

# Waimakariri Coastal Natural Character Study

Natural Character Study of the Waimakariri Coastal Environment  
Prepared for Waimakariri District Council

18 June 2018



Boffa Miskell

## Document Quality Assurance

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*Cover photograph:* [Bench at Pines Beach © James Bentley, 2018]. All photographs in this report were taken by BML.

# Contents

1.0	Executive Summary	2
2.0	Introduction and Study Background	4
2.1	Purpose and Background	4
2.2	Study Scope	5
2.3	Study Process	5
3.0	Natural Character Assessment Methodology	6
3.1	Extent of the Coastal Environment	6
3.2	Natural Character	7
4.0	The Waimakariri District Coastal Terrestrial Environment	11
4.1	Introduction to the Waimakariri District Coastal Environment	11
4.2	Waimakariri District's Terrestrial component of the coastal environment	12
4.3	Active Coastal Interface	12
4.4	Abiotic Systems and Landforms of the Coastal Terrestrial Area	13
4.5	Terrestrial Biotic Systems	13
4.6	Land Cover and Land Use	14
4.7	Perceptual and Experiential Factors	15
5.0	The Waimakariri District Coastal Terrestrial Areas	17
5.1	Coastal Terrestrial Area 1: Rakahuri	19
5.2	Coastal Terrestrial Area 2: Tūhaitara	26
6.0	Outstanding Natural Character within the Waimakariri Coastal Terrestrial Areas	34
6.1	ONC Area 1: Ashley River mouth/ Rakahuri Saltwater Creek Estuary (above MHWS)	36
6.2	Management of Effects	38
7.0	Appendix 1: References	39
8.0	Appendix 2: Study Approach and Natural Character Methodology	40
8.1	Coastal Environment	40
8.2	Coastal Natural Character	43
8.3	Mapping Information	54

## 1.0 Executive Summary

The Waimakariri coastal environment is located within the central part of Pegasus Bay and extends approximately 15 km from the Waimakariri River mouth to the Ashley River / Rakahuri Mouth and includes Saltwater Creek estuary. This central, east-facing part of Pegasus Bay represents one of the smaller coastal environments contained within the Canterbury region.

Much of the coastal environment comprises sand dunes backed by pine plantations and is reasonably homogenous, contained by two river systems, the Waimakariri River to the south and the Ashley River / Rakahuri to the north. Modification of the interdune vegetation communities has been substantial. Farmland and townships are evident immediately beyond the pine plantations.

The Study Team determined that due to the level of modification apparent in the coastal environment, that there were only a few areas that reached the Level 4 mapping scale of high and very high natural character. These were generally concentrated areas that typically included wetland communities and included:

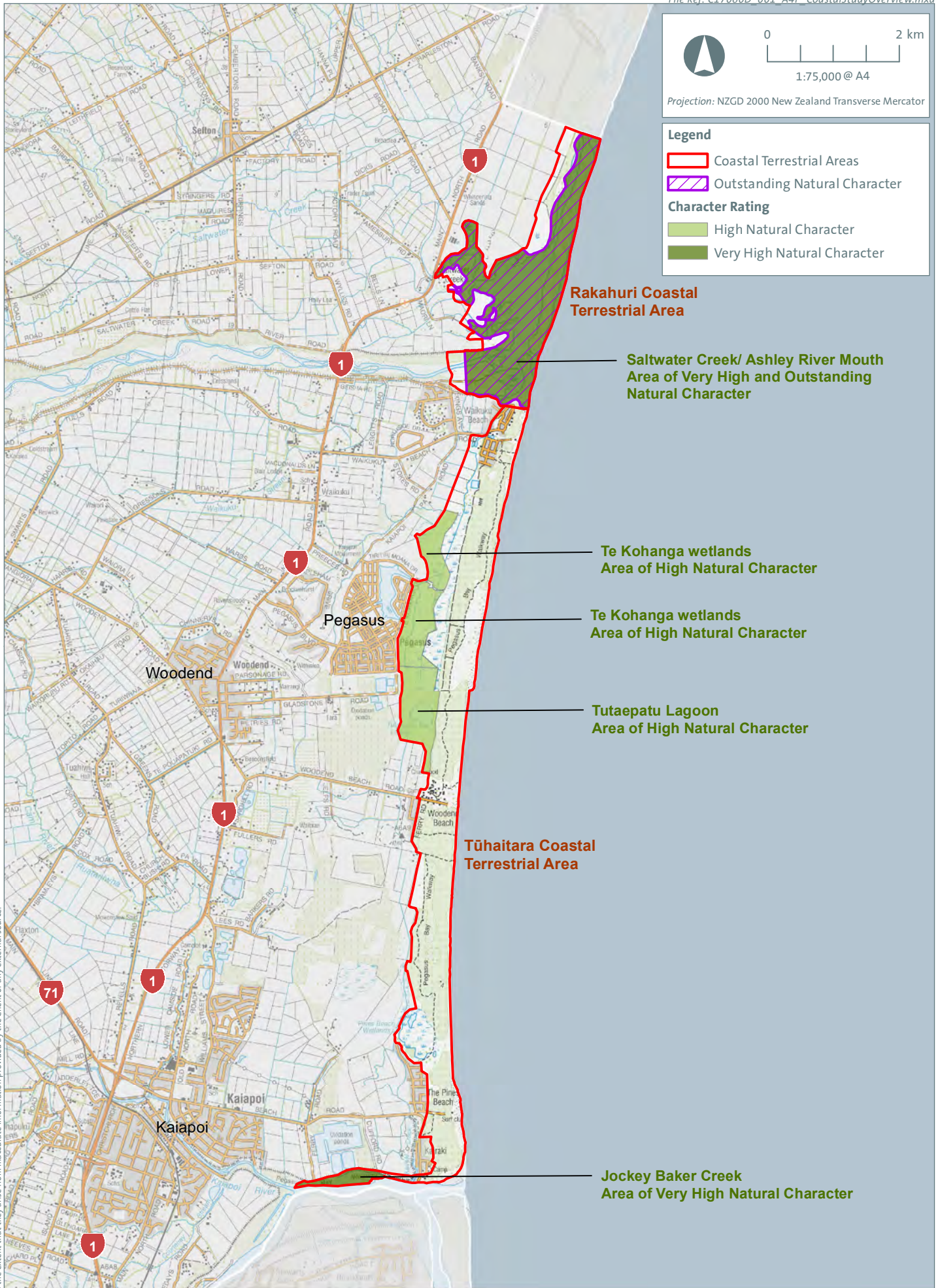
1. Saltwater Creek/ Ashley River / Rakahuri Mouth, which was mapped and rated Very High
2. Te Kohanga wetland, which was mapped and rated High
3. Tutaepatu Lagoon, which was mapped and rated High
4. Jockey Baker Creek, which was mapped and rated High

These areas displayed high and very high levels of abiotic, biotic and experiential aspects of natural character, due to their lack of modification. Typically, these areas were contained by farmland, or commercial forestry which effectively confined these areas to localised areas.

Of these areas, and after reappraisal under the outstanding methodology, only one area managed to reach the outstanding natural character threshold, which as Saltwater Creek/ Ashley River / Rakahuri Mouth. This was primarily due to the extensive intertidal mudflats and saltmarsh habitats that support an abundance of invertebrates as well as a significant variety of bird and fish life. Levels of modification are very low.

The following Figure illustrates the mapped areas within the Waimakariri coastal environment.

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## 2.0 Introduction and Study Background

### 2.1 Purpose and Background

Boffa Miskell (BML) was engaged by Waimakariri District Council (WDC) to define and map the terrestrial component of Waimakariri District's Coastal Environment, utilising the elements described within Policy 1 of the New Zealand Coastal Policy Statement (NZCPS) 2010. The NZCPS 2010, also requires local authorities under Policy 13 to map or otherwise identify (at a minimum) the areas of high natural character within the coastal environment. The NZCPS 2010 Policy 13 also refers to areas of outstanding natural character, necessitating additional evaluation.

As background, BML assisted the Regional Council (Environment Canterbury or ECan) in 2011 and 2012 and again in 2017 to identify and map the extent of the entire Canterbury Coastal Environment and to assess the relevant natural character. A First Draft report was prepared in 2012, entitled '*Canterbury's Coastal Natural Character: Defining and Mapping the Canterbury Coastal Environment*', which identified the inland extent of the coastal environment as well as assessing the natural character of 41 different coastal units. This study was undertaken at a regional scale with the extent of the coastal environment being drawn at a reasonably coarse scale of 1:10,000. Further, this study did not focus in to assess specific high or very high natural character parts on each coastal unit. No Outstanding Natural Character analysis was undertaken. This study focussed predominantly on the terrestrial component of the coastal environment, with little emphasis on the marine component. Since 2012, many other Coastal Studies<sup>1</sup> have been undertaken throughout the country, which have further refined the methodology and understanding of natural character. It is now common practice to assess the marine and terrestrial components separately from a technical perspective, however acknowledging that there are elements, patterns and processes that are inherent between the two. This is often difficult to accommodate when only a district council undertakes this work, since their jurisdictional boundary is the Coastal Marine Area and does not include the marine body of water (which is a regional council's jurisdiction).

In 2017, BML updated the 2012 ECan report. The result was that two separate reports<sup>2</sup> were prepared. One report focussed specifically on the marine environment (up to mean high water springs mark – MHWS), and the other was a slight update to the 2012 report, and focussed more on the terrestrial environment. Both reports remain in a draft status as further work is required to complete and ground-truth the studies. It is intended that as each district council prepares their second-generation district plan, the regional '*Draft Terrestrial*' Study will become superseded by each District's Terrestrial Study leaving only the '*Draft Marine*' Study which will be the other main piece of the coastal environment jigsaw<sup>3</sup>.

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<sup>1</sup> Including: Natural Character of the Marlborough Coast [BML 2014]; Natural Character of the Nelson Coastal Environment [2016]; Natural Character Study of the Waikato Coastal Environment [2016].

<sup>2</sup> Second Draft: Marine Natural Character Study of the Canterbury Coastal Environment [BML 2017] and Second Draft: Terrestrial Natural Character Study of the Canterbury Coastal Environment [BML 2017].

<sup>3</sup> Environment Canterbury has indicated to WDC that the work programme for their Canterbury Coastal Environment Plan review will focus on the seaward side of Mean High Water Springs in the coastal environment.

The emphasis, therefore of this current Coastal Environment study for Waimakariri District Council will be to refine and map the inland extent of the coastal environment at a district level, and to identify areas of high, very high and outstanding natural character.

BML were also involved in coastal natural character studies for adjacent districts, including Hurunui District and Christchurch City, so retain existing data to enable work in Waimakariri to complement those adjacent areas.

## 2.2 Study Scope

WDC is currently undertaking a series of technical studies which will inform their second-generation district plan. Specifically, the District Plan Review (DPR) needs to determine the extent to which the operative District Plan is required to be amended to give effect to both the New Zealand Coastal Policy Statement (NZCPS) and the Canterbury Regional Policy Statement (CRPS)<sup>4</sup>.

The operative District Plan (2005) recognises the coastal environment through policy (Chapter 7). However, the Plan does not spatially identify it, other than through the confinement of the urban beach settlements and the identification of a rural subdivision constraint area<sup>5</sup>.

## 2.3 Study Process

The coastal study has been undertaken as an independent technical assessment and has been subject to input by a terrestrial ecologist.

Following agreement with WDC concerning the methodology<sup>6</sup>, the study team refined the inland extent coastal environment and identified two coastal areas. This task involved using GIS and the original 2012 ECan alignment. Careful analysis of the inland extent of the coastal environment was determined on detailed aerial photographs and this was further refined through a site visit along the extent of the boundary.

A visit to the coastal environment was undertaken on 19 April 2018 by James Bentley to ground truth as much as possible the alignment of the inland extent of the coastal environment and the areas that rated at least high natural character. Some minor refining of the extent of the draft mapping took place following this field work.

Once the inland extent of the coastal environment was determined, the two originally identified coastal area extents<sup>7</sup> were further refined with BML terrestrial ecologist Scott Hooson. It is important to ensure that the terrestrial areas 'make sense ecologically' as well as ensuring that they capture characteristics that are representative of the specific area. This refined level of work confirmed that the extent of the three Coastal Terrestrial Areas as mapped in the original 2012 ECan Study (and reproduced in the 2017 ECan '*Draft Terrestrial Natural Character Study*') are accurate and appropriate.

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<sup>4</sup> Request for Professional Service, page 1.

<sup>5</sup> Request for Professional Service, page 1.

<sup>6</sup> Through discussion with WDC.

<sup>7</sup> Coastal Terrestrial Area 20: Ashley and Coastal Terrestrial Area 21; Pegasus (Second Draft: Terrestrial Natural Character Study of the Canterbury Coastal Environment, BML 2017)

The study team is familiar with this part of the Waimakariri District, particularly through the work involved in the recent Waimakariri Landscape Study, as well as the work completed for ECan. Ecologically, Scott Hooson is very familiar with this area, especially Saltwater Creek/ Ashley River / Rakahuri mouth.

