

Nelson Coastal Study

Natural Character of the Nelson Coastal Environment

June 2015

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Prepared for Nelson City Council | June 2015

Document Quality Assurance

Bibliographic reference for citation: Boffa Miskell Limited 2015. Nelson Coastal Study: Natural Character of the Nelson Coastal Environment. Report prepared by Boffa Miskell Limited for Nelson City Council.		
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Status: FINAL DRAFT	Revision / version: 4	Issue date: June 2015

Template revision: 20140326 0000

File ref: C14033_06a_Final_Draft_Nelson_Coastal_Study.docx

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Contents

Executive Summary	4
Section A: Introduction	11
Purpose of Study	12
Background	12
Study Focus	12
Study Process	13
Section B: Study Approach	14
Study Approach	15
Defining the Coastal Environment	15
The Coastal Environment – Zones of Significance	17
Coastal Natural Character	19
Study Scale	24
Outstanding Natural Character	25
Natural Character Assessments in Adjacent Regions	28
Section C: Nelson Coastal Environment	30
Introduction to the Nelson Coastal Environment	31
Nelson Region	31
Broad Collective Characteristics at the Level 2 scale	35
Marine	35
Terrestrial	38
Section D: Nelson Coastal Marine and Coastal Terrestrial Areas	42
Coastal Marine and Coastal Terrestrial Areas of Nelson	43
Coastal Marine Area A: Eastern Outer Te Tai-o-Aorere/Tasman Bay	46
Coastal Marine Area B: Southern Te Tai-o-Aorere/Tasman Bay	52
Coastal Marine Area C: Waimea	58
Coastal Terrestrial Area 1: Cape Soucis	62
Coastal Terrestrial Area 2: Kokorua	68
Coastal Terrestrial Area 3: Whangamoā	74
Coastal Terrestrial Area 4: Delaware Bay	80
Coastal Terrestrial Area 5: Horoirangi/Drumduan	88
Coastal Terrestrial Area 6: Wakapuaka	94
Coastal Terrestrial Area 7: Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea	98
Coastal Terrestrial Area 8: Malvern Hills	104
Coastal Terrestrial Area 9: Nelson	108
Coastal Terrestrial Area 10: Tahunanui	112

Section E: Outstanding Coastal Natural Introduction to Outstanding Coastal Natural Character Areas within Nelson **122**

Introduction to Outstanding Coastal Natural Character	123
Cape Soucis	126
Whangamoia River Mouth, Estuary & Whangamoia Rocks to Julia's Rescue	130
Delaware Bay & Horoirangi Marine Reserve	134

Section F: Appendices

Appendix 1: Bibliography and References	139
Appendix 2: Glossary	142
Appendix 3: Common Plant Names	147
Appendix 4: Common & Scientific names and threat status of indigenous freshwater fish	149
Appendix 5: Key threatened coastal birds in the Nelson region	150
Appendix 6: Potential for Restoration	151
Appendix 7: Marine Methodology	152

List of Figures

Map A: Natural Character Evaluation	7
Map B: Outstanding Coastal Natural Character	9
Map 1: Location Plan	32
Map 2: Land Types	34
Map 3: Coastal Marine & Coastal Terrestrial Areas of Nelson	45
Map 4: Eastern Outer Te Tai-o-Aorere/Tasman Bay Level 4 Evaluation Mapping	51
Map 5: Southern Te Tai-o-Aorere/Tasman Bay Level 4 Evaluation Mapping	57
Map 6: Cape Soucis Level 4 Evaluation Mapping	67
Map 7: Kokorua Level 4 Evaluation Mapping	73
Map 8: Whangamoia Level 4 Evaluation Mapping	79
Map 9: Delaware Bay Level 4 Evaluation Mapping	87
Map 10: Horoirangi/Drumduan Level 4 Evaluation Mapping	93
Map 11: Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Level 4 Evaluation Mapping	103
Map 12: Tahunanui Level 4 Evaluation Mapping	117
Map 13: Level 3 Natural Character Evaluation Mapping	119
Map 14: Natural Character Evaluation	121
Map 15: Outstanding Coastal Natural Character	125
Map 16: Cape Soucis Outstanding Coastal Natural Character Area	127
Map 17: Whangamoia Outstanding Coastal Natural Character Area	131
Map 18: Delaware Bay to Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Outstanding Coastal Natural Character Area	135



Executive Summary

Introduction

The Nelson Region is located within the eastern part of the shallow waters of Te Tai-o-Aorere/Tasman Bay, which itself is a broad embayment that separates the Marlborough Sounds to the east from Golden Bay to the west. Despite occupying only a portion of Te Tai-o-Aorere/Tasman Bay, the extent of the region's landform is highly varied, ranging from mountains to coastal plains, foothills and estuaries. As a result of this varied landform, the region's coastal environment is equally as diverse, where rocky coves and open estuaries provide sweeping vistas up and down the coastal waters of Te Tai-o-Aorere/Tasman Bay.

The diversity of Nelson's coastal environment is related to its variable morphology, which includes rocky shores, eroding cliffs and sand and gravel beaches. The morphology of the land and the underlying formative processes have influenced the land use and land cover associated with the coast. While much of the original land cover has been removed or modified, remnants of coastal bush and broadleaf forest can be found, in particular on the steeply rising slopes and gullies within the northernmost part of the region, around Cape Soucis.

When the New Zealand Coastal Policy Statement 2010 (NZCPS) was released in December 2010, local authorities were tasked under Policy 13 to map or otherwise identify (at least) areas of high natural character in the coastal environment. Subsequently, Boffa Miskell Limited (BML) has been engaged by Nelson City Council (NCC) to define and map the coastal environment of Nelson. It is understood that the coastal environment maps will be used in the review of the Nelson Resource Management Plan (NRMP) and production of the second generation combined district and regional plan known as the 'Nelson Plan'. The Introduction to this report in Section A provides more detailed background information to the project.

