Memo

To:	**Daniel Thorne**	**Job No:**	**2431**
From:	**Holly Madden; RMA Ecology Ltd**	**Date:**	**26 August 2023**
cc:	**Graham Ussher; RMA Ecology Ltd**		
Subject:	**Desktop assessment of values at Te Miko, West Coast**		

Dear Daniel,

This memorandum details the results of a desktop ecological values assessment undertaken by RMA Ecology Ltd at 4663 State Highway 6, Te Miko, West Coast ('the site') (**Figure 1**).

We understand that ACG Properties Limited is seeking consent to develop the 22.5 ha property at Perpendicular Point for luxury accommodation, consisting of a lodge and approx. 21 smaller guest cabins. Each guest cabin will be approx. 40 m^2 and 3 m in height located around the property to take in the views of the West Coast coastline.

The site is located 4 km north of the popular tourism destination Pancake Rocks and Blowhole at Punakaiki and contains similar geological features. Steep cliffs give way to the Tasman Sea at the north and west of the site. The state highway is situated to the east of the property, and mature coastal forest bounds the southern site boundary.

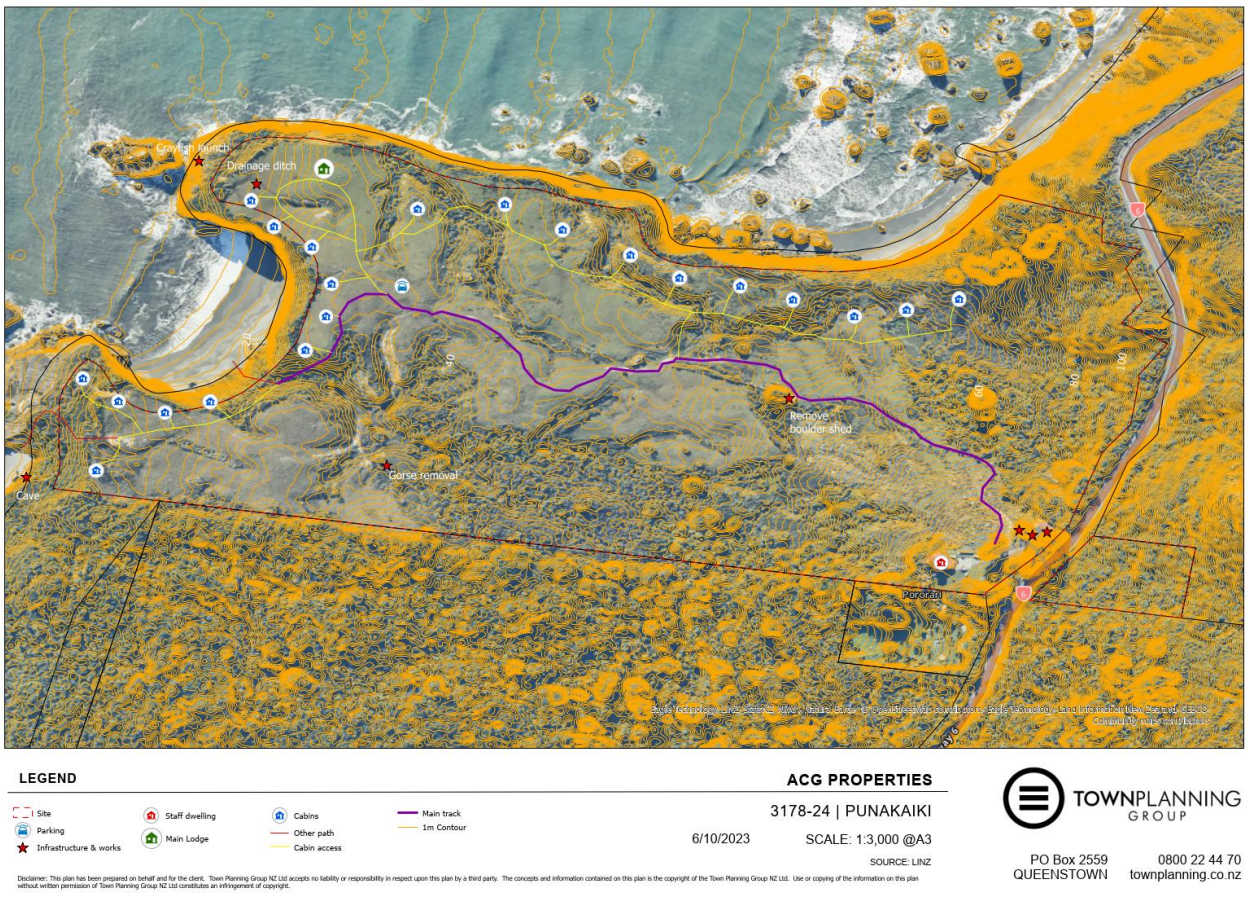

Figure 1. Investigations area and overview of the project concept at the site.

1 Assessment method

Desktop analyses were undertaken to determine the ecological values of terrestrial and freshwater areas within the site, as well as the significance of those values.

1.1 Desktop assessment

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

- Land Environments New Zealand (LENZ) and the Threatened Environment Classification (TEC)
- Historic aerial photographs (Retrolens)
- Drone imagery (supplied by client)
- WestMaps
- NIWA New Zealand Freshwater Fish database
- Department of Conservation National Amphibian and Reptile Database (Herpetofauna)
- Department of Conservation bat records database
- New Zealand Bird Atlas

The maps and aerial photographs (sourced from Google Earth, Retrolens, and recent drone imagery provided by the client) were reviewed to identify existing vegetation, wetlands, and streams present on the site, and to establish an understanding of these features' ecological status. Streams, wetlands, and terrestrial vegetation identified from the maps are recommended to be assessed by an ecologist on site for ground-truthing.

Data from national fauna reviewed to assess the likelihood of their presence on site, or nearby, and their threat status checked against the relevant national threatened species classification lists (Hitchmough *et al.* 2021, Robertson *et al.* 2021 and Dunn *et al.* 2017).

Site-specific surveys for bats, fish, and lizards have not been undertaken at this preliminary stage of the project; however, as the project design progresses, site specific surveys may be required.

1.2 Aquatic ecology

All waterways and flow paths were mapped as being permanent, intermittent, ephemeral, or artificial based on the information available for the region across various databases.

The NIWA New Zealand Freshwater Fish Database was reviewed to determine the species of freshwater fish that inhabit stream systems near the site.

1.3 Wetlands

Potential wetlands at the site were identified through desktop methods and assessed using the definition within the Resource Management Act 1991 (RMA):

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

The definition within the National Policy Statement for Freshwater Management 2020 (NPS-FM) was also used when assessing potential wetlands:

> ***"Natural inland wetland** means a wetland (as defined in the Act) that is not:*
>
> *a) in the coastal marine area; or*

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

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

d) *a geothermal wetland; or*

e) *a wetland that:*

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

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

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

The NPS-FM technical support documents updated by MfE in January 2024 regarding wetland classification and delineation require that a step-wise assessment is undertaken based on vegetation, soils, and hydrology.

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

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

A site assessment is required to accurately classify and delineate any potential wetlands identified through desktop mapping.

1.4 Terrestrial ecology

Native and exotic vegetation types were assessed across the site from aerial imagery with a focus on the presence of indigenous species. Potential food sources and nesting habitat for birds were noted for the purpose of estimating the potential loss of resources associated with the planned development.