Following this, work on reviewing and updating the 2017 ECan *Draft Terrestrial Natural Character Study* text to apply to the Waimakariri area commenced and identification of a more refined mapping occurred (i.e. the Level 4 scale<sup>8</sup>). These areas were identified and delineated on a series of maps and their condition and values tabulated. Following this, identification of any areas containing Outstanding Natural Character (ONC) were considered.

No stakeholder input has been provided into the preparation of this study, but it is understood that this study will provide a basis for consultation through the DPR process.

## 3.0 Natural Character Assessment Methodology

The full methodology that has been used for this Study is contained within Appendix 2. The following summarises the methodology used.

The objective of this Study is to identify and map the Coastal Environment and areas of high or outstanding natural character and their values under the NZCPS 2010, based on current best practice and guidance within higher order planning documents.

### 3.1 Extent of the Coastal Environment

The Resource Management Act 1991 (RMA) does not define 'coastal environment', nor does the NZCPS 2010. However, the extent of the coastal environment needs to be considered in order to respond to Policy 1 of the NZCPS 2010.

Policy 1 outlines the necessary matters that comprise the coastal environment, and these have been taken into account in terms of defining the inland extent of the coastal environment. As the Waimakariri District does not include the marine area, the extent of the 'seaward' coastal environment, extends to mean high water springs, or MHWS.

Boffa Miskell have developed a model of the different areas or 'zones' of the coastal environment. The Waimakariri District is concerned with the Coastal Significance Zone (or the terrestrial component of the coastal environment) and the Coastal Context Zone, which is located immediately adjacent to the coastal environment. For ease, this study refers to the coastal environment as Coastal Terrestrial Areas (as no marine areas are included).

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<sup>8</sup> The scaling for the Coastal Natural Character Study is explained in Section 2.2.4 of this report



## 3.2 Natural Character

Natural character is not defined in the RMA or in the NZCPS 2010. BML considers that the environments with the greatest natural character are those with comparatively low levels of human modification. Areas with high natural character are composed of natural elements appearing in natural patterns and underpinned by natural processes.

Within '*Natural Character and the NZCPS 2010*' [2012, DOC, p19] the following definition was endorsed:

*Natural character is the term used to describe the natural elements of all coastal environments. The degree or level of natural character within an environment depends on:*

- 1. the extent to which the natural elements, patterns and processes<sup>9</sup> occur and;*
- 2. the nature and extent of modification to the ecosystems and landscape/seascape.*

*The degree of natural character is highest where there is least modification.*

*The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community<sup>10</sup>.*

This definition, along with the matters outlined within Policy 13 of the NZCPS have been adopted for this study.

A scale of Very High to Very Low was determined to measure the naturalness of the Coastal Terrestrial Area.



**Illustration 1:** Naturalness rating scale.

### 3.2.1 Natural Character Scales

Natural Character assessments use different scales of reference that steadily decrease from the broad regional scale to the detailed local scale. Natural character is context and scale related. i.e. the coastal area can be perceived as having different levels of natural character at different scales, depending on the level of detail investigated.

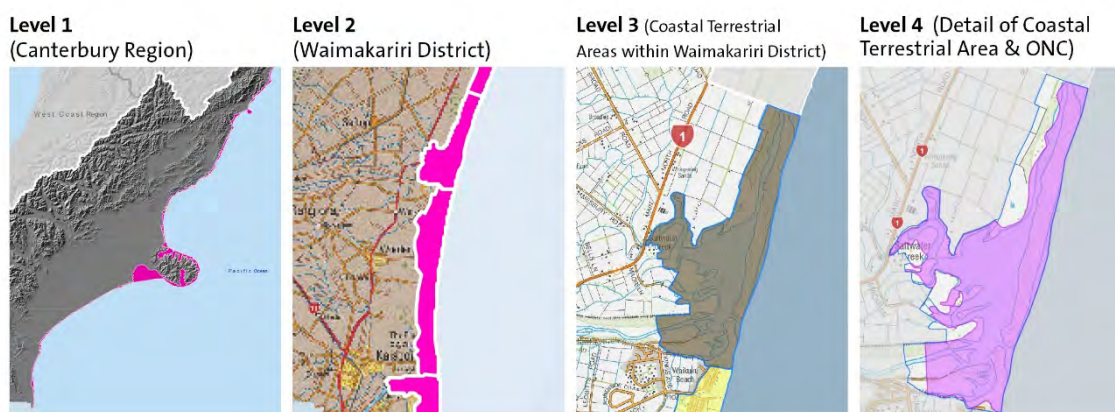
As the simplified diagram in Diagram 3 below illustrates, that natural character scales for Waimakariri can be considered at both a broad and more detailed scale. At a broad scale, the coastal environment of Waimakariri is located within the region of Canterbury, and therefore the broadest scale (i.e. Level 1) is Canterbury. At this scale, climate, geomorphological and land uses can have broad natural character inferences. The Waimakariri District as a whole would be considered as the next broad level, or for this (Level 2).

<sup>9</sup> For the purposes of interpreting the NZCPS 2010 Policy 13.2, 'elements, patterns and processes' means: biophysical, ecological, geological and geomorphological aspects; natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks; and the natural movement of water and sediment.

<sup>10</sup> Department of Conservation Natural Character Workshop Minutes; 2 August 2011(DOCDM-795012)

At a more **detailed scale Levels 3-4** are considered. At the more detailed scale is **Level 3**, which includes the Coastal Terrestrial Areas (CTAs - for this study, there are two labelled as Coastal Terrestrial Areas 1-2). At the most refined scale, is **Level 4** (mapped at 1:2,500). Only at this more detailed stage is outstanding natural character considered. **Level 4** scale is illustrated as bullet points in the tables and more refined mapping within the Level 3 CTAs.

The hierarchical approach, depicted by **Illustration 2** has been useful in further identifying specific features or stretches of coastline with higher levels of natural character compared to the remaining parts of the Coastal Environment.



**Illustration 2:** Scaling diagram of levels of natural character.

### 3.2.2 Evaluation of Natural Character

The following main points are adopted for this study:

- the methodology can be adapted to suit different types and scales of coastal landscapes and ecosystems;
- an understanding of natural character requires input from freshwater and terrestrial ecologists and other natural scientists, as well as the input of landscape architects and planners;
- that natural character can be assessed on a continuum of modification that describes the expression of natural elements, patterns and processes (or the 'naturalness') in a coastal landscape/ ecosystem where the degree of 'naturalness' depends on:
  - The extent to which natural elements, patterns and processes occur and are legible;
  - The nature and extent of human modifications to the landscape, seascape and ecosystems;
  - The fact that the highest degree of natural character (greatest naturalness) occurs where there is least modification/ uncluttered by obvious or disruptive human influence; and
  - Recognition that the degree of natural character is context-dependent and can change over time.

Only areas of high and very high natural character have been identified within the terrestrial environment.

When assessing natural character of the coastal environment, several key attributes need to be considered. The list of attributes that natural character may include (NZCPS 2010 Policy 13 (2)) have been grouped broadly into the categories of biotic, abiotic and experiential attributes to provide a systematic way to consider the different aspects of the natural patterns, processes and elements of the coastal environment and the degree of modification present:

<b>Table 1: Coastal Terrestrial Attributes</b>		
<b>ECan Marine Natural Character attributes</b>	<b>Waimakariri Terrestrial Coastal Natural Character Study Attributes</b>	<b>Comment on attributes</b>
	<i>Active Coastal Interface</i>	This is part of the coastal environment that closely overlaps with the marine area and is more descriptive.
Abiotic	Abiotic Systems and Landforms	All aspects of the abiotic terrestrial coastal environment included.
Biotic	Terrestrial Biotic Systems	All aspects of the biotic terrestrial coastal environment included.
	Land Cover and Land Use	Is a subset of the Terrestrial Biotic Systems and is not specifically rated.
Experiential	Perceptual/ experiential	This is part of the coastal environment that closely overlaps with the marine area.

The list of attributes has been developed to avoid double-counting and to ensure that the indicators for each attribute are mutually exclusive. Perceptual and experiential attributes for each have a small degree of overlap between marine and terrestrial, however, the descriptive approach allows for those overlaps to be clearly articulated. An overall value judgement as to the degree of natural character is then made for each coastal terrestrial area.

When determining the overall natural character evaluation at the area scale, the methodology that has been developed uses a greater weighting given to natural science attributes, which encompass abiotic and biotic values, compared with experiential values. This recognises that natural character is a condition rather than a quality or value; it exists regardless of experiential attributes.

### 3.2.3 Outstanding Natural Character

Outstanding Natural Character has been assessed as a separate component of this study. It has only been assessed where an area at the Level 4 scale is considered to have 'high' or 'very high' levels of natural character.

Outstanding natural character, by its very term, determines the highest rated areas should include systems that interconnect with each other and therefore should not be considered in isolation.

Under the BML methodology, an area of outstanding natural character must:

*'exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (the 'clutter' factor) and other modifications compared to other areas in the Waimakariri District. (Boffa Miskell)*

## 4.0 The Waimakariri District Coastal Terrestrial Environment

### 4.1 Introduction to the Waimakariri District Coastal Environment

The Waimakariri District coastal environment is located within the central part of Pegasus Bay which extends approximately 15 km from the Waimakariri River mouth to the Ashley River / Rakahuri Mouth and includes Saltwater Creek estuary. This central part of Pegasus Bay faces east and is exposed to moderate wave energy, sheltered predominantly from high-energy storm waves from the Pacific Ocean by the Banks Peninsula. The embayment is a large sediment trap in the sheltered lee of Banks Peninsula, where consistent southerly currents bring sandy deposits to the shore. The most significant dunes of the Canterbury coastline are located along the backshore of Pegasus Bay. Large river systems such as the Waimakariri and Ashley also nourish these beaches.



*Image 1: Backdunes of Pegasus Bay at Woodend Beach*

In order to stabilise the dune lands exotic grasses (in particular marram grass) and forest plantations have been planted across the majority of the area. Modification of the interdune vegetation communities has been substantial. Recently, some of the small lagoons found within this area, such as Tūtaepatu, have been restored from a degraded state dominated by exotic weeds. The rivermouth and estuary environments in the District are some of the most significant coastal bird habitats in the region. The hinterland of the coast is dominated by commercial

forestry, farming and urban development. The terrestrial component of the coastal environment is inextricably linked to the marine component.

Opportunities such as the creation of a series of wetlands close to the Pegasus township and the initiatives sought by the Te Kōhaka o Tūhaitara Trust have assisted to improve the health of the coastal environment. New planting and opportunities for increased biodiversity have resulted in a greater awareness of the natural environment and can improve the natural character of an area.

## 4.2 Waimakariri District's Terrestrial component of the coastal environment

The terrestrial component of the coastal environment is, with the exception of Saltwater Creek/ Ashley River / Rakahuri Mouth and part of the Waimakariri River Mouth, a slender area of sand beach backed by coastal dunes extending from the MHWS mark to the inland extent of the coastal significance zone. The narrow width of this coastal significance zone is due almost exclusively to land use activities that have modified the environment to almost immediately (in some locations) beyond the backshore.

To assist in describing the natural character of the terrestrial component of Waimakariri's coastal environment (or the land above MHWS mark), the following attributes have been determined. They have been broadly adopted from the *'Draft Terrestrial Natural Character Study of the Canterbury Coastal Environment'* [BML 2017] and broadly fit within the Abiotic, Biotic and Experiential attributes as discussed in earlier in this report.

### 4.3 Active Coastal Interface

Having a close relationship with the work contained within *'Draft Marine Natural Character Study of the Canterbury Coastal Environment'* [BML 2017], the active coastal interface is essentially the strip of land immediately abutting the MHWS mark (being the 'cut' off point between the two coastal natural character studies).

Since nature does not divide the coastal environment into two clean areas, the active coastal interface is often interpreted and described to include the part where the land is heavily influenced by the sea. As stated, there is often overlap between the marine and the terrestrial area as each influence the other.

The active coastal interface includes active and back dunes and any area immediately above the MHWS mark. This area clearly differs from one Coastal Terrestrial Area to another, and can be quite large in some areas and quite small in others.

The active coastal interface attracts a large number of birds, especially close to river mouths and creeks providing many important habitats for species such as shags, gulls, terns, waders and waterfowl.

Modification within the active coastal interface can have a direct impact on the broader area's level of natural character.

#### 4.4 Abiotic Systems and Landforms of the Coastal Terrestrial Area

The landforms found along the coast of Canterbury are diverse, reflecting underlying geology and ongoing erosional processes. The constant processes of deposition and erosion with sediments being transported by the rivers and currents of the sea, continue to shape the coastline. The Waimakariri River, a major mountain-fed river enters the ocean at the southernmost part of the district, depositing alluvial material. This material gets carried northwards by the currents, replenishing and nourishing Waimakairi's sandy beaches.



*Image 2: Walkway along the Waimakariri River*

Throughout Pegasus Bay, numerous river mouths have led to the formation of lagoons at the coastal interface. The more frequently occurring coastal lagoon is the hapua-type lagoon, where built-up material is shifted along the coast by the waves which offsets the river mouth further along the beach. These lagoons provide habitats that are often of national and international importance, attracting a variety of wetland and coastal bird species.