Overview and methods

Coastal Environment

For the purpose of this study the Coastal Environment was identified along the Nelson coastline, as interpreted under Policy 1 of the NZCPS 2010. The methodology used for this study recognises that the coastal environment is a dynamic system where the inland influence of coastal elements and processes on the environment gradually decreases with distance. Essentially the Coastal Environment contains two zones of significance, a) the coastal marine area and b) the coastal terrestrial area. The coastal marine area includes the seaward extent of the coastal environment and extends 12 nautical miles from MHWs (Mean High Water Springs

Mark) and is easy to define. Identifying the landward extent has relied on relevant and accessible data available to inform judgements. This information includes specialist terrestrial and freshwater ecological advice from DOC and Mike Harding, geomorphology aspects from Landcare Research as well as data received from the council including heritage and cultural values. Based on this information, the delineation of the inland extent of Nelson's varied coastal environment has utilised a number of different methods. These methods have been dictated by the area's topography, the level of modification of an area (through its land use), its processes and patterns including its relationship to the coast (i.e. whether the coast is exposed and open or whether the coast is more sheltered).

Inland, beyond the Coastal Environment, is a third area described as the Coastal Context. Here coastal processes, influences and qualities are not significant, but the area still forms part of the coastal landscape.

Natural Character Assessment

Assessing natural character is not new and the methodology developed draws on the considerable experience gained from evaluating coastal landscapes over the past 20 years as well as from Environment Court decisions. The NZCPS under Policy 13 confirms that natural character is not the same as natural features and landscapes or amenity values. The policy also lists a number of matters that may be included in natural character. The methodology developed for this study incorporates these matters in line with best practice.

The methodology used rates natural character on a seven-point scale from Very High (lowest amount of modification) to Very Low (greatest amount of modification). The matters included within Policy 13 of the NZCPS have been simplified and reordered into three broader attributes, namely abiotic, biotic and experiential aspects.

In order to understand and describe the coastal environment at an appropriate scale, the Nelson coast has been considered at a number of scales. Refer to page 24 for a more detailed explanation. As outlined within Section B of this study, natural character is context and scale related. Based on this, the study has assessed the Region both at a broad-scale (Level 1 and 2) and at more detailed scales (Levels 3-4). The broader scale, which is essentially Te Tai-o-Aorere/Tasman Bay (Level 1) and the Nelson Region (Level 2), is described in Section C. In Sections D and E, the focus is on a more refined scale. The Level 2 scale has been divided up into 13 broadly homogenous coastal areas. This

delineation has included three Coastal Marine Areas and ten Coastal Terrestrial Areas. This finer scale forms the bulk of this study and is referred to as the Level 3 scale. Where appropriate, specific information and mapping at a more local scale (i.e. individual bays, spits, cliffs and stretches of water within a single Coastal Marine Area or Coastal Terrestrial Area) are mapped, and this is referred to as the Level 4 scale. This is illustrated and further explained on page 24.

To meet the requirement outlined within Policy 13 of the NZCPS 2010, that 'at least areas of high natural character' are mapped, all Coastal Marine and Coastal Terrestrial Areas (at the Level 3 scale) have been mapped according to their degree of natural character based on an aggregation of values for each attribute. This enables comparisons within the Region. Only areas containing high or very high levels of natural character have been mapped at the Level 4 scale. Areas holding moderate, low or very low levels of natural character have not been mapped.

This is principally due to the fact that natural character values can change over time, sometimes quite quickly. An example of this could be that aquaculture development can quickly change an area's natural character rating once it is either towed in place or removed; or an area of bush is removed for residential development. An area could therefore change from 'high' to 'moderate' or 'low' in a short period of time. Based on this and as outlined within the NZCPS, only areas of high and very high at this detailed Level 4 mapping have been identified. These areas are also more likely to hold particular policy mechanisms around them.

Outstanding Natural Character has been assessed separately from the main assessment which determines areas holding very low to very high levels of natural character. Areas of Outstanding Natural Character have also been assessed at the most detailed level (Level 4). This decision to separate out this assessment from the main natural character study stems from Policy interpretation in the NZCPS. 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. The high threshold is outlined within Policy 13 (1)(c), where areas with at least 'high' natural character be identified.

This separation of outstanding natural character from the baseline follows best practice outlined within Environment Court decisions on natural character/ naturalness, where

everything in the coastal environment falls within the continuum from very low to very high (or pristine). The avoidance, therefore of effects under Policy 13(1) (a) on areas of outstanding natural character requires a reassessment of the highest rated areas (i.e. areas of high and very high). This approach is also consistent with studies identifying outstanding natural landscapes.

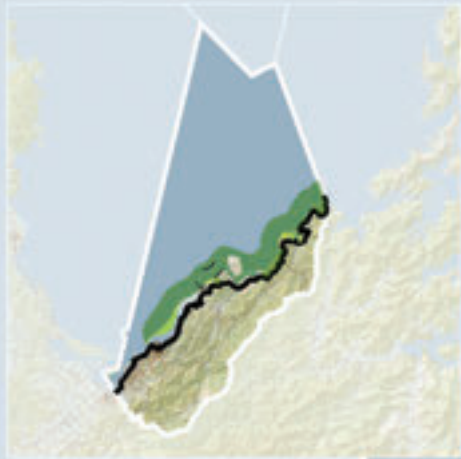
While the study team tried to maintain a high level of objectivity throughout this process, professional judgment was inevitably involved in the determination of the thresholds. However, this was based on a rigorous analysis of the data available and a carefully crafted and transparent methodology. The details of the delineation of the coastal environment and the Natural Character Assessment are described in the Study Approach section (Section B) and within Section D. This has also been subject to internal peer review.

