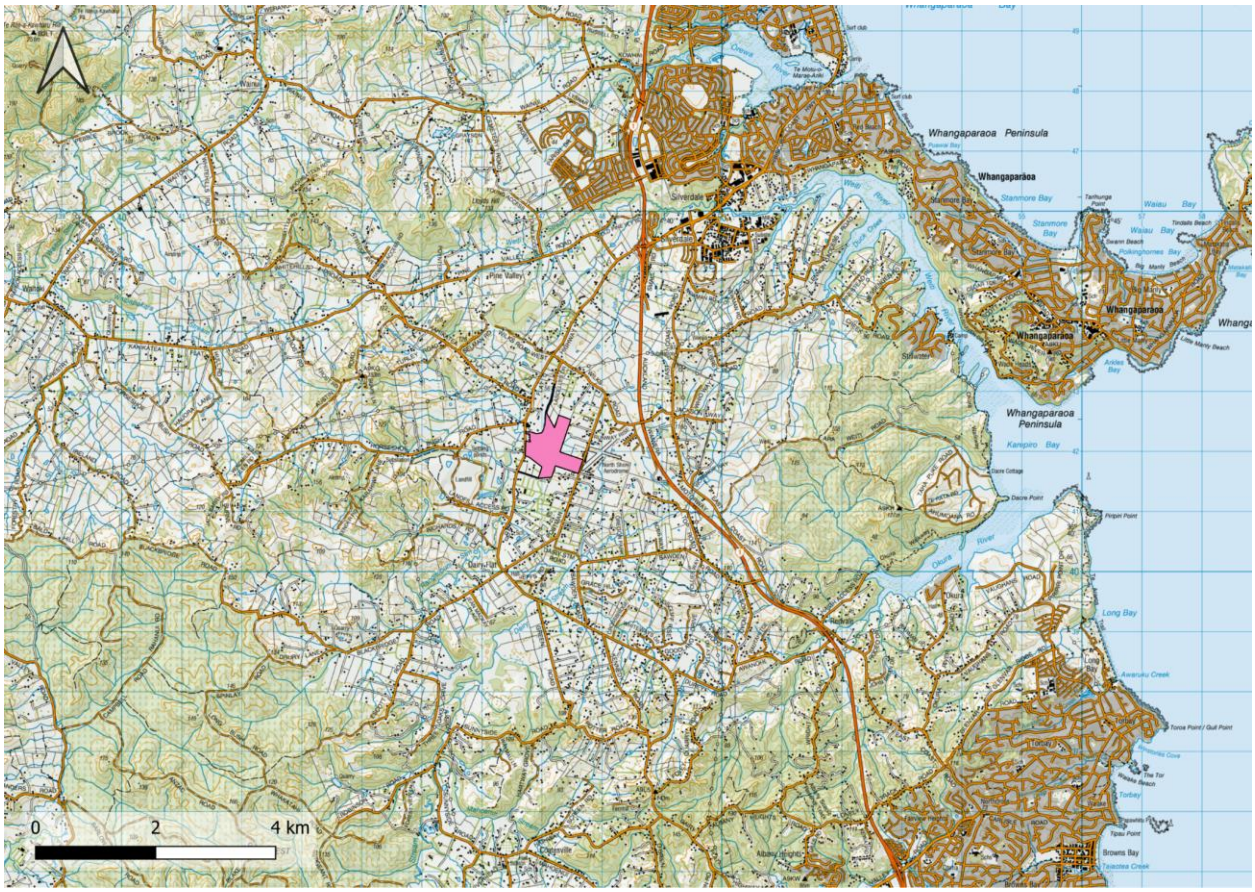


Figure 1. Site location as indicated by pink polygon (map source: LINZ NZ Topo 50).

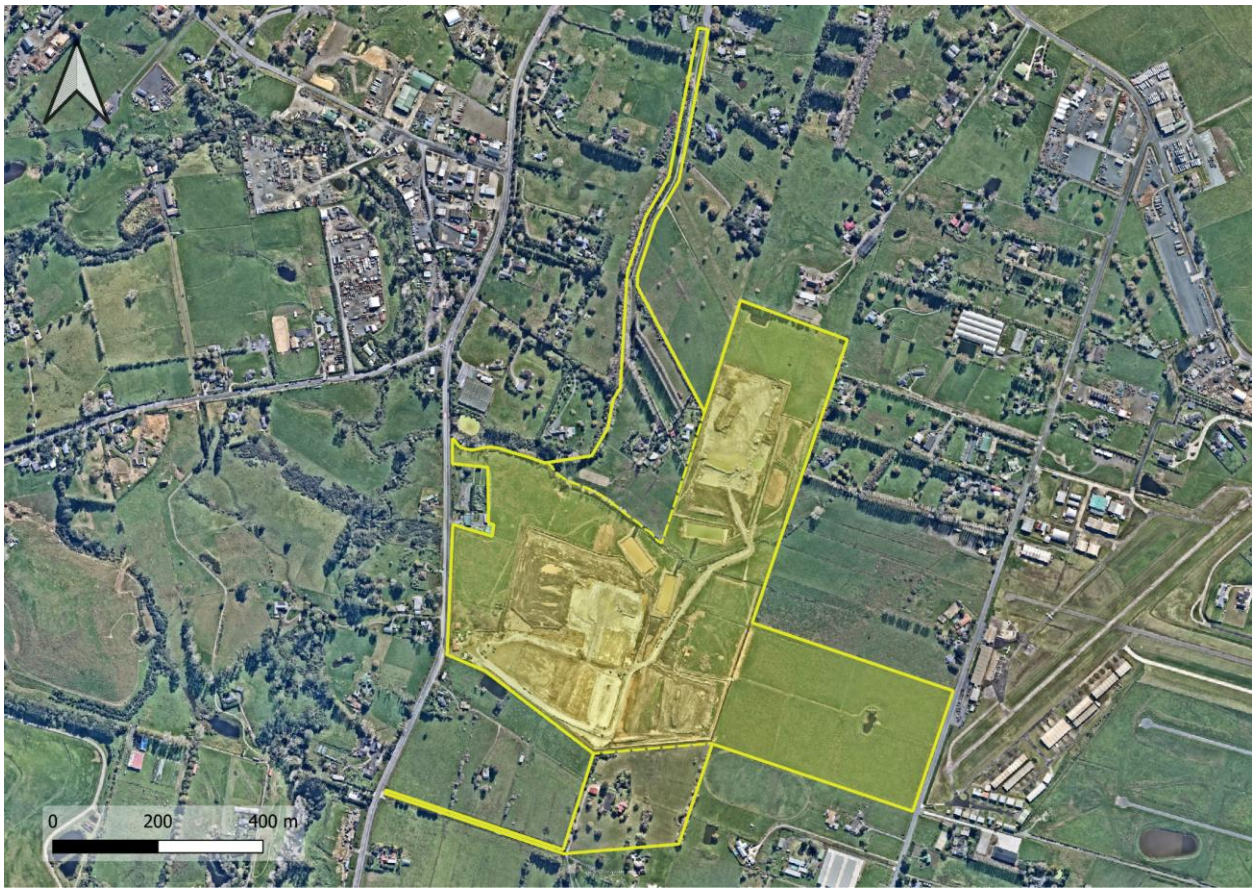


Figure 2. Site extent, with Stage 1 shaded yellow (aerial source: Nearmap, 2025).

2 METHODOLOGY

2.1 Overview

The assessment comprised a desktop review and site inspections undertaken by a suitably qualified freshwater ecologist. The desktop review included an examination of current and historical aerial imagery to identify changes in vegetation cover and surface water, as well as a review of Auckland Council's Geomaps data (including current biodiversity layers, predicted watercourses and site topography). Relevant previous ecological reports were also reviewed and relied upon where appropriate.

Field assessments for the Stage 1 consent were undertaken in April and July 2022 and June 2023 and monitoring associated with consented activities occurred in January 2025. More recent site assessments for Stage 2 were undertaken in July and September 2025. During these visits, the presence and extent of freshwater and terrestrial features within the site and surrounding area were recorded, and the quality of associated habitats (where present) was visually assessed, in accordance with the methodology described in Sections 2.2–2.3 below.