#### 4.5 Terrestrial Biotic Systems

Within the Canterbury Region generally, as well as the Waimakariri District, the ecological processes in the terrestrial part of the coastal environment have been significantly more modified than within the marine area. The habitats for marine mammals, such as dolphins and whales and the land/ sea interface, and intertidal habitats have been covered in the *Draft Marine Natural Character Study of the Canterbury Coastal Environment* [BML, 2017].

Before the arrival of humans, the land within the Waimakariri District (including Waimakariri's terrestrial coastal environment) was likely to have supported a mosaic of vegetation. There would have been podocarp forest in areas with deeper soils, while stable gravels would have

supported kanuka forest, kowhai and cabbage tree treeland, matagouri shrubland and silver tussockland. Native grassland would have occupied more recently-deposited gravels. There were also extensive areas of open freshwater wetland vegetation characterised by sedgeland, rushland, raupo reedland, and flax. Nearer the coast, saline wetlands and turfland will have been present (Stevens and Meurk 1996).

Following human arrival much of this vegetation was burnt and cleared, although extensive wetlands remained at the time of European settlement. Following European settlement, many of the wetlands were drained and developed into farmland. Most dunes have been stabilised with exotic marram grass as an erosion control measure and very few areas of duneland now retain native vegetation. The Canterbury Plains, including Waimakariri's coastal terrestrial environment, is now among one of the most modified regions in New Zealand. The land cover has been substantially modified by burning and land clearance for agriculture and settlement. Nearly all of the ecological district is intensively farmed, most soils have been cultivated and many areas are now irrigated.



*Image 3: Modified grazing land near Pines Beach*

Much of the remaining native vegetation is associated with coastal wetlands and lagoons behind the backdunes, and the estuarine communities of Saltwater Creek. The northern bank of the Waimakariri River, Tūtaepatu Lagoon and the Ashley Rivermouth/Saltwater Creek are recognised as being particularly important for their ecological values. They also provide important breeding, feeding and resting places for wetland and coastal birds, including waders.

#### 4.6 Land Cover and Land Use

This attribute is considered to be a sub-set of Terrestrial Biotic Systems and any rating will be cumulative.



The land cover of the Canterbury lowlands and the coastal environment has been substantially modified over the past centuries. This was driven by the desire to create pastoral farmland. In particular, 19th century European settlers removed much of the coastal vegetation, through burning and land clearance.

The most accessible and fertile parts of the Canterbury Region, such as the lowland plains within the Waimakariri District, have experienced the highest level of modification. The intensification of farming on the irrigated, fertile plains has led to the creation of distinctively unnatural patterns across this part of the district. In many instances, these extend very close to the coastal edge.

#### 4.7 Perceptual and Experiential Factors

There is a clear overlap with this attribute and the descriptions contained within the *Draft Marine Natural Character Study of the Canterbury Coastal Environment* [BML, 2017]. The following description, whilst trying to focus solely on terrestrial aspects, clearly is tied very closely with that of the marine environment. This artificial division is purely a way of organising data between two separate studies.

Ultimately the way people experience the Waikamariri coastal environment will be highly dependent on how accessible the area is. For the Waimakariri District, there are sheltered areas (such as parts of Saltwater Creek) and parts that are more exposed, such as the open coastline fronting the Pacific Ocean.

In the Waimakariri District, the ability for people to experience the coastal environment area is reasonably high. There are several small coastal settlements that align the coast, and include areas such as Kairaki, Pines Beach, Woodend Beach and Waikuku Beach. Whilst some inhabitants live year-round, during the summer, these settlements often become very busy, where a focus on the coastal environment is a priority. As a result, all of these settlements are focussed on recreational activities, such as surfcasting, horse riding, surfing, swimming, walking and bird watching with Kairaki Beach, Woodend Beach and Waikuku Beach having holiday parks. Pines Beach is a well-known surfing beach, noted for its ability to cater for all surfer levels. Access to the coast from Pegasus town is also possible through the recently constructed wetlands.

The Pegasus Bay Walkway, which extends from the northern bank of the Waimakariri River in the south to Waikuku Beach in the north offers walkers an opportunity to experience the coastal back dunes within the coastal environment. Part of the walkway extends through pine plantations which have assisted to stabilise the dunelands. Some areas of native planting have been established along the walkway.



**Image 4:** *Part of the Pegasus Bay Walkway extends through mature pine plantations*

Despite these nodal areas of activity and much of the back dunes occupied by pine plantation, opportunities to escape are plentiful. In between the settlement areas are several kilometres of broad, open sandy beach where it possible to gain relative senses of isolation, remoteness and wildness.

## 5.0 The Waimakariri District Coastal Terrestrial Areas

(Level 3 scale – or ‘Area’ scale)

The following Coastal Terrestrial Areas has been identified for the Waimakariri coastal environment (Refer to **Figure 2**):

Coastal Terrestrial Area 1: Rakahuri

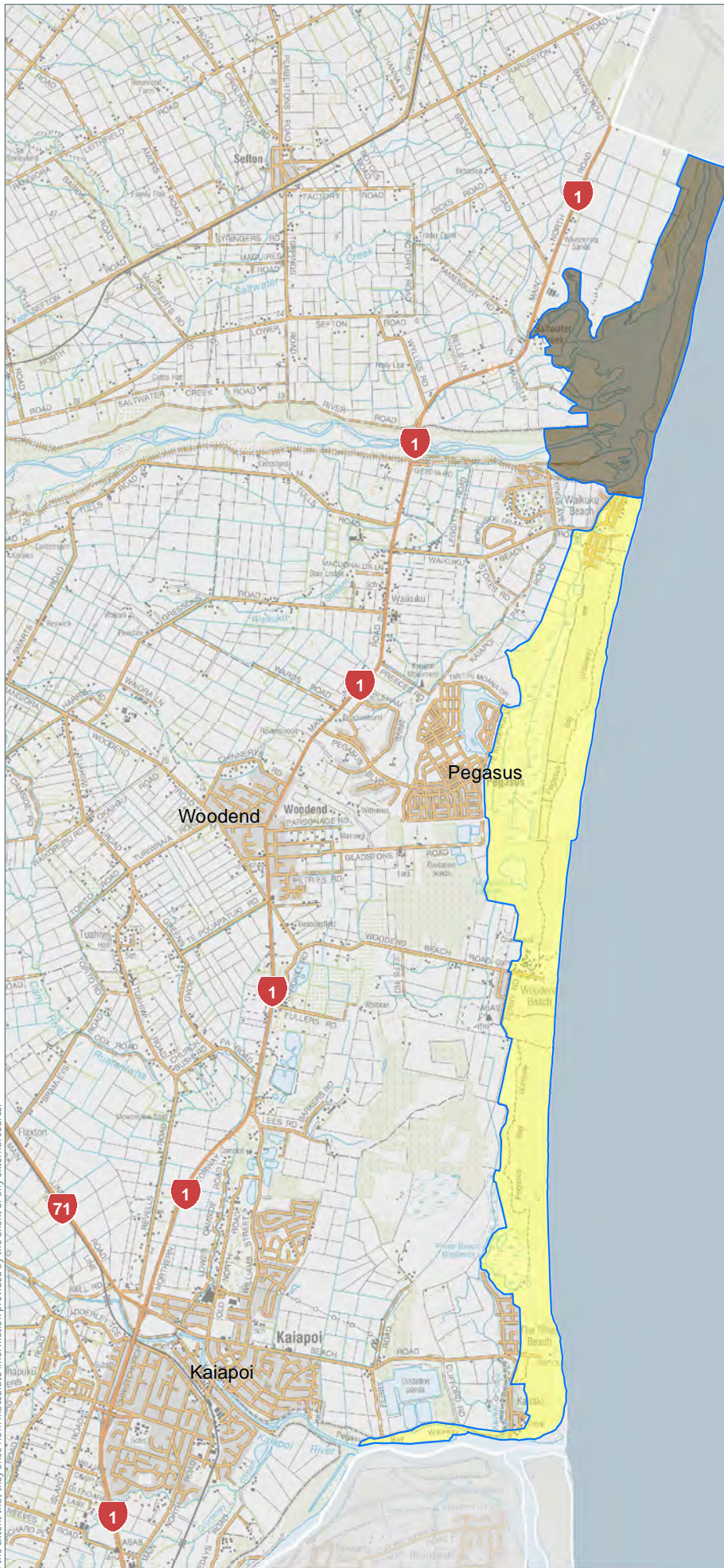
Coastal Terrestrial Area 2: Tūhaitara



Projection: NZGD 2000 New Zealand Transverse Mercator

Legend

- Coastal Environment
- Coastal Terrestrial Areas**
  - Rakahuri
  - Tūhaitara

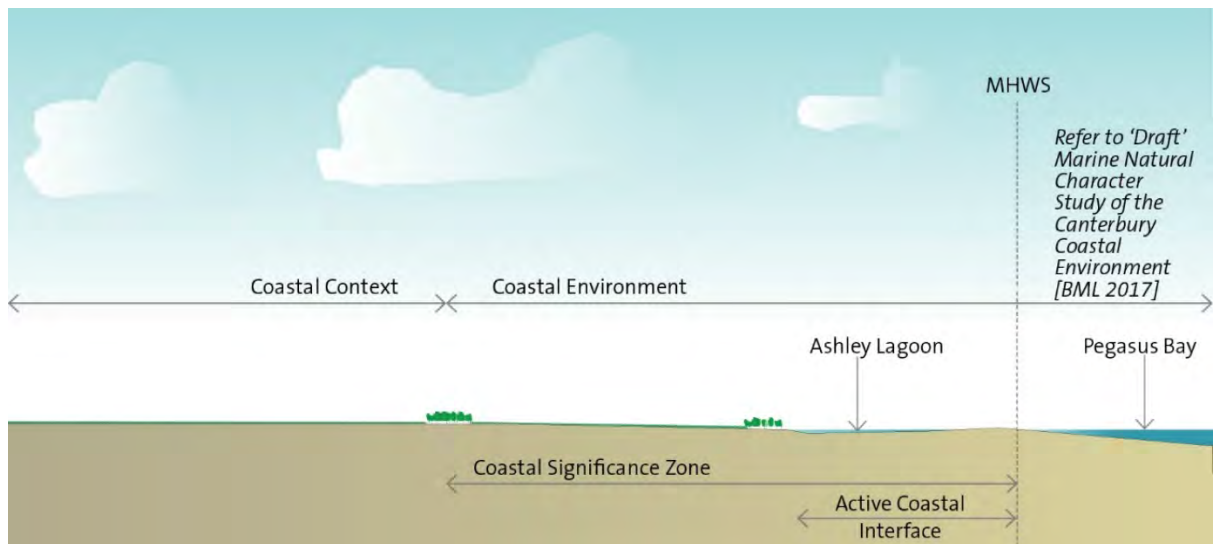


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## 5.1 Coastal Terrestrial Area 1: Rakahuri



**Image 5:** Ashley River / Rakahuri Estuary/ Saltwater Creek



**Diagram 1:** Representative coastal diagram of the Rakahuri Coastal Terrestrial Area.

### 5.1.1 Location and Key Characteristics

The Ashley River / Rakahuri / Saltwater Creek estuary is located just north of Waikuku settlement, approximately 30 km north of Christchurch.

The coastal area encompasses the full extent of the estuary and lagoon, which forms to the north of the Ashley River/ Rakahuri behind Ashworths Spit.

The estuary supports very high ecological values and includes extensive areas of saltmarsh and provides outstanding habitat for a very high diversity of coastal and wetland bird species including migratory species. It provides important habitat for a number of fish species. Saltwater Creek is an important inanga spawning area and is highly valued as a local whitebait fishery.

### 5.1.2 Coastal Context

The settlement of Waikuku lies on the south bank of the Ashley River / Rakahuri adjacent to the river mouth. On the northern side, residential use is sporadic and largely confined to the western side of State Highway 1, which forms the western boundary of the Saltwater Creek estuary. The general land use on the plains to the west is intensive agriculture, which raises concerns in relation to nutrient-rich run-off for slow-flowing, spring fed streams like Saltwater Creek.

#### Active Coastal Interface

Refer to '*Draft Marine Natural Character Study of the Canterbury Coastal Environment*' [BML, 2017] for information below MHWS. At page 98 and 99 of this study, the waters of the Ashley River Mouth/ Rakahuri Saltwater Creek Estuary (below MHWS) was considered to hold Outstanding Natural Character, predominantly for its ecological value and lack of modification.

Saltwater Creek (northwest) and the Ashley River/ Rakahuri (south-west) both discharge into the estuary which makes up this coastal area. Saltwater Creek is regarded as a highly productive and relatively unpolluted estuary that provides spawning habitat for freshwater fish. The estuary is relatively unmodified and includes sand dunes and spits, open brackish water, a river delta, low mud banks and extensive mudflats. Intertidal sediments within the estuary are quite variable in size and texture, ranging from fine mud in sheltered areas of Saltwater Creek through muddy sand to firm sand, stones and cobbles at the southern end.