Study findings

The inland extent of the coastal environment for Nelson is generally located within 2km from the coast. In some areas the extent is located within a few hundred metres. As outlined earlier, the topography, geology, land use and a host of other factors influence the extent of the coastal environment. The study team was keen to maintain an extent that related directly to the requirements of Policy 1 of the NZCPS, whilst also recognising particular requirements for ongoing coastal management. The attenuation of coastal patterns and processes severely affects the extent of the coastal environment, and in some areas it might be more appropriate to refer to it as an area of coastal transition where it is difficult to determine a definitive boundary of the coastal environment. These 'transition' areas might be more appropriate for more urban and modified parts of the coast such as Nelson Port, the city and parts of Waimea Inlet.

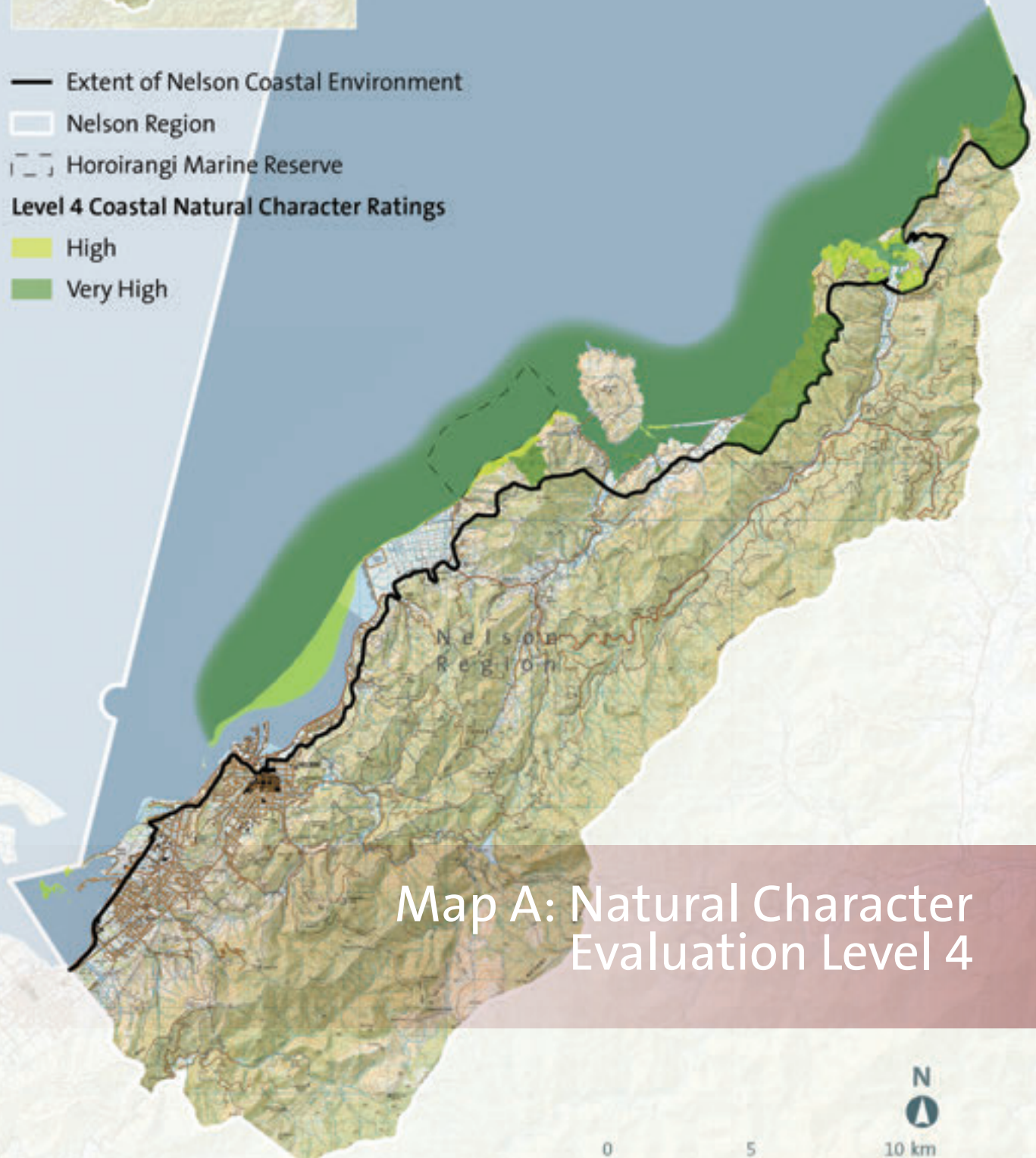
Indicative cross-sections have been prepared for each coastal area to illustrate these differences and photographs provide an overview of the key landscape elements found.

For natural character at the broader Level 3 'Area' scale, the Coastal Marine and Coastal Terrestrial Areas were found to be broadly homogenous and covered the spectrum of naturalness from very low (i.e. Nelson) to very high (i.e. Cape Soucis). The more remote and isolated the area, again for example Cape Soucis, the higher the degree of natural character due to the unmodified abiotic, biotic and experiential values. Generally these areas either contain a large proportion of native vegetation and/ or particularly important habitat values. Some areas, which



*Te Tai-o-Aorere/
Tasman Bay*

- Extent of Nelson Coastal Environment
- Nelson Region
- - - Horoirangi Marine Reserve
- Level 4 Coastal Natural Character Ratings**
- High
- Very High



Map A: Natural Character Evaluation Level 4



are typically more sheltered, have undergone a higher degree of modification (such as Delaware Bay) and this is reflected in the 'Area' rating. More heavily modified areas such as Nelson and Tahunanui rate reasonably low, due to the attenuation of natural patterns and processes by built environment dominance. These are outlined within Section D of this report.