2.2 Terrestrial Ecology

The ecological values of terrestrial features were determined in accordance with the methodology prescribed in the Environment Institute of Australia and New Zealand (EIANZ) guidelines (refer Section 2.4).

Vegetation

Vegetation within the site was assessed during field visits. Both native and exotic species were recorded, and the structure, condition, extent and connectivity of vegetation were described. Particular attention was given to identifying vegetation types that may provide habitat for terrestrial fauna (e.g. lizards, birds and bats), noting features such as ground cover, shrub density, tree canopies and proximity to riparian areas.

This information was used to characterise terrestrial habitats and to inform the targeted fauna surveys described below.

Avifauna

No formal avifauna surveys were undertaken; however, birds seen or heard were recorded opportunistically during multiple site visits. Additional records were collated from nearby eBird.org iNaturalist.org records (accessed November 2025) and observations made by Viridis ecologists in the wider area.

Herpetofauna

Herpetofauna (lizard) values were informed by both desktop and field methods. A desktop review of local lizard records from the Department of Conservation's (DoC) Amphibian and Reptile Distribution (ARDs) database and Bioweb was undertaken to identify species with potential to be present on site.

Lizard surveys associated with the Stage 1 fauna management works were undertaken by Epoch Ecology under Wildlife Act Authority Permit 96260-FAU. An experienced herpetologist worked alongside an excavator to systematically scrape back grass, rank ground cover and farm debris within areas mapped in the approved Lizard Management Plan, exposing the ground surface and potential refugia.

Manual hand-searching and raking were undertaken concurrently to ensure all suitable microhabitats were thoroughly searched. Following initial clearance, a post-vegetation-clearance search of the construction footprint was completed to confirm that no lizards remained undetected. These methods were used to inform the assessment of lizard presence and habitat value.

Chiropteran fauna

Chiropteran (bat) values were assessed using desktop review and acoustic monitoring associated with the Stage 1 fauna management works.

Bat activity was monitored using Automatic Bat Monitors (ABMs; Song Meter Mini Bat 2 acoustic detectors), which were deployed across the site for varying periods between 13 and 29 January 2025. ABMs were placed in a range of habitats, including riparian edges, shelterbelts, pasture margins and likely flyways, to maximise detection probability. Devices were mounted and oriented to minimise obstruction and interference.

Acoustic files were subsequently processed and analysed following standard bat call identification procedures to determine bat presence/absence and relative activity levels. These data, together with the desktop records and habitat assessment, informed the evaluation of chiropteran ecological values on site.

Figure 3. ABM location within the site (map source: LINZ 2017).

2.3 Freshwater Ecology

The ecological values of freshwater features were determined in accordance with the methodology prescribed in the EIANZ guidelines (refer Section 2.4).

2.3.1 Streams

During the site assessment, the presence and extent of streams and any wetlands on site were noted, and the quality of freshwater habitat was visually assessed. Watercourses were classified using AUP-OP definitions to determine whether they were ephemeral, intermittent, or permanent. Freshwater habitat was assessed with reference to ecological aspects such as channel modification, hydrological heterogeneity, riparian vegetation extent, substrate type, and any fish or macroinvertebrate habitat observed.

Fish

The NIWA New Zealand Freshwater Fish Database (NZFFD) was reviewed to identify fish species potentially present within the site. Field surveys were then undertaken in the central stream reach using an EFM300 electric fishing machine, following the New Zealand Freshwater Fish Sampling Protocols (Joy et al. 2013). Electric fishing temporarily stuns fish so they can be captured, identified and counted, after which all individuals are returned to their habitat. Fish surveys were carried out alongside a Stream Ecological Valuation assessment in 2023 and a fish salvage in 2025.

An Index of Biotic Integrity (IBI) was calculated for the reach based on the fish community present, altitude, and distance inland (Joy & Henderson 2004). Fish IBI is a multi-metric measure of taxonomic richness that incorporates habitat guilds and factors such as altitude and distance from the coast, using quantile regression scoring. The NPS-FM provides Attribute Bands (A–D) for fish IBI scores to assist interpretation.

Macroinvertebrates

Three macroinvertebrate samples were collected within the site (Figure 4) using a D-net and the quantitative soft-bottomed stream sampling method described in NEMS (2022). All samples were preserved in 70% isopropyl alcohol for subsequent identification and counting. Benthic macroinvertebrates were identified and enumerated to a level appropriate for calculating the Macroinvertebrate Community Index (MCI) and Quantitative MCI (QMCI), following NEMS (2022) protocols. The NPS-FM provides Attribute Bands (A–D) for MCI and QMCI scores to assist interpretation.

Figure 4. Macroinvertebrate sampling locations.

2.3.2 Wetlands

Where appropriate, potential wetland areas were assessed in accordance with wetland delineation protocols (MfE 2022, Clarkson 2014), to determine if an area met the regulatory definition of 'natural inland wetland' (NPS-FM 2020). Potential wetland areas were assessed based on the prevalence of certain vegetation species and their indicator status ratings, as defined in Clarkson et al. (2021):

- Obligate wetland (OBL) vegetation, which almost always is a hydrophyte (a plant which only grows in wet environments), rarely found in uplands (non-wetland areas).
- Facultative wetland (FACW) vegetation, which usually is a hydrophyte but can occasionally be found in uplands.
- Facultative (FAC) vegetation, which is commonly either a hydrophyte or non-hydrophyte.
- Facultative upland (FACU) vegetation, which is occasionally a hydrophyte but is usually found in uplands.
- Upland (UPL) vegetation, which is rarely a hydrophyte and is almost always found in uplands.

Where the dominance or prevalence tests showed unclear results, hydric soils and hydrology tests were undertaken in accordance with methodology outlined in MfE (2022) and Clarkson (2014).

Wetland assessments also included identifying native and exotic vegetation species, examining the structural tiers within wetland areas, and assessing the quality and abundance of aquatic habitats. Signs of wetland degradation such as pugging and grazing from stock access, structures such as culverts impeding hydrological function, and weed infestation were also noted.

2.4 Ecological Impact Assessment

The overarching approach of this analysis and reporting is to ascertain the existing ecological values on the site and determine the impact of the proposed works on those values.

The ecological value of the site, relating to species, communities and systems, were determined in general accordance with the EIANZ Ecological Impact Assessment guidelines (EcIAG) for use in New Zealand (Roper-Lindsay et al. 2018). This report also identifies statutory guidelines and regulation with respect to ecology (such as watercourses, wetlands, high value vegetation and habitats) where relevant to the proposed development. Using this framework, the EcIAG describes a simple ranking system to assign value to species as well as other matters of ecological importance such as species assemblages and levels of organisation. The overall ecological value is then determined on a scale from '*Negligible*' to '*Very High*'.

Criteria for describing the magnitude of effects are given in Chapter 6 of the EcIAG. The level of effect can then be determined through combining the value of the ecological feature/attribute with the score or rating for magnitude of effect to create a criterion for describing level of effects (Table 1). A moderate level of effect requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures need to be introduced to avoid through design, or appropriate mitigation needs to be addressed (Roper-Lindsay et al. 2018).

Table 1. Criteria for describing the level of effects (from Roper-Lindsay et al. 2018).

Magnitude of Effect	Ecological Value				
	Very High	**High**	**Moderate**	**Low**	**Negligible**
Very High	*Very High*	*Very High*	*High*	*Moderate*	Low
High	*Very High*	*Very High*	*Moderate*	Low	Very Low
Moderate	*High*	*High*	*Moderate*	Low	Very Low
Low	*Moderate*	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

Notes: Where text is italicised, it indicates 'significant effects' where mitigation is required.

3 SITE DESCRIPTION

3.1 Background

The site is situated in the Rodney Ecological District of the Auckland region. Historically (pre-human), the site comprised of the ecosystem type pūriri forest (WF7-3) (Singers *et al.*, 2017). This ecosystem type would have supported a diverse range of invertebrates, amphibians, reptiles, birds, and bats. However, a review of the earliest available aerial imagery indicates that the site, and much of the surrounding landscape, was cleared over 85 years ago for agricultural land uses. As farming in the area likely commenced prior to this, it is expected that the landscape has been largely devoid of significant native vegetation for a considerably longer period than the available imagery indicates (Figure 5).

