robertson

environmental

ECOLOGICAL ASSESSMENT & REPORTING SERVICES

Proposed Māpua Boat Ramp

Coastal Ecological Impact Assessment

For Māpua Boat Ramp Trust

January 2023

REPORT INFORMATION & QUALITY CONTROL

Prepared for:	Māpua Boat Ramp Trust C/- Gary Stevenson & Mark Morris, Davis Ogilvie & Partners Limited

Authors:	Dr Ben Robertson Principal Consultant Ecologist, Director
Internal Reviewer:	Dr Barry Robertson Technical Advisor, Director

Document Name:	RobEnv_Māpua Boat Ramp_EcIA v2.0 (18 January 2023)

Version History:	RobEnv_Māpua Boat Ramp_EcIA 221111 DRAFT (11 November 2022) RobEnv_Māpua Boat Ramp_EcIA v1.0 (15 November 2022)

- **Ben Robertson** (Principal Consultant, Director) BSc (Hons), PhD, CEnvP
- **Barry Robertson** (Technical Advisor, Director) BSc, Dip Sci, PhD
- **Jodie Robertson** (Senior Consultant, GIS Tech) BSc, PG Dip, MSc
- **Julian Goulding** (Technical Officer, Skipper) BComm, Master 3000 Gross Tonnes

89 Halifax Street East
Nelson 7071
Phone: +64 27 823 8665
robertsonenvironmental.co.nz

Contents

List of Appendices

List of Tables

List of Figures

Executive Summary

Māpua Boat Ramp Trust seeks to install an access road to a concrete boat ramp that will project into Waimea (Waimeha) Inlet at a coastal lowland property located off Tahi Street, immediately south of the existing Māpua Wharf precinct, Māpua, Tasman. To understand and evaluate the ecological values present within the receiving environment, Robertson Environmental Limited was engaged to undertake an ecological assessment of the values and potential effects of the project (based on preliminary site design). This assessment has been undertaken in accordance with the EIANZ Guidelines (2018).

Desktop, database and field survey indicated that the coastal area to be directly impacted by the project is highly modified coastal lowland flat and estuarine wetland habitat of limited ecological value. This area has been heavily impacted by historical and current land use practices, but the proposal includes partial loss of estuarine wetland habitat (Waimea Inlet) identified with higher values. Key conclusions of the assessment were as follows:

- The terrestrial aspect of the lowland and margin habitat directly affected is relatively small in area, dominated by exotic grassland or bare ground with limited indigenous vegetation, common across the adjacent lowland environment, and of relatively low value ecologically.
- The estuarine habitat directly affected is also relatively small in area, common along the wider mid-upper estuary margins, and of relatively low value ecologically;
- Fragmentation and edge effects were apparent throughout the site, including within areas of estuarine wetland habitat, with exotic weed species a common feature and animal pests likely present.
- No significant or indigenous habitat types are known to occur within the project footprint or wider survey area and the ultimate downstream receiving environment (the wider Waimea Inlet and Tasman Bay) will be unaffected assuming adequate erosion sediment control measures are implemented.
- Regarding native fauna (namely lizards and birds), the potential for adverse effects is considered low, primarily given the site's modified nature and existing disturbance levels.
- Predominantly the overall magnitude of the potential effects, both direct and indirect, are low or very low, and the resultant significance of the potential adverse effect (in the absence of any mitigation measures) is generally low to very low.

Despite the level of effect for native species being low, compliance with the Wildlife Act 1953 will be required for vegetation clearance to ensure native birds and lizards are not impacted. Recommended measures include a pre-works lizard survey as well as programming works to ensure avoidance of the peak bird breeding season.

Generally, the proposal is relatively minor in terms of ecological impacts based on site design and existing values, and therefore the life-supporting capacity of associated coastal ecosystems will be maintained through the construction and operation of the project.

It is recommended that direct effects to the littoral shore below Mean High Water Spring and sediment discharges (albeit limited) to the intertidal and coastal waters be minimised, and that affected area be vegetated, wherever appropriate, with native vegetation as befitting the area. It is noted that planting of estuarine vegetation (e.g. saltmarsh and seagrass) at the proposed site is not likely to be successful given the present absence of such species, that available saltmarsh habitat (high water to supratidal) is very narrow and dominated by hard substratum, and that intertidal seagrass beds are highly vulnerable to fine sediments in overlying waters and sediment quality (particularly where elevated mud content limits oxygen exchange).

1 Introduction

Māpua Boat Ramp Trust ('the Applicant') seeks to install an access road to a concrete boat ramp that will project into Waimea (Waimeha) Inlet at a coastal lowland property (3633376) located off Tahi Street, immediately south of the existing Māpua Wharf precinct, Māpua, Tasman ('the Site').

A preliminary overview of the Project by Davis Ogilvie & Partners Ltd (DO) outlines the approach and identifies the project footprint including the extent of aquatic and terrestrial areas where modification works are proposed to occur. In order to establish a baseline ecology state, and to understand design opportunities and constraints, an assessment of ecological values and potential effects is required.

The following report is an ecological impact assessment (EcIA) of the proposed activity. It was commissioned by DO on behalf of the Applicant.

1.1 Ecological Assessment Scope

With detailed methodology outlined in Section 2, and limitations in Section 9, the purpose of this report is to:

- Identify and describe the significance and value of aquatic and terrestrial habitat and features within the Site (Section 3);
- Describe the potential effects on local ecology arising from the Project (Section 4);
- Recommend measures as appropriate to avoid, remedy or mitigate potential effects (including any proposed conditions/management plan required) (Section 5); and,
- Discuss and present an overall conclusion of the level of potential effects of the Project on local ecology (Section 6).

We note potential contamination effects that may arise through disturbance of soils on-site have been addressed in the Envirolink report dated 3 May 2022 and are not discussed further in this report.

1.2 Description of Project

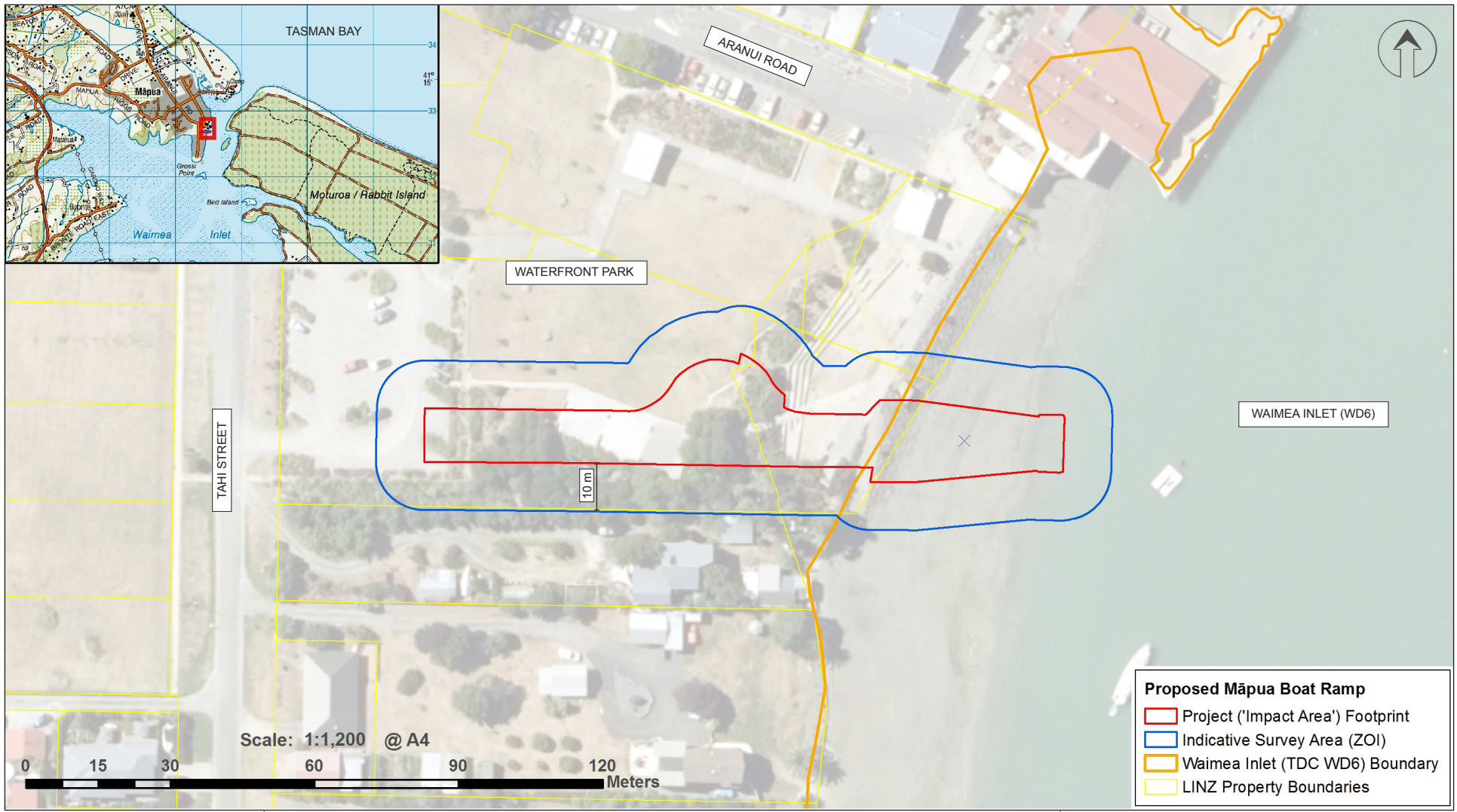
The location of the Site within the property boundaries and survey area is shown in Figure 1.1. The proposed boat ramp and access way extend east from Tahi Street, through Waterfront Park, into Waimea Inlet approximately 40 meters seaward from Mean High Water Spring (MHWS). The overall extent to be directly affected by the proposal ('the Impact Area') is a combination of terrestrial and aquatic area encompassing approximately 0.13 hectares of highly modified coastal lowland/margin and 0.05 hectares of estuarine wetland habitat associated with the lower reaches of the Waimea Inlet.

Based on the preliminary concept drawings, the method of construction would involve removal of some existing ground material and most vegetation and excavation of the foreshore to form a base upon which the access way and boat ramp can be built. Excavation would proceed as tidal conditions allowed and will predominantly occur from the foreshore. The toe of the boat ramp includes a rock mattress that would extend approximately 0.5 m into the estuary bed face to provide some protection from wave scour and long-term erosion effects.

In terms of sediment management, it is understood that;

- An Erosion and Sediment Control Plan (ESCP) will be developed and implemented in accordance with Nelson Tasman Erosion and Sediment Control Guidelines 2019 or any subsequent version, prior to any land-disturbing activities occurring. This will effectively minimise sediment discharges to adjacent watercourses.

As such, this EcIA assumes that issues related to sediment generation is adequately mitigated and will not lead to adverse ecological effects. This includes the potential effects on the downstream receiving environment as it has been assumed that such effects can be acceptably managed as part of project delivery.



expert ecological services.

Figure 1.1. Survey area (or Zone of Influence) overlaid with the Impact Area and relevant property boundaries based on preliminary site design supplied to Robertson Enviro by DO.

PROJECT: PROPOSED MĀPUA BOAT RAMP, MĀPUA BOAT RAMP TRUST

Project Survey Area

| Date: 18 January 2023 | Revision: B | Aerial: LINZ 22
Plan map prepared for DO by Robertson Environmental Limited

Project Manager: Ben.Robertson@robertsonenviro.co.nz

2 Assessment Methodology

The ecological assessment of the Site has been undertaken using a combined desktop, database and field survey approach outlined below.