### 5.1.3 Abiotic Systems and Landform

The Ashley-Saltwater Creek estuary is the third largest tidal estuary in the Low Plain Ecological District. It consists of a river delta mud and sand flats and saltmarsh behind a sand dune barrier. Most of the estuary is tidal estuarine saltmarsh, and located mean high-water springs, but there are small areas of adjoining non-tidal saltmarsh and riverine and palustrine marsh. Saltwater Creek joins the Ashley estuary as a meandering, slow flowing tidal stream. On the coastal side of the estuary, adjoining Pegasus Bay is Ashworths Spit, a prominent sand spit that protrudes south to the mouth of the estuary. The Ashley River / Rakahuri is a foothills river, characterised by higher winter flows, some of which carry substantial sediment loads from the foothills and agricultural land into the estuary.

#### 5.1.4 Terrestrial Biotic Systems

The estuary supports very high ecological values and includes a relatively extensive, intact and diverse sequence of estuarine vegetation communities in its lower reaches. It extends approximately 2.5 km upstream from the estuary up Saltwater Creek past the bridge on SH 1.

Wetland habitats grade from saline tidal flats to a freshwater flax swamp. Narrow mudflats that line the creek mouth are colonised by salt tolerant herbs, including *Samolus repens*, *Leptinella dioica* and *Isolepis cernua* and buck's horn plantain. The tidal channel has a fringe of three-square and jointed wire rush in uniform stands and sea rush is also common. Saltmarsh ribbonwood is abundant away from inundated areas. Extensive and dense stands of raupo, toetoe, cutty grass (*Carex geminata*), then flax with willows occupy the mid and upper sections of the wetland. Along most of the mid and upper sections there is a rapid transition from wetland to developed farmland. Gorse is common around the estuary and creek mouth, usually mixed within a thick tangle of sea rush, saltmarsh ribbonwood and rank grasses. Parker (2014) identified the main wetland vegetation types as sea rush rushland, saltmarsh herbfield, saltmarsh ribbonwood shrubland, oioi restaid rushland, sea rush – oioi rushland and exotic saltmarsh grassland.



**Image 6:** Mudflat areas colonised by salt tolerant vegetation

The area is a wetland of international significance for wildlife. It has been ranked by O'Donnell (2000) as having 'outstanding' habitat for birds. It provides habitat for migratory bird species and provides feeding habitat for many of the braided river bird species that breed upstream in the Ashley River. The diversity of bird species is very high (a total of 69 bird species recorded of which 45 are wetland species) and it supports large numbers of some species. It is particularly important as an autumn-winter habitat for a number of threatened species. Noteworthy species

include black-fronted tern, banded dotterel, pied stilt, black stilt (very occasionally) and marsh crake (Parker 2014).

The estuary is important habitat in the life cycle of many native fish species including inanga, eels, koaro, flounder, common smelt, torrentfish and bullies (Daly 2004). Saltwater Creek is an important inanga spawning area and is highly valued as a local whitebait fishery. Undisturbed low vegetation along the stream margins is essential habitat for spawning galaxiids.



*Image 7: Koaro*

#### 5.1.5 Land Cover & Land Use

A subset of Terrestrial Biotic Systems. This coastal area is largely confined to the immediate estuary/ river mouth and contains a high proportion of indigenous wetland and salt marsh vegetation. The surrounding areas, including the land between Saltwater Creek and the Ashley River / Rakahuri are farmed and highly modified with cultivated paddocks and drains, which contrasts with the sinuous outlines of the river channels and estuary.

#### 5.1.6 Perceptual/ experiential

Waikuku Beach and the Ashley River / Rakahuri mouth area are popular spots for fishing, camping, family gatherings, surfing and swimming. The river mouth is also popular for its whitebaiting opportunities. Access to the beach and river mouth is easy and efforts have been undertaken to reduce vehicle usage to protect the sensitive environment. The estuary has a



unique character with its many side arms and tidal mudflats. It retains high experiential values, notably through the high degree of naturalness that is apparent, a sense of remoteness and tranquillity through the lack of modification apparent.

It is a haven for bird watchers and for quiet enjoyment, and separate from the Waikuku Beach settlement and surf club on the south bank of the Ashley, which are nodes of activity.

### 5.1.7 Summary of Natural Character Characteristics at Level 3

<b>Level 3 Rating: Coastal Terrestrial Area 1</b>					
Degree of Natural Character	Natural Character Attributes				
	<i>Descriptive</i>	<b>Abiotic</b>	<b>Biotic</b>		<b>Experiential</b>
	Active Coastal Interface	Abiotic Systems & Landforms	Terrestrial Biotic Systems	Land Cover & Land Use (sub-set of biotic)	Perceptual/Experiential
Very High				✓	
High		✓			✓
Moderate - High					
Moderate					
Moderate - Low					
Low					
Very Low					
<b>Overall Natural Character Rating</b>			High		



**Image 8:** Saltwater Creek fishing platforms

## Coastal Terrestrial Area 1: Specific Characteristics at the local scale (Level 4)

These are mapped with reference to <b>Figure 3</b>							
Area	Overall Rating	Abiotic	Biotic		Exp	Key Characteristics	Additional Comments
		Abiotic Systems & Landforms	Terrestrial Biotic Systems	Land Cover & Land Use	Perceptual/ Experiential		
Saltwater Creek/ Ashley River / Rakahuri Mouth	Very High	VH	VH		H	<ul style="list-style-type: none"> <li>• The estuary supports very high ecological values and includes extensive areas of saltmarsh vegetation.</li> <li>• The estuary is relatively unmodified and includes sand dunes and spits, open brackish water, a river delta, low mud banks and extensive mudflats. It therefore retains high legibility.</li> <li>• Provides outstanding habitat for a very high diversity of coastal and wetland bird species, including migratory species.</li> <li>• Important habitat in the life cycle of many native fish species.</li> <li>• Experiential values relating to high degree of naturalness, tranquillity and remoteness due to lack of built structures.</li> <li>• Opportunities for white baiting and fishing and bird watching.</li> </ul>	<p>The 'Marine' component retains High levels of natural character, as mapped within the '<i>Draft Marine</i>' ECan Study 2017.</p> <p>The coastal area is largely confined to the immediate estuary/ river mouth. The surrounding areas are farmed and highly modified</p> <p>Excludes the more modified pastoral land and areas of settlement.</p> <p>Includes fishing platforms.</p>

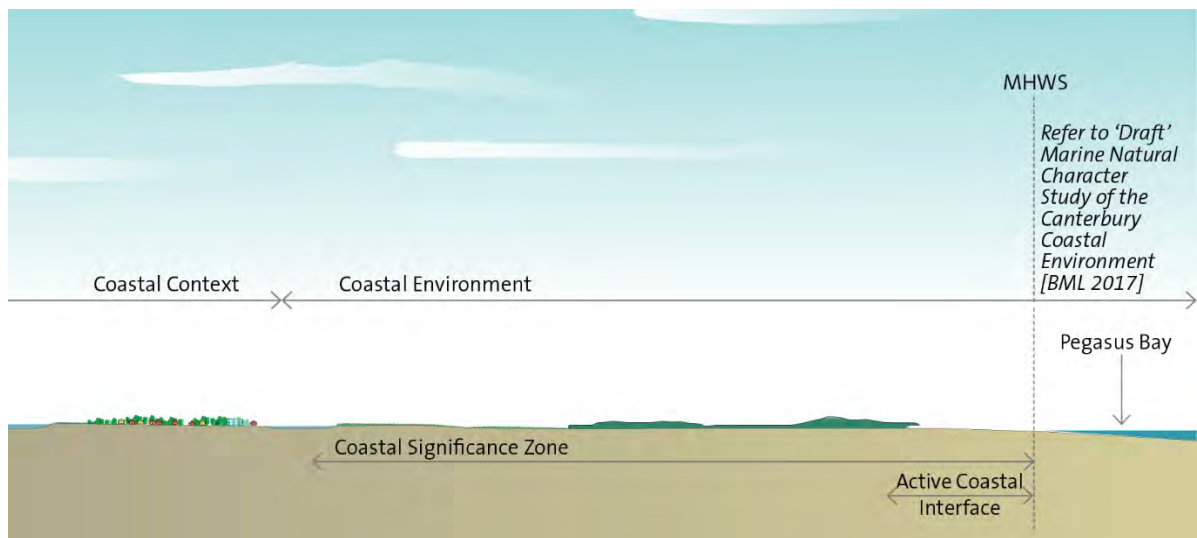


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## 5.2 Coastal Terrestrial Area 2: Tūhaitara



**Image 9:** Waikuku Beach



**Diagram 2:** Representative coastal diagram of the Tūhaitara Coastal Terrestrial Area.

### 5.2.1 Location and Key Characteristics

This central section of the Pegasus Bay coast, is situated between the Ashley River / Rakahuri in the north and the Waimakariri River in the south and comprises the majority of the coastal environment in this district. The wide, sandy beaches and steep marram covered dunes are typical of this central and southern part of Pegasus Bay. A number of settlements are located in, or near to, this coastal area, including Waikuku Beach in the north, Pegasus Township in the centre, and Woodend/ Pines Beach and Kairaki in the south. The beaches of this coastal segment are popular for recreational activities. The dunes and hinterland are intensively used for plantation forests and small settlements. There are several coastal wetlands within the coastal environment that are of high ecological value, and restoration efforts are being undertaken at several of them.

### 5.2.2 Coastal Context

The context for this coastal area is formed by an intensively settled part of the plains. The large-scale settlements of Pegasus Township, Woodend and Kaiapoi are in close proximity to the coastal environment of Pegasus Bay. Oxidation ponds for these townships are located adjacent to the Waimakariri River and Woodend/ Pegasus Town. Extensive pine plantations have led to large-scale landscape change in the coastal hinterland south of Pegasus Township. Intensive agriculture is the dominant land use further inland.

### 5.2.3 Active Coastal Interface

Refer to '*Marine Natural Character Study of the Canterbury Coastal Environment*' [BML, 2017] for information below MHS. The central Pegasus Bay coast is characterised by wind and wave dominated fine-sand beaches backed by dunes. The coastline is aggrading gradually in the lee of Banks Peninsula, which shields Pegasus Bay from southerly storms. Waves within the bay are typically less than 2m high and approach from northerly and easterly directions.

### 5.2.4 Abiotic Systems and Landform

Active dunes and the intertidal beach is backed by fixed dunes and drained interdune areas, mostly blue clay flats formerly occupied by tidal lagoons and swamp. Sand flats and undulating low dunes, including areas levelled for sand use are located behind. Between the foredunes and the main dunes are dune slacks which are low lying depressions, which means that in winter they are often close to the water table. In these areas soil is starting to develop and the vegetation cover in these wet saline hollows is becoming extensive with very specific plant associations. In many areas, the dunes have been modified through extensive forest plantations, and the introduction and spread of the exotic sand binder marram grass. There are very few areas where natural dune processes can still be observed.

### 5.2.5 Terrestrial Biotic Systems

Extensive pine forest plantations have substantially modified the coastal environment. Towards the coast, young, unstable dunes are present that would have originally been covered by pingao. These dunes are now almost completely dominated by the exotic sand binder marram grass.

The coastal area between the Ashley/Rakahuri and Waimakariri Rivers still provides a significant corridor for native biodiversity, including Tūtaepatu Lagoon (east of the settlement of Woodend) and associated wetland areas and indigenous vegetation remnants. A large portion of the area is within the Tūhaitara Coastal Park, which covers around 575 ha along the coastline between the Waimakariri River mouth and the township of Waikuku. The Coastal Park includes natural features of local, regional and national importance<sup>11</sup>. This area is the focus of extensive restoration efforts by the Te Kōhaka o Tūhaitara Trust. Keystone projects include the establishment of a biota node network and the rehabilitation of Tūtaepatu Lagoon and The Pines Beach Wetland.

Te Kohanga wetlands, associated with the Pegasus township adjoin the Tūhaitara Coastal Park and comprise of a large network of restored wetlands with indigenous species which is accessible via network of tracks.



*Image 10: Te Kohanga wetlands, Pegasus*

Tūtaepatu Lagoon is a small near-permanent spring-fed lowland lagoon. It is unusual in that it flows north into Taranaki Stream which then flows into the Ashley River, as well as south into the Waimakariri River. The lagoon, and wider area, has undergone considerable hydrological modification, and has been heavily grazed in parts. While the vegetation is mostly exotic willows and grass, some native regeneration is occurring under the willow forest and extensive ecological restoration work is being undertaken. The lagoon provides important habitat for indigenous fauna, including nationally significant bird habitat. It supports large populations of some bird species and a high diversity of waterfowl. It is good breeding habitat for New Zealand scaup, marsh crane and other wetland species, and is a breeding location for little shags and an over wintering habitat for waterfowl (O'Donnell, 2000). Freshwater fishes include eels, whitebait

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<sup>11</sup> [http://ngaitahu.iwi.nz/our\\_stories/tuhaitara-coastal-park/](http://ngaitahu.iwi.nz/our_stories/tuhaitara-coastal-park/)

species and the threatened (Nationally Critical) Canterbury mudfish. Despite the relatively high levels of modification, and low level of naturalness, in the context of the wider area it is of high ecological significance.