At present, outside of the constructed farm ponds indicated as "open water", the site does not have any identified ecosystem types as per Auckland Council's Geomaps existing ecosystems extent layer. No Significant Ecological Areas (SEA) are present within the site and the nearest designated SEA is approximately 1.6 km to the south.

The wider site consists of managed pasture, along with isolated exotic trees, constructed farm ponds, artificial drainage channels, three modified natural streams, and three rural-residential dwellings and associated farm ancillary buildings. Stage 1 is actively undergoing consented earthworks which are at varying stages of completion. The predominant land uses within the surrounding environment are agriculture and low-density rural residential development, and the North Shore Airport immediately to the east.

Figure 5. Historical aerial imagery of the site, dated 1957.

3.2 Terrestrial Ecology

3.2.1 Vegetation

All vegetation within the Stage 1 area has already been consented for removal. Most of this vegetation has been removed as part of Stage 1 works; accordingly, it is not reassessed in this application.

Vegetation across the remaining Stage 2 area is dominated by exotic pasture species typical of grazed farmland, including kikuyu (*Cenchrus clandestinus*), perennial ryegrass (*Lolium perenne*), white clover (*Trifolium repens*), dock (*Rumex obtusifolius*), lotus (*Lotus pedunculatus*), and creeping buttercup (*Ranunculus repens*) (Figure 6). These species form a generally uniform pasture sward with negligible structural diversity.

Scattered trees occur sporadically, mostly associated with former garden plantings and amenity areas (Figure 10a). These include willow species (*Salix* spp.), blackwood (*Acacia melanoxylon*), palms (*Arecaceae* spp.) and magnolia (*Magnolia* spp.). Shelterbelts within paddocks typically comprise poplars (*Populus* spp., cover photo), Chinese privet (*Ligustrum sinense*) or willow species (*Salix* spp.).

Only a small number of native plants were recorded. A small patch along the northern boundary of 1320 Dairy Flat Highway contained planted flax (*Phormium tenax*), cabbage tree (*Cordyline australis*), tarata (*Pittosporum eugenioides*), karaka seedlings (*Corynocarpus laevigatus*) and kauri (*Agathis australis*), all of low stature and limited ecological value due to their young age and isolated distribution (Figure 10b). These natives were interspersed with exotics and pest plant species.

Pest plant species were widespread and often abundant. The most common included Chinese privet (*L. sinense*), agapanthus (*Agapanthus praecox*), cotoneaster (*Cotoneaster* spp.), pampas grass (*Cortaderia selloana*), blackberry (*Rubus fruticosus*), arum lily (*Zantedeschia aethiopica*) and German ivy (*Delairea odorata*) (Figure 10c & d).

Riparian margins also exhibited low ecological condition (Figure 10c, e & f). The riparian strip within 1320 Dairy Flat Highway was dominated by Chinese privet with patches of arum lily. On the southern edge of 105 Lascelles Drive, riparian vegetation was similarly dominated by dense privet, and extensive pampas grass occurred along the northern boundary of 89 Lascelles Drive.

Overall, vegetation within the Stage 2 area is highly modified, dominated by exotic pasture grasses and pest plant species, and provides limited indigenous biodiversity or habitat diversity. As a result, the botanical and ecological value of the terrestrial vegetation is assessed as low.

Figure 6. Exotic dominant trees and shrubs (purple polygons) within Stage 2.

a)

b)

c)

d)

e)

f)

Figure 7. Typical vegetation within Stage 2: a) scattered trees at 105 Dairy Flat Highway; b) small patch of native vegetation interspersed with exotics at 105 Dairy Flat Highway; c) Chinese privet along the riparian margin at 105 Dairy Flat Highway; d) poplar shelterbelt and pampas at 89 Lascelles Drive; e) upper reach riparian margin at 105 Lascelles Drive; and f) Chinese privet along the lower reach riparian margin at 105 Dairy Flat Highway.

3.2.2 Avifauna

Table 2 presents a list of species observed on site or collated from nearby records. The conservation status of species was assigned following Robertson et al. (2021) and used to inform the assessment of avifaunal ecological value.

Native species observed onsite included spur-winged plover (*Vanellus miles novaehollandiae*), welcome swallow (*Hirundo neoxena neoxena*), pīwakawaka / fantail (*Rhipidura fuliginosa*), silvereye (*Zosterops lateralis*), paradise shelduck (*Tadorna variegata*) and pūkeko (*Porphyrio melanotus*). No native nesting birds were recorded during the bird nesting survey undertaken in January 2025 as part of the Stage 1 fauna management works.

Introduced species recorded included blackbird (*Turdus merula*), common starling (*Sturnus vulgaris*), Canada goose (*Branta canadensis*) and common myna (*Acridotheres tristis*). A review of online databases indicates that the avifauna community in the area is dominated by these common native and exotic species, with no indication of regionally uncommon or threatened birds regularly using the site or surrounding area.

Avifauna habitat across most of the site is limited to managed pasture, scattered exotic trees, garden plantings and shelterbelts. Native vegetation is sparse, highly fragmented and subject to strong edge effects, resulting in low habitat quality and limited foraging, roosting or nesting opportunities for indigenous birds. Overall, the ecological value of the site for avifauna is assessed as low.

Table 2. Birds known to be present in the site and wider area.

Common name	Species name	Conservation status	Observed on site
Australian magpie	*Gymnorhina tibicen*	Introduced and Naturalised	
Australasian harrier	*Circus approximans*	Not Threatened	
Blackbird	*Turdus merula*	Introduced and Naturalised	✓
Black backed gull	*Larus dominicanus dominicanus*	Not Threatened	
California quail	*Callipepla californica*	Introduced and Naturalised	
Canada goose	*Branta canadensis*	Introduced and Naturalised	✓
Chaffinch	*Fringilla coelebs*	Introduced and Naturalised	
Eastern rosella	*Platycercus eximius*	Introduced and Naturalised	
Fantail	*Rhipidura fuliginosa placabilis*	Not Threatened	✓
Goldfinch	*Carduelis carduelis*	Introduced and Naturalised	
Greenfinch	*Chloris chloris*	Introduced and Naturalised	
Grey warbler	*Gerygone igata*	Not Threatened	
Kererū	*Hemiphaga novaeseelandiae*	Not Threatened	
Kingfisher	*Todiramphus sanctus vagans*	Not Threatened	
Laughing kookaburra	*Dacelo novaeguineae*	Introduced and Naturalised	
Mallard	*Anas platyrhynchos*	Introduced and Naturalised	
Myna	*Acridotheres tristis*	Introduced and Naturalised	✓

New Zealand dabchick	*Poliocephalus rufopectus*	At Risk – Naturally Increasing	
Little black shag	*Phalacrocorax sulcirostris*	At Risk – Naturally Uncommon	
Paradise shelduck	*Tadorna variegata*	Not Threatened	✓
Pheasant	*Phasianus colchicus*	Introduced and Naturalised	
Pied stilt	*Himantopus himantopus*	Not Threatened	
Pūkeko	*Porphyrio melanotus melanotus*	Not Threatened	✓
Ruru	*Ninox novaeseelandiae*	Not Threatened	
Silvereye	*Zosterops lateralis lateralis*	Not Threatened	✓
Shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	
Skylark	*Alauda arvensis*	Introduced and Naturalised	
Song thrush	*Turdus philomelos*	Introduced and Naturalised	
Sparrow	*Passer domesticus*	Introduced and Naturalised	
Spotted dove	*Streptopelia chinensis*	Introduced and Naturalised	
Spurwinged plover	*Vanellus miles novaehollandiae*	Not Threatened	✓
Starling	*Sturnus vulgaris*	Introduced and Naturalised	✓
Tūī	*Prosthemadera novaeseelandiae novaeseelandiae*	Not Threatened	
Welcome swallow	*Hirundo neoxena neoxena*	Not Threatened	✓
White faced heron	*Egretta novaehollandiae*	Not Threatened	
Yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	

3.2.3 Herpetofauna

Herpetofauna (reptiles and amphibians) form an important component of New Zealand's terrestrial biodiversity. At least 135 endemic taxa are currently recognised (Hitchmough *et al*. 2021), with approximately 86% classified as *Threatened* or *At Risk*. All indigenous reptile and amphibian species are legally protected under the Wildlife Act 1953, and habitats that provide significant value for native herpetofauna are afforded protection under the Resource Management Act 1991 (RMA). Where land development may disturb resident populations, statutory management obligations apply.