2.1 Desktop Analysis

Existing biological databases and all published information on habitat types and biological values within the Site were researched. This phase also included preparation of site maps and plans to direct the field survey. The extent and differences in vegetation and habitat type within the Site were delineated on geographic information systems (GIS) using topographical maps and high resolution aerial photography (LINZ rectified ~0.3 m per pixel resolution flown in 2022) prior to the site visit. Information was derived from known data sets on landforms, soils, climate, and topography of the Site. Preliminary vegetation communities and habitat types were identified and described through a combination of New Zealand Land Cover Database (LCDB5), Tasman District Council (TDC) reports and data, and the use of aerial photographs.

The national threat classification of species was derived from the appropriate threat classification list for each taxa (Andrew et al., 2021; Baker et al., 2021; Burns, et al., 2018; Dunn 2018; Hoare et al., 2017; Grainger, et al., 2018; de Lange, et al., 2018; Mayfield et al., 2021; Nelson et al. 2019; Trewick et al. 2016; Hitchmough et al. 2021; Leschen et al., 2012; Robertson et al., 2021; O' Donnell et al. 2018; van Winkle et al. 2018; Walker et al., 2021) and their regional status was derived from the Draft Conservation Management Strategy for the Nelson/Marlborough Conservancy 1996-2006 (Department of Conservation 1996).

2.1.1 Vegetation and Rare Plants

Local plant species lists obtained from the New Zealand Plant Conservation Network website (http://www.nzpcn.org.nz/observation_site_search.aspx) and other sources (e.g. Courtney et al. 2003; TDC 2012), were examined to identify any rare or uncommon plants in which to focus field surveys.

2.1.2 Terrestrial Macroinvertebrates

Macroinvertebrate lists obtained from various representative sources (e.g. Butler 2008) were examined to identify any rare or uncommon species in which to focus field surveys.

2.1.3 Lizards

A list of lizard species in the area, as noted in Department of Conservation's Bioweb database (accessed October 2022), Butler (2008) and van Winkle et al. (2018), was collated.

2.1.4 Birds

A list of bird species in the area, as noted in eBird (Grid BY52, July 2019 - October 2022), was collated.

2.1.5 Aquatic Fauna

Macroinvertebrate lists obtained from representative sources were examined to identify any rare or uncommon species in which to focus field surveys. A review of fish records from Waimea Inlet (Davidson 1990) and Redwood Valley and Seaton Valley Stream catchment areas on the New Zealand Freshwater Fish Database (NZFFD) was undertaken.

2.2 Field Survey

Terrestrial and aquatic habitats within the Site were assessed by field survey. The survey targeted an area based on the proposed footprint as shown in Figure 1.1. The survey was undertaken on 1 November 2022 during a low tidal state when the weather conditions were mostly fine. On this day, the tide was low at 0932 (1.13 m) and high at 1554 (3.37 m).

2.2.1 Habitat Classification

Broad ecological or habitat zones in the study area were identified, and with the aid of a handheld Garmin GPSMAP 64sc WW unit (accuracy approx. ±5-10 m) broadly delineated. Each habitat was subjectively classified into one of several different qualitative habitat type descriptors according to unique features identified. Qualitative inspection of habitats was then conducted to note key flora and fauna for each zone. Upon completion of field work the broad habitat zones where then imported into a georeferenced aerial photo of the area using Garmin BaseCamp (version 4.8.3) and ArcMap 10.5 GIS software. Using colour aerial photos (LINZ 2022) delineated habitat zones were adjusted accordingly, to more accurately reflect the likely tonal gradations of respective habitats, and a map of different habitats was produced.

2.2.2 Terrestrial Ecology

Vegetation and Rare Plants

The desktop delineated vegetation communities were ground-truthed in the field, where each identified community type was described on-site. Native and exotic vegetation was noted across the Site with a focus on the presence of indigenous species (Appendix A).

Terrestrial Macroinvertebrates

No surveys of terrestrial invertebrates were undertaken. Rather, we relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of macroinvertebrates present within similar habitats nationally.

Lizards

Field surveys for terrestrial lizards were not conducted. Rather, we relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of lizards present within nearby habitats.

Birds

A roaming inventory of birds sighted or heard was taken during the field survey. We also relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published accounts of birds present within nearby habitats.

2.2.3 Aquatic Ecology

Habitat Quality Assessment

Synoptic assessment of specific aquatic habitat types and the associated values was completed at the Site. All watercourses to be impacted both directly and indirectly were photographed and classified as either permanent, intermittent or ephemeral. The assessment of the waterbodies examined the key physical parameters including, but not limited to hydrological connectivity, thermal regulation, vegetation composition (both aquatic and marginal vegetation).

The aquatic aspect of the Site (below MHWS) includes intertidal and subtidal estuarine habitat. TDC has identified this habitat as estuarine wetland habitat associated with Waimea Inlet (WD6), and the ecological quality of the predominant intertidal habitat was mapped at a broadscale in 2020 (Stevens et al. 2020). No other aquatic habitat types are known to occur at the Site.

Aquatic Fauna

Dedicated fish or macroinvertebrate surveys were not undertaken. We relied on the vegetation community and habitat type descriptions obtained from the field investigations to identify areas of potential habitat for species likely to occur within the area, as well as published and unpublished

accounts of fish and invertebrates present within the wider area or similar habitats regionally.

2.3 Assessment of Effects Methodology

The location of the Site falls within the jurisdictional boundary of TDC and its operative Tasman Regional Management Plan (TRMP), and is part of the Motueka Ecological District and the Nelson Ecological Region. The Site occupies Recreation and Open Space land and Coastal Marine Area under the TRMP. All statutory planning documents relevant to the consenting and ecological assessment of the proposed activity, and the New Zealand Coastal Policy Statement 2010 (NZCPS), were considered in the assessment.

The assessment of ecological effects follows Ecological Impact Assessment guidelines (EcIA) produced by the Environment Institute of Australia and New Zealand (EIANZ, 2018). The EcIA approach follows the steps outlined below:

Step 1: Assessment of ecological values

Ecological values are assigned based on the matters to be considered when assigning ecological value outlined in Table 2.1, with corresponding criteria specific to terrestrial and aquatic habitats and species as set out in the EcIA guidelines (Table 2.2).

Table 2.1. Assignment of values to species, vegetation and habitats within the surveyed area (adapted from EIANZ, 2018).

Matter	Assessment matters considered; terrestrial and aquatic ecosystems
Representativeness	Criteria for representative vegetation and habitats: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Thresholds may need to be lowered where all examples of a type are strongly modified Criteria for representative species and species assemblages: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/distinctiveness	Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon, or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National priority for protection Criteria for rare/distinctive species or species assemblages: • Habitat supporting nationally Threatened or At Risk species, or locally uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations – pattern, complexity • Temporal considerations, considerations of life cycles, daily or seasonal cycles of habitat availability and utilisation

Matter	Assessment matters considered; terrestrial and aquatic ecosystems
Ecological context	• Site history, and local environmental conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience (from "intrinsic value" as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning – high level, key species identification, habitat as proxy

Table 2.2. Criteria for assigning ecological value to terrestrial and aquatic habitats and species (modified from EIANZ 2018)

Value	Species Value requirements	Habitat Value requirements
Very High	Threatened - (Nationally Critical, Nationally Endangered, Nationally Vulnerable)	Area rates High for 3 or all of the four assessment matters listed in Table 1. Likely to be nationally important and recognised as such.
High	Important for Nationally At Risk – species and may provide less suitable habitat for Nationally Threatened species	Area rates High for 2 of the assessment matters, Moderate and Low for the remainder, or Area rates High for 1 of the assessment matters, Moderate for the remainder. Likely to be regionally important and recognised as such.
Moderate	At Risk - (Recovering, Relict, Naturally Uncommon) Locally (Ecological District) uncommon or distinctive species	Area rates High for one matter, Moderate and Low for the remainder, or Area rates Moderate for 2 or more assessment matters Low or Very Low for the remainder. Likely to be important at the level of the Ecological District.
Low	Native - Not Threatened. Nationally and locally common indigenous species	Area rates Low or Very Low for majority of assessment matters and Moderate for one. Limited ecological value other than as local habitat for tolerant native species.
Very Low	Exotic species, including pests, species having recreational value	Area rates Very Low for 3 matters and Moderate, Low or Very Low for remainder.

Step 2: Magnitude of effect assessments

Step 2 of the EcIA guidelines requires an evaluation of the magnitude of effects on ecological values based on the extent of any area which is likely to be affected, intensity and duration of effect. The magnitude of the effect that the Project is expected to have on ecological values is evaluated as being either No effect, Negligible, Low, Moderate, High or Very High, based on the proposed works (footprint size, intensity and duration; see Table 2.3).

Table 2.3. Summary of the criteria for describing the magnitude of effect as outlined in EIANZ, 2018.

Magnitude of effect	Description
Very High	Total loss or major alteration of the existing baseline conditions; and/or Loss of high proportion of the known population or range
High	Major loss or alteration of existing baseline conditions; and/or Loss of high proportion of the known population or range
Moderate	Loss or alteration to existing baseline conditions; and/or Loss of a moderate proportion of the known population or range
Low	Minor shift away from existing baseline conditions; and/or Minor effect on the known population or range
Negligible	Very slight change from the existing baseline conditions; and/or Negligible effect on the known population or range

Step 3: Level of effects assessment in the absence of mitigation

Step 3 of the EcIA guidelines requires the overall level of effect to be determined using a matrix that is based on the ecological values and the magnitude of effects on these values in the absence of any efforts to avoid, remedy or mitigate for potential effects. Level of effect categories include No Effect, Very Low, Low, Moderate, Moderate/High, High and Very High. Table 2.4 shows the EcIA matrix outlining criteria to describe the overall level of ecological effects.

Table 2.4. Summary of the criteria for describing the overall level of ecological effects as outlined in EIANZ, 2018.

Magnitude of effect	Ecological Value				
	Very High	High	Moderate	Low	Very Low
Positive	Net gain	Net gain	Net gain	Net gain	Net gain
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

Assessment also considered the temporal scale at which potential impacts were likely to occur:

- Permanent (>25 years);
- Long-term (15-25 years);
- Medium-term (5-15 years);

- Short-term (0-5 years); or,
- Temporary (during construction).

Step 4: Establish if mitigation is required

Results from the matrix in Table 2.4 is used to determine the type of responses that may be required to mitigate potential direct and indirect impacts, considering the following EcIA guidelines:

- A 'Low' or 'Very Low' level of impact is not normally of concern, though design should take measures to minimise potential effects.
- A 'Moderate' to 'High' level of impact indicates a level of impact that qualifies careful assessment on a case-by-case basis. Such activities could be managed through avoidance (revised design) or appropriate mitigation. Where avoidance is not possible, no net loss of biodiversity values would be appropriate.
- A 'Very High' level of impact is are unlikely to be acceptable on ecological grounds alone and should be avoided. Where avoidance is not possible, a net gain in biodiversity values would be appropriate.

As discussed later in this report, the Project would largely have only low to very low ecology effects (in terms of Step 3 of the EcIA guidelines), even without taking into account mitigation measures.

3 Ecological Description

3.1 Site Description and Ecological Context

Based on an initial desktop review of available information we have identified the following ecological attributes within the terrestrial and aquatic receiving environment of the Project. Figure 3.1 provides an overview of existing land use, vegetation cover and aquatic attributes at the Site.