At the more specific Level 4 scale, individual bays, estuaries, headlands and islands have been mapped to illustrate those areas holding high or very high levels of natural character. This more detailed mapping has only been done where specific mention or detail has been included within the broader 'Area' descriptions and evaluations. For example, specific mention is made of the very high estuarine biotic values of the Wakapuaka River mouth, despite this feature being contained within the broader Delaware Bay Coastal Terrestrial Area and Eastern Outer Te Tai-o-Aorere/Tasman Bay which rate as both high

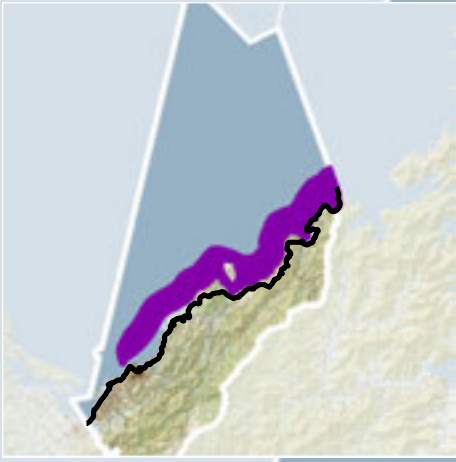
at the broader Level 3 Area scale. These are outlined within Section D of this report. An outline of the associated values are contained within the table below and within the Natural Character Evaluation Plan (previous page).

Areas holding outstanding natural character are contained within Section E of this study and outlined below in the table. Generally these areas '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 Nelson Region' (BML quote).

Cape Soucis has been included as holding outstanding natural character. This includes the remote and unmodified parts of the northernmost part of the Region, encompassing the steep and dramatic headland of Cape Soucis itself and precipitous cliffs, rocky outcrops and sand coves southwards to the entrance of the Whangamoia River Mouth. This area also contains the region's largest extent of intact indigenous coastal forest, harboring distinct and threatened biota.

Table 1: List of Coastal Marine Areas (CMA) and Coastal Terrestrial Areas (CTA) Holding High or Very High levels of natural character

CMA's & CTA's	Natural Character rating	
	Level 3	Level 4
CMA A: Eastern Outer Te Tai-o-Aorere/Tasman Bay	High	Very High: Coastal waters from Cape Soucis to Horoirangi Marine Reserve, including Whangamoia Inlet, Delaware Inlet and Rotokura/Cable Bay.
CMA B: Southern Te Tai-o-Aorere/Tasman Bay	Moderate-High	Very High: Southern part of Horoirangi Marine Reserve to exposed waters off Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea High: Western part of Nelson Haven
CMA C: Waimea	Moderate	n/a
CTA 1: Cape Soucis	Very High	Very High: Exposed rocky coastline from Cape Soucis to Whangamoia inlet
CTA 2: Kokorua	High	Very High: Estuarine margins and sand spit Very High: Lowland alluvial forest High: Regenerating slopes flanking estuary
CTA 3: Whangamoia	Very High	Very High: West facing slopes of Gentle Annie and Maunganui. High: Cliffs and regenerating area around Hori Bay.
CTA 4: Delaware Bay	High	Very High: Estuarine fringes of Wakapuaka River and Bishops Peninsula High: Dune system on Delaware Spit and Pepin Island spit
CTA 5: Horoirangi/ Drumduan	High	Very High: Protected Indigenous area of forest and QEII (Horoirangi/Drumduan) High: Lower west facing coastal cliffs of Horoirangi/Drumduan
CTA 6: Wakapuaka	Moderate-Low	n/a
CTA 7: Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea	High	High: Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea spit
CTA 8: Malvern Hills	Moderate-Low	n/a
CTA 9: Nelson	Very Low	n/a
CTA 10: Tahunanui	Moderate-Low	High: Saxton Island, Pig Island, Oyster Island