A review of the DoC's Herpetofauna Database (accessed November 2024) identified very few native lizard records within 5 km of the site. Only four records (2009–2017) were found, identifying copper skink (*Oligosoma aeneum*; At Risk – Declining), ornate skink (*Oligosoma ornatum*; At Risk – Declining) and forest gecko (*Mokopirirakau granulatus*; At Risk – Declining). The closest record was more than 3 km from the site.

Targeted lizard surveys undertaken as part of the Stage 1 fauna management works found no native lizards within areas of potential habitat. Only eight plague skinks (*Lampropholis delicata*), an introduced species, were detected.

Overall habitat quality for native lizards within the site is low. The area is dominated by managed pasture with limited understorey, fragmented vegetation, strong edge effects and poor connectivity between potential refuges such as shelterbelts and amenity plantings. Given the low-quality habitat, absence of detections during previous targeted surveys, and scarcity of nearby records, native lizards are not expected to be present within the areas proposed for earthworks.

3.2.4 Chiropteran fauna

New Zealand has two species of endemic bats on the mainland. The most widespread is the long-tailed bat (*Chalinolobus tuberculatus*, Threatened – nationally critical, regionally critical), although colonies are assumed to be small and their health is largely unknown (O'Donnell et al., 2023; Woolly et al., 2023).

The lesser short-tailed bat has three described subspecies; the northern lesser short-tailed bat (*Mystacina tuberculata aupourica*, Threatened – nationally vulnerable), the central lesser short-tailed bat (*Mystacina tuberculata rhyacobia*, At-risk – declining) and the southern lesser short-tailed bat (*Mystacina tuberculata tuberculata*, Threatened – nationally increasing) (O'Donnell et al., 2023). There are no known populations of the short-tailed bat on the mainland in the Auckland region, with the closest known population being the northern lesser tailed bat population on Te Hauturu-o-Toi/Little Barrier Island.

Bats roost in tree hollows and under split bark of native and exotic trees, and also in rocky overhangs. Over the breeding season, large communal roosts occur in similar habitat. Bats tend to utilise linear features in the landscape, including vegetation edges, gullies, waterways, and road corridors as they transit between roosts and foraging sites. Long-tailed bats in particular are known to be highly mobile, with large home ranges (>5,000 ha) and can travel large distances (~25 km) each night during foraging.

A review of the DoC's bat database (accessed May 2025) identified 20 long-tailed bat records within 10 km (Figure 8) of the site (out of 140 total records). The closest record was approximately 4.5 km east of the site, associated with larger forested areas such as Riverhead Forest, Okura Bush and Kings Quarry.

Acoustic monitoring undertaken in January 2025 as part of the Stage 1 fauna management works placed detectors across a range of habitats, including riparian margins, shelterbelts, pasture edges and potential flyways. No bats were detected during this time.

Suitable bat habitat within the site is extremely limited. Vegetation is fragmented, dominated by pasture, and poorly connected to larger habitat blocks in the wider landscape. While some mature exotic trees (e.g., willows and poplars) may provide occasional low-quality roosting opportunities, the lack of vegetation corridors, absence of nearby high-quality habitat, and proximity to the airport further reduce the site's suitability for bats.

Given the low-quality habitat, absence of detections from targeted acoustic surveys, and the limited number of nearby records, bats are not expected to be present within the areas proposed for earthworks. Accordingly, the ecological value of the site for bats is assessed as low.

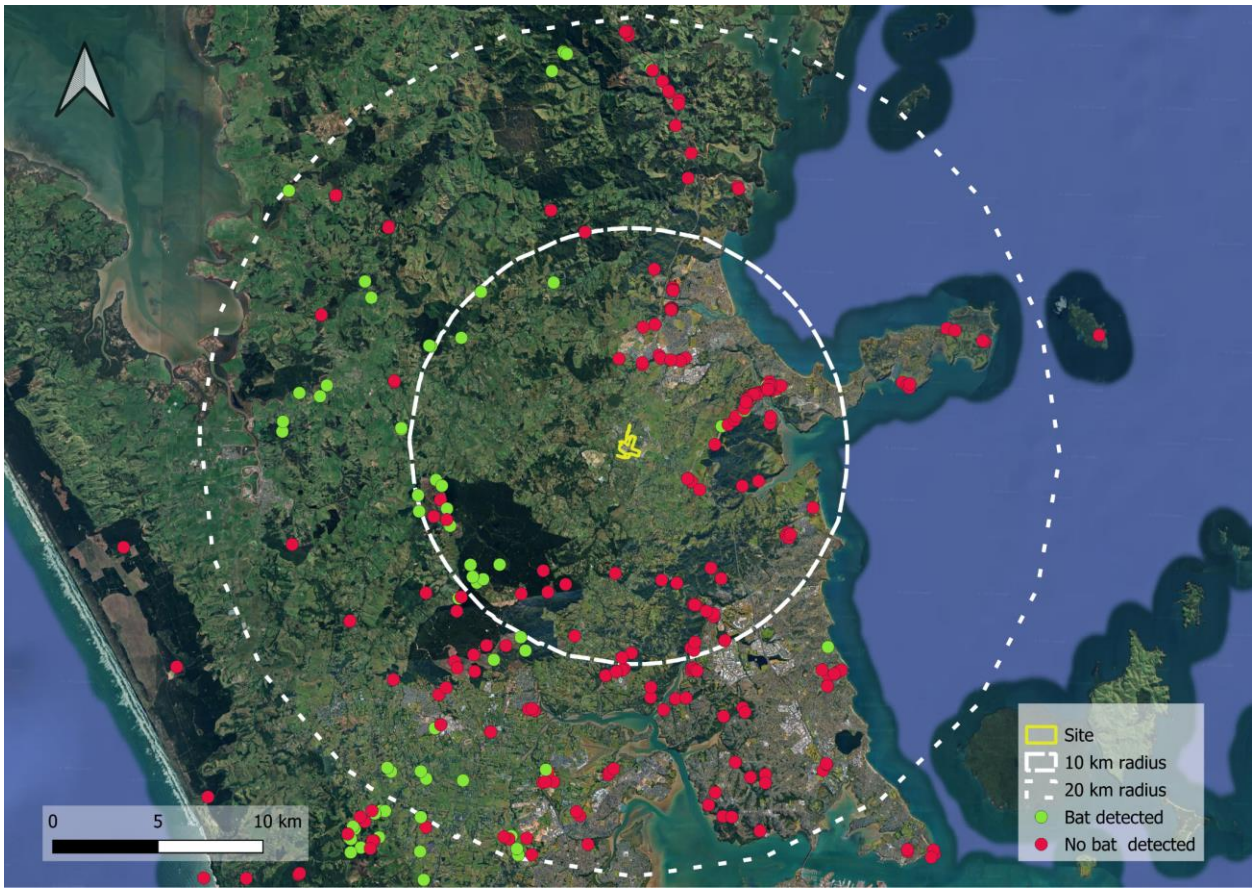


Figure 8. DoC bat records as of May 2025 within the wider environment (Google Earth).

4 FRESHWATER ECOLOGY

4.1.1 Streams

Three streams occur within the site: a southern stream within 105 Dairy Flat Highway, a central stream within the Stage 1 area, and a northern stream within 105 Lascelles Drive (Figure 9). The northern and central streams converge within the property before continuing downstream as tributaries of the Rangitopuni Stream. Several artificial drainage channels were identified during the Stage 1 consenting process; these have since been approved for reclamation and are therefore not shown in Figure 9 or discussed further. An additional artificial channel was also identified in Stage 2 running parallel to, and between, the accessway to 89 and 105 Lascelles Drive and the northern stream.

To enable more efficient use of the land and to naturalise the highly modified central stream, diversion of the upper reach was consented as part of the Stage 1 consenting process. This diversion remains unchanged under the Stage 2 application.