The Site is within low topography[1], coastal environment adjacent to the lower reaches of the Waimea Inlet. The Site comprises mainly Exotic Grassland (LCDB5), with smaller areas of bare ground, planted native-exotic vegetation, armored seawall and access way, intertidal flats and subtidal channel environment. Predominantly land use cover across the wider catchment area is one of pasture grasses, cropping, and rural/residential development.

3.1.1 Coastal Marine Environment

Waimea Inlet, including part of the Site, is a large (3,462 hectare), shallow, well-flushed, tidal lagoon type estuary with high ecological and human use values (Stevens and Robertson 2010). The inlet receives freshwater inputs from Waimea River and several smaller tributaries and discharges to Tasman Bay via tidal entrances at either end of Rabbit Island.

Despite having undergone significant historical reclamation and modification and consequent habitat loss (principally saltmarsh vegetation from its margins), the estuary still supports a variety of important habitats (e.g. saltmarsh, seagrass/macroalgal beds, unvegetated mud/sand flats, subtidal channel) and communities (e.g. macroinvertebrates, fish and birds).

In 2010, the overall ecological vulnerability of Waimea was assessed as 'moderate-high' (Stevens and Robertson 2010) with the main pressure identified as elevated fine sediment (grain size <63 um - silt/clay) from catchment runoff and habitat loss. Sediment nutrient and toxicant (trace metals) levels are generally low, except for often naturally elevated nickel and chromium concentrations (McArthur 2016; Robinson et al. 1996; Rattenbury et al.1998).

TDC routinely monitors the ecological health of the estuary following the National Estuary Monitoring Protocol (NEMP; Robertson et al. 2002a,b) and NZ Estuary Trophic Index (NZ ETI; Robertson et al. 2016a,b; Plew et al. 2020) approaches. The overall condition of the intertidal estuary was assessed at a broad scale in 2020 (Stevens et al. 2020), and was described as follows:

- "*...Overall, despite extensive historical habitat modification, significantly reduced habitat diversity, and large areas of mud-dominated sediments, Waimea Inlet retains many areas of very significant ecological value. However, the prevalence of mud-dominated substrate, the persistence of localised dense macroalgal beds and High Enrichment Conditions, and pressures on saltmarsh near the estuary margin from drainage and reclamation are key broad scale habitat stressors that threaten these values. Salt marsh losses are likely to increase in future in response to sea level rise due to the current limited capacity for landward migration. Reductions in sediment loads, and targeted management of localised nutrient inputs, will be required to improve estuary condition....*".

Fauna residing in or utilising nearshore benthic habitat within the present application site were not comprehensively assessed in Stevens et al. (2020). However, based on previous monitoring of softshore intertidal communities at several comparable sites within the upper reaches of Nelson Haven (Robertson and Asher 2001), inhabitant communities are likely to comprise species of nemerteans (ribbon worms), nematodes (round worms), polychaete, gastropods (snails), bivalves and amphipods. Above MHWS, supralittoral communities present among boulder/cobble substratum are likely to be considerably less diverse and limited to a few highly mobile/opportunistic species (e.g., beetles, spiders, snails, and mites), if present at all, owing to harsh environmental conditions and limited food resources.

The boulder habitat at the foot of the terrestrial margin may also provide refuge for species of

[1] Predominantly Flat to Gently Undulating (0-3°) slope; Landcare Research NZ Limited 2009-2022.

Figure 3.1. Planted native-exotic vegetation and exotic grassland cover, access way, and recreational area contiguous with the armored seawall and intertidal and subtidal reaches of Waimea Inlet within the survey area, at the proposed site, November 2022.

skink and gecko, although this is unlikely given the quality and quantity of available habitat and high degree of disturbance from immediately adjacent sources.

The wider Waimea Inlet and adjacent coastline is known to provide refuge for a variety of indigenous flora and fauna including Threatened and At Risk species (further discussed below).

3.1.1 Terrestrial Environment

The terrestrial environment encompassing the Site is highly modified, and its exposure to disturbance and impacts from humans, pest plant and animal species is very high. The area is classified as Category 1 (<10% indigenous cover left) under the Threatened Environment Classification (TEC) version 2012. In these areas, habitats are highly fragmented and indigenous biodiversity is likely significantly reduced[2]. The LENZ prediction (Landcare Research Ltd, 2012) of the historic land cover for this Site is coastal dunelands.

3.2 Existing Terrestrial Habitat Types and Vegetation

Key areas of vegetation within the Site are listed below and described in the following sections. An example of how habitat margins were delineated is provided in Figure 3.2. A summary of the approximate proportions of each habitat type mapped within the Impact Area and wider survey area is presented in Table 3.1. A GIS-based broad scale map of the Site is provided in Figure 3.3.

- Planted mixed exotic/native vegetation.
- Exotic grassland.
- Bare land/access way (no vegetation).
- Armored seawall.

There was no evidence of dense indigenous forest or old (primary) growth at the Site. Representative field photographs of each identified habitat type are presented in Appendix G.

3.2.1 Planted mixed exotic/native vegetation

Planted native vegetation occurs on the property (Figure 3.3). Dominant native plantings include taupata, whararikí, tī kōuka, kāpuka, ngaio, purei, mānatu, jointed rush, small-leaved pōhuehue, small-leaved kōwhai, salt marsh ribbonwood, and kānuka. The plantings have been established within terrestrial margins within the middle and along the southern boundary of the Site. Southern rātā shrubs are present. The plantings are not fenced from the surrounding recreational area and humans and other animals are not excluded. Exotic (sub-dominant) species present among the native growth include english daisy, Onehunga weed, prairie grass, sow thistle, black medick, sweet vernal, common groundsel, and fennel. Understorey growth is largely rank exotic grasses and herbs or bare ground.

3.2.2 Exotic grassland

Terrestrial vegetation in the area is characterised by a high proportion exotic grassland. These areas comprise exotic grasses and herbs e.g. Yorkshire fog, cocksfoot, clover, dock, narrow-leaved plantain. Occasional (mainly exotic) specimen trees are planted within and along edges above the grassland vegetation.

3.2.3 Bare land/access way/armored seawall (no vegetation)

The balance area is bare ground, armored seawall or access ways lacking any notable vegetation or habitat features.

[2] Manaaki Whenua Landcare Research, Our Environment threatened environment classifications.

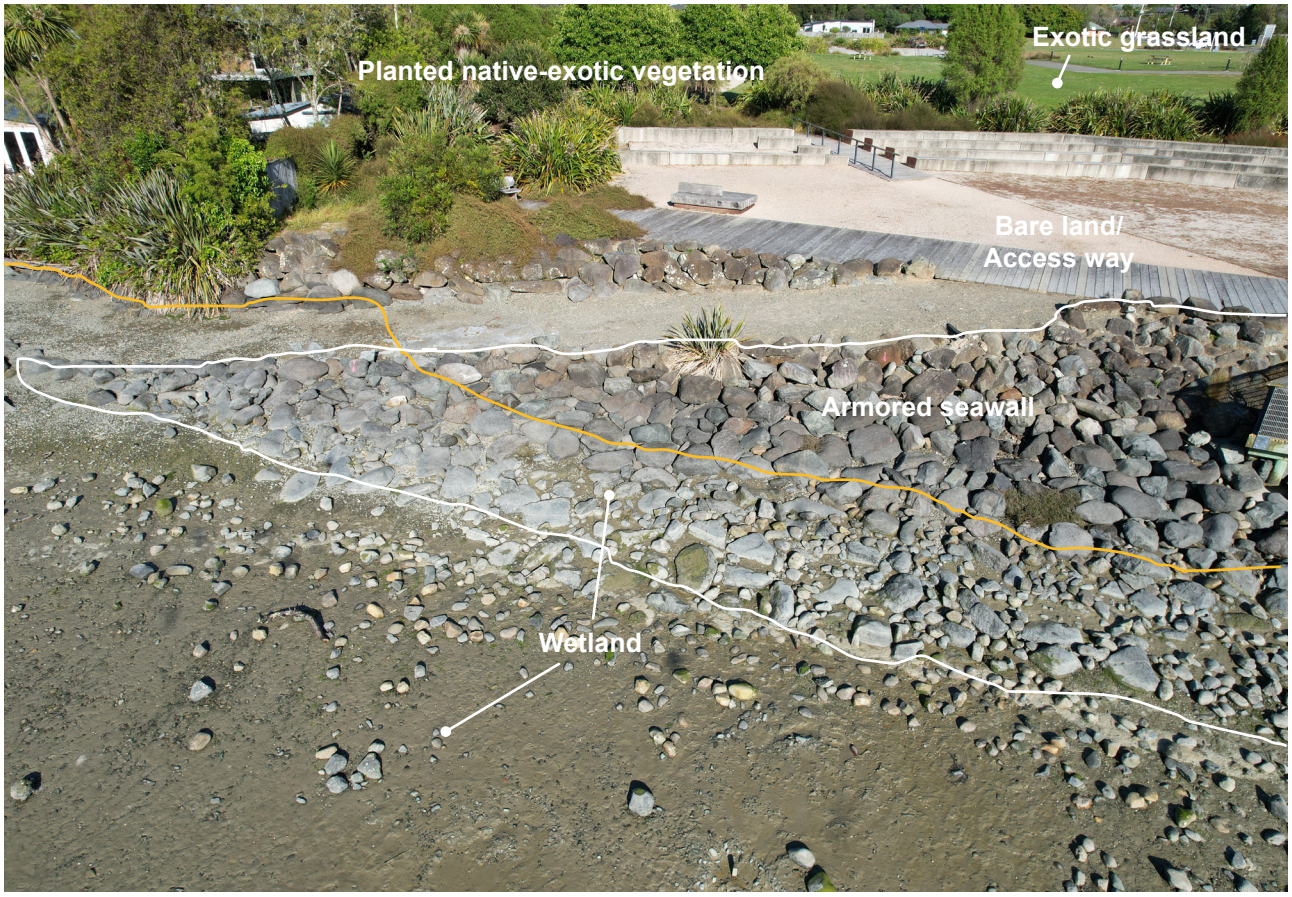
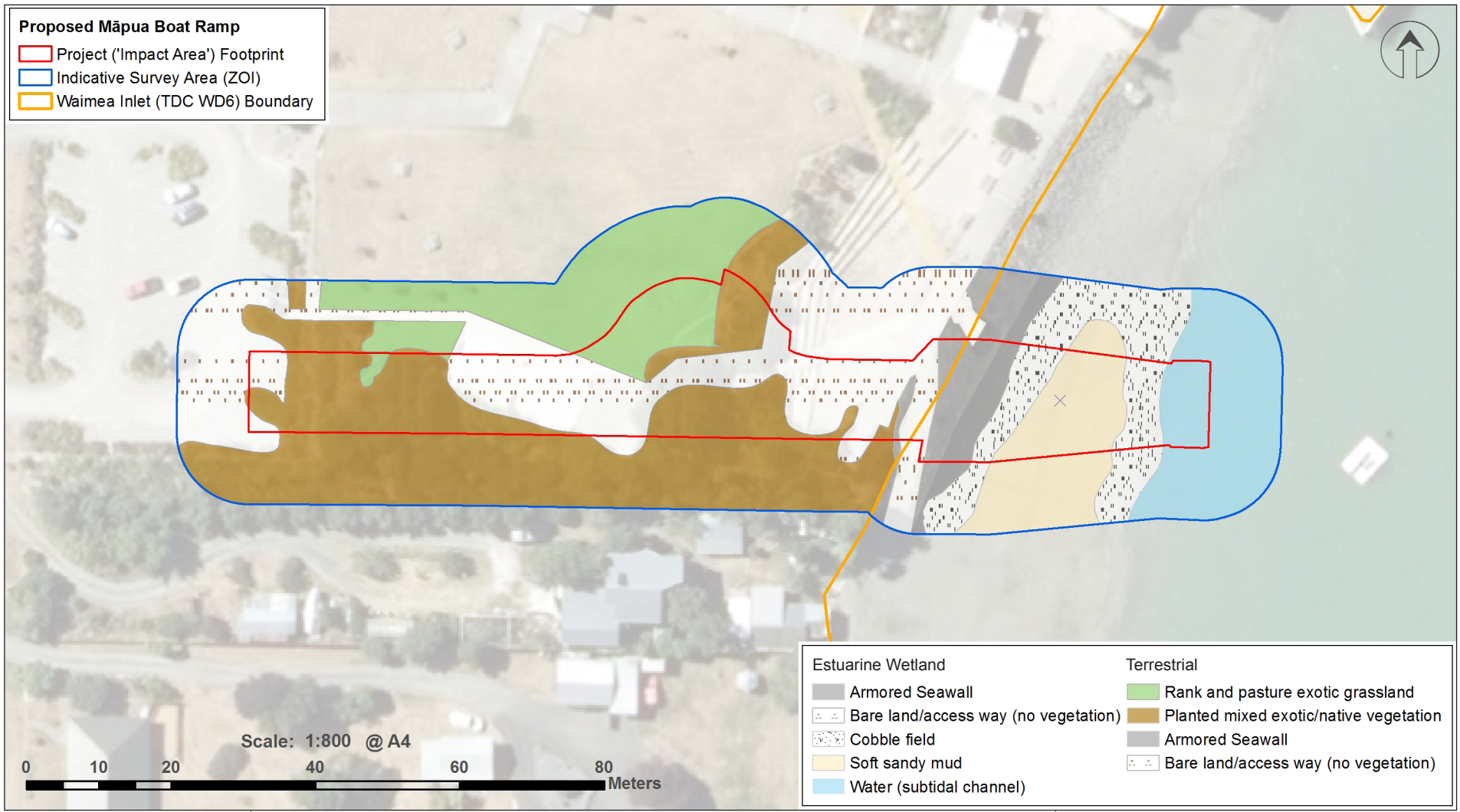