The Pines Beach Wetland is a 36 hectare dune slack wetland. Originally it was a lagoon open to the sea, however around 1970, the opening was closed and the area is now in the late stages of transitioning from an estuarine wetland to a freshwater marsh. There are relict saltmarsh species scattered within mainly freshwater wetland vegetation. The main vegetation communities are grey willow forest with three square and exotic grasses, tall fescue grassland, three square reedland and *Juncus* rushland (Parker 2012). Wetland planting is being undertaken on the wetland's margins. The wetland is of low significance as habitat for birds, although in wetter seasons may provide habitat for waterfowl and marsh crake (O'Donnell, 2000).

Kairaki Creek, a small tidal estuarine creek, runs north from just inland of the Waimakariri river mouth. This waterway is relatively highly modified and the vegetation is dominated by exotic species, particularly willow forest and treeland, but a range of indigenous estuarine and freshwater wetland species also grow here.

Further up the Waimakariri River between Kairaki Creek and the Kaiapoi River is a large wetland of high ecological value known as Jockey Baker Creek. This wetland has undergone extensive changes following the Christchurch earthquakes. The majority of the wetland is now an estuarine saltmarsh that has relatively intact sequences of intertidal – supratidal saltmarsh and freshwater shallow water habitats that are dominated by native vegetation. The main vegetation communities are raupō reedland, Caldwell's sedge reedland, three square reedland and tall fescue grassland. This wetland is utilised by wading birds and waterfowl and provides good habitat for the threatened (Nationally Critical) Australasian bittern (Parker 2016).

#### 5.2.6 Land Cover & Land Use

A subset of Terrestrial Biotic Systems. Due to the introduction and spread of marram grass, few indigenous plants remain on the dunes along this coastline. Pines were extensively planted in some rear-dune areas, which has led to significant modification of these systems. Small settlements are encroaching into the coastal environment and almost all of the land behind the dunes has been drained and cleared and is now either in pine forest or cultivated pasture. Exceptions are areas of restored wetlands, such as those east of Pegasus Township and Tūtaepatu Lagoon.

#### 5.2.7 Perceptual/ experiential

In addition to the large-scale settlement in Pegasus Township, which falls just outside the identified coastal environment, this coastal area contains clusters of baches in beach settlements. Pegasus Bay has highly accessible beaches, which are frequently used by locals and visitors. Recreational fishing, whitebaiting, tramping the coastal walkways, camping and building campfires on the beach are popular activities. Surfing is popular at Kairaki Beach just north of the Waimakariri River and at Waikuku Beach south of the Ashley River mouth. The Pegasus Bay walkway connects Kaiapoi Township with Woodend Beach and Waikuku Beach, extending mainly through pine forest along the entire length of this coastal area. The construction of a boardwalk also allows access to Tūtaepatu Lagoon.

5.2.8 Summary of Natural Character Characteristics at Level 3

<b>Level 3 Rating: Coastal Terrestrial Area 2</b>					
Degree of Natural Character	Natural Character Attributes				
	<i>Descriptive</i>	<b>Abiotic</b>	<b>Biotic</b>		<b>Experiential</b>
	Active Coastal Interface	Abiotic Systems & Landforms	Terrestrial Biotic Systems	Land Cover & Land Use (sub-set of biotic)	Perceptual/Experiential
Very High					
High					
Moderate - High		✓			✓
Moderate				✓	
Moderate - Low					
Low					
Very Low					
<b>Overall Natural Character Rating</b>			Moderate - High		



**Image 11:** Access opportunities to the beach from Pegasus township



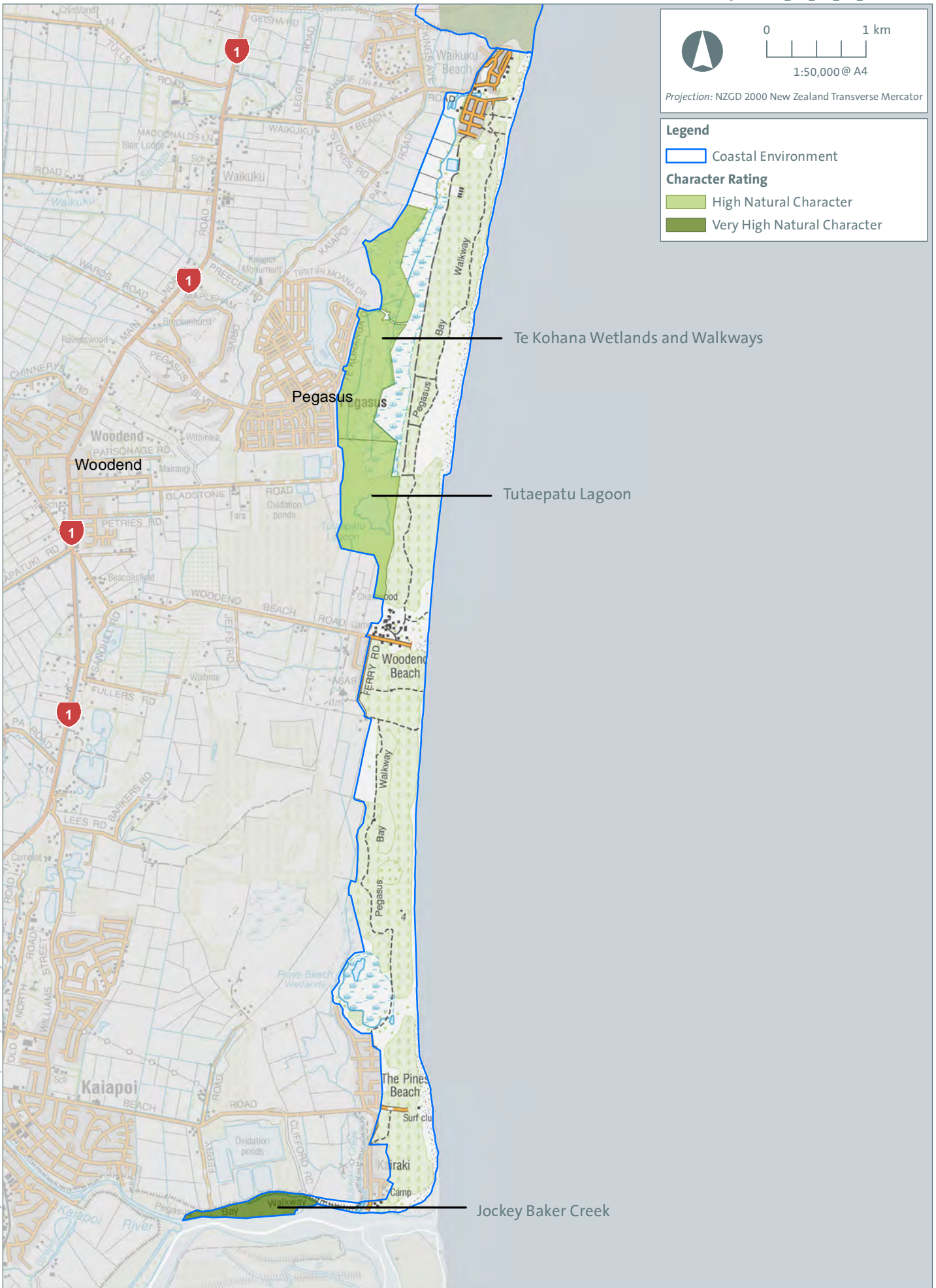
## Coastal Terrestrial Area 2: Specific Characteristics at the local scale (Level 4)

These are mapped with reference to <b>Figure 4</b>							
Area	Overall Rating	Abiotic	Biotic		Exp	Key Characteristics	Additional Comments
		Systems & Landforms	Terrestrial Biotic Systems	Land Cover & Land Use	Perceptual/ Experiential		
Te Kohanga wetlands	High	H	H		H	<ul style="list-style-type: none"> <li>• A number of wetland areas are the focus of extensive ecological restoration efforts.</li> <li>• A number of recreational opportunities including, walking, cycling and horse riding.</li> <li>• High experiential values, including naturalness and tranquillity.</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive pine forest plantations and the introduced sand binder marram grass have substantially modified the coastal environment and are excluded from this mapped area.</li> </ul>
Tutaepatu Lagoon	High	H	VH		H	<ul style="list-style-type: none"> <li>• Tūtaepatu Lagoon provides a very important habitat for indigenous fauna, including birds and freshwater fish and is of high ecological significance.</li> <li>• It supports large populations of some bird species and a high diversity of waterfowl.</li> <li>• Generally low levels of modification, and high levels of naturalness.</li> </ul>	<ul style="list-style-type: none"> <li>• Pine forest plantations and modified adjacent land excluded from this mapped area.</li> </ul>

Jockey Baker Creek	Very High	VH	VH	H	<ul style="list-style-type: none"> <li>• This Creek is now an estuarine saltmarsh that has relatively intact sequences of intertidal – supratidal saltmarsh and freshwater shallow water habitats that are dominated by native vegetation.</li> <li>• This wetland is utilised by wading birds and waterfowl and provides good habitat for the threatened (Nationally Critical) Australasian bittern.</li> <li>• High experiential values.</li> </ul>	More modified area of land excluded from area, including stopbank, rock armouring, drains and culverts.
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*Image 12: South Island Pied Oystercatcher*



0 1 km  
1:50,000 @ A4  
Projection: NZGD 2000 New Zealand Transverse Mercator

**Legend**

- Coastal Environment
- Character Rating**
  - High Natural Character
  - Very High Natural Character

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## 6.0 Outstanding Natural Character within the Waimakariri Coastal Terrestrial Areas

As outlined within Section 3 of this Study, areas of Outstanding Natural Character have been assessed as a separate step in the assessment process following when the assessment of degree of natural character for each terrestrial area had been determined. This is consistent with the identification of ONC areas in the marine environment undertaken on behalf of ECan and entitled '*Draft Marine Natural Character Study of the Canterbury Coastal Environment*, Boffa Miskell, August 2017'.

The following pages outline the results of this separate assessment. Within the '*Draft Marine Natural Character Study of the Canterbury Coastal Environment*, Boffa Miskell, August 2017', the Ashley River mouth/ Rakahuri Saltwater Creek Estuary was identified and mapped as containing outstanding levels of natural character below the MHWS mark. To be consistent with this mapping, the Study Team reviewed the extent of this area, and the extent to which parts of the area could extend above the MHWS mark (and into the Coastal Terrestrial Area).

As outlined in Section 3.4 of this report, for Waimakariri District, an assessment to establish whether all or parts of its coastal terrestrial area contain outstanding natural character needs only to be undertaken when all of the attributes, appraised at an adequate scale (in this case the more detailed – or Level 4 scale) and using adequate data, are assessed as being of 'high' or 'very high' levels of natural character."

Based on this statement, there were only a few areas that reached the Level 4 mapping scale of high and very high. These were:

1. Saltwater Creek/ Ashley River / Rakahuri Mouth, which was mapped and rated Very High
2. Te Kohanga wetland, which was mapped and rated High
3. Tutaepatu Lagoon, which was mapped and rated High
4. Jockey Baker Creek, which was mapped and rated High

From this list, there was debate around what area could be also be considered as holding outstanding natural character. The Te Kohanga wetland, Tutaepatu Lagoon, and Jockey Baker Creek have either been previously modified or contained within an area where modification is sufficiently strong preventing natural elements, patterns and processes from being exceptional in their intactness.

Therefore, only the parts of the Ashley River mouth/ Rakahuri Saltwater Creek Estuary that extend above MHWS mark was considered as reaching the outstanding levels of natural character, based on the methodology. The Ashley River mouth/ Rakahuri Saltwater Creek Estuary holds at least high or very high abiotic, biotic and experiential attributes retaining extensive intertidal mudflats and saltmarsh habitats that support an abundance of invertebrates as well as a significant variety of bird and fish life. Levels of modification are very low.