All streams exhibit a high degree of modification resulting from historical agricultural land use. Channel straightening and deepening have been used to improve drainage, creating simplified and uniform watercourses. Substrates were dominated by soft sediment and fine silt, and the water was typically brown and turbid, reflecting the elevated sediment loads common in agricultural catchments.

The surrounding catchment is almost entirely pastoral, with little to no native or structurally complex riparian vegetation. Riparian margins consisted primarily of pasture grasses interspersed with narrow strips of invasive species such as Chinese privet. Despite this, moderate to high shading was present in some reaches due to overhanging pest plant trees. In-stream habitat diversity was very low, with reaches dominated by shallow run habitat of uniform depth and velocity. Pools, riffles, undercut banks, woody debris, root mats and other microhabitats were largely absent, and hydrological heterogeneity was minimal.

MCI and QMCI results further confirm the degraded condition of streams within the site. The northern stream recorded MCI and QMCI scores of 53 and 2.1 respectively, placing it in Attribute State D, below the national bottom line under the NPS-FM. This indicates a macroinvertebrate community characteristic of severe organic pollution or nutrient enrichment, dominated by taxa that are largely insensitive to such stressors. The central stream showed similarly poor results, with MCI/QMCI scores of 51/1.6 in the lower reach and 54/1.9 in the upper reach, also within Attribute State D and indicating a comparably degraded community. Given the comparable physical condition, water quality and habitat modification observed in the southern stream, it is expected to support a similarly poor macroinvertebrate assemblage. Raw invertebrate data are presented in Appendix A.

A review of the NZFFD identified several indigenous species recorded elsewhere in the Rangitopuni catchment, including īnanga (*Galaxias maculatus*; At Risk – Declining), and Not Threatened Cran's bully (*Gobiomorphus basalis*), common bully (*G. cotidianus*), redfin bully (*G. huttoni*), eels (*Anguilla* spp.), freshwater shrimp (*Paratya curvirostris*) and kōura (*Paranephrops* spp.). Exotic species such as goldfish (*Carassius auratus*) and grass carp (*Ctenopharyngodon idella*) have also been recorded.

Fish surveys undertaken as part of the Stage 1 assessment and fish salvage detected only shortfin eel (*Anguilla australis*) in the central stream. Given the similar physical characteristics of the northern and southern streams, a comparable low-diversity fish assemblage is expected across the site. The central stream produced a Fish Index of Biotic Integrity (IBI) score of 20, corresponding to Attribute Band C

under the NPS-FM, indicating low community integrity and considerable impairment of habitat and/or migratory access.

Overall, the combination of highly modified channels, degraded riparian margins, limited in-stream structure, and poor water quality results in low ecological value for all streams within the site. Native fish diversity is expected to be low, and habitat conditions provide limited support for high-quality freshwater communities.

Figure 9. Freshwater features within the site.

a)

b)

c)

d)

e)

f)

Figure 10. The northern stream a) upper and b) lower reach, the central stream c) upper and d) lower reach, and the southern stream e)upper and f) lower reach.

4.1.2 Wetlands

The site is dominated by FACU and UPL pasture species and exotic tree/shrub plantings. A few sporadic and isolated soft rush (*Juncus effusus*, FACW) plants were scattered through the pasture, and willow (*Salix* spp., FACW) was occasionally present. However, FACW species were rare and no OBL species were identified outside of stream channels. Given the clear dominance of FACU and UPL species, and the very limited occurrence of FACW species, the site is considered not to contain any natural inland wetlands as

defined under the NPS-FM. Accordingly, detailed wetland vegetation, soil and hydrology assessments were not considered warranted.

4.1.3 Constructed ponds

Three constructed farm ponds and three constructed stormwater ponds were identified within the site.

Two of the farm ponds, both located within the Stage 1 area, were identified during the Stage 1 consenting process and have since been approved for reclamation. The three stormwater ponds were recently constructed (2025) as part of the Stage 1 works and are also proposed to be removed as those works progress.

The remaining farm pond is located in the corner of a paddock at the eastern end of 1320 Dairy Flat Highway. A review of historic aerial imagery indicates that this pond was built sometime between 1970 and 1988. The pond is stagnant, of poor water quality and is not connected to any other freshwater features.

Man-made ponds meet the definition of constructed wetlands under the NPS-FM and are therefore excluded from the definition of natural inland wetlands and from regulation under the NES-F. These waterbodies may develop associated wetland habitat as a direct or unintentional result of being built and maintained, and the definition of a constructed wetland also extends to these incidental wetlands.

The farm ponds may support highly mobile, pollution-tolerant fish such as native shortfin eel and pest species gambusia (*Gambusia affinis*). However, given their poor water quality, small size and the likelihood that only common native and pest fish are present, their ecological value is considered negligible. Due to their very recent construction and lack of direct connection to streams, fish are not expected to be present within the stormwater ponds.

Figure 11. The farm pond within 1320 Dairy Flat Highway.

5 ASSESSMENT OF ECOLOGICAL EFFECTS

5.1 Proposal

AWHL proposes to develop the site into the Auckland Surf Park Community, an integrated development extending across approximately 54 hectares at 1320 and 1350 Dairy Flat Highway, 89 and 105 Lascelles Drive, and 237 and 253 Postman Road. Stage 1 of the project was previously consented under the Covid-19 Recovery (Fast-track Consenting) Act and approved the construction of a surf park, visitor accommodation, a data centre, a solar farm, and associated infrastructure and ecological restoration works.

The Stage 2 application, progressed under the FTAA, seeks to refine elements of the Stage 1 layout (via Section 127 variations) and authorise a substantial expansion of the project. Proposed Stage 2 components include a hyperscale artificial intelligence data centre campus, three residential neighbourhoods, a village centre, live/work areas, Stage 5A Vacant Lot Subdivision, an extension to the solar farm, and associated roading, civil works, infrastructure, landscaping and ecological restoration.

To enable this development, AWHL proposes to undertake extensive earthworks (Figure 12), vegetation clearance, and construction of stormwater, wastewater and transport infrastructure across the site. The project also includes native regenerative planting and landscape planting to support ecological enhancement.