The assessment includes identification of habitats potentially occupied by native lizards. The ecological investigation used the National Policy Statement for Indigenous Biodiversity (NPS-IB) criteria for Significant Natural Areas to assess the significance of terrestrial ecology values recorded from the site.

Ecological significance of flora and fauna was assessed following Appendix 1 of the Operative West Coast Regional Policy Statement (RPS). One or more criteria needs to be met for the site to be deemed significant.

1.4.1 NPS-IB

The NPS-IB requires that any significant adverse effects on indigenous biodiversity outside of SNA areas (Clause 3.16) must be managed by applying the effects management hierarchy (Avoid, Minimise, Remedy, Offset, Compensate).

1.4.2 Birds

Avifauna desktop instigation was undertaken to compile a list of bird species that are possibly present at the site or could possibly frequent the site at some time of the year.

Data from the New Zealand bird Atlas was reviewed and collated from the 10 x 10 km grid square (CH38) which encompasses the project area.

Habitats for each bird species identified from the Atlas was assessed against those habitats available at the site for the likelihood of species occurrence.

1.4.3 Lizards

The DOC online herpetofauna database was searched for nearby records of herpetofauna within a radius of the site.

The likelihood of species being present at the site was determined by reviewing the species preferred habitat and whether that was readily available on the site.

1.4.4 Bats

The DOC bat database was reviewed for records of bats near the site of both long-tailed and short-tailed bats.

Aerial imagery of the site was reviewed to assess the quality of bat habitat and the likelihood of bats occupying the site.

2 Results

A summary of the results from the desktop analysis is provided below:

2.1 Ecological context

The site is located along the coastline at Perpendicular Point above karst cliffs that bound the Tasman Sea and west of Paparoa National Park. A mapped sea cave is located at the south western corner of the site. Mature coastal forest spans the southern boundary of the site. State Highway 6 is adjacent to the site and provides access. The original natural ecology has been heavily modified or removed through vegetation clearance. Historic aerial photographs indicate that the land has been cleared of the majority of its native vegetation since at least the 1950s, for farming activities (**Figure 2**). The site is slowly regenerating into native coastal forest, particularly in areas adjacent to established forest on neighbouring DOC reserve (**Plate 1**).

The site is located within the Punakaiki Ecological District and is a 'Paparoa Character Area'. The original vegetation of the Ecological District comprised of hardwood forest with few podocarps inland from the coast. The coastline had a vegetation community that comprised of high diversity broadleaved forest species and northern rata. The Punakaiki Ecological District has remained largely unmodified throughout, with the coastline of the district succumbing to the highest degree of modification.

The Threatened Environments Classification (*Walker et al*. 2015) shows how much native (indigenous) vegetation remains within land environments, and how past vegetation loss and legal protection are distributed across New Zealand's landscape. The site lies within the Threatened Environment class categorised as having 30 % of indigenous cover left and 20 % of that cover legally protected from clearance. In these environments, the indigenous vegetation cover is still vulnerable to threats such as weeds, pests, logging, and other extractive land uses.

Land Environments of New Zealand (LENZ) is a quantitatively-based classification of New Zealand's terrestrial environment developed by Landcare Research[1], which has resulted in a number of datasets including the Land Cover Database (LCDB).

LCDB v5.0 provides an indication of current land use, and land use change since its inception in 1996. The LCDB shows that the site has been used as 'high producing exotic grassland', 'indigenous forest', and 'broadleaved indigenous hardwoods' since at least 1996.

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

Figure 2. Historic aerial photograph depicting the vegetation cover from 1988 across the site. Sourced from Retrolens.

Plate 1. Aerial photograph depicting the current vegetation cover across the site as of July 2024.

2.2 Streams

There are no recorded streams on the site on NZ Topo Maps or WestMaps. The NIWA River Environment Classification (REC) database shows one REC segment on the site, REC 12055730, which has been mapped as Stream 1. Three additional intermittent streams have been mapped after reviews of drone imagery, vegetation changes, and topography at the site (**Figure 3**).

Drone video recorded running water discharging over the cliffs at the northern boundary of the site into the Tasman Sea, this stream has been mapped as Stream 3. The discharge point of all four potential streams on site is the Tasman Sea.

- Stream 1 is located beneath dense regenerating mixed shrubland vegetation and discharges to the sea at the western boundary of the site. It is unknown whether there are any fish barriers along the stream extent.
- Stream 2 was mapped as an intermittent stream based on aerial imagery investigations which showed a change in vegetation compared to the vegetation that surrounds it. The extent is moderately vegetated and the discharge point to the sea is over the edge of the cliffs at the northern boundary of the site, which is a barrier to fish migration.
- Stream 3 is moderately vegetated and discharges to the sea over the edge of the cliffs at the northern boundary of the site, there is a barrier to fish migration at this point.
- Stream 4 is located beneath the mature coastal forest and discharges over the cliff into the sea.

Aerial imagery of the site was unable to provide enough information to accurately classify the streams or determine the exact extent or condition of any of the streams on the site; hence ground truthing by an ecologist is required to accurately map these features and their value.