Figure 3.2. Example of the different habitats in the surveyed area and mapped during the field survey. Habitat boundaries are indicative only and do not accurately reflect those presented in Figure 3.3.

Table 3.1 Summary of current broad terrestrial vegetation and habitat types to be directly affected by the proposed activity. Estuarine habitat also included for context.

Dominant Habitat Feature		Surveyed Area		Impact Area[1]	
		ha	%	ha	%
Terrestrial	Planted mixed exotic/native vegetation	0.16	30.8%	0.05	29.5%
	Bare land/access way (no vegetation)	0.13	24.2%	0.06	31.4%
	Exotic grassland	0.07	13.3%	0.02	8.9%
	Armored Seawall	0.01	1.0%	0.00	0.5%
Estuarine wetland	Bare land/access way (no vegetation)	0.01	1.1%	0.00	0.6%
	Armored Seawall	0.02	4.8%	0.01	7.2%
	Cobble field	0.04	8.3%	0.01	7.9%
	Soft sandy mud	0.04	7.4%	0.02	9.8%
	Water (subtidal channel)	0.05	9.2%	0.01	4.3%
	Total	**0.52 ha**	**100%**	**0.18 ha**	**100%**

[1] As delineated in Figure 3.3.



expert ecological services.

Figure 3.3. Broad scale (indicative) map of existing habitats within the survey area based on the mapping of aquatic and vegetation features visible in aerial imagery, supported by ground-truthing to validate the visible features.

PROJECT: PROPOSED MĀPUA BOAT RAMP, MĀPUA BOAT RAMP TRUST

Existing Habitat Occupying Survey Area

| Date: 18 January 2023 | Revision: B | Aerial: LINZ 22
Plan map prepared for DO by Robertson Environmental Limited

Project Manager: Ben.Robertson@robertsonenviro.co.nz

3.3 Terrestrial Flora

Plant species encountered during the survey are listed in Appendix A. Indigenous species present at the site included:

- kānuka (*Kunzea ericoides*) — Nationally Vulnerable;
- southern rātā (*Metrosideros umbellata*) — Nationally Vulnerable;
- jointed rush (*Apodasmia similis*) — Not Threatened;
- purei (*Carex secta*) — Not Threatened;
- ngaio (*Myoporum laetum*) — Not Threatened;
- taupata (*Coprosma repens*) — Not Threatened;
- kāpuka (*Griselinia littoralis*) — Not Threatened;
- mānatu (*Plagianthus regius subsp. regius*) — Not Threatened;
- salt marsh ribbonwood (*Plagianthus divaricatus*) — Not Threatened;
- tī kōuka (*Cordyline australis*) — Not Threatened;
- small-leaved kōwhai (*Sophora microphyll* — Not Threatened;
- whaririki (*Phormium cookianum*) — Not Threatened;
- small-leaved pōhuehue (*Muehlenbeckia complexa*) — Not Threatened;
- glasswort (*Salicornia quinqueflora*) — Not Threatened;
- sea primrose (*Samolus repens*) — Not Threatened;
- fleabane (*Erigeron bilbaoanus*) — Not Threatened; and,
- silver tussock (*Poa cita*) — Not Threatened.

In total, eighteen (18) indigenous vascular taxa were recorded within vegetation and habitat types in the area surveyed. Of the recorded taxa, most are relatively common and are typical of regenerating native vegetation in modified coastal lowland flats and margins of the Motueka Ecological District. However, two species are included in the New Zealand Threat Classification Lists. Both kānuka and pōhutukawa are classified 'Threatened - Nationally Vulnerable' (de Lange et al. 2018), acknowledging the threat they face from disease (i.e., myrtle rust) and pressure from introduced herbivores (namely possums), respectively. No other plant species of significance were recorded.

3.4 Terrestrial Fauna

3.4.1 Macroinvertebrates

The overall diversity of ground active macroinvertebrates is expected to be very low within the highly modified (grassland) areas, but potentially higher within the mapped planted native vegetation (Appendix B).

Native vegetation typically habours greater species richness and diversity than other vegetation types and land dominated by rank grass or other monocultures. At the feeding guild level, present communities are likely to be dominated by detritivores and, to a lesser extent, scavengers, predators, parasitoids and phytophages given that on the day of the field survey organic aggregations of readily consumable leaf litter and woody debris (primary food source for detritivores) were present within some vegetated areas (i.e. within planted native vegetation). Ecologically, detritivore-based communities are particularly important given their role in nutrient cycling by facilitating the decomposition of organic material.

Most native invertebrates are not legally protected under the Wildlife Act 1953. Protected invertebrates are listed in Schedule 7 of the Act and include a small number of large or threatened species, none of which are known to occur within the Site. Other likely present invertebrate species that are not listed as protected may nevertheless contribute to the identification of valuable habitats by their presence.

The overall ecological value of inhabitant invertebrates is considered to be Low given the likely

absence of Threatened/At Risk species.

3.4.2 Lizards

Based on the habitat preference and recorded distributions of lizard species (Appendix C), the only species of lizard with the potential to inhabit the wider area is the northern grass skink *Oligosoma polychroma* (Not Threatened) (Whitaker 2004, and van Winkle et al. 2018). The northern grass skink has been recorded within c. 350 m of the Site[3] (Bioweb database - accessed October 2022) and their range could potentially extend to mapped grassland areas, although disturbances from existing land use likely significantly reduce the carrying capacity of this habitat for native lizards.

The ecological value of lizard populations in the lowland receiving environment of the Site is Low given the obvious paucity of suitable habitat for less common or Threatened/At Risk species.

3.4.3 Birds

All native birds are protected under the Wildlife Act except those listed in Schedule 5 of the Act. The presence of 'Threatened' and 'At Risk' species would be considered significant if identified within the Site. A roaming inventory of birds sighted or heard was taken during the field survey. Of those recorded (several piwakawaka), none were classified as Threatened or At Risk. The bird life observed during survey within the Site generally reflects the modified state of the local environment.

Recent indigenous bird sightings (Appendix D) in the adjacent lowland and coastal area included (eBird - Grid BY52, July 2019-Oct 2022):

- silver gull (*Chroicocephalus novaehollandiae*) — At Risk (Declining);
- pied stilt (*Himantopus himantopusleucocephalus*) — Not Threatened;
- royal spoonbill (*Platalea regia*) — At Risk (Naturally Uncommon);
- pied oystercatcher (*Haematopus finschi*) — At Risk (Declining);
- black-billed gull (*Larus bulleri*) — Nationally Vulnerable;
- bar-tailed godwit (*Limosa lapponica*) — At Risk (Declining);
- black-fronted tern (*Chlidonias albostriatus*) — Nationally Endangered;
- māpunga, black shag (*Phalacrocorax carbo*) — At Risk (Relict);
- kāruhiruhi, pied shag (*Phalacrocorax varius)* — At Risk (Recovering);
- kawau tūī, little black shag (*Phalacrocorax sulcirostris)* — At Risk (Naturally uncommon); and,
- variable oystercatcher (*Haematopus unicolor*) — At Risk (Recovering).

OSNZ shorebird counts include records for white-faced heron, pukeko, mallard, grey teal, little shag, pied shag, red-billed gull (At Risk - Declining) and black-backed gull from adjacent Waimea Inlet. It is acknowledged the range of banded rail (At Risk - Declining) could potentially extend to this locality.

The ecological value of bird populations in the receiving environments of the Site is Low-Very High given the recent sightings within adjacent area and known inhabitants of the area which may include Threatened/At Risk bird species; however, the likelihood that significant numbers of indigenous bird species actually utilise the Site is low based on the existing disturbances and the quality and quantity of existing habitat. Again, these species are not restricted to these habitats within the Site and likely utilise available habitat across the wider lowland environment and adjacent coastal area.

Notably, none of the published accounts of sightings of At Risk or Threatened bird species with

[3] Distance is approximated from the centre of the Site to the location of the DOC record.

the potential to occupy the Site occurred at the Site (refer locations in Appendix D), and no such species were recorded at the Site during the present field survey.

3.5 Existing Aquatic Habitats

3.5.1 Estuarine Wetland (Waimea Inlet)

As mentioned above, part of the Site extends seaward beyond MHWS to include an area of Waimea Inlet (Figure 3.3). This aspect of the Site is delineated by two regions, the supralittoral and intertidal, and the shallow nearshore subtidal.

At the base of the scarp leading down from the access way/terrestrial margin to the backshore proper lies boulder/cobble field habitat. This supra-mid upper littoral shore area is relatively wide (15-30 m wide) and sloping, compared to further down the shore, and accounts for 13.2% of the study area or ZOI (Table 3.1; Figure 3.3). Apart from boulder habitat above MHWS, this zone is intermittently submerged by the tide, and often accumulates drift seaweed and other flotsam. Typically this organic material supports detrital specialists. During/following periods of strong wind/wave energy, the deposited organic material is mobilised, along with the cobble substratum, resulting in a highly disturbed, ephemeral habitat for resident animals. Except for highly sparse (<5%) coverage of drift sea lettuce (*Ulva lactuca*) and very occasional, localised patches of herbfield (glasswort and sea primrose), this habitat did not appear to support any estuarine vegetation (e.g. saltmarsh, seagrass or macroalgae).

Downshore of the boulder/cobble habitat is a 10-15 m wide band of soft sandy mud (>50-90% mud content) habitat. This lower littoral shore habitat is subject to twice daily tidal inundation and with a gentle gradient bed shear velocities are low with a limited swash climate. Sediments with >25% mud content have been shown to result in a degraded (low biodiversity) macroinvertebrate community tolerant of muds. Estuarine vegetation was again absent from this part of the survey area. Such benthic conditions likely extend seaward into the shallow nearshore subtidal habitat.