Te Tai-o-Aorere / Tasman Bay

□ Nelson Region

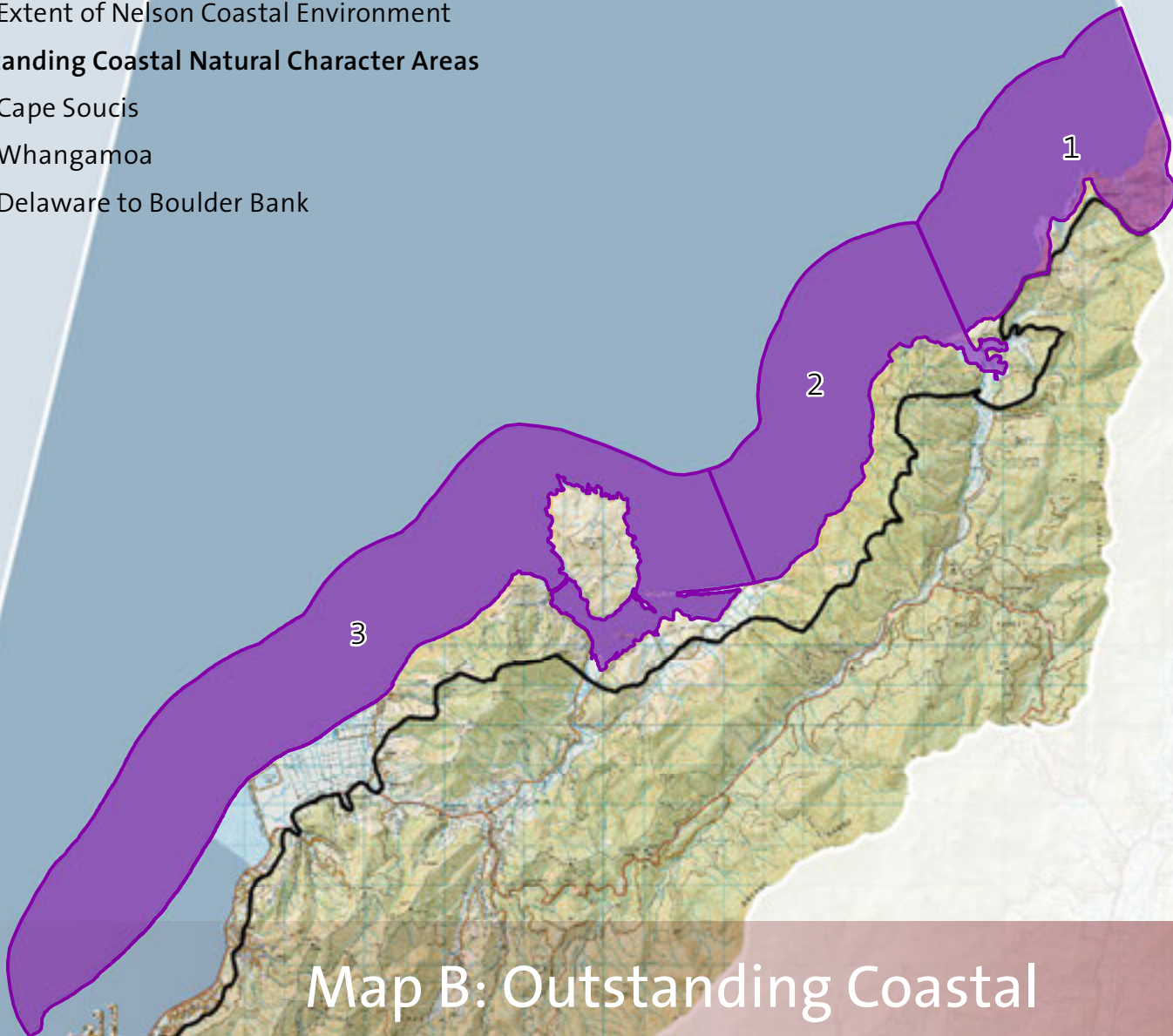
— Extent of Nelson Coastal Environment

Outstanding Coastal Natural Character Areas

1 Cape Soucis

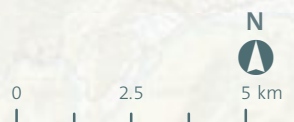
2 Whangamoā

3 Delaware to Boulder Bank



Map B: Outstanding Coastal Natural Character

Nelson
Region



Whangamoā River Mouth, Estuary & Whangamoā Rocks to Julia’s Rescue has also been included as holding outstanding natural character. This area encompasses the ecologically rich Whangamoā River Mouth and its associated coastal and alluvial unmodified features as well as the coastal waters and rocky bluffs that form part of the unmodified biological continuum from the Marlborough Sounds to Horoirangi Marine Reserve.


The third area identified as holding outstanding natural character includes Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea. Extending from the sheltered waters of Delaware Inlet in the north to the open coastal waters off the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea in the south, this area of Outstanding Natural Character contains an exceptional sequence of coastal landforms supporting a diverse range of habitat communities, many of which are uncommon. The largely unmodified Delaware Inlet supports some of the region’s best dune ecosystems extending out to the coastal waters of the Horoirangi Marine Reserve. This area of Outstanding Natural Character also includes the coastal waters associated with the elements, patterns and processes that formed New Zealand’s largest boulder spit, the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.

Table 2: Summary table of areas holding Outstanding Natural Character

Cape Soucis
Whangamoā River Mouth, Estuary & Whangamoā Rocks to Julia’s Rescue
Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea

The remaining mapped coastal areas are considered to be of moderate, low or very low natural character. This is due to a variety of modification evident in several of the attributes. The lowest natural character occurs in urban, densely populated areas with intensive modifications, such as around Nelson Port, the city and around the Waimea Inlet. Areas of moderate natural character may contain a range of human interventions to its natural elements, patterns and processes. The level of modification may vary in intensity and/or spatial extent within these moderately natural coastal areas.

Moderate, low or very low natural character does not necessarily equate to an absence of values within the coastal environment. It is necessary to consider natural character alongside other values addressed in the Resource Management Act. It is highly probable that the coastal environment will be valued by the community even in areas where natural character is considered unexceptional, particularly where the areas are close to centres of population. Consequently management within these areas should be tailored to both the level of intrinsic natural character and to community expectations and values within the particular location. This report will provide background material of value to all those involved in resource management issues within the Nelson coastal environment.



Section A: Introduction

Purpose of Study

Nelson City Council (NCC) engaged Boffa Miskell Limited (BML) to undertake a natural character assessment within the coastal environment in light of the New Zealand Coastal Policy Statement 2010 (NZCPS). This report contains the results of the study, which NCC will use in its review and policy development of its resource management documents.

Background

When the NZCPS was released in December 2010, local authorities were tasked under Policy 13 to map or otherwise identify (at least) areas of high natural character in the coastal environment. The NZCPS also introduced the new term, ‘outstanding natural character’. Local authorities had, at the time, no guidance on how to undertake the necessary natural character assessments. It was, therefore, necessary to develop a methodology for coastal natural character assessments and interpretation of NZCPS terms as part of this study. Since then, some guidance has emerged from the Department of Conservation (Natural Character and the NZCPS) 2012.

Assessing natural character is not new and the methodology developed draws on the considerable experience gained from evaluating coastal landscapes

over the past 20 years and on case law. As more councils undertake an assessment of its coastline under the NZCPS 2010, it is possible that the methodology will be further refined through ongoing peer review processes, workshops and framed through Environment Court decisions. Furthermore, whilst this study was being prepared, the Supreme Court decision in relation to New Zealand King Salmon was released, which has implications for natural character. This is outlined further within Section B.