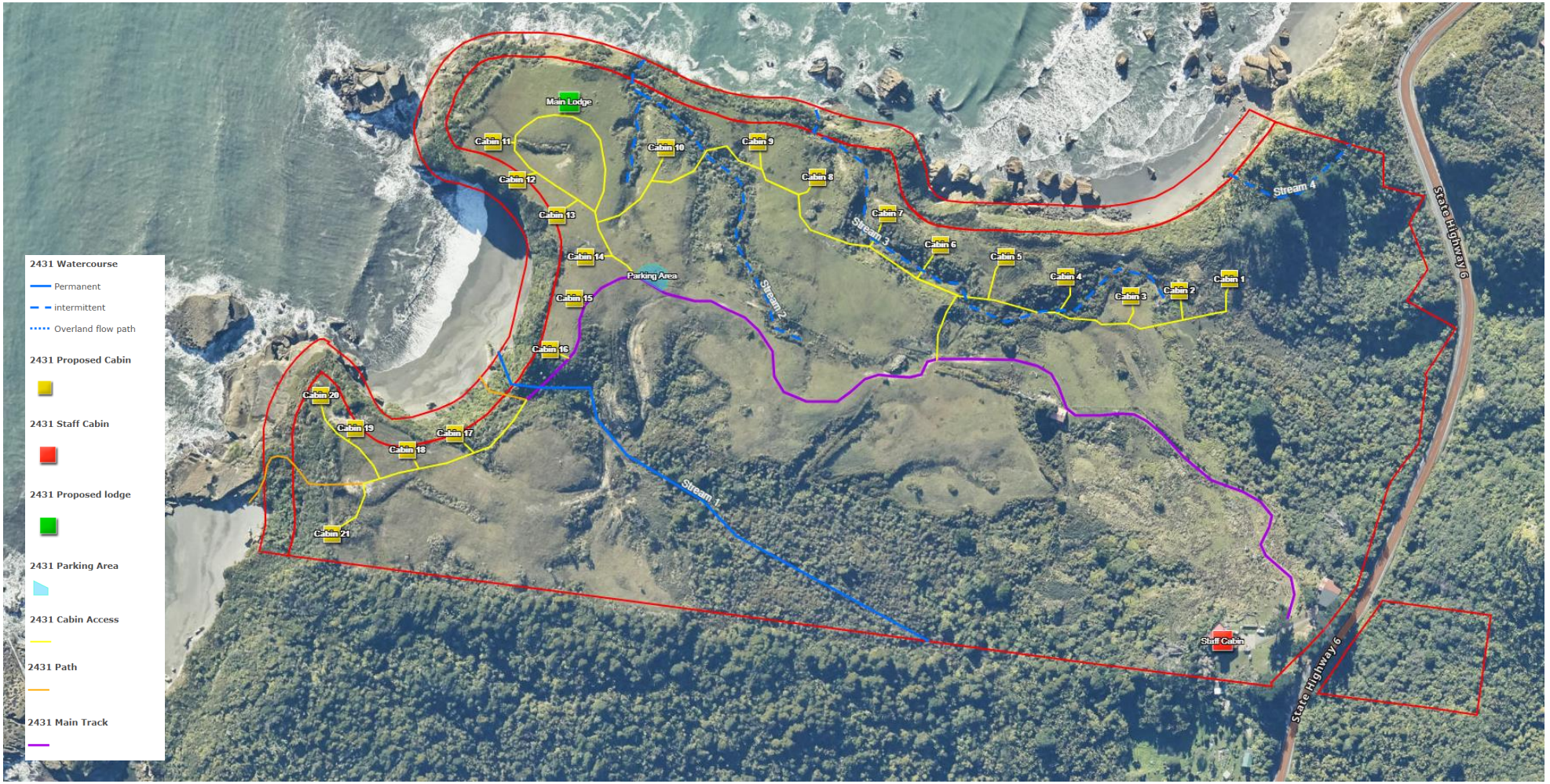

Figure 3. Map of the site (red boundary) with preliminary mapped watercourses.

2.3 Fish

There are no records of freshwater fish from the site. NIWA New Zealand Freshwater Fish Database (NZFFD) records from the nearest watercourses, Bullock Creek, Pororari River, and Punakaiki River were reviewed to create a list of species most likely to be present in the area wider area.

Bullock creek is 1.5 km south of the site, Pororari River is 2.2km south of the site, and Punakaiki River is 4.3 km south of the site. Records of two freshwater species were found for Bullock creek. Pororari River provided no records of freshwater fish species. Ten species are recorded as being present in Punakaiki River.

It is likely that only koura are present in desktop mapped Stream 1. It is unlikely that fish are present in desktop mapped Stream 2, and Stream 3 due to the streams discharging from height into the sea which poses a fish barrier. It is also unknown if any of the three desktop mapped streams are connected to larger waterbodies.

The native fish species records held by NZFFD are summarised in **Table 1**, with the most recent record of the species displayed.

Based on observation of other streams to south at Punakaiki, it is likely that only koura may be present in the streams; a site assessment by an ecologist will clarify this.

Table 1. NIWA New Zealand Freshwater Fish Database (NZFFD) records for Bullock Creek, and Punakaiki River.

Species	Common name	Waterbody name	Status	Date of record
Paranephrops	Koura	Bullock Creek	Not Threatened	1987
Anguilla dieffenbachii	Longfin eel	Bullock Creek	At Risk – Declining	1987
Rhombosolea retiaria	Black flounder	Punakaiki River	Not Threatened	1987
Gobiomorphus hubbsi	Bluegill bully	Punakaiki River	At Risk – Declining	1987
Gobiomorphus cotidianus	Common bully	Punakaiki River	Not Threatened	1987
Gobiomorphus gobioides	Giant bully	Punakaiki River	Naturally Uncommon	1878
Galaxias maculatus	Inanga	Punakaiki River	At Risk – Declining	1987
Anguilla dieffenbachii	Longfin eel	Punakaiki River	At Risk – Declining	1987
Gobiomorphus huttoni	Redfin bully	Punakaiki River	Not Threatened	1987
Anguilla australis	Shortfin eel	Punakaiki River	Not Threatened	1963
Cheimarrichthys fosterae	Torrentfish	Punakaiki River	At Risk – Declining	2012

2.4 Wetlands

Our desktop assessment indicates that six potential wetlands are located within the assessment area (**Figure 4**).

The primary indicators of the presence of wetlands include characteristic vegetation colours and patterns or signs of water pooling in depressions in the landscape. Although less common, wetlands can also exist on flat or sloping land where there is seepage from groundwater, or overland flow paths.

The definition within the NPS-FM was then used to determine if each area should be classified as a natural inland wetland.

Land contour was also assessed to determine whether a hydrological connection exists between earthworks sites and potential wetlands.

All six mapped potential wetlands were conservatively mapped after assessing aerial imagery and drone footage of the site. These potential wetlands have been mapped based on the land form and the vegetation differences with the surrounding land (**Plate 2; Plate 3**).

No vegetation was able to be identified to species level through the available imagery of the investigations area. The vegetation community composition of the potential mapped wetlands was unknown following desktop assessment and therefore a site visit will need to be undertaken to determine their classification and extent.

Plate 2. Aerial imagery of the site indicating the presence of potential wetlands (red circles) through vegetation and land form.

Plate 3. Aerial imagery of the site indicating the presence of potential wetlands (red circles) through vegetation, saturation, and land form.