Recent sampling of contaminant (trace metals and organochlorine pesticides) concentrations in surface sediments indicated the following[4]:

- "...*The organochlorine pesticides contaminants that showed a detectable concentrations* [in excess of] *default ANZ sediment quality values[5]. For DDT the concentrations are 100 to 550-fold higher than the default guidelines. One aldrin result was detected at the limit of detection for screening levels. Further analysis using a lower detection limit may indicate further exceedances. All the nickel and one chromium concentration exceed the default sediment quality guidelines. Within the Nelson Tasman region, naturally generated concentrations of nickel and chromium are common due to the and the Nelson Lakes District. It is highly likely that the concentrations that have been detected are sourced from geological formations naturally elevated in these elements*...".

There is strong connectivity between the mapped wetland area and the wider Waimea Inlet. The mapped wetland may act as a buffer (filtration and organic input) and connect adjacent ecosystems. It may support Nationally Threatened, At Risk or locally uncommon or rare species (e.g. birds, lizards); however, the high degree of modification (habitat reclamation and seawall armouring), existing edge effects (as evidenced through the encroachment of exotic plants species), lacking vegetated margin habitat (limiting available habitat and shade), and exposure to a relatively high degree of disturbance likely significantly reduces the carrying capacity of this habitat for indigenous fauna.

The wetland area mapped within the Site is considered to have Low ecological value overall.

---

[4] Based on results from the collection of five sediment samples from the foreshore of the Site as described in the Envirolink report dated 3 May 2022.

[5] Australia & New Zealand Guidelines for Fresh & Marine Water Quality: Toxicant default guideline values for sediment quality (last updated in 2019).

3.6 Aquatic Fauna

3.6.1 Fish Community

A list of fish (and crustaceans) from the Waimea Inlet (Davidson 1990) and Redwood Valley and Seaton Valley Stream catchment areas was extracted from the NZFFD, to determine the likely presence of marine and freshwater fish on-site. The NZFFD database held no fish records for Waimea Inlet itself; however, database records for the nearby Redwood Valley and Seaton Valley streams are presented in Appendix F and included:

- longfin eel (*Anguilla dieffenbachii*) — At Risk (Declining);
- inanga (*Galaxias maculatus*) — At Risk (Declining);
- torrentfish (*Cheimarrichthys fosteri*) — At Risk (Declining);
- upland bully (*Gobiomorphus breviceps*) — Not Threatened;
- common smelt (*Retropinna retropinna*) — Not Threatened; and,
- common bully (*Gobiomorphus cotidianus*) — Not Threatened.

In addition, Davidson (1990) listed thirty-one (31) marine and eleven (11) freshwater fish species recorded from the Waimea Inlet or tidal reaches of its stream tributaries. Common marine species included snapper (*Chrysophrys auratus*), yellow-eyed mullet (*Aldrichetta forsteri*), kahawai (*Arripis trutta*), flathead grey mullet (*Mugil cephalus*), rig (*Mustelus lenticulatus*), and various flatfish. Some freshwater species included kōaro (*Galaxias brevipinnis*), banded kōkopu (*Galaxias fasciatus*), common smelt (*Retropinna retropinna*), torrentfish, inanga.

No native fish (or crustaceans) were opportunistically observed within the adjacent subtidal channel during the present survey.

No marginal vegetation or intertidal pools which fish (including juvenile fish) could utilise as habitat were recorded within the survey area. The area is unlikely to be important habitat for fish and although the Site may provide some intermittent habitat for fish these potential habitats were of relatively low value. The ecological value of fish populations in the estuarine receiving environment is Low. If present at all, fish species are not restricted to these aquatic habitats within the Site and likely utilise suitable habitat within the surrounding Waimea Inlet catchment area.

3.6.2 Macroinvertebrates

There has been no monitoring of aquatic macroinvertebrates in the Site.

Within boulder/cobble field (supra-mid upper littoral) habitat, the overall diversity of macrofauna is expected to be very low given the moderate swash climate of the shoreline profile (during high water). Such a high boulder/cobble fraction typically limits the number and abundance of species towards levels more representative of the largely depauperate community known to populate upshore habour/estuarine sites in New Zealand (Morton and Miller 1973). Accordingly, and noting that on the day of the field survey organic aggregations of drift seaweed, driftwood or decaying organic (i.e. a primary food source) were all but absent from the upper shoreline, communities at the proposed site are expected to comprise principally species typical of high shore boulder/cobble habitat (e.g., beetles, spiders, snails, and mites). These macrofaunal species are generally mobile, scavenging organisms.

Similarly, soft sandy mud (lower littoral shore) sediments with >25% mud content have been shown to result in a degraded macroinvertebrate community (Robertson et al. 2015, 2016), and an excessive mud content decreases water clarity and lowers biodiversity. Based on previous monitoring of softshore intertidal communities at several comparable sites within the upper reaches of Nelson Haven (Robertson and Asher 2001), macrofaunal communities inhabiting this zone of the Site are expected to comprise species of nemerteans (ribbon worms), nematodes (round worms), polychaete, gastropods (snails), bivalves and amphipods.

The overall ecological value of macrofaunal communities within the surveyed area is considered to be Low given the estimated low diversity, species richness and abundance, and absence of Threatened, At Risk or locally uncommon or rare species.

4 Assessment of Effects on Ecological Values

4.1 Positive Effects

Positive ecological outcomes and enhancement opportunities may be developed during detailed design. If implemented, these could include:

- Opportunities for a net increase in green infrastructure and habitats within the Site.
- Landscape planting that enhances existing retained habitat (e.g. under-plant retained native and exotic shrubs and trees with native understorey vegetation and replace exotic vegetation with native species).
- Connecting wetland restoration/enhancement and landscape planting with adjacent reaches of the Waimea Inlet in accordance with the Waimea Inlet Management Strategy[6].

4.2 Assessment of Construction Effects

In the absence of efforts to avoid, remedy or mitigate adverse ecological effects, the potential effects on identified ecological values come primarily from direct effects within the Impact Area during vegetation clearance and earthworks activities.

Erosion and sedimentation after vegetation clearance and earthworks could result in sediment travelling down to the aquatic environment. Works within and near to watercourses may also reduce some hydrological connectivity, remove estuarine wetland habitat and reduce migration pathways. This work also has the potential for injury or mortality of native fauna.

The likelihood (or risk) and magnitude of these effects occurring and the potential level of adverse effects on these receiving environments relevant to the Project are discussed as follows.

4.2.1 Terrestrial Ecology

Table 4.1 integrates specific ecological values described in Section 3 above, and lists the potential effects (direct and indirect) to the terrestrial habitats and fauna within the Site and their magnitude of effect. This is then used to calculate an overall level of effect to each habitat, prior to impact management. Requirements for proposed activities to preclude injury/mortality of native animals under the Wildlife Act (1953) is considered separately to this assessment and is addressed as part of impact management (Section 5).

Embedded mitigation has been considered as part of this effects assessment.

[6] https://www.tasman.govt.nz/my-council/key-documents/more/environment-reserves-and-open-space/waimea-inlet-management-strategy/

Table 4.1 Magnitude of effects and subsequent level of effect (without mitigation) of the Project on the terrestrial ecology features present within the Site during the construction phase.

Terrestrial Habitat/ Species	Ecological Value	Effects Description	Magnitude of Effect	Justification of Magnitude	Level of Effect, Without Mitigation
Terrestrial Habitats - *Planted mixed exotic/native vegetation, Exotic grassland*	Very Low to High[1]	Partial loss of habitat/ecosystem and edge effects.	Low	The overall extent of (highly modified) habitat loss is limited at both a site and catchment scale. Post-construction native replanting of affected area (where practicable) will reestablish/enhance native habitat values and sequences within the Site.	Low
Macroinvertebrates	Low	Loss of foraging and breeding habitat through vegetation removal. Fragmentation of habitat.	Negligible	Macroinvertebrate communities potentially inhabiting exotic grassland and planted native areas are most likely to have low and moderate to high diversity, species richness and abundance, respectively, but not include Threatened/At Risk species.	Very Low
Lizards	Low	Loss of foraging and breeding habitat through vegetation removal. Fragmentation of habitat.	Negligible	Retained habitat (exotic grassland and planted native vegetation) within the Site and surrounding area will continue to provide habitat for native lizards including northern grass skink.	Very Low
Birds	Low to Very High	Loss of foraging and breeding habitat through vegetation removal. Fragmentation of habitat.	Negligible	Retained habitat (exotic grassland and planted native vegetation) within the Site and surrounding area will continue to provide habitat for native birds.	Low

[1] The High rating reflects kānuka and pōhutukawa's Threatened status, and the importance of the planted native vegetation as habitat for indigenous fauna and for linking ecosystems within the fragmented Motueka Ecological District.

4.2.2 Aquatic Ecology

Table 4.2 lists the potential effects (direct and indirect) to the aquatic habitats and fauna within the Site and their magnitude of effect. This is then used to calculate an overall level of effect to each habitat, prior to mitigation.

The effects assessment is based assumptions regarding implementation of appropriate sediment controls (as outlined above in Section 1.2) and embedded mitigation being delivered as part of the Project.

Table 4.2 Magnitude of effects and subsequent level of effect (without mitigation) of the Project on the aquatic ecology features present within the Site during the construction phase.

Aquatic Habitat/Species	Ecological Value	Effects Description	Magnitude of Effect	Justification of Magnitude	Level of Effect, Without Mitigation
Estuarine Wetland	Low	Permanent loss of approximately 0.05 hectares of highly modified estuarine wetland. Earthworks may result in erosion and sedimentation or chemical spills from machinery entering the downstream reaches, impacting on wetland habitat and species.	High	This habitat occurs extensively throughout the mid-upper intertidal reaches of Waimea Inlet. Any effect on the habitat as a whole is considered to be minor at a scale larger than the Project footprint because of the small area to be affected relative to the total area in adjacent parts of Waimea Inlet. Indirectly, impacts related to potential construction-related discharges and noise/activity disturbance (temporary) of fauna may occur. The potential impact of sediment/chemical contaminants could extend beyond the Impact Area. The effects assessment assumes the successful implementation of embedded controls such as erosion and sediment control. Effective implementation of the embedded controls will reduce the frequency, duration and probability of this effect occurring. As such, any effect is not considered to be significantly adverse in terms of NZCPS Policy 11(b).	Low

Aquatic Habitat/Species	Ecological Value	Effects Description	Magnitude of Effect	Justification of Magnitude	Level of Effect, Without Mitigation
Fish	Low	Disturbance and partial loss of wetland habitat during construction may impact on native fish within the subject wetland. This activity may result in fish injury or death. Fragmentation of habitat.	Low	Death/injury of native fish species is considered to be an unacceptable effect; however, the magnitude of the effect is decreased due to existing habitat quality and quantity with very limited carrying capacity for native fish populations. Given that Threatened or At Risk taxa are unlikely to be present, effects are not considered adverse in terms of the New Zealand Coastal Policy Statement Policy 11(a).	Very Low
Macroinvertebrates	Very Low to Low	Partial loss of habitat during construction. Fragmentation of habitat.	Negligible	Given the relatively depauperate macroinvertebrate community likely to be present at the Site, any impacts on them are expected to be negligible. Threatened or At Risk taxa are unlikely to be present, and so effects are not considered adverse in terms of the New Zealand Coastal Policy Statement Policy 11(a).	Very Low

4.3 Assessment of Operational Effects

The operation of the Project has the potential to cause impacts on ecological features (aquatic and terrestrial) within and adjacent to the Site, without impact management.