Study Focus

The study team aimed to develop a consistent assessment approach (refer to Section B: Study Approach) that incorporates both landscape and ecological expertise in developing a method for:

- determining the inland extent of the Coastal Environment, which relates to Policy 1 of the NZCPS and
- Policy 13 of the NZCPS, which concerns the preservation of natural character.

These are two different topics under the NZCPS but are closely aligned under Section 6(a) of the Resource Management Act 1991 (RMA).

The potential for restoration of natural character in Nelson (Policy 14 of the NZCPS) is also briefly summarised in **Appendix 6**.



The New Zealand Coastal Policy Statement 2010 and supporting guidance notes on Policies 1, 13 and 14

This study does not address Policy 11 (indigenous biological diversity) nor Policy 15 (natural features and natural landscapes). Policy 15 is specifically dealt with by the Nelson Landscape Study, (Boffa Miskell 2015).

Study Process

The study has been undertaken as an independent technical assessment by Boffa Miskell with input from the Cawthron Institute, DOC, Landcare Research, NCC and Mike Harding (Ecologist).

The methodology used for this study has been adapted from a number of recently completed natural character studies, including the Marlborough Coastal Natural Study, finalised in May 2014 and from two DOC workshops held in 2011. Due to the geographic scale difference between the Nelson Region and the Marlborough Region, a more refined scaling was determined for Nelson, however the overriding method of characterisation and evaluation remains the same.

Refinement of the methodology took place during a workshop, hosted by NCC in April 2014. This workshop was attended by a number of personnel from DOC, Cawthron, NCC, Boffa Miskell and consultants Liz Gavin and Mike Harding. This workshop was held in tandem with the

Landscape Study. The Landscape Study for Nelson includes a comprehensive assessment of all of Nelson's landscapes through a landscape characterisation study. A separate, yet complimentary study evaluates these landscapes to identified potential Outstanding Natural Landscapes, as required under RMA Section 6(b) and NZCPS Policy 15.

During the workshop, the extent of the coastal environment was discussed and amended as well as the methodology for natural character. An aerial site visit by helicopter followed, as did numerous car trips along the coastline. Following the workshop, a further site visit by boat was undertaken along Nelson's entire coastline. All these sites visits further aided in refining both the extent of the coastal environment as well as assisting in collating and evaluating each Coastal Marine and Coastal Terrestrial Area.

The personnel involved within the study team were all very familiar with the Nelson coastal environment, which has greatly assisted the study team to interpret data.

The methodology outlined in this document has therefore been developed through an iterative process involving a range of professional environmental and planning practitioners.

The methodology applied in carrying out this study is explained in Section B, Study Approach.



An aerial view of Tahunanui Beach as taken on the aerial site visit by helicopter

Section B: Study Approach

Study Approach

In this section, the key components of the study methodology are outlined. The NZCPS 2010 and RMA contexts and the interpretation of relevant policies for the purposes of this study are discussed. Technical aspects are explained, including the scales at which the study was undertaken; the approach to natural character evaluation; digital mapping and the use of the New Zealand landcover database.

Defining the Coastal Environment

The extent of the coastal environment shown in this report is essentially to determine a management line for the Nelson City Council to use in managing Nelson's coasts. It should be noted that, in some places, the landward extent of the coastal environment may be different to that identified in this study, for example through evaluation at a finer scale.

RMA/NZCPS Context

The RMA 1991 does not define 'coastal environment'. Policy 1 of the NZCPS 2010 which recognises that the extent and characteristics of the coastal environment will vary from location to location and identifies nine characteristics which may be included in the coastal environment. In the context of this project, the Coastal Environment is defined as an environment in which the coast is a significant part or element and includes:

- 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*

Policy 1 is not taken as a direction to define the coastal environment but, as stated above, the council decided to use those elements to do so in its territory for practical management purposes recognising that the line is a transition zone where those elements in Policy 1 become less dominant.

The above list of characteristics has assisted in defining what is included within the coastal environment. However, the list is not absolute and does not provide an answer on how to define the landward extent of this environment, particularly as there are 'grey areas' in relation to many of the characteristics that make it difficult to draw a 'hard line'. DOC has provided guidance material (2012) on implementing Policy 1, which reflects best practice. Environment Court decisions (refer to footnotes later in this section for specific decisions) to date have also assisted the study team to form an overall judgement as to the extent of the coastal environment within Nelson.

The DOC guidance note on Policy 1 (DOC, May 2013) outlines under its 'origins of the policy' several influential Environment Court decisions that have guided practitioners and decision makers to determine the inland extent of the coastal environment. In the case *Mainpower NZ Ltd v Hurunui District Council* (NZEnvC384) in 2011, the Environment Court found a number of factors that were important in defining the landward extent of the coastal environment:

"[320] ...where a dominant ridge maybe a useful means to identify a coastal environment boundary, such a boundary should be relevant to the coastline and coastal environment. There is no necessity to identify a dominant ridge in each case, particularly one that may be kilometres away from the coast. In any event we are satisfied that the effects on natural character and landscape would not extend to that area which could properly be considered to be coastal environment of Hurunui.

[321] ...By contending that the coastal environment has an extreme reach, we are concerned that attention could be drawn from the importance of the coastline and derogate from the focus of section 6(a)."

Opposite: Arrow Rock (Fifeshire Rock) before a storm

Method

The methodology used for this study recognises that the coastal environment is a dynamic system where the inland influence of coastal elements and processes on the environment gradually decreases with distance.

In applying the methodology, the study team addressed all the characteristics (or factors) of the coastal environment listed in NZCPS 2010 Policy 1(2) (see above) but gave particular consideration to “where coastal processes, influences or qualities are significant” as this provides the clearest and strongest direction for interpreting the coastal extent. It is important to recognise that each coastline is different and different factors will come into play when considering the extent of the coastline.

The term ‘significant’ is not defined in the NZCPS 2010 but in the context of its Policy 1(2)(c), 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 (Mean High Water Springs Mark) and is easy to define (as it is also the seaward limit of the Region).