**Figure 5** provides an overview of the extent of the area which was mapped at a scale of 1:2,500.



*Image 13: Waters of Saltwater Creek Estuary and below, Image 14: Red Billed Gull frequents Saltwater Creek*

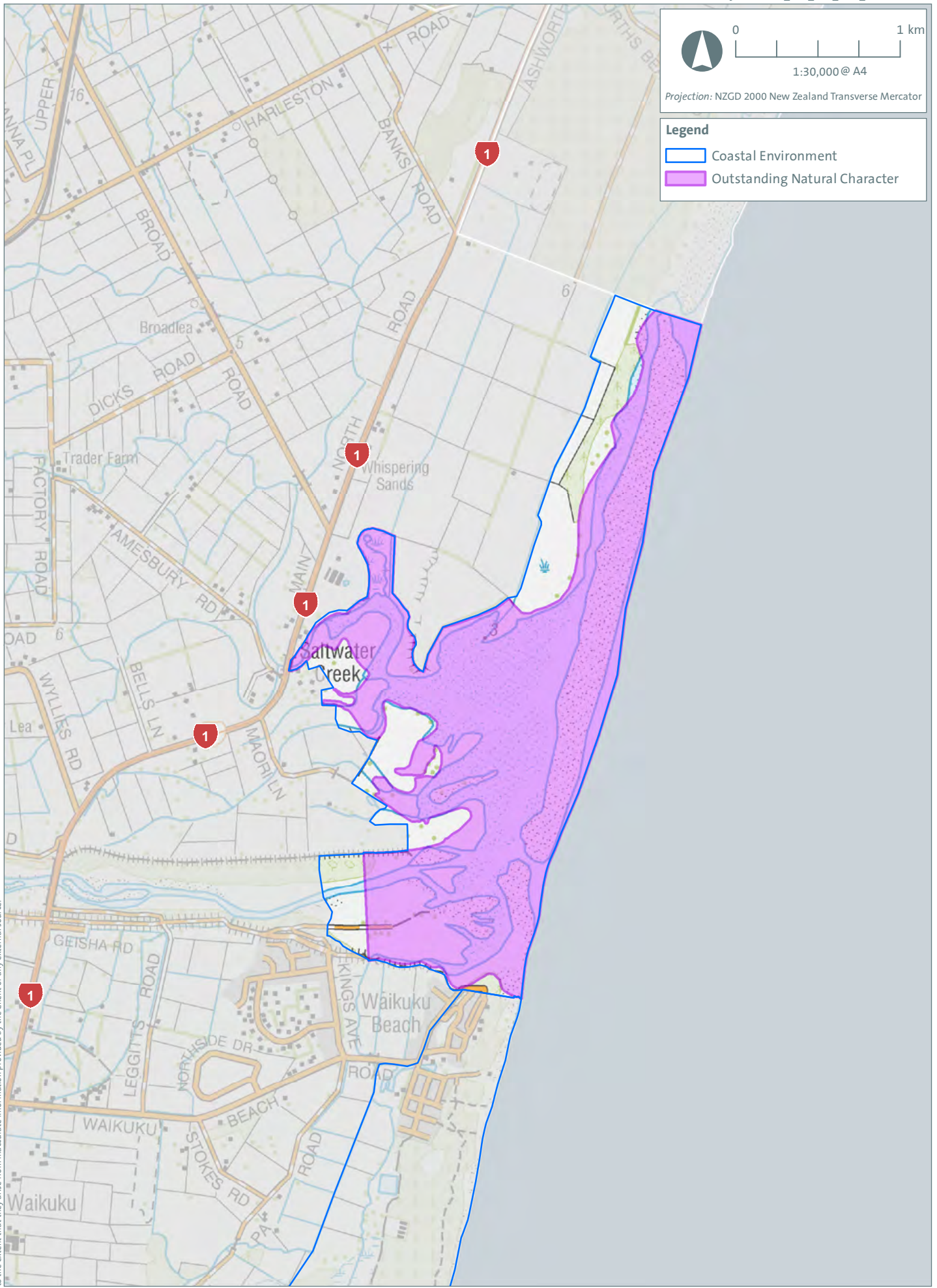


6.1      **ONC Area 1: Ashley River mouth/ Rakahuri Saltwater Creek Estuary (above MHWS)**

*This area of Outstanding Natural Character retains extensive intertidal mudflats and saltmarsh habitat that supports an abundance of invertebrates as well as a significant variety of bird and fish life*

<b>Outstanding Natural Character</b>		
Values		
Abiotic Systems & Landforms	<ul style="list-style-type: none"> <li>Braided Ashley River / Rakahuri mouth and saltmarshes retain high legibility through lack of modification.</li> <li>It is a largely unmodified example of a large river mouth and saltmarsh community with its hydrological and geomorphological processes largely intact.</li> </ul>	
Terrestrial Biotic Systems & Land Cover/ Land Use	<ul style="list-style-type: none"> <li>The estuary supports very high ecological values and includes extensive areas of saltmarsh vegetation.</li> <li>Provides outstanding habitat for a very high diversity of coastal and wetland bird species, including migratory species.</li> <li>It provides a significant habitat for the life cycle of fish, including providing flatfish nursery habitats</li> </ul>	Does not include the more modified exotic vegetated areas.
Perceptual/ Experiential	<ul style="list-style-type: none"> <li>It retains high experiential, legibility and naturalness values due to lack of modification.</li> <li>Excellent bird watching opportunities.</li> <li>White baiting and fishing opportunities.</li> </ul>	
<b>Mapped Extent</b>		
The mapped extent of this Outstanding Natural Character Area is defined by the waters of the river mouth and the lagoon and excludes the more modified parts of the adjacent land. The mapped area does include areas below MHWS, however, for this area of ONC, it is difficult to separate out marine and terrestrial components based on their interdependency.		
Rating	<b>OUTSTANDING</b>	

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## 6.2 Management of Effects

Under the NZCPS (2010) Policy 13 specifically states:

*“(1) To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development:*

*(a) avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character; and*

*(b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on natural character in all other areas of the coastal environment;...”*

Policy 13 (1)(a) requires avoidance of adverse effects of activities on natural character in the coastal environment with outstanding natural character. For all other areas in the coastal environment, Policy 13(1)(b) requires that significant adverse effects are avoided, remedied or mitigated. [Emphasis added.] These are two quite different assessments.

There is only one Outstanding Natural Character area and this is focussed on Saltwater Creek/ Ashley River / Rakahuri Mouth (above MHWS).

For the remainder of the coastal environment (i.e. not considered Outstanding Natural Character), there is a requirement to avoid significant adverse effects.

Significant adverse effects would arise from any major change to the current situation. Large scale land-use change e.g. clearance and land modification and land intensification e.g. change to the back dunes to pasture, would, in some areas have significant adverse effects. This could also affect biodiversity values in the coastal environment.



## 7.0 Appendix 1: References

<http://www.legislation.govt.nz/regulation/public/1990/0155/latest/DLM138916.html>

<http://www.waimakariri.govt.nz/leisure-and-recreation/activities/outdoor-activities/walking-and-cycling/walks-in-waimakariri>

[http://www.nzsurguide.co.nz/surf\\_breaks/canterbury/pines-beach](http://www.nzsurguide.co.nz/surf_breaks/canterbury/pines-beach)

<https://www.ecan.govt.nz/your-region/living-here/regional-parks/northern-pegasus-bay/>

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## 8.0 Appendix 2: Study Approach and Natural Character Methodology

### 8.1 Coastal Environment

#### 8.1.1 Defining the Coastal Environment

The Resource Management Act 1991 (RMA) does not define 'coastal environment', nor does the NZCPS 2010. However, the extent of the coastal environment needs to be considered in order to respond to Policy 1 of the NZCPS 2010. This policy recognises that the extent and characteristics of the coastal environment will vary from location to location and needs to be specifically assessed for each area.

Policy 1 of the NZCPS also recognises that the coastal environment may include the following nine characteristics set out in Policy 1(2):

- a. The coastal marine area;
- b. Islands within the coastal marine area;
- c. Areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, saltmarshes, coastal wetlands, and the margins of these; (Study Team emphasis)
- d. Areas at risk from coastal hazards;
- e. Coastal vegetation and the habitat of indigenous coastal species including migratory birds;
- f. Elements and features that contribute to the natural character, landscape, visual qualities or amenity values;
- g. Items of cultural and historic heritage in the coastal marine area or on the coast;
- h. Inter-related coastal marine and terrestrial systems, including the intertidal zone; and
- i. Physical resources and built facilities, including infrastructure, that have modified the coastal environment.

The above list of characteristics has assisted in defining what is included within the coastal environment. DOC has also provided guidance material on implementing Policy 1<sup>12</sup> which is widely utilised when undertaking these assessments. A parallel study has been commissioned from Jacobs to define a Coastal Hazard zone, which, once complete, could assist further in refining the extent of the coastal environment.

Through the development of a methodology to determine the extent of the coastal environment, BML were guided by all of the identified characteristics above, although particular consideration

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<sup>12</sup> <http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/coastalmanagement/guidance/policy-1.pdf>

was given to item (c) of Policy 1(2) of the NZCPS 2010 '*where coastal processes, influences or qualities are significant*'. This, along with the relationship to the accompanying marine natural character study, provided helpful guidance. All other characteristics of the coastal environment were also addressed in the methodology.

The term 'significant' is not defined in the NZCPS 2010. Within the context of the RMA the word is used to address Section 6(c) matters<sup>13</sup>. In the context of Policy 1(2)(c) of the NZCPS 2010, the study team have interpreted the term 'significant' to mean 'sufficiently great or important to be worthy of attention; noteworthy', as outlined within the Oxford English Dictionary.

The seaward extent of the coastal environment extends 12 nautical miles from MHWS. Although the Waimakariri coastline is short in comparison to other districts in Canterbury, specific attention needs to be given to more complex areas, including around the riparian edge of Saltwater Creek and the Ashley River / Rakahuri mouth.

As mentioned, this study only refers to the part of the coastal environment that is relevant to the jurisdictional control of the Waimakariri District, which is related primarily to the terrestrial component of the coastal environment, although acknowledges that there is some overlap with the marine environment, especially around the active coastal interface zone.

A general rule of thumb<sup>14</sup> is that the inland extent of the coastal environment extends to the first [proximate] significant ridgeline inland of the coast, although for flat areas, such as for most of Waimakariri, the boundaries are determined more by landscape character and where coastal elements, patterns and processes are still sufficiently significant to be dominant.

Fundamental to this assessment of the inland extent of the coastal environment is the relevant and accessible data available to inform judgements. This is listed in the Mapping Information section (Section 2.3). The use of professional knowledge of the study team in relation to the elements outlined within Policy 1 of the NZCPS 2010 was also an essential source of information.

### 8.1.2 Zones of Significance

BML have developed the following model which has been applied to the Waimakariri Coastal Environment.

The coastal environment has been divided into two areas to aid description (Zone A and Zone B). These two areas, divided by the mean high-water spring (MHWS) mark, are labelled Coastal Terrestrial Areas and Coastal Marine Areas. Landward of the coastal environment is a zone labelled the Coastal Context zone. A description of each zone is summarised in Table 1 below:

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<sup>13</sup> It is not defined in the RMA but there is a lot of caselaw around what it means.

<sup>14</sup> Derived from a number of sources, including Environment Court Decisions including *Mainpower NZ Limited v Hurunui District Council* (December 2011) and the May 2011 decision by the Board of Inquiry into the Hauāuru Mā Raki Wind Farm.

Table 1: Zones of Coastal Significance		
Coastal Landscape	Coastal Environment	<p><b>Zone A</b></p> <p>This zone includes the <b>Coastal Marine Area (CMA)</b>. Within the statutory context the CMA means the foreshore, seabed and coastal water and the air above the water to twelve nautical miles (or the territorial sea boundary). Inland, the CMA extends to the mean high-water spring (MHWS). The CMA includes the rock, beach, coastal lagoons and lakes below MHWS. The CMA extends approximately 1 km upstream of a river or a point that is calculated by multiplying the width of the river mouth by five.</p> <p><b><u>Zone A is the focus of a separate study completed for Environment Canterbury: 'Draft Marine Natural Character Study of the Canterbury Coastal Environment' (BML, 2017).</u></b></p>
		<p><b>Zone B</b></p> <p>The <b>Coastal Significance Zone</b> includes the <b>Active Coastal Interface</b> (land above MHWS) and generally includes land up to the summit of the first coastal ridge/ crest or escarpment (with the width of this zone varying depending on the topographic environment). The Active Coastal Interface is generally a slender component of the Coastal Significance Zone where the sea is the dominant element and the primary or significant influence on landform, vegetation and perception. This zone is where coastal processes are significant and may include cliffs, settled (or modified) dune lands, farm land, settlements and coastal forests. For this project, this zone is also referred to as the Coastal Terrestrial Zone.</p>
	Coastal Context	<p><b>Zone C</b></p> <p><b>Coastal Context.</b> This area is where coastal elements, patterns and processes have an influencing presence on the coastal landscape and would include developed dune ridges which no longer exhibit significant coastal processes plus coastal plains, and hill-slopes. This zone generally extends inland from Zone B to where coastal influences are sufficiently diminished. It is also recognised that some activities occurring within this zone can significantly affect the coastal environment (Zones A and B), either experientially or physically, to varying degrees. The inland extent of Zone C will not be identified, as it falls outside of the Coastal Environment.</p>

The Coastal Environment Zones and the Coastal Context Zone can collectively be referred to as The Coastal Landscape.

The diagram (below) **Diagram 1**, illustrates the extent of the Coastal Environment and the three zones within a very typical coastal environment in Waimakariri. The diagram illustrates that the coastal environment is determined by a variety of factors and changes from one coastal area to another.



**Diagram 3:** Illustration of the extent of the Coastal Environment and the three zones with a very typical coastal environment in Waimakariri.

## 8.2 Coastal Natural Character

### 8.2.1 Definition of Natural Character

Natural character is not defined in the RMA or in the NZCPS 2010. BML considers that the environments with the greatest natural character are those with comparatively low levels of human modification. Areas with high natural character are composed of natural elements appearing in natural patterns and underpinned by natural processes.