5.2 Terrestrial Ecology

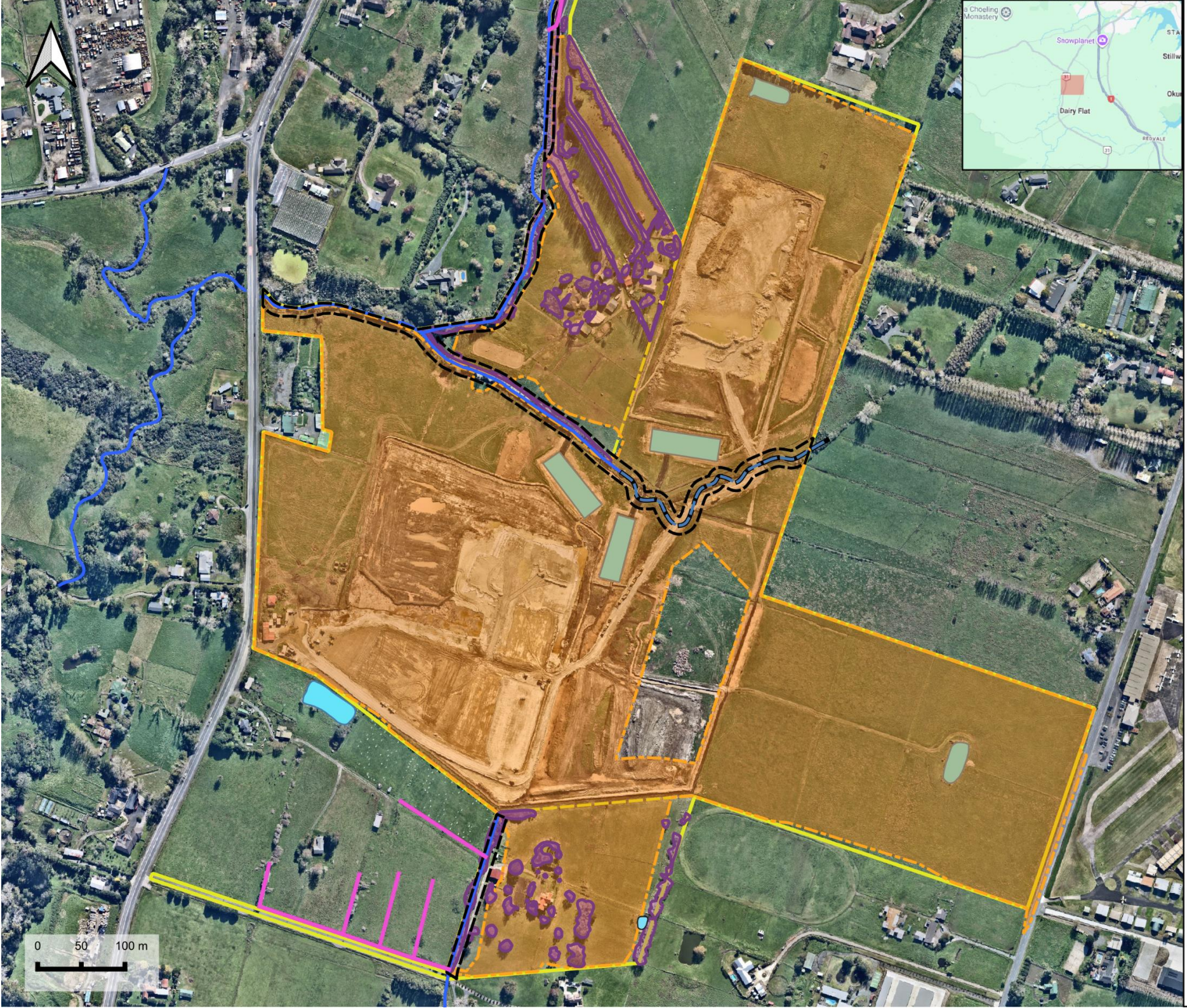
5.2.1 Vegetation

All vegetation within the Stage 1 area has already been approved for removal and is not reassessed here. Most of this vegetation has already been cleared. Within the wider 54-ha site, vegetation outside of managed pasture comprises approximately 2.5 ha of exotic-dominated canopy cover, including shelterbelts, amenity plantings and degraded riparian margins. Pest plant species are widespread and often abundant, and the botanical and ecological value of this vegetation has been assessed as low.

Excluding the vegetation along the accessway to 89 and 105 Lascelles Drive, which is proposed to remain, approximately 2.1 ha of vegetation will be removed to enable construction, earthworks, infrastructure installation, landscaping and the implementation of restorative riparian planting. Although the magnitude of vegetation removal is relatively high in a spatial sense relative to the site, the low ecological value of the vegetation means that the overall level of adverse effect is assessed as low. When assessed in the context of the ecological district, the loss of the vegetation on the site will have a negligible impact on wider ecological values.

Substantial native planting is proposed throughout the site, resulting in considerable ecological enhancement. Riparian restoration along the central stream, previously proposed at approximately 2.7 ha, has been refined and expanded to 3.4 ha within the Stage 1 footprint. Pedestrian pathways are proposed within the riparian planting areas, consistent with the previously approved Stage 1 design, and the current proposal does not introduce any substantial increase in pathway extent within riparian margins.

A further 1.4 ha of riparian planting is proposed along the northern, central and southern streams outside of the Stage 1 footprint, providing a total of 4.8 ha of riparian restoration planting. Extensive native landscape planting is also proposed throughout the development area. Collectively, these works will significantly increase the extent, quality and diversity of indigenous vegetation across the site.



VIRIDIS
Environmental Consultants

Figure 12

Eartworks Extent

Surf Park Community

Legend

- Site extent
- Stream
- Stage 1 stream realignmnet
- 10m riparian margin
- Artificial drainage channel
- Constructed pond
- Stage 2 vegetation
- Stage 2 earthworks extent

SOURCES

Nearmap 2025

SCALE **1:5,500** @ A4

PROJECT NO.	10034
DRAWN BY:	MD
DATE:	18 November 2025

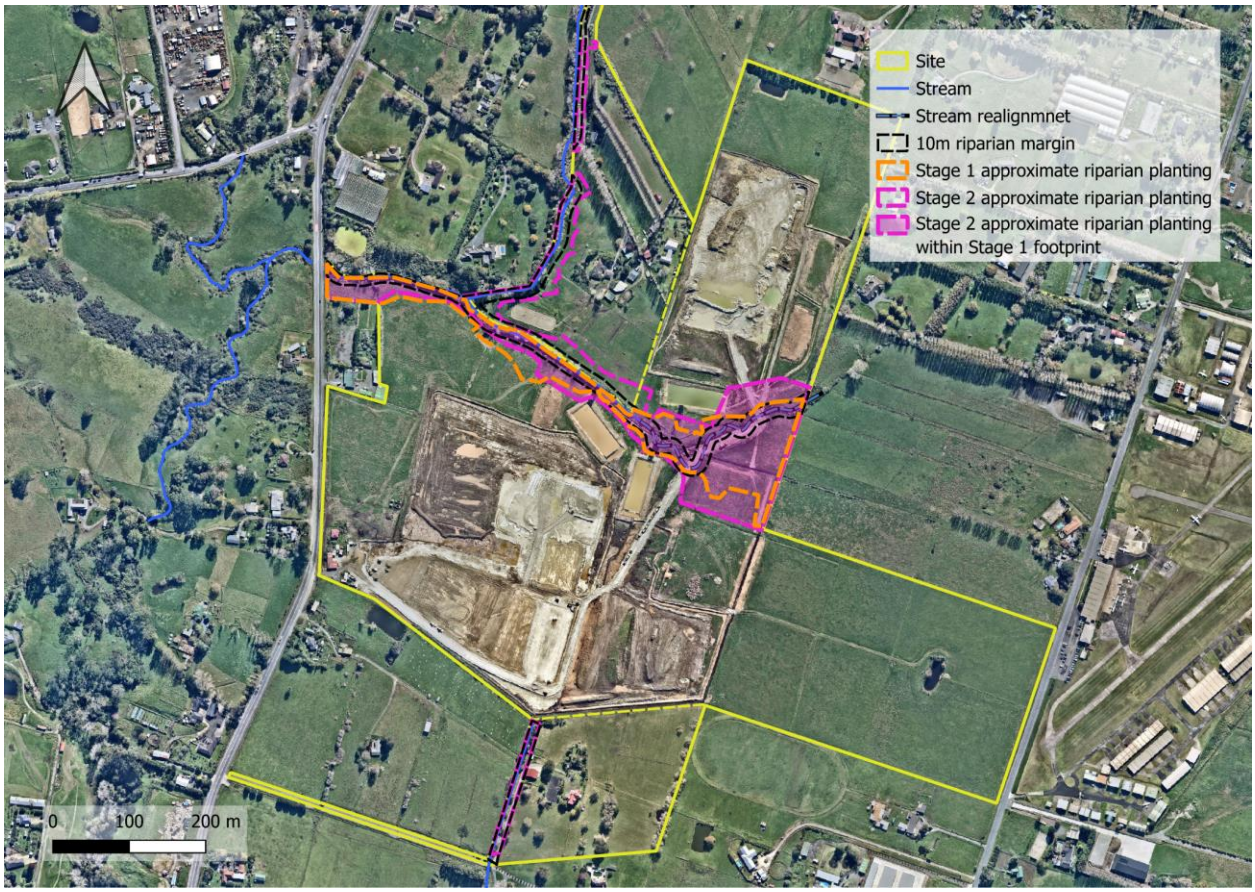


Figure 13. Proposed riparian planting.

5.2.2 Fauna

Because vegetation removal will primarily affect exotic pasture species, pest plants and low-quality exotic vegetation, effects on native fauna are expected to be minimal. Low numbers of native birds were observed during surveys, and the vegetation provides limited foraging or nesting habitat; therefore, effects on native avifauna are considered low. Similarly, given the poor-quality habitat, lack of connectivity, and absence of any confirmed native lizard populations despite targeted survey effort, potential effects on lizards are assessed as negligible to low. No bat activity was detected during acoustic monitoring, and the vegetation offers only low-quality roosting or foraging opportunities; therefore, effects on bats are also considered negligible to low.