Identifying the landward extent has relied on relevant and accessible data available to inform judgements. Data includes specialist terrestrial and freshwater ecological advice from Mike Harding and DOC, geomorphology aspects from Landcare Research as well as data received from the council including heritage and cultural values. Future changes resulting from climate change are predicted to have significant consequences for Nelson’s coastal environment and its natural character but those potential changes were not included in this study.

The study team also used, as an essential source of information, its own professional knowledge and judgement in relation to the characteristics outlined within Policy 1 of the NZCPS 2010 and the DOC guidance of 2012. The work undertaken for the landscape characterisation and landscape evaluation has also provided additional information particularly relating to cultural and historic aspects. All benthic/ bathymetry and ecological/ physical data has been recorded by Cawthron, DOC and Landcare Research through their land typing information.

Based on this information, the delineation of the inland extent of Nelson’s varied coastal environment has utilised a number of different methods. These methods have been dictated by the area’s topography, its level of modification of an area (through its land use), its processes and patterns

including its relationship to the coast (i.e. whether the coast is exposed and open or whether the coast is more sheltered).

Where more open and exposed coastlines are evident, such as to the north of the region, the first prominent ridge along with land cover has been a guiding factor. In areas that are flatter, such as Delaware Bay and the Wakapuaka Sandflats areas, the extent of the coastal environment has been guided by the extent of the flats, the level of freshwater influences as well as areas where coastal processes have formed and have significantly influenced the landforms.

The level of modification is also another consideration that can affect the extent of the coastal environment. In some areas this can decrease the extent of the coastal environment, such as in flatter areas including the Wakapuaka Flats and around more urban areas such as Nelson City itself. Where structures, such as roads and buildings are evident, these can dramatically reduce the natural elements, patterns and attenuate processes of the coastal environment. Therefore, the extent of the coastal environment in built up areas, tends to be slimmer than in rural areas such as the Wakapuaka Flats. Roads, contour lines and topographical relief have assisted determine the extent in these areas.

Furthermore, it is important to note that if the coast can be seen from any particular location, does not automatically mean that that location is considered to be within the coastal environment. An overall professional judgement of all factors within Policy 1 of the NZCPS is required, as well as whether coastal processes, influences or qualities are significant’.

The mapping of the coastal environment was undertaken at a local scale of 1:10,000 using 1:50,000 topographic maps and Google Earth. The mapping has been assisted through the Land System exercise provided by Landcare Research as well as any biotic data from Cawthron and DOC. It is acknowledged that the information provided for this study ranged in detail and mapping scale.

The Coastal Environment – Zones of Significance

The coastline of Nelson, despite its short length in comparison to its neighbours of Tasman and Marlborough Regions is highly variable. The northern part, including Cape Soucis, Rotokura/Cable Bay and the steep cliffs of Horoirangi/Drumduan hold a diverse range of ecosystems, geology, climate and biota that is very different when compared to the flatter more modified coast to the south around Nelson City.

Boffa Miskell have developed the following Zones of Significance framework to apply to the coastline to determine the extent of the Coastal Environment, as interpreted under Policy 1 of the NZCPS 2010. As illustrated on **Figure 1** the framework interprets the coastal environment to contain the following zones that, collectively, are called the Coastal Landscape:

- Zones A and B (the coastal marine area and the coastal significance zone), which make up the Coastal Environment, and
- Zone C, the Coastal Context.

<p>Coastal Landscape</p> <p>Coastal Environment</p> <p>Coastal Context</p>	Zone A	This zone includes the Coastal Marine Area (CMA) . 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 1km upstream of a river or a point that is calculated by multiplying the width of the river mouth by five.
	Zone B	The Coastal Significance Zone includes the Active Coastal Interface (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 .
	Zone C	Coastal Context. 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.

For the purposes of the natural character part of this report, the coastal significance zone will be termed Coastal Terrestrial Area, to ensure consistency when referencing the Coastal Marine Area.

Figure 1, (overleaf) illustrates the extent of the zones and the coastal environment at the local scale in two very different types of coastal areas: one a steep coastal area and the second a flat coastal area. The diagrams illustrate that the character and extent of the coastal environment is determined by a range of landform, land type, topography and other influencing factors. It is in a constant state of change.

Representations of the range of coastal environments in Nelson are illustrated in **Section D under each Coastal Terrestrial Area**.