Within '*Natural Character and the NZCPS 2010*' [2012, DOC, p19] the following definition was endorsed:

*Natural character is the term used to describe the natural elements of all coastal environments. The degree or level of natural character within an environment depends on:*

1. *the extent to which the natural elements, patterns and processes<sup>15</sup> occur and;*
2. *the nature and extent of modification to the ecosystems and landscape/seascape.*

*The degree of natural character is highest where there is least modification.*

*The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community<sup>16</sup>.*

Policy 13 (2) of the NZCPS recognises that natural character is not the same as natural features and landscapes or amenity values and identifies that natural character may include (but is not limited to):

- a. *natural elements, processes and patterns;*
- b. *biophysical, ecological, geological and geomorphological aspects;*
- c. *natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks;*

<sup>15</sup> For the purposes of interpreting the NZCPS 2010 Policy 13.2, 'elements, patterns and processes' means: biophysical, ecological, geological and geomorphological aspects; natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks; and the natural movement of water and sediment.

<sup>16</sup> Department of Conservation Natural Character Workshop Minutes; 2 August 2011(DOCDM-795012)

- d. *the natural movement of water and sediment;*
- e. *the natural darkness of the night sky;*
- f. *places or areas that are wild or scenic;*
- g. *a range of natural character from pristine to modified;*
- h. *experiential attributes, including the sounds and smell of the sea; and their context or setting.*

The definition adopted for this study is the DOC endorsed definition mentioned earlier. Essentially, BML understand that natural character is a sub-set or component of landscape. Whereas landscape encompasses biophysical, aesthetic and associative components, natural character is primarily concerned with the degree of naturalness associated with the natural elements, patterns and process within the landscape (or coastal environment in this study) and the level or degree of modification to those components.

### 8.2.2 Naturalness

The term ‘naturalness’ has been discussed in numerous Environment Court decisions<sup>17</sup>, including the Long Bay decision<sup>18</sup>, which stated the following regarding the term ‘natural’:

*“The absence or compromised presence of one or more of these criteria [below] does not mean that the landscape or coastal environment is non-natural, just that it is less natural. There is a spectrum of naturalness from a pristine natural landscape to a cityscape and a ‘cultured nature’ landscape may still be an outstanding natural landscape.”*

Recognising a lack of national guidance, BML, with the assistance of ecologists and landscape architects determined that ecologists’ and landscape architects’ views of ‘natural’ and ‘naturalness’ are complementary yet sufficiently different to warrant further clarification. Ecologists interpret natural character in terms of indigenous attributes and take a broader view that can encompass both indigenous and exotic natural attributes. Accordingly, the thresholds of naturalness differ and a refined definition of ‘naturalness’ was agreed as being:

*“A measure of the degree of human modification of a landscape/ seascape or ecosystem expressed in terms of:*

- i) ecological naturalness (indigenous nature); and*
- ii) landscape naturalness (perceptions of nature).”*

The naturalness concept was discussed within the Mackenzie District Plan Change 13 Appeal Decision<sup>19</sup>, where the court restated the principle that perceptions of naturalness under the RMA are a “cultural construct” and “vary with the beholder”. Whilst natural science factors are important in underpinning the term, they should not be given undue weight at the expense of experiential and associative (i.e. recreational) factors.

<sup>17</sup> Including High Country Rosehip Orchards Limited and Mackenzie Lifestyle Limited and Ors v Mackenzie District Council, Interim Decision No. [2011] NZEnvC387 and Port Gore, Decision No [2012] NZEnvC72 paragraphs 66-67.

<sup>18</sup> *Long Bay-Okura Great Park Society Incorporated v North Shore City Council* (2008)

<sup>19</sup> High Country Rosehip Orchards Limited and Mackenzie Lifestyle Limited and Ors v Mackenzie District Council. Decision No. [2011] NZEnvC 387

A rating of very high to very low was also provisionally adopted by the court for rating naturalness as shown in **Diagram 2** below.



**Diagram 4:** Naturalness rating scale.

This construct was also reiterated within the Port Gore mussel farm decision<sup>20</sup>. Here the Judge considered that naturalness “*is an anthropomorphic concept*”. The Court noted that “a scale of naturalness of habitats is not the same as a scale of naturalness of landscapes or natural character of the coastal environment”.

For the purposes of this report, the term ‘natural’ is interpreted slightly differently for use in the terms ‘natural’ character and ‘natural’ landscapes. Natural as in ‘natural character’ is inferring a bias towards the natural science attributes with some experiential aspects, whilst natural as in ‘natural landscapes’ is referring more to the visual or aesthetic aspects of naturalness (i.e. it looks natural), rather than ecological intactness.

### 8.2.3 NZCPS and pertinent court decisions

Since the inception of the NZCPS in December 2010, there have been numerous court decisions that have attempted to provide further clarity over Policy 13 (Natural Character).

Of the many, the most pertinent is a Supreme Court decision (NZSC38<sup>21</sup>) in April 2014 on two appeals in relation to salmon farms in the Marlborough Sounds which focussed attention on the underlying policies (in this case the NZCPS), particularly in relation to directive policies that require the avoidance of effects. The essence of the decision clearly provides strong direction to avoid adverse effects on Outstanding Natural Character and Outstanding Natural Landscapes in the Coastal Environment. The decision states that where policy direction states ‘avoid’, essentially this is what should occur. The implications of this decision have yet to be fully determined and further guidance on this will develop over time.

### 8.2.4 Study Scale

Natural Character assessments use different scales of reference that steadily decrease from the broad regional scale to the detailed local scale. Natural character is context and scale related. i.e. the coastal area can be perceived as having different levels of natural character at different scales, depending on the level of detail investigated.

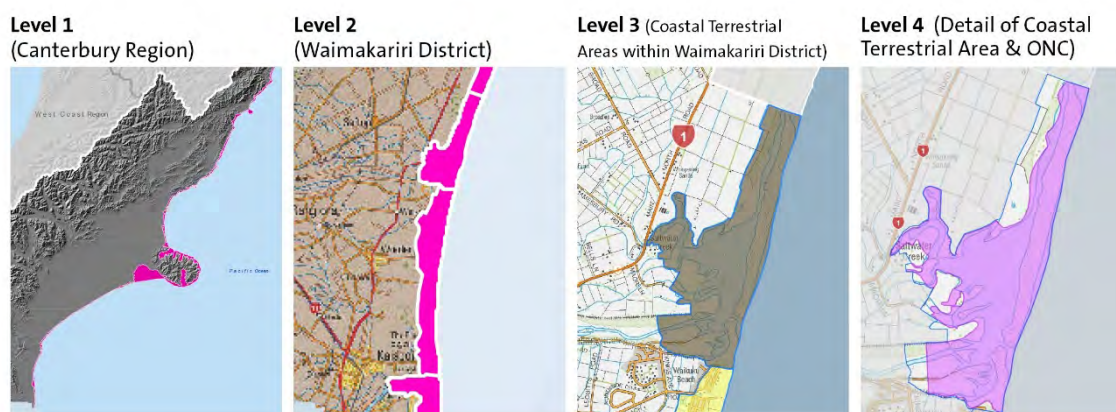
As the simplified diagram in **Diagram 3** below illustrates, that natural character scales for Waimakariri can be considered at both a broad and more detailed scale. At a broad scale, the coastal environment of Waimakariri is located within the region of Canterbury, and therefore **the broadest scale (i.e. Level 1)** is Canterbury. At this scale, climate, geomorphological and land uses can have broad natural character inferences. The Waimakariri District as a whole would be considered as the next broad level, or for this **(Level 2)**.

<sup>20</sup> Decision No (2012) NZEnvC 72. 26th April 2012 (paragraphs 66 – 67)

<sup>21</sup> *Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd* [2014]

At a more **detailed scale Levels 3-4** are considered. At the more detailed scale is **Level 3**, which includes the Coastal Terrestrial Areas (CTAs - for this study, there are two labelled as Coastal Terrestrial Areas 1-2). At the most refined scale, is **Level 4** (mapped at 1:2,500). Only at this more detailed stage is outstanding natural character considered. **Level 4** scale is illustrated as bullet points in the tables and more refined mapping within the Level 3 CTAs.

The hierarchical approach, depicted by **Diagram 3** has been useful in further identifying specific features or stretches of coastline with higher levels of natural character compared to the remaining parts of the Coastal Environment.



**Diagram 5:** Scaling diagram of levels of natural character.

## 8.2.5 Evaluation of Natural Character

The assessment approach is based upon best practice of key terminology, as well as the development of an evaluation matrix and calibration for identifying at least 'high' natural character (as required by Policy 13 (1)(a) and (c) of the NZCPS 2010).

Specifically, the following main points are adopted for this study:

- the methodology can be adapted to suit different types and scales of coastal landscapes and ecosystems;
- an understanding of natural character requires input from freshwater and terrestrial ecologists and other natural scientists, as well as the input of landscape architects and planners;
- that natural character can be assessed on a continuum of modification that describes the expression of natural elements, patterns and processes (or the 'naturalness') in a coastal landscape/ ecosystem where the degree of 'naturalness' depends on:
  - The extent to which natural elements, patterns and processes occur and are legible;
  - The nature and extent of human modifications to the landscape, seascape and ecosystems;
  - The fact that the highest degree of natural character (greatest naturalness) occurs where there is least modification/ uncluttered by obvious or disruptive human influence; and
  - Recognition that the degree of natural character is context-dependent and can change over time.



In accordance with the requirement outlined within Policy 13 of the NZCPS 2010, mapping and identification of at least areas of high natural character has been undertaken. Following this, a separate exercise has considered whether any areas of high or very high natural character qualify as Outstanding Natural Character and where appropriate, these have also been mapped.

Based on similar natural character assessments undertaken throughout the country, an understanding of natural character has been initially identified within separate coastal terrestrial areas and coastal marine areas (the former for the purposes of this report). The extent of each Coastal Terrestrial Area has been primarily determined based on differences in biophysical condition as appropriate for the study scale and it also takes account of previous assessments of natural character (including the *Draft Terrestrial Natural Character Study of the Canterbury Coastal Environment*, August 2017 report) as well as other studies, such as the Regional Canterbury Landscape Review, dated 2010.

On the basis of separating marine and terrestrial areas, study members have captured the necessary terrestrial data which has helped inform the assessment of terrestrial natural character ratings. This includes aspects for delineation of the continuity of biotic patterns parallel to the shore and further inland, including dunes, backdunes, river mouths, coastal wetlands and lakes. Overall, a generally similar level of natural character homogeneity is sought. (refer to **Table 2**).

When assessing natural character of the coastal environment, several key attributes need to be considered. The list of attributes that natural character may include (NZCPS 2010 Policy 13 (2)) have been grouped broadly into the categories of biotic, abiotic and experiential attributes to provide a systematic way to consider the different aspects of the natural patterns, processes and elements of the coastal environment and the degree of modification present. For this Study, these three groupings have been integrated into the original five categories included in the Draft 2012 ECan Coastal Study and updated Draft 2017 Terrestrial Coastal Study. These are articulated as follows:

<b>Table 2: Coastal Terrestrial Attributes</b>		
<b>ECan Marine Natural Character attributes</b>	<b>Waimakariri Terrestrial Coastal Natural Character Study Attributes</b>	<b>Comment on attributes</b>
	<i>Active Coastal Interface</i>	This is part of the coastal environment that closely overlaps with the marine area and is more descriptive.
Abiotic	Abiotic Systems and Landforms	All aspects of the abiotic terrestrial coastal environment included.
Biotic	Terrestrial Biotic Systems	All aspects of the biotic terrestrial coastal environment included.
	Land Cover and Land Use	Is a subset of the Terrestrial Biotic Systems and is not specifically rated.
Experiential	Perceptual/ experiential	This is part of the coastal environment that closely overlaps with the marine area.

The attributes are described for each Coastal Terrestrial Area identified in **Table 3** (below) and were assessed for their degree of natural character by way of the evaluation matrix **Table 4**.

The list of attributes has been developed to avoid double-counting and to ensure that the indicators for each attribute are mutually exclusive. They expand on the coastal environment diagrams in **Table 2: Coastal Terrestrial Attributes**. Perceptual and experiential attributes for each have a small degree of overlap between marine and terrestrial, however, the descriptive approach allows for those overlaps to be clearly articulated.

The division of attributes between the coastal terrestrial areas (and coastal marine areas) is used as a way of organising the data, where activities within the water can be quite different from what is occurring on the land. Notwithstanding this, the relationship between terrestrial and marine systems has also been taken into account. Each attribute is described specific to the particular area (rather than using standard descriptions) so that variations in the attributes between different areas are recorded and taken into account when assessing the degree of natural character. An overall value judgement as to the degree of natural character is then made for each coastal terrestrial area and each coastal marine area.

In evaluating the degree of natural character, BML landscape architects (James Bentley and Amanda Anthony), with relevant input from a BML terrestrial ecologist (Scott Hooson), have described the experiential characteristics. As discussed, there is a clear overlap with this attribute and the descriptions contained within the *Draft Marine Natural Character Study of the Canterbury Coastal Environment* [BML, 2017]. The description, whilst trying to focus solely on terrestrial aspects, clearly is tied very closely with that of the marine environment. This artificial division is purely a way of organising data between two separate studies.

No community engagement or consultation has been undertaken in this phase of the project, and will be subject to further discussions with WDC. Experiential characteristics and values are therefore those determined by the study team.