Overall, while the vegetation removal results in a short-term loss of low-value exotic cover, the extensive programme of native riparian and landscape planting (Figure 14) will produce a net ecological gain, delivering long-term improvements to vegetation structure, habitat quality and biodiversity values for indigenous birds, lizards, bats and invertebrates.

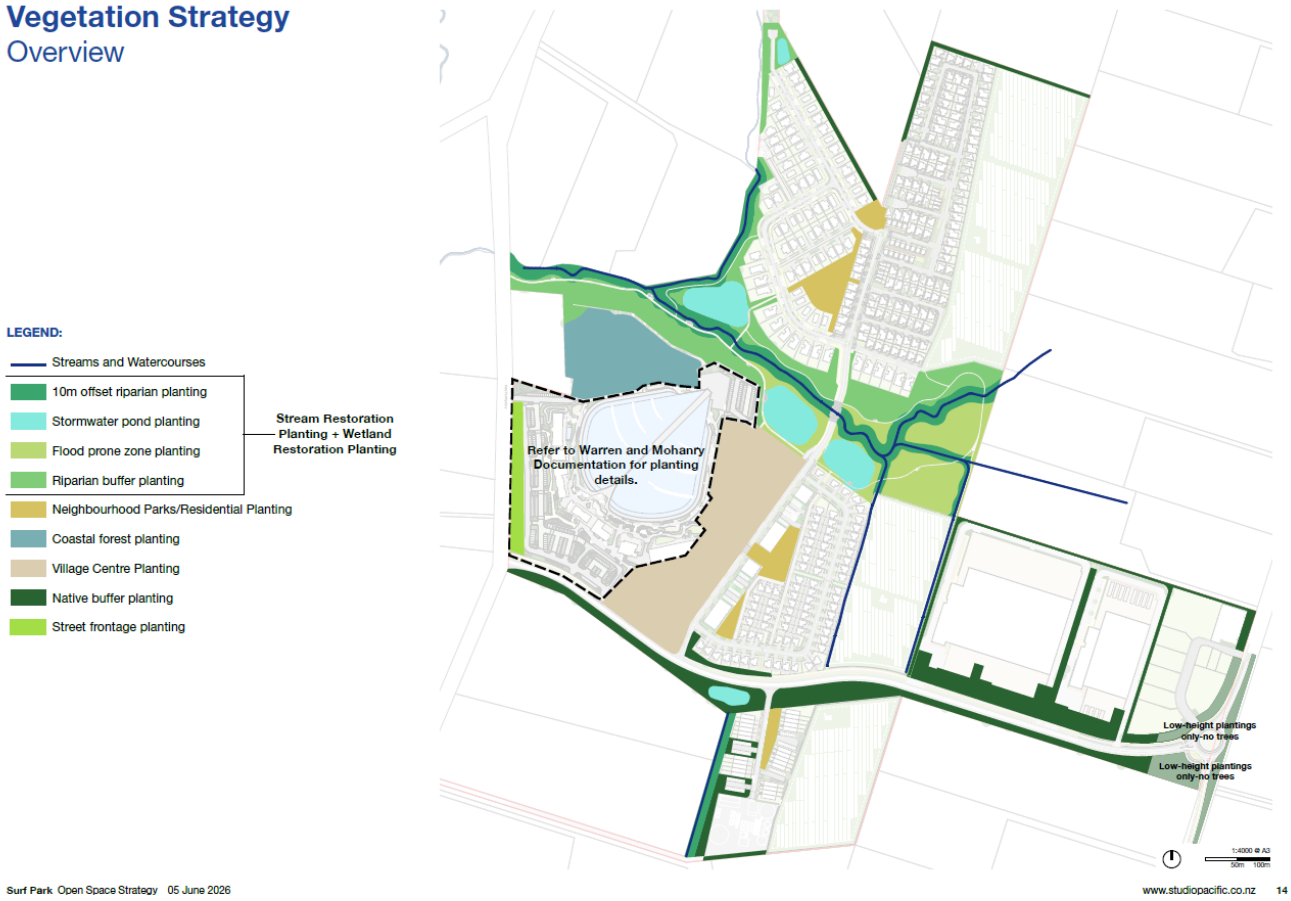


Figure 14. Vegetation strategy from Studio Pacific's Open Space Strategy Design Report (November 2025).

5.3 Freshwater Ecology

5.3.1 Streams

No additional in-stream works are proposed as part of Stage 2 beyond those already consented under the Stage 1 consent, which includes the diversion of the upper reach of the central stream and a single culverted road crossing. Three new pedestrian crossings are proposed across the central stream; however, these crossings will fully span the watercourse, and no works within the wetted channel are required.

To enable more efficient use of the land and to naturalise the highly modified central stream channel, a diversion of the upper reach of the central stream was proposed as a part of the Stage 1 application. This diversion has already been approved under the Stage 1 consent, and no changes to its alignment or design are proposed as part of Stage 2. A Streamworks Management Plan and a Final Stream Restoration Plan were required under Stage 1 to guide detailed design, planting, and implementation, and to ensure the diversion and associated restoration deliver the anticipated ecological benefits (Conditions 159–160 of LUS60429185). No changes to this condition are proposed.

Although the streams on site provide only low-quality aquatic habitat, shortfin eels are expected to be present. To avoid potential harm or mortality during the Stage 1 diversion and any associated works, a native fish rescue and relocation plan was required (Conditions 161-164 of LUS60429185. No changes to this condition are proposed. However, a condition of consent for native fish capture prior to pond reclamation is proposed for Stage 2.

Across the site, approximately 2.2 ha of land lies within 10 m of the stream margins. Earthworks will occur over approximately 1.2 ha of this area (55%), although the vast majority (approximately 1.1 ha) is

associated with the already-consented Stage 1 footprint. Stage 2 therefore introduces only an additional 0.1 ha of earthworks within the 10 m margin, equating to roughly 5% of the total riparian area.

As discussed in Section 5.2.1, the vegetation within these margins is of low ecological value and patchy. While the extent of riparian clearance may appear relatively high, the limited ecological freshwater functions the existing vegetation provides means the overall adverse effect is assessed as low. Moreover, the proposed riparian restoration and landscape planting will substantially improve freshwater ecological values by enhancing shading, increasing filtration and bank stability, strengthening buffering functions and providing organic matter inputs to the stream system. A larger amount of riparian vegetation will be established when compared to the total area removed.

In combination, the avoidance of further in-stream works, the implementation of native fish salvage procedures, and the extensive riparian rehabilitation programme will ensure that the adverse effects of the proposal on stream ecological values are low and will lead to long-term enhancement of freshwater habitat within the site.

5.3.2 Wetlands

No natural inland wetlands were identified within the site or in close proximity to it which could be affected by a potential change in the site's hydrology. Accordingly, no adverse effects on wetlands are anticipated.

5.3.3 Constructed ponds

Auckland Council's interpretation of a lake under the RMA includes all constructed ponds, regardless of size, purpose, or history. Six constructed ponds have been identified on site (Figure 9). Three constructed farm ponds and three constructed stormwater ponds were identified within the site.

Two of the farm ponds, both located within the Stage 1 area, were identified during the Stage 1 consenting process and have since been approved for reclamation. The three stormwater ponds were recently constructed (2025) as part of the Stage 1 works and are also proposed to be removed as those works progress.

The remaining farm pond is located in the corner of a paddock at the eastern end of 1320 Dairy Flat Highway and is proposed to be removed. The pond is small, shallow, stagnant, of poor water quality and is not connected to any other freshwater features, as such it is of very low ecological value. Due to the lack of connectivity and very poor condition, the pond is unlikely to support native fish. However, the presences of highly resilient native species such as shortfin eels cannot be ruled out. Mitigation measures, including a native fish capture and relocation plan and sediment controls, are proposed to address potential adverse effects.

Given its small size and shallow depth, this pond does not function ecologically as lakes. Overall, its removal is expected to result in low ecological effects.

5.3.4 Sediment

Elevated suspended sediment can adversely affect aquatic environments by reducing light penetration, smothering benthic habitats, clogging the gills of fish and invertebrates, and degrading overall water and habitat quality. While aquatic communities are adapted to short-term increases in sediment during natural high-flow events, prolonged or excessive sedimentation can cause significant ecological stress.