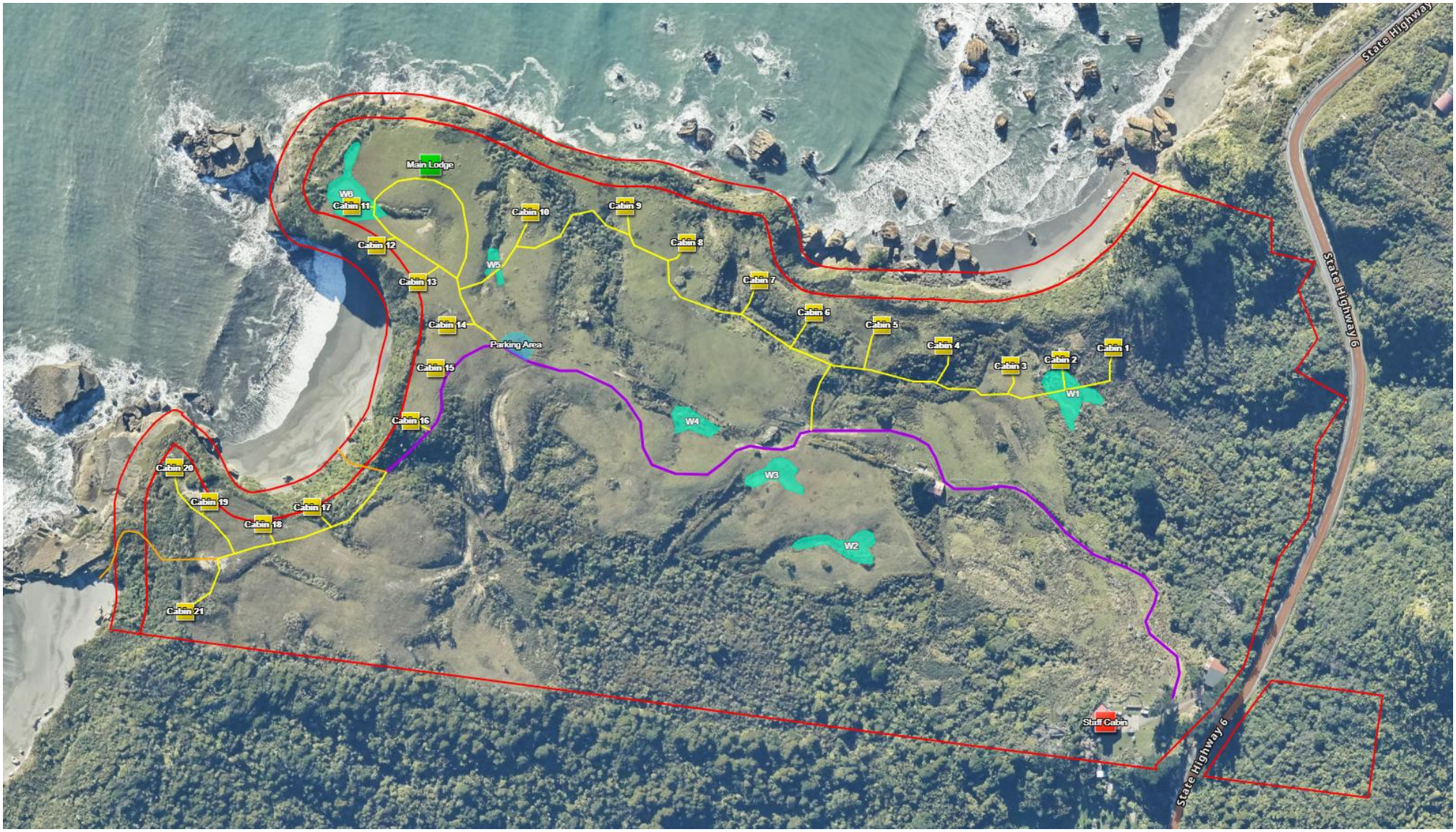

Figure 4. Potential wetlands (cyan polygons labelled W1 – W6) mapped across the site (red boundary) and their location to the project design footprint.

2.5 Terrestrial vegetation

Land use at the site has primarily been open pasture grass, most likely for farming purposes, for many decades after indigenous vegetation cover was cleared prior to the 1950s. The site is currently largely regenerating in mixed native and exotic species, with some areas covered densely with gorse as the site has not been maintained as grassland. Desktop analysis of aerial imagery, drone footage and databases has determined there are a range of terrestrial vegetation communities on the site (**Figure 5**), including:

- Native dominated forest – coastal species not cleared when the majority of site was cleared pre-1950s (**Plate 4**). Dominated by mature nikau (*Rhopalostylis sapida*);
- Regenerating mixed native and exotic scrub/shrub (**Plate 5**). Mahoe (*Melicytus ramiflorus*), cabbage tree (*Cordyline australis*), harakeke (*Phormium tenax*), kamahi (*Pterophylla racemosa*);
- Exotic grassland (**Plate 6**);
- Exotic weedland/scrub – primarily gorse (*Ulex europaeus*) (**Plate 7**);
- Native shrubland – low growing species that are growing along the exposed cliff faces in the north and west boundaries of the site. Primarily harakeke (**Plate 8**);
- Mixed scrub – native and exotic species growing together, often on the edges of exotic weedland and regenerating shrubland; and
- Saline grasses – on flat rock surfaces of the cliffs where the salt water splashes onto and collects.

There is a diverse suite of species that make up the vegetation types on site. It is unknown from desktop analysis whether there are any rare plant species at the site. An assessment of the significance of the vegetation and habitats on the site within the proposed vegetation clearance and earthworks/ construction footprint under the RPS significance criteria is presented in **Table 2**.

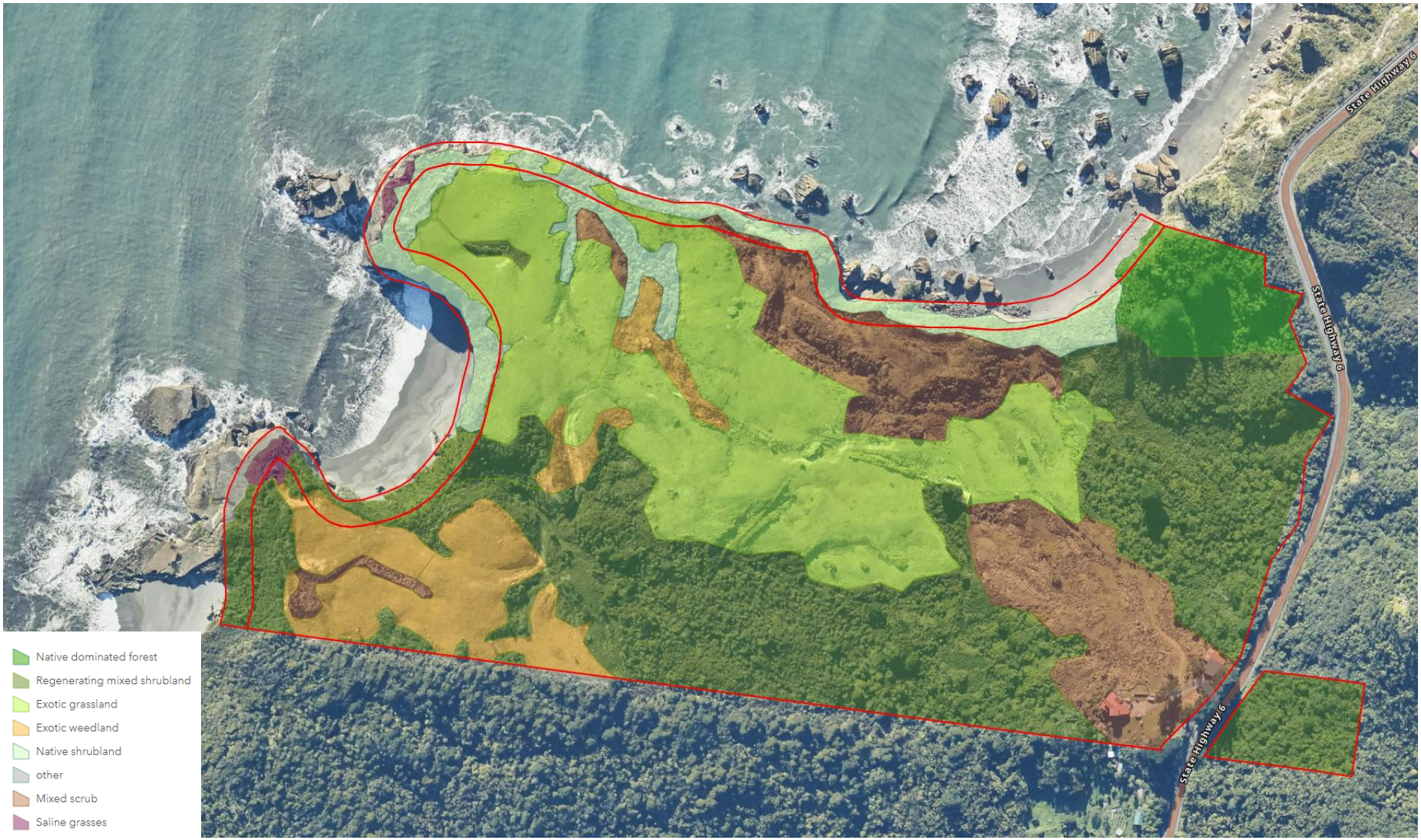

Figure 5. Map displaying the vegetation communities on the site from desktop reviews of aerial imagery and drone footage. These vegetation units will be reviewed and revised (if necessary) on site as part of our site investigations.