The Site's aquatic and terrestrial aspects are generally highly disturbed and fragmented by existing land use. As such, the magnitude of operational effects on aquatic and terrestrial habitats are largely pre-existing and have been assessed and are considered to be Low.

The overall level of effect on wetland and terrestrial ecological features is Very Low and so have not been considered any further.

5 Impact Management Recommendations

5.1 Recommendations for avoiding or minimising potential adverse effects

5.1.1 Aquatic Ecology

In accordance with the EIANZ guideline measures to avoid, remedy or mitigate effects is focused on estuarine wetland (TDC WD6) where the level of effect was assessed to be Moderate, High or Very High.

In this case there were no aquatic ecological features identified where the level of effect (construction and operation) was assessed to be Moderate or higher. As such, and in accordance with the EIANZ guidelines, specific efforts to avoid, remedy or mitigate effects on these features is not required.

Nevertheless, it is suggested to vegetate the affected area (wherever appropriate) with native vegetation as befitting the area[7].

5.1.2 Terrestrial Ecology

There were no terrestrial ecological features identified where the level of effect (construction and operation) was assessed to be Moderate or higher. As such, and in accordance with the EIANZ guidelines, specific efforts to avoid, remedy or mitigate effects on these features is not required.

Notwithstanding, we suggest the following measures be implemented prior to and during the construction phase of the Project:

- Avoid direct effects to the habitat immediately outside of the Project footprint. This should include careful selection of appropriate machinery to minimise disturbance.
- Where the proposed works remove indigenous vegetation it is recommended that care is taken to ensure stabilisation of exposed earthworks as soon as possible along the exposed edge, with suitable native tree and shrub species. In this regard, invasive weeds need to be managed along these edges. Avoid washing of organic material into watercourses, stockpile organic mulch away from watercourses, the output from chippers etc should not to be directed towards watercourses, and cleared vegetation on site should only be stockpiled short-term and either mulched or disposed of off-site.
- Avoid removal of larger shrubs/trees where practicable.

The Wildlife Act 1953 must be complied with, hence management measures must still be implemented to ensure that Project activities do not injure or kill native wildlife. These are outlined below:

Lizard management

There is potential for native lizards to be occupying habitat within the Site. A pre-works lizard survey by an appropriately qualified and experienced herpetologist is therefore recommended. If native lizards are found to be present, a specific Lizard Management Plan should be prepared and implemented for the site to ensure native lizards are relocated into retained vegetation of equal or greater quality on-site. Lizard management should be undertaken before and during vegetation removal by an appropriately qualified ecologist.

[7] Noting that planting of estuarine vegetation (e.g. saltmarsh and seagrass) at the proposed site is not likely to be successful given that available saltmarsh habitat (i.e. high water to supratidal) is very narrow and dominated by hard substratum, and that intertidal seagrass (*Zostera muelleri*) beds are highly vulnerable to fine sediments in overlying waters and sediment quality (particularly where elevated mud content limits oxygen exchange). Such estuarine wetland restoration planting is likely to be more successful if undertaken in estuarine areas immediately adjacent to existing saltmarsh or seagrass beds.

Bird management

To effectively manage the potential direct injury/mortality threats on native birds and their eggs, mitigation is recommended by means of seasonal constraints for vegetation clearance activities across the higher quality native dominant areas. The removal of native woody trees and large shrubs should be carried out outside of the peak bird breeding season (August to February inclusive).

5.2 Recommendations for addressing adverse residual effects that cannot be avoided or minimised

Monitoring of the coastal environment is not proposed given that the proposal is expected to have no more than minor effects on associated ecological values[8].

[8] Consistent with Policy 11 of the NZCPS.

6 Cumulative Effects

As per EIANZ guidelines, assessment of ecological effects of a project should consider cumulative impacts on the environment and not just the direct effects of the single project application. For the purposes of the Project it is considered that the proposed footprint area and the downstream receiving environment associated with the Waimea Inlet are an appropriate spatial scale for consideration of cumulative effects, given this area provides habitat for mobile fauna species such as native birds and fish.

As the existing environment is highly modified, the specific Project impacts discussed within this report have been minimal and adverse effects have largely been avoided. Cumulative adverse effects are therefore anticipated to be no more than minor.

7 Summary & Conclusions

An estimate of habitat change resulting from the Project can be undertaken by importing the preliminary site design into a GIS environment. This allows a semi-quantitative estimate to be made of the habitat likely to be impacted. The areal footprint of the Impact Area overlaid on a map of habitat types is shown above in Figure 3.3 with spatial proportions summarised in Table 3.1.

The main effect on local ecology is the direct loss of highly modified terrestrial and wetland and wetland margin habitat during the construction phase. It is unlikely that those remaining habitats adjacent to or downstream of the Site would be appreciably altered. Given that the size of the survey area was selected based on the scale of the Project, these calculations suggest that approximately 0.05 ha (34%) of the planted mixed exotic/native vegetation habitat, 0.02 ha (24%) of the exotic grassland habitat, and 0.05 (42%) of the existing wetland habitat associated with the survey area will be temporarily replaced by the Project. Existing cleared land use occupies the balance of the Site where vegetation has already been removed.

Where possible the preliminary site design has minimised impacts on Waimea Inlet. There will be some impacts to the estuarine habitats to accommodate the proposed site design; however, this habitat occurs extensively throughout the mid-upper intertidal reaches of Waimea Inlet, and while a small part will be removed by the proposed activity, this is not seen to have any discernible impact on the ecology of the area.

Vegetation removal and earthworks associated with the Project have the potential to generate sediment which, if unmitigated, may enter the catchment's aquatic ecosystems and cause significant adverse ecological effects. The implementation of appropriate ESC measures should be adequate to avoid adverse effects on the aquatic receiving environment.

Overall, assuming integration of impact mitigation and management measures as outlined above in Section 5, it is considered that any effects resulting from the proposed activity will be relatively localised and therefore minor with regard to the wider coastal environment.

8 References

Andrew, I.G., Macfarlane, R.P., Johns, P.M., Hitchmough, R.A., and Stringer, I.A.N. 2012. The conservation status of New Zealand Diptera. New Zealand Entomologist 35(2): 99–102.

Barker, G.M., Brook, F.J., Mahlfeld, K., Walker, K., Roscoe, D.J., Hitchmough, R.A., Edwards, E., and Rolfe, J.R. 2021. Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails), 2020. Part 1. Athoracophoridae (leaf-veined slugs) and Succineidae (amber snails). New Zealand Threat Classification Series 32. Department of Conservation, Wellington. 15 p.

Butler, D.J. 2008. Tasman District Biodiversity Overview - Indigenous terrestrial vertebrates and invertebrates. Published by Tasman District Council. Design and Layout: Dry Crust Communications. ISBN 978-1-877445-06-4

Burns, R. J., Bell, B. D., Haigh, A., Bishop, P., Easton, L., Wren, S., . . . Makan, T. 2018. Conservation status of New Zealand amphibians, 2017. Wellington: Department of Conservation.

Courtney, S.P., Bradshaw, D.H., Moore, S.H., and Atkinson, M.A. 2003. Living Heritage - Growing Native Plants in Nelson. Perpartment of Conservation Nelson-Marlborough Conservancy and Nelson City Council. 52p.

Davidson, R.I., and C.R. Moffat. 1990. A report on the ecology of Waimea Inlet, Nelson. Department of Conservation, Nelson/Marlborough Conservancy, Occasional Publication No.I. 16Opp.

de Lange, P., Rolfe, J., Barkla, J., Courtney, S., Champion, P., Ford, K., . . . Ladley, K. 2018. Conservation status of New Zealand indigenous vascular plants, 2017. Wellington: Department of Conservation.

Dunn, N.R., Allibone, R.M., Closs, G.P., Crow, S.K., David, B.O., Goodman, J.M., Griffiths, M., Jack, D.C., Ling, N., Waters, J.M., and Rolfe, J.R. 2018. Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington. 11 p.

EIANZ. 2018. Ecological impact assessment (EcIA): EIANZ guidelines for use in New Zealand: Terrestrial and freshwater ecosystems. Melbourne: Environment Institute of Australia and New Zealand.

Grainger, N., Harding, J., Drinan, T., Collier, K., Smith, B., Death, R., . . . J., R. 2018. Conservation status of New Zealand freshwater invertebrates, 2018. Wellington: Department of Conservation.

Hitchmough, R.A., Barr, B., Knox, C., Lettink, M., Monks, J.M., Patterson, G.B., Reardon, J.T., van Winkel, D., Rolfe, J., and Michel, P. 2021. Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

Holmes, R., Clapcott, J., Haidekker, S., Hicks, A., Pingram, M., Hodson, R., Death, A., Fuller, I., Harding, J., Neale, M., Valois, A., and Franklin, P. 2020. National rapid river pressures assessment protocol for streams and rivers. Prepared for Hawke's Bay Regional Council/Envirolink. Cawthron Report No. 3543. 36 p. plus appendices.

Hoare, R.J.B., Dugdale, J.S., Edwards, E.D., Gibbs, G.W., Patrick, B.H., Hitchmough, R.A., and Rolfe, J.R. 2017. Conservation status of New Zealand butterflies and moths (Lepidoptera), 2015. New Zealand Threat Classification Series 20. Department of Conservation, Wellington. 13 p.

Leschen, R.A.B., Marris, J.W.M., Emberson, R.M., Nunn, J., Hitchmough, R.A., and Stringer, I.A.N. 2012. The conservation status of New Zealand Coleoptera. New Zealand entomologist 35(2): 91–98.

Mahlfeld, K., Brook, F.J., Roscoe, D.J., Hitchmough, R.A., and Stringer, I.A.N. 2012. The conservation status of New Zealand terestrial Gastropoda excluding Powelliphanta. New Zealand Entomologist 35(2): 103–109

Nelson, W., Neill, K., D'Archino, R., & Rolfe, J. 2019. Conservation status of New Zealand macroalgae, 2019. Wellington: Department of Conservation.

Robertson, H.A., Baird, K.A., Elliott, G.P., Hitchmough, R.A., McArthur, N.J., Makan, T.D., Miskelly, C.M., O'Donnell, C.F.J., Sagar, P.M., Scofield, R.P., Taylor, G.A., Michel, P. 2021. Conservation status of birds in Aotearoa New Zealand, 2021 . New Zealand Threat Classification Series 36. Department of Conservation, Wellington. 43 p.

Robertson, B.M., Stevens, L.M., Robertson, B.P., Zeldis, J., Green, M., Madarasz-Smith, A., Plew, D., Storey, R., Hume, T. and Oliver, M. 2016b. NZ Estuary Trophic Index. Screening Tool 2. Screening Tool 2. Determining Monitoring Indicators and Assessing Estuary Trophic State. Prepared for Envirolink Tools Project: Estuarine Trophic Index MBIE/NIWA Contract No: C01X1420. 68p.

Robertson, B.M., and Asher, R. 2001. Neale Park and Wood Stormwater Discharge Nelson Haven. Monitoring Prepared for Nelson City Council. Cawthron Report No. 691.

Stevens L.M., Scott-Simmonds T., and Forrest, B.M. 2020. Broad Scale Intertidal Monitoring of Waimea Inlet. Salt Ecology Report 052, prepared for Tasman District and Nelson City Councils, November 2020. 50p.

Stevens, L.M. and Robertson, B.M. 2010. Waimea Inlet 2010: Vulnerability Assessment & Monitoring Recommendations. Report prepared by Wriggle Coastal Management for Tasman District Council. 58p.