Earthworks and vegetation clearance associated with the proposed development have the potential to generate sediment, which, if poorly managed, could be transported to downstream freshwater

environments. To minimise this risk, all earthworks will be undertaken in accordance with a comprehensive Erosion and Sediment Control Plan (ESCP) (McKenzie & Co. 2025). The ESCP will set out site-specific control measures such as sediment fences, stabilised entranceways and runoff diversions to prevent sediment-laden water from leaving the site, particularly via overland flow paths connected to streams.

The final design will ensure that all finished slopes are stabilised, appropriately vegetated and integrated with the stormwater management system to reduce ongoing erosion risk. An indicative ESCP has been provided with this application, and a detailed, staged ESCP will be submitted for approval prior to construction. This will specify the exact controls required, taking into account the volume and timing of earthworks, so that adverse sediment-related effects on freshwater environments are avoided or minimised.

5.3.5 Stormwater

If not carefully designed and managed, changes to a site's stormwater regime can adversely affect freshwater environments through altered flow patterns, reduced baseflows, increased erosion potential, and elevated contaminant loads. The proposed development is located within a SMAF 1 zone, requiring comprehensive hydrology mitigation and high-quality stormwater treatment.

Stormwater for Stage 2 will be managed through an integrated, catchment-scale system centred on large, constructed wetlands supported by swales and raingardens (McKenzie & Co. 2025). The wetlands have been designed to provide both water-quality treatment and flow-attenuation functions, including a Permanent Water Volume sized to protect aquatic ecosystem health (90th percentile event) and additional detention storage for stream protection (95th percentile event). Climate-change resilience has been incorporated by applying a 3.8°C climate factor to detention design, exceeding GD01 requirements.

Most runoff will be collected via a conventional piped network and directed to the central wetland, ensuring efficient capture and treatment of stormwater from roads, roofs, and hardstand areas. The system is designed to achieve at least 80% Total Suspended Solids (TSS) removal and to ensure post-development peak flows up to the 95th percentile do not exceed pre-development rates. Where topography prevents gravity discharge, independent treatment devices (such as raingardens or proprietary systems) will be used to meet equivalent performance standards.

A portion of the existing stream will be realigned under the Stage 1 LUS60429185 approval and integrated hydraulically with the wetland system, creating a multi-functional drainage and ecological asset that improves flood management and supports long-term enhancement of riparian and aquatic habitat.

Overall, provided the stormwater system is constructed as designed and maintained appropriately, potential stormwater-related effects on freshwater environments are assessed as low. The well-controlled and distributed nature of the proposed network is expected to protect existing hydrological and ecological functions within the site and downstream catchments.

5.3.6 Stream Water Take and Discharge

Water is required to initially fill the surf lagoon, to undertake occasional full refills for major maintenance, and to provide ongoing daily top-ups to offset evaporative losses. This demand will be met via a water take from the central stream, using both low-flow and high-flow abstraction regimes as previously assessed under the Stage 1 WAT60429183 approval. Routine maintenance will be undertaken

while the lagoon remains full, using specialist commercial divers. Only infrequent major maintenance or significant repairs would require the lagoon to be drained, with discharge directed back to the central stream in accordance with the existing consent conditions. The effects of this water take and discharge regime were assessed and approved under Stage 1, and no changes are proposed as part of Stage 2.

5.3.7 Wastewater

The effects of the proposed wastewater discharge on water quality and stream ecology are addressed separately in the dedicated wastewater assessment and are not in this EcIA.

6 SUMMARY AND RECOMMENDATIONS

This EcIA evaluates the potential ecological effects of the proposed Auckland Surf Park Community Stage 2 development at 1320 and 1350 Dairy Flat Highway, 89 and 105 Lascelles Drive, and 237 and 253 Postman Road, Dairy Flat. The site is highly modified, with most of the landscape comprising grazed exotic pasture, scattered exotic trees, shelterbelts, and degraded riparian margins. Native vegetation is extremely limited, occurring only as small, isolated plantings of low ecological value. No SEAs or natural inland wetlands are present within the site, and terrestrial habitats have been assessed as providing low ecological value.

Vegetation removal associated with Stage 2 will primarily affect exotic and pest plant species, with approximately 2.1 ha of low-value vegetation to be cleared. No works are proposed within the wetted extent of any stream. While earthworks will occur within parts of the 10 m riparian margin, existing riparian vegetation is of low ecological quality and function. Substantial ecological enhancement is proposed, including approximately 4.8 ha of native riparian restoration planting across the Stage 1 and Stage 2 areas and extensive landscape planting throughout the development, greatly improving future connectivity, shading, and habitat quality.

The site provides limited habitat for indigenous fauna. Only common native bird species were recorded, and habitat quality for avifauna is low. Targeted surveys undertaken as part of Stage 1 management works detected no native lizards, and only introduced plague skinks were found. Acoustic bat monitoring identified no bat activity, and suitable bat habitat is minimal due to fragmented vegetation and poor landscape connectivity. Adverse effects on birds, lizards, and bats are therefore assessed as negligible to low.

Three degraded, highly modified streams occur within the site, dominated by soft sediment substrates, straightened channels, invasive riparian vegetation, and poor water quality. Fish surveys indicate a low-diversity assemblage, with only shortfin eel recorded. No additional in-stream works are proposed beyond those already consented under Stage 1, and all works will be supported by a fish salvage protocol and comprehensive erosion and sediment controls. The proposed stormwater system, centred on large, constructed wetlands and supported by swales and raingardens, will provide effective contaminant treatment and hydrological mitigation in accordance with SMAF 1 requirements. The Stage 1 conditions (LUS60429185) relevant to ecology have been reviewed against the proposed variation and are still considered appropriate.

The proposal is expected to have a low level of ecological effect, result in a net ecological gain and be consistent with the objectives of the AUP-OP, NPS-FM, NES-F, and NPS-IB, provided the following recommendations for the Stage 2 development are implemented and secured as conditions of consent:

Erosion, Sediment, and Earthworks Management

- All earthworks shall be undertaken in accordance with a certified Erosion and Sediment Control Plan (ESCP) that meets the requirements of Auckland Council GD05.

Freshwater Ecology and Stream Protection

- No additional in-stream works beyond those consented under Stage 1 shall occur as part of Stage 2. Pedestrian bridges shall fully span the stream and avoid any disturbance to the wetted channel.

- All diversion works associated with the previously approved alignment shall continue to follow the certified Final Stream Restoration Plan, including riparian planting, bank stabilisation, and habitat enhancement measures.
- Stormwater treatment and hydrological mitigation shall be designed and implemented in accordance with GD01 and SMAF 1 requirements, ensuring post-development flows (up to the 95th percentile) do not exceed pre-development levels.
- A native fish rescue and relocation plan must be submitted to the Consent Authority for certification. The purpose of the native fish rescue and relocation plan is to ensure native fish will be appropriately removed prior to the removal of the constructed pond in Stage 2. The native fish rescue and relocation plan must be prepared by a suitably qualified and experienced freshwater ecologist.

Terrestrial Biodiversity and Riparian Enhancement

- Native riparian vegetation removal shall be minimised, and all clearance shall be limited to that necessary for Stage 2 construction activities.
- All proposed Stage 2 native riparian restoration and landscape planting shall be implemented in accordance with certified planting plans, with ongoing maintenance and replacement of plant failures for a minimum of five years.
- Pedestrian pathways within riparian areas shall be designed to avoid adverse effects on newly planted vegetation and maintain setbacks from the stream edge.

Provided these recommendations are implemented, together with the extensive riparian restoration and regenerative native planting programme proposed across the site, the development is expected to achieve long-term ecological enhancement and result in positive outcomes for freshwater and terrestrial ecological values both within the site and in downstream receiving environments.

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Appendix A
Macroinvertebrate Data

Address | Unit A1, 72 Apollo Drive, Mairangi Bay, Auckland 0632
Post | PO Box 301709, Albany, Auckland 0752
Telephone | 64 9 475 5750
Email | contact-us@viridis.co.nz

www.viridis.co.nz