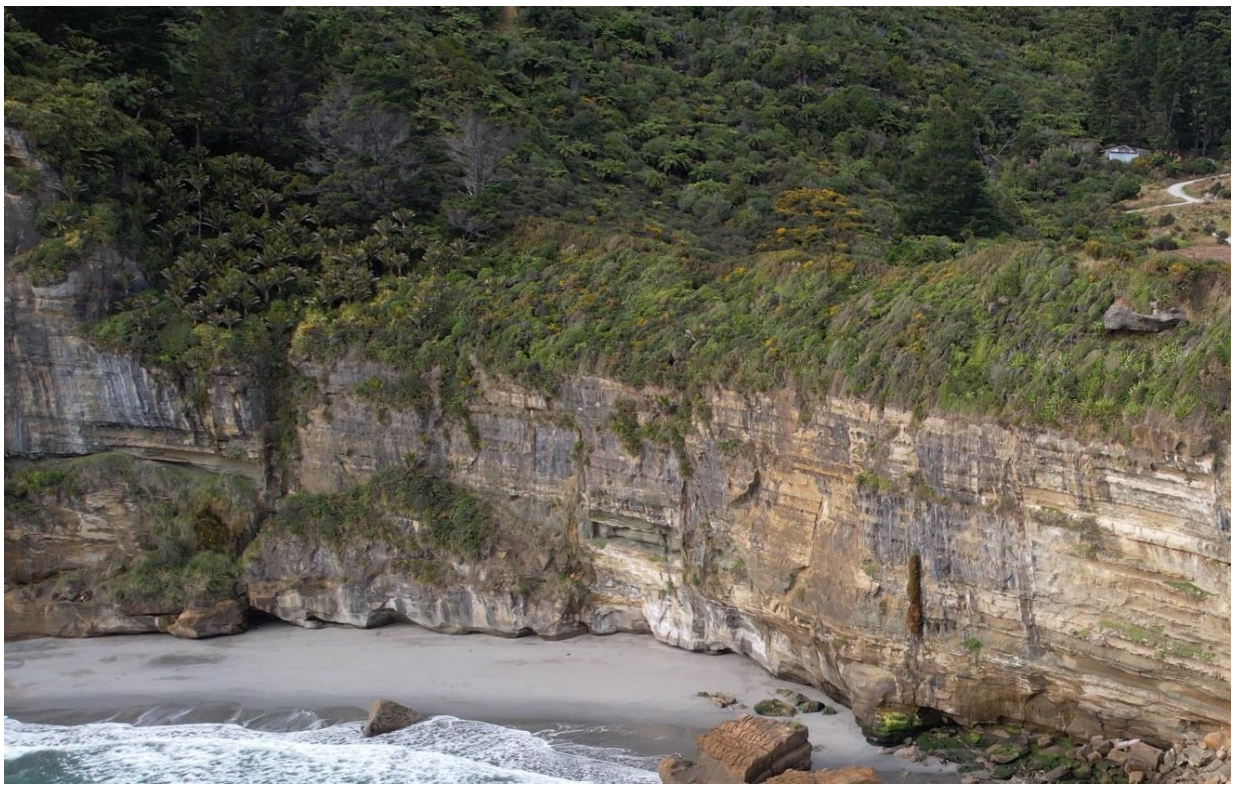

Plate 4. Mature native dominant forest in the north eastern corner of the site.

Plate 5. Species composition of regenerating mixed shrubland. Predominantly native species with gorse growing throughout.

Plate 6. Exotic grassland is dominant across the flat areas of the site.

Plate 7. Exotic weedland and scrub dominated by gorse across the flat parts of the site above the vegetation growing on the edges of the cliffs.

Plate 8. Low growing native shrubland is bounded by the exotic grassland above and the exposed cliff faces below.

2.5.1 NPS-IB significance assessment

The operative Buller District Plan does not identify the site as a Significant Natural Area (SNA), however it does identify the site as a Paparoa Character Area. The process of identifying SNAs on private land in the West Coast region is relatively recent and therefore the vegetation and habitats at the site which could be impacted by the proposed development were assessed against the ecological significance criteria in Appendix 1 of the West Coast RPS (**Table 2**).

Our preliminary assessment below indicates that the native vegetation units on the site could qualify as significant indigenous vegetation, which means that any development proposal should aim to minimise or avoid clearance of these vegetation types. Qualification as 'significant' in an ecological sense does not confer SNA status on a site, so the provisions of the NSP-IB relating to SNA site do not apply to this site.

Continuous habitats at the site comprising forest and scrub areas have been assessed as a whole, regardless of the individual vegetation types. Areas of exotic grassland and exotic scrub are **not ecologically significant** and have not been combined or considered with the continuous habitats.

Table 2. Assessment of the site against the RPS Ecological Significance criteria.

Criterion (factor)	Assessment	Conclusion
Representativeness	Most of the vegetation on this site is mixed exotic and indigenous plant species. The parts that are dominated by native vegetation comprise the cliff edges, the mature forest, and parts of the regenerating scrub/shrub. Vegetation community present is not a typical example of a West Coast region indigenous ecosystem, as native vegetation within it is less dense and younger than vegetation that is commonly seen across the coastline of the region. LENZ/ TEC classifies the site as a regional example where 20-30 % indigenous cover is left, and therefore does not comprise a Threatened ecosystem.	The vegetation **does not meet this criterion** for significance.
Rarity of ecosystems or species	It is undetermined if the site supports any rare or threatened species of plants. The site does offer habitat for Threatened or At-Risk birds. The site has habitat that could potentially support Threatened or At Risk listed lizards.	The site provides habitat for At Risk or Threatened species and **does meet this criterion**
Diversity and pattern; natural diversity within the area	The vegetation on the site supports a sub-set of native plant species that are expected in a natural regenerating shrubland site. The overall diversity of native plants across the site compared with those expected in the wider region indicates that this site is representative of the natural diversity of the region.	The vegetation community **does not meet this criterion for significance**
Ecological context, connectivity, buffering and core habitat	The area which contains regenerating shrub/forest provides some ecological connectivity and buffering to neighbouring expansive forests. The mature coastal forest and the indigenous vegetation that borders the cliffs provides habitat for native birds.	The vegetation **does meet this criterion** for significance.

2.6 Native lizards

Habitat quality for native lizard species appears to vary across the site for the species that could potentially be present. The site has been historically extensively cleared of indigenous vegetation. Lizards could be present on the site if populations have persisted through habitat loss by surviving in small remnant habitats that remain at the site. it is also possible that populations on neighbouring properties have moved into the site by recolonising the regenerating vegetation that has formed on the site.

Lizard habitat types on site determined by desktop mapping:

- Native and exotic regenerating scrub/forest;
- Mature native coastal forest;
- Native shrubland;
- Exotic weedy scrubland;
- Exposed limestone cliff faces; and
- Rank grassland.

There are no records of native lizards from the site, according to the Department of Conservation herpetofauna database. Records from the DOC herpetofauna database show that the native lizards most likely to be encountered at the site are Newman's speckled skink (*Oligosoma newmani,* recorded 4 km from site), forest gecko (*Mokopirirakau granulatus,* recorded 800 m from site), and West Coast green gecko (*Naultinus tuberculatus,* recorded 4 km from site. The native lizards that are known to occupy the wider region and their likelihood of being present at the site based on distribution and habitat preference are summarised in **Table 3**.