9 Limitations & Applicability

As with all one-off field ecological assessments, seasonal or temporal variation in the presence of mobile fauna means that the presence or absence of such fauna cannot be ascertained with great accuracy. The condition of habitat becomes the surrogate for the presence or absence of fauna rather than observed condition on the day of the survey.

This assessment has been carried out in line with the proposal given to the Client by Robertson Environmental Limited. This is assumed in this assessment to be designation being sought by this application. We note that this design may not be final. Depending on the scope of any future development and detailed design changes, further ecological assessments, including further quantitative assessments may be required.

Robertson Environmental's professional opinions are based on its professional judgement, experience, and training. These opinions are also based upon data derived from the field survey and analysis described in this document, with the support of relevant guidelines (EIANZ, 2018). It is possible that additional surveying, testing and analyses might produce different results and/or different opinions. Should additional information become available, this report should be updated accordingly. Robertson Environmental Limited has relied upon information provided by the Client to inform parts of this document, some of which has not been fully verified by Robertson Environmental Limited. This document may be transmitted, reproduced or disseminated only in its entirety.

Appendix A:

Plant Species List

Species	NVS Code used on field sheets	Common name	Structural Class	Threat Status[1]	Location[2]
Kunzea ericoides	KUNeri	kānuka	Dicotyledonous Trees & Shrubs	Nationally Vulnerable	Terrestrial
Metrosideros umbellata	METumb	southern rātā	Dicotyledonous Trees & Shrubs	Nationally Vulnerable	Terrestrial
Apodasmia similis	APOsim	jointed rush	Rushes & Allied Plants	Not Threatened	Terrestrial
Carex secta	CARsec	purei, pukio	Sedges	Not Threatened	Terrestrial
Myoporum laetum	MYOlae	ngaio	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Coprosma repens	COPrep	taupata	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Griselinia littoralis	GRIlit	kāpuka	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Plagianthus regius subsp. regius	PLAreg	mānatu	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Plagianthus divaricatus	PLAdiv	salt marsh ribbon-wood	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Cordyline australis	CORaus	tī kōuka	Monocotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Sophora microphylla	SOPmic	small-leaved kōwhai	Dicotyledonous Trees & Shrubs	Not Threatened	Terrestrial
Phormium cookianum	PHOcoo	whaririki	Monocotyledonous Herbs	Not Threatened	Terrestrial
Muehlenbeckia complexa	MUEcom	small-leaved pōhuehue	Dicotyledonous Lianes & Related Trailing Plants	Not Threatened	Terrestrial
Salicornia quinqueflora	SALqui	glasswort	Herbs - Dicotyledonous composites	Not Threatened	Wetland margin
Samolus repens	SAMrep	sea primrose	Herbs - Dicotyledonous composites	Not Threatened	Wetland margin
Erigeron bilbaoanus	ERIbil	fleabane	Herbs - Dicotyledonous composites	Not Threatened	Wetland margin
Poa cita	POAcit	silver tussock	Grasses	Not Threatened	Wetland margin
Peltigera spp.	-	-	Lichen - Foliose	Not Threatened	Wetland margin
Juncus effusus	JUNeff	soft rush	Rushes & Allied Plants	Exotic	Terrestrial

[1] de Lange et al. (2018).

[2] As identified on Figure 3.3.

Species	NVS Code used on field sheets	Common name	Structural Class	Threat Status[1]	Location[2]
Bellis perennis	BELper	english daisy	Herbs - Dicotyledonous composites	Exotic	Terrestrial
Soliva sessilis	SOLses	Onehunga weed	Herbs - Dicotyledonous composites	Exotic	Terrestrial
Bromus catharticus	BROcat	prairie grass	Grasses	Exotic	Terrestrial
Sonchus oleraceus	SONole	sow thistle	Herbs - Dicotyledonous composites	Exotic	Terrestrial
Medicago lupulina	MEDlup	black medick	Herbs - Dicotyledonous composites	Exotic	Terrestrial
Foeniculum vulgare	FOEvul	fennel	Herbs - Dicotyledonous composites	Exotic	Terrestrial
Acacia longifolia	ACAlong	Sydney golden wattle	Dicotyledonous Trees & Shrubs	Exotic	Terrestrial
Anthoxanthum odoratum	ANTodo	sweet vernal	Grasses	Exotic	Terrestrial
Senecio vulgaris	SENvul	common groundsel	Herbs - Dicotyledonous composites	Exotic	Terrestrial

[1] de Lange et al. (2018).

[2] As identified on Figure 3.3.

Appendix B:

Potential Terrestrial Macroinvertebrate Species

Summary of potential ground active terrestrial invertebrate communities based on previous sampling of New Zealand successional vegetation (Munro 1995; Butler 2008). Taxa list is indicative and not exhaustive.		
Habitat Type	Taxa	What the species indicates in terms of habitat quality
Forest	Landhoppers	Heavily involved with decomposition, and indicate significant leaf litter and woody debris
	Pachycondyla sp. (ant)	
	Millipedes	
	Saphobius inflatipes (Scarab beetle)	
	Prolasius advenus (ant)	Common taxa in forests which have some type of disturbance
	Diapriidae (parasitoid wasps)	
Pine Forest	Harvestmen	General diversity but not overly specialised
	Darkling beetle	
	Parasitoid wasp (*Aucklandella* sp., *Sphictostethus* sp.)	
Riparian[1]	Slaters	General decomposition in disturbed areas
	Landhoppers	
	Rover beetles	Generalists, scavengers
	Relatively low numbers of beetles and wasps	Low general diversity
Pasture[1]	Cricket	Common in grass habitats
	Nylandaria sp. (ant)	Introduced ant, common in disturbed areas
	Relatively low numbers of beetles and wasps	Low general diversity
Tussock	Mites	Likely associated with grasses
	Cicindela tuberculata (tiger beetle)	Common in tussock / bare ground, usually found in open bare ground

[1] indicative broad habitat types present within the area surveyed in the present study.

References:

Butler, D.J. 2008. Tasman District Biodiversity Overview - Indigenous terrestrial vertebrates and invertebrates. Published by Tasman District Council. Design and Layout: Dry Crust Communications. ISBN 978-1-877445-06-4.

Munro, V.W. 1995. Terrestrial inverebrate communities: the effect of successional age, habitat structure and seasonality. Massey University Masters Thesis.

Appendix C:

Potential Lizard Species

Summary the threat classification, habitat preferences and distribution of lizard species known to occur within the Nelson/Tasman area.							
Region	**Taxonomically determinate**	**Group**	**Species**	**Common name**	**Threat classification[1]**	**Distribution[2]**	**Habitat[2]**
Tasman	Yes	Gecko	*Mokopirirakau granulatus*	forest gecko	At Risk - Declining	North and South Islands. Widespread throughout the upper North Island from South Taranaki to southern part of Bay of Islands, including some offshore islands; absent from northern Northland and Aupouri Peninsula. In the South Island, occurs from Marlborough to Nelson, Tasman and Westland.	Coastal, Lowland, Montane/subalpine, Alpine - Inhabits forest, scrublands, herbfields, and rocky bluffs and sandstone pavements. Commonly found in mānuka or kānuka scrub and on trunks, branches or foliage of trees. Takes refuge beneath bark, in dense foliage, in hollow tree trunks, in the crowns of ferns and beneath rock slabs or in crevices during the day. Also known to inhabit peri-urban areas, where it lives in gardens and takes refuge beneath outdoor furniture, woodpiles or timber decking. May disperse across open ground, even rural roads, to reach new habitat.
Tasman	Yes	Gecko	*Naultinus stellatus*	starred gecko	Nationally Vulnerable	South Island only. Occurs throughout the Nelson and Tasman regions, from the Maitai Valley east of Nelson to the northern West Coast, and southwards to Nelson Lakes.	Coastal, Lowland, Montane/subalpine - Occupies scrub, kānuka and mānuka shrubland, beech forest, subalpine shrubland and herbfields. Usually found among foliage but will shelter on the ground beneath rocks and logs, or in dense low-growing vegetation during inclement weather and in winter, especially when snow covers large areas of their habitat.
Tasman	Yes	Skink	*Oligosoma polychroma*	northern grass skink	Not Threatened	North and South Islands. Central North Island from Gisborne to the Central Plateau southwards to Wellington and across Cook Strait. Occurs on Stephens Island/Takapourewa and other islands in the western Marlborough Sounds. In the South Island, occurs in Nelson, Tasman and West Coast regions, from Nelson southwards along the west coast to about Hokitika.	Coastal, Lowland, Montane/subalpine - Occupies a wide range of habitats including littoral zones, duneland, wetlands, grassland, shrublands, forest edges, small rocky islets, offshore islands, screes and talus slopes, rocky or boulder areas, shrublands, subalpine tussockland and even suburban gardens. Also persists in areas of exotic forestry.

1. Hitchmough et al. (2016)
2. van Winkle et al. (2018)

Region	Taxonomically determinate	Group	Species	Common name	Threat classification[1]	Distribution[2]	Habitat[2]
Tasman	Yes	Skink	*Oligosoma infrapunctatum*	speckled skink	At Risk - Declining	South Island only. Occurs on Stephens Island/Takapourewa in the Marlborough Sounds, southwards to St Arnaud, through Kahurangi National Park (including Mt Arthur) and northern West Coast to Hokitika; also introduced from Stephens Island to Maud and Mana Islands.	Coastal, Lowland, Montane/subalpine, Alpine - Inhabits coastal cobble and boulder beaches, densely vegetated or shrubland habitats, open grassland, fernland and open forest. During day, sun-basks and forages on stones, boulders, cobbles, driftwood and low-growing vegetation. Retreats beneath rocks or dense vegetation at night. On Stephens Island, known to use burrows of fairy prions (Pachyptila turtur) as refuges.
Tasman	Yes	Gecko	*Woodworthia maculata*	Raukawa gecko	Not Threatened	North and South Islands. Widely distributed from Northland to northern South Island (Marlborough and Nelson, just at the northern margins of Westland and Canterbury), including many offshore islands.	Coastal, Lowland - Littoral zone to forest. Occurs on coastal sand dunes, coastal cliffs and rock outcrops, boulder beaches; in flaxland, kānuka and regenerating shrubland, and in old-growth forest.

1. Hitchmough et al. (2016)
2. van Winkle et al. (2018)

Appendix D:

Potential Bird Species

Summary the threat classification of bird species recently sighted within grid BY52 (eBird - New Zealand Bird Atlas 2022).				
Species	Common name	Threat classification[1]	Observation	
			Location	Date
Rhipidura fuliginosa	South Island fantail	Not Threatened	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Zosterops lateralis	silvereye, waxeye, tauhou	Not Threatened	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Hirundo neoxena	welcome swallow	Not Threatened	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Sturnus vulgaris	common starling	Introduced and Naturalised	Kelling Rd Pond	31 Oct 22
Todiramphus sanctus vagans	New Zealand kingfisher	Not Threatened	Kelling Rd Pond	31 Oct 22
Turdus merula	Eurasian blackbird	Introduced and Naturalised	Playhouse Ponds	2 Sept 22
Branta canadensis	kuihi, Canada goose	Introduced and Naturalised	Hoddy Estuary Park	22 Oct 22
Spatula rhynchotis	kuruwhengi, Australasian shoveler	Not Threatened	Kelling Rd Pond	22 Oct 22
Anas platyrhynchos	rakiraki, mallard	Introduced and Naturalised	Playhouse Ponds	24 Oct 22
Hemiphaga novaeseelandiae	kererū, New Zealand pigeon	Not Threatened	Hoddy Estuary Park	2 Sept 22
Himantopus himantopus	poaka, pied stilt	Not Threatened	Hoddy Estuary Park	22 Oct 22
Haematopus unicolor	variable oystercatcher	At Risk (Recovering)	Hoddy Estuary Park	22 Oct 22
Chroicocephalus bulleri	tarāpuka, black-billed gull	At Risk (Declining)	Hoddy Estuary Park	2 Sept 22
Larus dominicanus dominicanus	kelp gull (Southern black-backed gull)	Not Threatened	83 Old House Road, Upper Moutere, Tasman, NZ (-41.237, 172.996)	23 Oct 22
Egretta novaehollandiae	white-faced heron	Not Threatened	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Gerygone igata	riroriro, grey gerygone	Not Threatened	Playhouse Ponds	22 Oct 22
Anthornis melanura melanura	korimako, bellbird	Not Threatened	83 Old House Road, Upper Moutere, Tasman, NZ (-41.237, 172.996)	23 Oct 22
Gymnorhina tibicen	makipai, Australian magpie	Introduced and Naturalised	83 Old House Road, Upper Moutere, Tasman, NZ (-41.237, 172.996)	23 Oct 22
Microcarbo melanoleucos	little pied cormorant	Vagrant	Broadsea Avenue, Ruby Bay, Tasman	24 Jul 22

[1] Robertson et al. (2021).