It is important to recognise that for an area to rate 'high' or 'very high' for experiential aspects of natural character, their intactness of biotic or abiotic factors needs to be high with no or little human modification. This means that, for example, a popular beach near a populated area, is likely to rate lower in terms of the experiential attributes of natural character due to the lack of wildness, remoteness and high level of modification often associated with these popular areas, despite the extensive range of available recreation opportunities in the area. The shared and recognised aspects of available recreation infrastructure and activities are generally factored into landscape assessments as a positive contributor, but this is considered a detractor in terms of an assessment of natural character.

Not all human intervention within an environment has the effect of reducing natural character. For example, modifications associated with restoration and management to keep pest and weed levels low, is an intervention that enhances the natural character of a place.

It has only been possible to capture terrestrial data where that data exists and is easily accessible. Accordingly, the mapped areas illustrate existing knowledge at this point in the study process.

Table 3: Coastal Terrestrial Areas – Zone B		
Attributes	Descriptors	Spectrum of naturalness*
<b>Abiotic Systems and Landforms (Abiotic)</b>	<ul style="list-style-type: none"> <li>- Climatic influences (wind, rain, exposure);</li> <li>- Geomorphology and identification of different types of landforms (i.e. peninsulas, cliffs, dunes, wetlands);</li> <li>- Terrestrial coastal processes, including erosion, river mouth processes including sedimentation (within the terrestrial zone);</li> <li>- Freshwater processes.</li> </ul>	<ul style="list-style-type: none"> <li>- The evident intactness of the abiotic systems. The degree (very high to very low) to which physical modifications such as built structures, road cuts, earthworks and reclamation works affect this abiotic attribute.</li> </ul>
<b>Terrestrial Biotic systems and Land Cover/ Land Use (Biotic)</b>	<ul style="list-style-type: none"> <li>- The margins of estuaries, wetlands and terrestrial areas in Zone B including the intactness of their natural ecological processes, patterns and elements;</li> <li>- Extent of freshwater communities;</li> <li>- Land cover and associated land use, including the composition, distribution, and condition of land cover, and the presence of indigenous/exotic species;</li> <li>- Presence of indigenous fauna.</li> </ul>	<ul style="list-style-type: none"> <li>- The degree (very high to very low) to which modifications affect this biotic attribute. Influences include the presence of exotic species on native communities, physical structures such as infrastructure, housing, roading, tracking, reclaimed land, stop banks, as well as commercial forestry, agricultural and viticulture land use that reduce the naturalness of the biota;</li> <li>- This attribute also includes modifications to freshwater systems, including channelizing watercourses, stop banks, culverts, dams etc. which affect freshwater biota.</li> </ul>
<b>Perceptual/ Experiential (Experiential)</b>	<ul style="list-style-type: none"> <li>- The experience in seeing, feeling and perceiving the Coastal Significance and Active Coastal Interface;</li> <li>- Aromas, visual and scenic, auditory, sense of wildness, remoteness, isolation, natural darkness of the night sky;</li> <li>- Ephemeral biotic activity (i.e. seasonality of flora, presence of birds);</li> <li>- Ephemeral human activity affecting the naturalness (such as recreation, commercial activities);</li> <li>- <i>Note, this study does not cover heritage values as that is addressed by a separate workstream and requires integration at some point in the district plan review process.</i></li> </ul>	<ul style="list-style-type: none"> <li>- The degree (very high to very low) to which physical and biotic modifications affect the naturalness experienced. Influences reducing naturalness include the presence of physical structures including ports, reclaimed land, infrastructure, roading, lighting, industrial noises and non-natural aromas;</li> <li>- Presence of exotic species;</li> <li>- Presence of humans, including recreational activities (driving, walking, camping, settlements) <i>(Note, different people experience naturalness differently with some of these matters being identified by future consultation processes);</i></li> <li>- No cultural input has been provided.</li> </ul>

\* Each Coastal Marine Area is measured on the spectrum of naturalness (degree of human modifications) to each attribute from Very High to Very Low, then an overall judgement is made. The degree of physical and experiential naturalness is related to the location's context.

### 8.2.6 Evaluation Matrix

An evaluation matrix was developed for the marine areas to provide clarity and consistency for the assessment of the level of natural character for each attribute. Refer to **Table 4** below:

Table 4: Coastal Terrestrial Areas – Area B Evaluation Matrix							
Degree of Natural Character	Very High	High	Moderate - High	Moderate	Moderate - Low	Low	Very Low
<b>Abiotic</b> ( <i>Geology / geomorphology Hydrology Climatic influences.</i> )	- Rare modification / structures - Dynamic processes virtually intact.	- Very small levels of modification / isolated structures - Dynamic processes largely intact - Freshwater quality very slightly modified	- Small scale modification/ limited structures - Dynamic processes generally intact with some interference - Freshwater quality slightly modified	- Moderate scale modification/ several structures - Dynamic processes still apparent - Freshwater quality moderately modified	- Frequent modification /several structures - Some natural processes capable of recovery - Freshwater quality markedly modified	- Large areas of modification/ structures and or reclamation - Some key natural processes are no longer able to operate - Freshwater quality highly modified	- Very extensive modification / large reclamation - Few or no natural elements, patterns, processes remain - Freshwater quality extremely modified
<b>Biotic</b> ( <i>Land cover (indigenous / exotic species) Indigenous biota Estuaries, freshwater Communities</i> )	- Exotic biota may occur but virtually no invasive species - Virtually all expected species present and their population structure virtually unmodified - Contains species and habitats of high conservation value - All ecosystem functions virtually intact	- Exotic biota may occur and invasive biota rare -Virtually all expected species present and population structure is largely unmodified -Very likely to contain species and habitats of high conservation value - Almost all ecosystem functions intact	- Exotic biota common with few invasive species - Virtually all expected species present with slight modification to population structure -Some species and habitats of high conservation value - Most ecosystem functions intact	- Exotic and invasive biota regularly present -Some expected species absent with moderate modification to population structure -A few species and habitats of high conservation value -Some ecosystem functions varying	- Exotic and invasive biota common -Many expected species absent with marked modification to population structure -Species and habitats of high conservation value rare -Most ecosystem functions varying well outside natural range	- Exotic and invasive biota very common -Most expected species absent with remnant population structure highly modified -Species and habitats of high conservation value absent -Few original ecosystem functions remain	- Exotic and invasive biota dominate -Expected species virtually absent -Only the most hardy or adaptable species occur -Original ecosystem functions rare or absent
<b>Experiential</b> ( <i>Views, sounds and smells of the sea; Sense of wildness and ecological intactness</i> )	- Overwhelming sense of wildness and remoteness - Rare human influence	- Predominantly wild and remote - Limited human interference	- Frequent sense of wildness and remoteness - Some human interference	- Opportunities to experience Wildness and remoteness - Obvious human influence	- Limited sense of wildness or remoteness - Strong human influence	- Rare sense of wildness or intact ecosystems - Built environment clearly apparent	- No sense of wildness, remoteness or intact ecosystem - Built environment dominates

When determining the overall natural character evaluation at the area scale, the methodology that has been developed uses a greater weighting given to natural science attributes, which encompass abiotic and biotic values, compared with experiential values. This recognises that natural character is a condition rather than a quality or value; it exists regardless of experiential attributes.

The priority ascribed to natural science attributes in the NZCPS 2010 recognises that natural character is primarily based on a condition that can be described with natural scientific methods. Experiential attributes are important contributing factors to a natural character assessment. However, they are more subjective and can be perceived differently by different people and over different timescales. Therefore, it is appropriate to base assessments of natural character primarily on natural science methods which may be more enduring and also more transparent.

At the component scale, abiotic, biotic and experiential attributes have been evaluated. Either the abiotic or biotic attributes have to score at least 'high' for the component to be identified as having a 'high' level of natural character. Similarly, if either the abiotic or biotic attributes are scored as 'very high', the component will be scored 'very high'. This also recognises the primacy of such natural science attributes which determine natural character condition. Notwithstanding this, the scoring for abiotic, biotic and experiential attributes have been recorded for each component to ensure transparency in this assessment.

**Table 5** shows an example of the matrix approach used to rank the level of natural character in relation to the natural character attributes for a particular location.

<b>Table 5</b>					
<b>Level 3 Rating: Coastal Marine Area 1</b>					
Degree of Natural Character	Natural Character Attributes				
	<i>Descriptive</i>	<b>Abiotic</b>	<b>Biotic</b>		<b>Experiential</b>
	Active Coastal Interface	Abiotic Systems & Landforms	Terrestrial Biotic Systems	Land Cover & Land Use (sub-set of biotic)	Perceptual/Experiential
Very High					
High		✓		✓	✓
Moderate - High					
Moderate					
Moderate - Low					
Low					
Very Low					
	<b>Overall Natural Character Rating</b>		e.g.: High		

### 8.2.7 Outstanding Natural Character

Areas of Outstanding Natural Character have been identified through a detailed assessment process and mapped on **Figure 5** of this study. Under RMA s6(a) it is necessary to determine the existing attributes and extent of naturalness. This approach is also required under the NZCPS 2010. However, Policy 13 of the NZCPS 2010 also specifically requires that an evaluation is made as to whether the natural character in the existing coastal environment is at

least 'high' – in order to then be able to determine whether Policy 12 (1) (a) or 13 (1)(b) is triggered. Policy 13(1) of the NZCPS states:

*“(1) To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development:*

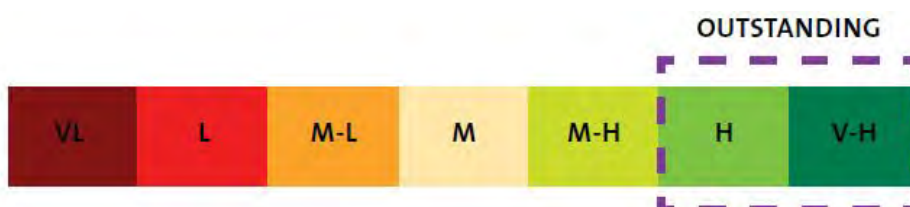
*(a) avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character; and*

*(b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on natural character in all other areas of the coastal environment;...”*

An area with outstanding natural character may be an area within the coastal environment that is considered to have 'high' or 'very high' levels of natural character, although it is important to note that the 'high' or 'very high' ratings do not in themselves equate to 'outstanding', as clarified by the following Boffa Miskell definition:

*'Outstanding' is a comparative evaluative term meaning; to stand out, exceptional, pre-eminent'.*

It was determined by the study team that outstanding natural character should be assessed separately from the main assessment of natural character, which determines areas holding 'very low' to 'very high' levels of natural character. This decision to separate out this assessment from the main natural character study stems from Policy interpretation in the NZCPS 2010. Policy 13 (1)(a) requires avoidance of adverse effects of activities on natural character in the coastal environment with outstanding natural character. For all other areas in the coastal environment, Policy 13(1)(b) requires that significant adverse effects are avoided, remedied or mitigated. [Emphasis added.] These are two quite different assessments.



This separation of outstanding natural character from the baseline follows current best practice outlined within Environment Court decisions on natural character, where everything in the coastal environment fits on the continuum from very low to very high (or pristine). The avoidance therefore of effects under Policy 13(1)(a) for outstanding requires a reassessment of the highest rated areas. This approach is also consistent with BML coastal studies identifying outstanding natural landscapes.

The assessment of whether an area qualifies as having outstanding natural character combines both terrestrial and marine components. This means that where sequences of ecological naturalness are considered important these are clearly captured (such as from the top of a ridge on the land to the bottom of the sea adjacent). Within the 'Draft Marine Study' only one area of ONC was identified within the Waimakariri District and this relates to the mouth of the Ashley River Mouth/ Rakahuri Saltwater Creek Estuary (refer to pages 98-99 of that Study).

Outstanding natural character, by its very term, determines the highest rated areas should include systems that interconnect with each other and therefore should not be considered in isolation.

Under the BML methodology, an area of outstanding natural character must:

*'exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (the 'clutter' factor) and other modifications compared to other areas in the Waimakariri District. (Boffa Miskell)*

For Waimakariri District, an assessment to establish whether all or parts of its coastal terrestrial area contain outstanding natural character needs only to be undertaken when all of the attributes, appraised at an adequate scale (in this case the more detailed – or Level 4 scale) and using adequate data, are assessed as being of 'high' or 'very high' levels of natural character. The results of this assessment are contained within Section 5 of this Study.

### 8.3 Mapping Information

GIS has been used to assist in the mapping of the Coastal Environment. The mapping scale varies but the majority of the data used for this study is at scales greater than 1:50,000. The Coastal Terrestrial Areas have been mapped on 1:50,000 topographic maps. More detailed evaluation mapping in Sections 4 and 5 have been mapped at approximately 1:2,500 and 1:5,000 scale. Areas of Outstanding Natural Character have also been mapped at 1:2,500 scale. The MWHS mark follows the extent of the district boundary.

The study team utilised the following GIS sources:

#### Topo Maps (LINZ)

- Digital contour information at 20 metre intervals (LINZ)
- New Zealand Land Cover Database v4 (derived from the 2012-2013 LUCAS satellite imagery)
- DOC conservation units
- QE II covenants
- River Environment Classification (NIWA)
- Land Resource Inventory (Landcare Research)
- Ecan Coastal Wetland Survey data
- Canterbury Maps