Records for the wider West Coast area in the DOC database are minimal; however, this could be due to lack of observations rather than lack of lizards present. As such, the region is under surveyed and as a result information on lizard species populations and distributions is sparse.

For most of the lizards recorded locally, the site does not support adequate or appropriate habitat. The site has been modified so much over the past several decades that the likelihood of lizards being present is low or nil.

Table 3: Native lizards known to inhabit the wider region around the site and the likelihood of the species being present at the site based on records and available habitat. Source: New Zealand Herpetological Society Website.

Species	Common Name	Threat Classification	Preferred Habitat Type	Likelihood of presence
Mokopirirakau granulatus	Forest gecko	At Risk - Declining	Arboreal and terrestrial. Occupy a range of habitats such as swamps, scrubland, mature forests, rock fields, and scrubby regenerating habitats.	Low
Naultinus tuberculatus	West Coast green gecko	Threatened – Nationally Vulnerable	Primarily arboreal. Occupy forested habitats, swamps, scrubland, low scrub, regenerating scrubby habitats, and mature forests.	Low
Oligosoma newmani	Newman's speckled skink	At Risk - Declining	Occupy wide range of habitats; pebble banks, dense vegetation in coastal areas, grassland, rock piles, open areas in forest and scrub. Will climb onto low vegetation or debris to bask, retreat quickly when approached. Take refuge under rocks, logs, dense vegetation, and leaf litter.	Low

Oligosoma polychroma	Northern grass skink	Not Threatened	Wide range of habitats, including gardens, coastal vegetation, rock piles, grassland, flaxes, shrubland, scree, forest margins, tussocks, and modified suburban areas.	Very Low
Oligosoma zelandicum	Glossy brown skink	At Risk - Declining	Coastal areas, pebble banks, grassland, wetland, scrubland, forest, and prefer to inhabit areas with dense ground cover.	Nil
Oligosoma albornense	Alborn skink	Threatened – Nationally Critical	Tolerant of damp habitat. Occur in beech forest clearings, regenerating scrub, and wetlands. Take refuge under logs and anthropogenic debris.	Nil

2.7 Birds

An avifauna desktop instigation was undertaken to compile a list of bird species possibly present or possibly frequent at the site. Data from the ornithological society of New Zealand Bird Atlas was collated from the 10 x 10 km grid square (CH38) which encompassed the project area. The data available for this grid square provided a list of 56 species of birds.

The habitats available for birds at this site limit the likelihood of many of the 56 species recorded in the database being present on the site. Forty-one of those species have a moderate to high chance of occupying parts of the site. Habitat for native birds at the site includes native forest, exotic scrub, grassland, cliff faces, and native shrubland, vegetated cliff margins. Some species recorded are also likely only occasional visitors to the site.

A site-specific bird survey during appropriate seasons (such as spring) for At Risk and Threatened birds is required to determine their presence at the site, and if they use the site for breeding purposes.

Table 4 provides a summary of the Threatened and At-Risk bird species that have been recorded within 10 km of the site, many of these species are unlikely to be encountered at the site due to habitat requirements. A comprehensive list of birds observed within the investigations area taken from the NZ bird atlas database and the likelihood of them occupying the site is provided in **Table 5**.

Table 4. At Risk and Threatened birds recorded near the site; sourced from the NZ bird Atlas.

Scientific name	Common name	Threat Status (Robertson *et al.* 2016)
Urodynamis taitensis	Long-tailed cuckoo	Threatened – nationally vulnerable
Phalacrocorax punctatus	Spotted Shag	Threatened – nationally vulnerable
Anas superciliosa	Grey duck	Threatened – nationally vulnerable
Hydroprogne caspia	Caspian Tern	Threatened – nationally vulnerable
Apteryx haastii	Great Spotted Kiwi	Threatened – nationally vulnerable
Anthus novaeseelandiae	New Zealand Pipit	At Risk - Naturally Uncommon
Procellaria westlandica	Westland Petrel	At Risk - Naturally Uncommon
Phalacrocorax carbo	Black shag	At Risk - Relict
Microcarbo melanoleucos	Little shag	At Risk - Relict
Cyanoramphus auriceps	Yellow-crowned Parakeet	At Risk - Declining
Poodytes punctatus	New Zealand Fernbird	At Risk - Declining
Chroicocephalus bulleri	Black-billed Gull	At Risk - Declining
Eudyptula mino	Little Penguin	At Risk - Declining
Ardenna bulleri	Buller's Shearwater	At Risk - Declining
Chroicocephalus novaehollandiae	Red-billed Gull	At Risk - Declining

Scientific name	Common name	Threat Status (Robertson *et al.* 2016)
Sterna striata	White-fronted Tern	At Risk - Declining
Anarhynchus bicinctus	Banded dotterel	At Risk - Declining
Petroica australis	South Island Robin	At Risk - Declining
Haematopus finschi	South Island Oystercatcher	At Risk - Declining
Haematopus unicolor	Variable Oystercatcher	At Risk - Recovering
Falco novaeseelandiae	New Zealand Falcon	At Risk - Recovering
Phalacrocorax varius	Pied shag	At Risk - Recovering

Table 5. Comprehensive species list of birds recorded near the site.

Scientific name	Common name	Threat Status (Robertson *et al.* 2016)	Habitat type	Year recorded	Likelihood of occupying site
Procellaria westlandica	Westland Petrel	At Risk - Naturally Uncommon	Coastal forest	2024	Moderate
Morus serrator	Australasian Gannet	Not Threatened	Coastal rocks	2024	Low
Carduelis carduelis	European Goldfinch	Introduced and Naturalised	Coastal vegetation, farmland, urban	2024	High
Porphyrio melanotus	Australasian Swamphen	Not threatened	Open pasture, wet areas	2024	High
Chroicocephalus bulleri	Black-billed Gull	At Risk - Declining	Braided rivers, farmland	2024	Low
Phalacrocorax punctatus	Spotted Shag	Threatened – nationally vulnerable	Coastal areas	2024	Moderate
Hemiphaga novaeseelandiae	New Zealand Pigeon	Not Threatened	Wide variety of forest types	2024	High
Tadorna variegata	Paradise Shelduck	Not Threatened	Pastoral landscapes, shorelines	2024	High
Egretta novaehollandiae	White-faced Heron	Not Threatened	Rock shores, estuaries, mudflats, damp pasture	2024	Moderate
Falco novaeseelandiae	New Zealand Falcon	At Risk - Recovering	Wide variety from coast to above the treeline	2024	Moderate
Stercorarius parasiticus	Parasitic Jaeger	Migrant	Coastal waters	2024	Nil
Anas superciliosa	Grey Duck	Threatened – nationally vulnerable	Forested headwater catchments	2024	Low
Mohoua novaeseelandiae	Pipipi	Not Threatened	Wide range of forest types from the coast to above the tree line	2024	High
Circus approximans	Swamp Harrier	Not Threatened	throughout New Zealand	2024	High
Hirundo neoxena	Welcome Swallow	Not Threatened	Coastal areas, wetlands	2024	High
Hydroprogne caspia	Caspian Tern	Threatened – nationally vulnerable	Open coastal shell banks, sandspits, braided rivers	2024	Moderate
Sturnus vulgaris	European Starling	Introduced and Naturalised	Throughout New Zealand	2024	High
Apteryx haastii	Great Spotted Kiwi	Threatened – nationally vulnerable	Forest, scrub, uplandtussock grasslands	2023	Low
Ninox novaeseelandiae	Morepork	Not Threatened	Native and exotic forests	2023	Low
Todiramphus sanctus	Sacred Kingfisher	Not Threatened	Wide range of forest types, river margins, farmland, rocky coastlines, estuaries	2023	High
Anas platyrhynchos	Mallard	Introduced and Naturalised	Urban streams, parks, lakes, estuaries, pasture	2023	High
Prosthemadera novaeseelandiae	Tui	Not Threatened	Native forest and scrub, exotic forest, rural gardens, urban	2023	High