Summary the threat classification of bird species recently sighted within grid BY52 (eBird - New Zealand Bird Atlas 2022).				
Species	Common name	Threat classification[1]	Observation	
			Location	Date
Circus approximans	kāhu, swamp harrier	Not Threatened	Kelling Road pond	11 Oct 22
Anser anser	kuihi, greylag goose	Introduced and Naturalised	Playhouse Ponds	19 Jul 22
Athene noctua	ruru nohinohi, little owl	Introduced and Naturalised	Playhouse Ponds	19 Jul 22
Haematopus finschi	tōrea, South Island pied oystercatcher	At Risk (Declining)	Waimea inlet--Stringer creek	15 Jul 22
Charadrius bicinctus	pohowera, banded dotterel	At Risk (Declining)	Waimea inlet--Stringer creek	15 Jul 22
Anarhynchus frontalis	ngutu pare, wrybill	Nationally Increasing	Waimea inlet--Stringer creek	15 Jul 22
Limosa lapponica	kuaka, bar-tailed godwit	At Risk (Declining)	Waimea inlet--Stringer creek	15 Jul 22
Emberiza cirlus	cirl bunting	Introduced and Naturalised	Waimea inlet--Stringer creek	15 Jul 22
Chroicocephalus novaehollandiae	tarāpunga, red-billed gull	At Risk (Declining)	Hoddy Estuary Park	11 Jul 22
Chlidonias albostriatus	tarapirohe, black-fronted tern	Nationally Endangered	Hoddy Estuary Park	11 Jul 22
Puffinus gavia	pakahā, fluttering shearwater	At Risk (Relict)	McKee Memorial Reserve	3 Jul 22
Morus serrator	tākapu, Australasian gannet	Not Threatened	McKee Memorial Reserve	3 Jul 22
Columba livia	kererū aropari, rock pigeon	Introduced and Naturalised	Mapua Estuary and Wharf	14 Jun 22
Phalacrocorax varius	kāruhiruhi, pied shag	At Risk (Recovering)	Mapua Estuary and Wharf	14 Jun 22
Ardea modesta	kōtuku, white heron	Nationally Critical	Mapua Estuary and Wharf	14 Jun 22
Platalea regia	kōtuku ngutupapa, royal spoonbill	At Risk (Naturally uncommon)	Hoddy Estuary Park	22 Oct 22
Anas superciliosa	pārera, grey duck	Nationally Vulnerable	Hoddy Estuary Park	11 Jun 22
Phalacrocorax carbo	māpunga, black shag	At Risk (Relict)	Neudorf Road, Price's Corner	19 May 22
Falco novaeseelandiae	kārearea, New Zealand falcon	Nationally Endangered	Grossi Point (Mapua)	1 May 22

[1] Robertson et al. (2021).

Summary the threat classification of bird species recently sighted within grid BY52 (eBird - New Zealand Bird Atlas 2022).				
Species	Common name	Threat classification[1]	Observation	
			Location	Date
Porphyrio melanotus	pūkeko	Not Threatened	104 Kelling Road, Upper Moutere, Tasman, NZ (-41.26, 172.994)	18 Apr 22
Sterna striata	tara, white-fronted tern	At Risk (Declining)	Grossi Point (Mapua)	30 Mar 22
Tachybaptus novaehollandiae	tokitokipio, Australasian little grebe	Coloniser	Kelling Rd Pond	31 Oct 22
Callipepla californica	tikaokao, California quail	Introduced and Naturalised	McKee Memorial Reserve	11 Feb 22
Chrysococcyx lucidus	pīpīwharauroa, shining cuckoo	Not Threatened	Playhouse Ponds	22 Oct 22
Carduelis carduelis	European goldfinch	Introduced and Naturalised	Playhouse Ponds	6 Jan 22
Fringilla coelebs	pahirini, chaffinch	Introduced and Naturalised	Hoddy Estuary Park	31 Dec 21
Alauda arvensis	kairaka, Eurasian skylark	Introduced and Naturalised	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Emberiza citrinella	yellowhammer	Introduced and Naturalised	Kelling Rd pond, Upper Moutere -41.26025, 172.99287	31 Dec 21
Fulica atra	Australian coot	At Risk (Naturally uncommon)	Kelling Road pond	31 Dec 21
Anas gracilis	tētē-moroiti, grey teal	Not Threatened	Playhouse Ponds	18 Dec 21
Chloris chloris	European greenfinch	Introduced and Naturalised	Hoddy Estuary Park	22 Oct 22
Numenius phaeopus	Eurasian whimbrel	Migrant	43 Apple Valley Road East, Mahana, Tasman, NZ (-41.258, 173.079)	24 Nov 21
Turdus philomelos	song thrush	Introduced and Naturalised	Moutere Hills Cemetery	23 Nov 21
Tadorna variegata	pūtangitangi, paradise shelduck	Not Threatened	97 Trafalgar Road, Mahana, Tasman, NZ (-41.264, 173.071)	27 Oct 22
Gallirallus australis australis	weka	Not Threatened	Redwood Cider Co	21 Oct 21
Prosthemadera novaeseelandiae	tūī	Not Threatened	Playhouse Ponds	2 Oct 21

[1] Robertson et al. (2021).

Summary the threat classification of bird species recently sighted within grid BY52 (eBird - New Zealand Bird Atlas 2022).				
Species	Common name	Threat classification[1]	Observation	
			Location	Date
Prunella modularis	dunnock	Introduced and Naturalised	Playhouse Ponds	2 Oct 21
Cygnus atratus	kakīānau, black swan	Not Threatened	Nuttall Road, Tasman	14 Sept 21
Poliocephalus rufopectus	weweia, New Zealand dabchick	Nationally Increasing	Nuttall Road, Tasman	14 Sept 21
Phasianus colchicus	common pheasant	Introduced and Naturalised	Hoddy Estuary Park	22 Oct 22
Phalacrocorax punctatus	kawau tikitiki, spotted shag	Nationally Vulnerable	Pinehill Reserve, Ruby Bay	24 Jun 21
Acanthis flammea	common redpoll	Introduced and Naturalised	Playhouse Ponds	31 May 21
Phalacrocorax sulcirostris	kawau tūī, little black shag	At Risk (Naturally uncommon)	Hoddy Estuary Park	28 Mar 21
Streptopelia risoria	barbary dove	Introduced and Naturalised	Grossi Point (Mapua)	10 Mar 21
Arctic skua Stercorarius parasiticus	Arctic skua	Migrant	McKee Reserve, Ruby Bay	2 Dec 20
Chenonetta jubata	Australian wood duck	Coloniser	Playhouse Ponds	2 Nov 20
Numenius madagascariensis	Eastern curlew	Vagrant	Grossi Point (Mapua)	2 Nov 20
Vanellus miles	spur-winged plover	Not Threatened	Upper Moutere Firestation	14 Sep 20
Hydroprogne caspia	taranui, caspian tern	Nationally Vulnerable	Mapua Estuary, Rabbit Island, NZ (-41.255, 173.107)	7 Jun 20
Ninox novaeseelandiae	ruru, morepork	Not Threatened	36 Pine Hill Road West, Ruby Bay, Tasman, NZ (-41.228, 173.074)	9 May 20
Anthus novaeseelandiae	pīhoihoi, New Zealand pipit	At Risk - Declining	Acheron	16 Mar 20
Aythya novaeseelandiae	pāpango, New Zealand scaup	Not Threatened	Kelling Road pond	15 Dec 19
Bowdleria punctata punctata	mātātā, South Island-fernbird	At Risk - Declining	Hoddy Estuary Park, Tasman, NZ (-41.292, 173.098)	24 Jul 19

[1] Robertson et al. (2021).

Appendix E:

Potential Fish Species

Summary the threat classification of fish species recorded within the Redwood Valley Stream and Seaton Valley Stream Catchments (New Zealand Freshwater Fish Database 2022).						
Species	Common name	Threat Classification[1]	Recorded observation			
			NZTM E	NZTM N	Year	Catchment
Anguilla	Unidentified eel	-	1607843	5433956	2006, 2008, 2011	Seaton Valley Stream
Anguilla australis	Shortfin eel	Not Threatened	1607843	5433956	2006, 2008, 2011	Seaton Valley Stream
Anguilla dieffenbachii	Longfin eel	At Risk (Declining)	1607843	5433956	2006, 2008, 2011	Seaton Valley Stream
Galaxias argenteus	Giant kokopu	At Risk (Declining)	1606361	5434626	2008	Seaton Valley Stream
Galaxias fasciatus	Banded kokopu	Not Threatened	1606361	5434626	2006, 2008	Seaton Valley Stream
Galaxias maculatus	Inanga	At Risk (Declining)	1607843	5433956	2006, 2008, 2011	Seaton Valley Stream
Gobiomorphus	Unidentified bully	-	1606361	5434626	2008	Seaton Valley Stream
Paranephrops	Koura	Not Threatened	1606646	5434506	2006, 2008	Seaton Valley Stream
Paratya curvirostris	Freshwater Shrimp	Not Threatened	1607871	5433911	2006, 2008	Seaton Valley Stream
Galaxias fasciatus	Banded kokopu	Not Threatened	1604390	5426154	2006, 2008	Redwood Valley Stream
Gobiomorphus cotidianus	Common bully	Not Threatened	1605910	5427148	2006	Redwood Valley Stream
Retropinna retropinna	Common smelt	Not Threatened	1607710	5427798	2006	Redwood Valley Stream
Galaxias argenteus	Giant kokopu	At Risk (Declining)	1605911	5427199	2002	Redwood Valley Stream
Galaxias maculatus	Inanga	At Risk (Declining)	1605910	5427148	2006, 2008	Redwood Valley Stream
Paranephrops	Koura	Not Threatened	1604390	5426154	2006, 2008	Redwood Valley Stream
Anguilla dieffenbachii	Longfin eel	At Risk (Declining)	1605910	5427148	2006	Redwood Valley Stream
Anguilla australis	Shortfin eel	Not Threatened	1604390	5426154	2006, 2008	Redwood Valley Stream

[1] Dunn et al. (2018).

Appendix F:

Field Photographs






Photo 1-6: Overview of existing (modified) estuarine wetland and terrestrial margin/terrace conditions within the property, 1 November 2022.






Photo 7-12: Overview of existing (modified) estuarine wetland and terrestrial margin/terrace conditions within the property, 1 November 2022.

www.robertsonenvironmental.co.nz