Scientific name	Common name	Threat Status (Robertson *et al.* 2016)	Habitat type	Year recorded	Likelihood of occupying site
Cyanoramphus auriceps	Yellow-crowned Parakeet	At Risk - Declining	Tall native forests	2023	Nil
Branta canadensis	Canada Goose	Introduced and Naturalised	Pastoral land adjacent to pond/lake	2023	Low
Poodytes punctatus	New Zealand Fernbird	At Risk - Declining	Wetlands, saltmarshes	2023	Low
Phalacrocorax varius	Pied shag	At Risk - Recovering	Coastal areas	2023	Moderate
Eudyptula mino	Little Penguin	At Risk - Declining	Coastline	2023	Moderate
Phalacrocorax carbo	Black shag	At Risk - Relict	Coastal waters, rivers, estuaries	2023	Moderate
Chloris chloris	European Greenfinch	Introduced and Naturalised	Modified habitats; farmland, parks, orchards	2023	Moderate
Anthus novaeseelandiae	New Zealand Pipit	At Risk - Naturally Uncommon	Coastline, alpine areas, wetlands, tussock grassland, farmland	2023	Moderate
Gerygone igata	Gray warbler	Not Threatened	Forest, shrubland, urban	2023	Moderate
Ardenna bulleri	Buller's Shearwater	At Risk - Declining	Coastal areas	2023	Nil
Chrysococcyx lucidus	Shining Bronze-Cuckoo	Not Threatened	Forest, scrub, farmland, urban	2022	Moderate
Turdus philomelos	Song Thrush	Introduced and Naturalised	Urban, lowland forests, farmland	2022	High
Fringilla coelebs	Common Chaffinch	Introduced and Naturalised	Native and exotic forests and scrub, parks, gardens, farmland	2022	High
Prunella modularis	Dunnock	Introduced and Naturalised	Scrub, forest, parks, urban	2022	High
Chroicocephalus novaehollandiae	Red-billed Gull	At Risk - Declining	Coastal areas	2022	High
Sterna striata	White-fronted Tern	At Risk - Declining	Coastal areas	2022	High
Anarhynchus bicinctus	Banded dotterel	At Risk - Declining	Riverbeds, farmland, beaches	2022	Low
Larus dominicanus	Kelp Gull	Not Threatened	Coastal areas, riverbeds, near urban areas	2022	High
Haematopus finschi	South Island Oystercatcher	At Risk - Declining	Estuaries, harbours, coastal areas	2022	High
Rhipidura fuliginosa	New Zealand Fantail	Not threatened	Native and exotic forest and shrubland, parks	2022	High
Turdus merula	Eurasian Blackbird	Introduced and Naturalised	Urban areas, farmland, parks, lowland forests	2022	High
Acanthis cabaret	Redpoll	Introduced and Naturalised	Farmland, tussock grassland, clearings in forests and shrublands	2022	High

Scientific name	Common name	Threat Status (Robertson *et al.* 2016)	Habitat type	Year recorded	Likelihood of occupying site
Urodynamis taitensis	Long-tailed cuckoo	Threatened – nationally vulnerable	Native and exotic forests and shrubland	2022	Low
Petroica australis	South Island Robin	At Risk - Declining	Forest, scrub	2022	Low
Anthornis melanura	New Zealand Bellbird	Not threatened	Native and exotic forests and shrubland, parks, gardens	2022	Moderate
Haematopus unicolor	Variable Oystercatcher	At Risk - Recovering	Sandy beaches, sandspits, dunes, coastal areas	2022	Moderate
Passer domesticus	House Sparrow	Introduced and Naturalised	Farmland, urban	2022	High
Petroica macrocephala	Tomtit	Not threatened	Forest	2022	Low
Zosterops lateralis	Silvereye	Not threatened	Urban, farmland, native and exotic forest and shrubland	2022	High
Emberiza citrinella	Yellowhammer	Introduced and Naturalised	Farmland, urban, parks	2021	Moderate
Vanellus miles	Spur-winged plover	Not threatened	Low vegetation near water, riverbeds, wetlands	2021	Moderate
Microcarbo melanoleucos	Little shag	At Risk - Relict	Coastal areas, freshwater	2021	Moderate
Gallirallus australis	Weka	Not threatened	Coastal areas, rough pasture, shrubland, forests, wetlands	2019	High

2.8 Bats

There are two species of native bats that remain in New Zealand; long-tailed bat/ pekapeka (*Chalinolobus tuberculatus*), which is currently classified 'Threatened – Nationally Critical' (O'Donnell *et al.*, 2022), and the lesser short-tailed bat/ pekepeka-tou-poto (*Mystacina tuberculata*). There are three subspecies of the lesser short-tailed bat, the subspecies relevant to this area is the southern lesser short-tailed bat which is classified as 'At Risk – Recovering' (O'Donnell *et al.*, 2022).

The national bat database held by DOC records the closest detection of lesser short-tailed bats within approx. 3 km of the site in 1997 and 1998 (**Figure 6**). These bat detections occurred in the lower reaches of Bullock Creek and Pororari River. Surveys for lesser short-tailed bats were conducted in similar locations along the river reaches as the 1997 and 1998 records in 2000, 2018, and 2020 which all yielded no detection of bat activity. The nearest detection of long-tailed bats to the site is from 1998 approx. 28 km from site in the Rough River catchment. One recent record of long-tailed bat from 2017 is approx. 33 km from site in the Stony River catchment.

Aerial imagery was of the site was reviewed to identify habitat features that are commonly used by bats. Bats require large trees (including standing dead trees) with cavities (e.g. deep knot holes), epiphytes, or loose bark for roosting. They typically use linear landscape features such as bush edges, gullies, water courses, and roadways to transit between roosting and feeding sites (Borkin and Parsons, 2009). Bat activity is influenced by overnight weather conditions such as temperature, rainfall, humidity, wind speed, and moonlight.

Although there are historic bat records in close proximity to the site, it is unlikely that bats occur on the site or transit through the site due to lack of viable habitat.

Figure 6. Historic records from 1997 and 1998 of lesser short-tailed bats (orange dots) in relation to the project site (red rectangle).

2.9 Summary of ecological values

The site, of approximately 22.5 ha in area, has been historically cleared of indigenous forest cover over most of the site since at least the 1950s. A small remnant of coastal forest has remained in the north eastern corner of the site and much of the site is regenerating in mixed native and exotic shrubland (**Figure 7**).

The following ecological features have been recorded:

- Preliminary mapping has identified one permanent stream, Stream 1, and three intermittent streams – Stream 2, Stream 3, and Stream 4.
- Native fish species may be present in Stream 1; however, it is likely that only Koura are present due to the barriers limiting fish migration and movement to other waterbodies.
- Six potential wetlands, W1 – W4, have been preliminarily mapped on site.
- Three species of native lizards have been recorded within a 4 km proximity of the site and could potentially inhabit areas on site.
- A list of 56 bird species, including 23 At Risk and Threatened birds, has been compiled for possibly inhabiting parts of the site.
- The site is very unlikely to support native bats. The aerial imagery of the site indicates poor quality bat habitat and that the site is unlikely to be used by bats for roosting, foraging, or transiting across.

All of the above information is based on desktop research form nearby or surrounding sites. A site assessment is required to ground-truth the potential values listed in this section of the report.

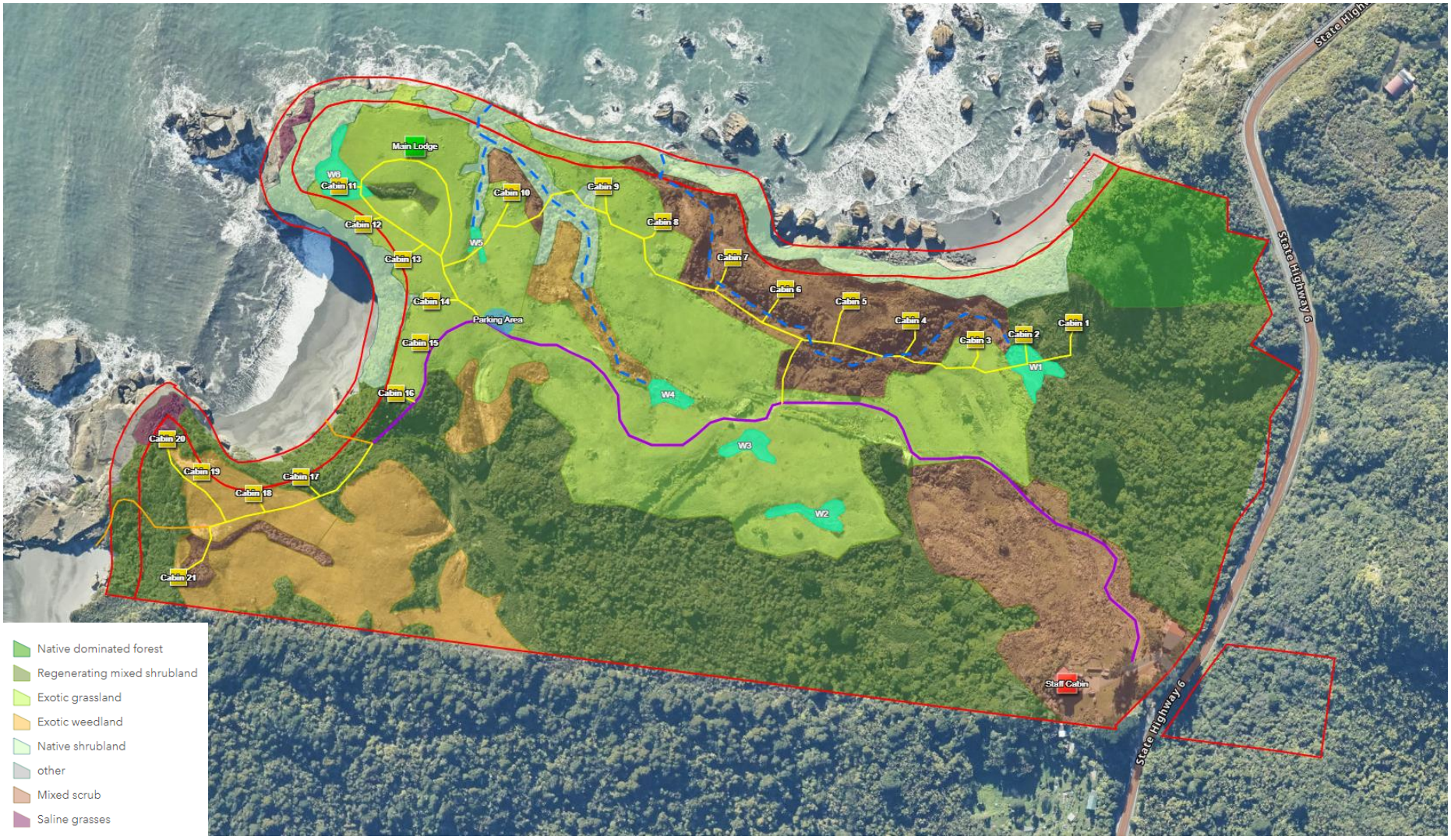

Figure 7. Summary of desktop-mapped ecology features at the site in conjunction with the preliminary project design.

2.10 Avoidance of potential ecological effects

Design of the luxury accommodation cabins for the site should attempt to avoid or minimise potential adverse effects on ecological values.

The features that should form part of a protection layer for this site (within which vegetation clearance, earthworks and other impacts are avoided) are:

1. Any natural inland wetlands on the site following confirmation from a wetland assessment on site, and a planting/ screening buffer of at least 10 m around it; and
2. The three streams and a 5 m wide riparian margin buffer along each bank. There is potential to enhance the streams, as long as by doing so the extent and values of stream are retained or improved – subject to confirmation of extent and classification.
3. The native forest, native shrubland, and regenerating coastal forest classified vegetation areas across the site, which serves as habitat for lizards and native birds. This area should be retained and could be improved through weed control and infill native planting.

3 Discussion and conclusion

The site has the potential to support a range of ecological features that have protection under national or regional planning documents, and may support species of conservation importance.

The proposed plans for the development of the site are confined to very small areas of development and the placement of these on the concept design plans indicates that adverse effects on ecology values could be avoided in most instances.

Any development proposal is likely to be required by Council to demonstrate how potential adverse effects on ecology will be avoided, minimised or - where avoidance is not feasible – offset, through beneficial ecological works elsewhere on the site.

Once we have undertaken site investigation to ground-truth aspects of ecology highlighted in this preliminary desktop report, we will be able to advise in more detail on the ways in which specific potential effects can be managed.

For example, it is likely that the actions listed below will need to be included as part of an effects management package and as part of the engineering design.

- Clear delineation of proposed clearance areas on the ground to avoid effects outside of consented clearance;
- Erosion and sediment control plan to prevent uncontrolled sediment discharge into wetland (if any) and watercourses
- An ecologist on site during clearance where rank grassland and mixed weedland/ shrubland are proposed, so that any native lizards can relocated outside of the development footprint.
- Crossings of streams should be via bridges (not culverts) so as to minimise potential effects on stream bed, habitat of freshwater fauna, and stream flows.
- Design of lighting that aims to minimise light spill and avoid potential effects on nocturnal seabirds (esp. petrels)

There are opportunities for enhancing the ecology of the site, and these could be included as part of the overall development project:

- Control of invasive ecological weeds
- Accelerate the change from native weedland/ grassland to native coastal and shrubland communities through a planting programme
- Include pest animal control as part of the site restoration programme
- Plant native species that produce flower and nectar to encourage native birds to the site.

We trust that this information meets your requirements and proves useful in regard to strategic planning for this site.

Yours sincerely,

Holly Madden

Ecologist[2]

26-Aug-24
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