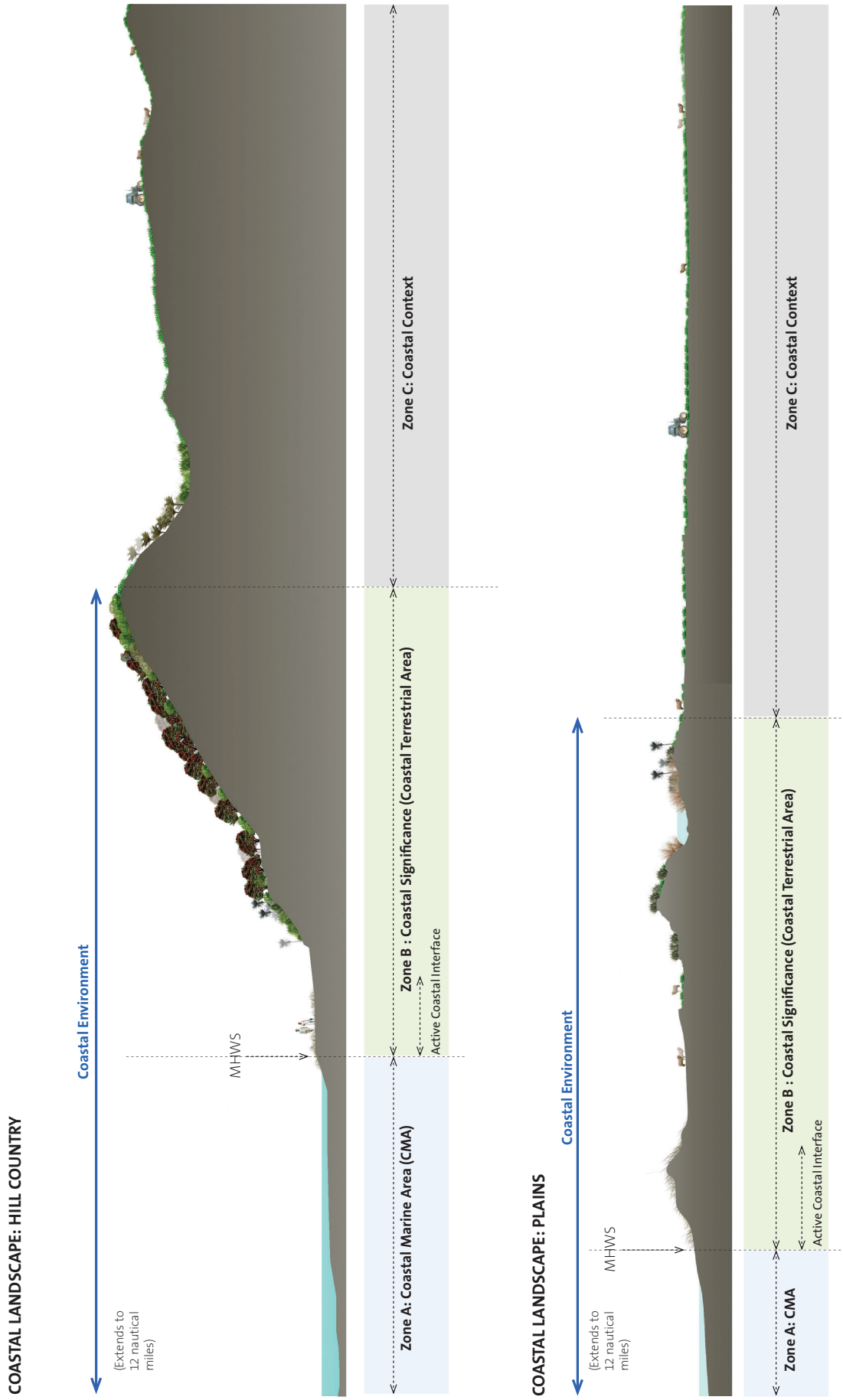


Figure 1: Representative diagrams of the coastal environment

Coastal Natural Character

Definition of Natural Character

The environments with the greatest natural character are those with comparatively low levels of human modification and are therefore composed of natural elements appearing in natural patterns and underpinned by natural processes.

Natural character is not defined in the RMA or in the NZCPS 2010. There are various working definitions of the concept which are broadly similar and have been used in a number of Environment Court cases. In light of the NZCPS 2010, the definition was discussed at a workshop in August 2011, the first of two convened by DOC in 2011 to provide guidance on policies 1, 13 and 14 of the NZCPS 2010. At this workshop, landscape architects, DOC and local authority personnel, and other environmental practitioners discussed and debated the term and its origins. Building on a previous definition from the Ministry for the Environment (MfE), the workshop confirmed the following definition, finding it both useful and workable:

‘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 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.’

Essentially, Boffa Miskell understand that natural character is a sub-set or component of landscape. The term ‘landscape’ is described in the 2015 Boffa Miskell Nelson Landscape Study. 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.

Naturalness

The term ‘naturalness’ has been discussed in numerous Environment Court decisions, including the Long Bay decision, 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.”

“relatively unmodified and legible physical landform and relief;

the landscape being uncluttered by structures and/or obvious human influence;

the presence of water (lake, river, sea);

the presence of vegetation (especially native vegetation) and other ecological patterns.”

Since the development of this definition, the NZCPS 2010 has come into effect stating (Policy 13) 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;*
- (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.”*

Recognising a lack of guidance for implementing and interpreting the NZCPS 2010, BML held a two-day in-house workshop in early 2011 to develop a consistent approach to natural character assessment and interpretation of NZCPS 2010 terms. At this workshop, it was evident that ecologists’ and landscape architects’ views of ‘natural’ and ‘naturalness’ are complementary yet sufficiently different

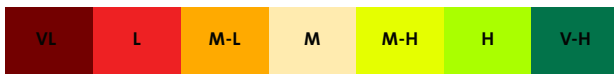
to warrant further clarification. Ecologists interpret natural character in terms of indigenous attributes and landscape architects take a broader view that can encompass both indigenous and exotic natural attributes. Accordingly, the thresholds differ and a refined definition of ‘naturalness’ was agreed 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, where the court restated the principle that the perception of naturalness under the RMA is a “cultural construct” and “varies 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.

A rating of very high to very low was also provisionally adopted by the court for rating naturalness, and has been used for this study.



This construct was also reiterated within the Port Gore mussel farm decision. Here the Court 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”.

This comment was made in relation to a five-point rating scale used to assess the indigenous naturalness of an area and broadly supports the view that there is a difference between ecological [indigenous] naturalness and landscape [perceived] naturalness. As stated above, the study team consider these to be related and complementary, with both requiring assessment.

For the purposes of this report and the complementary Landscape Report 2015, 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.

A Supreme Court decision (NZSC38) in April 2014 on two

appeals in relation to salmon farms in the Marlborough Sounds focussed the 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.

Method

Through the BML workshop, participants were able to develop a consistent assessment approach that incorporates landscape and ecological expertise as well as taking into consideration the ‘MfE definition’, relevant case law, and those definitions developed in the NZILA Best Practice Note 2010. The assessment approach is based upon an agreed interpretation of key terminology, as well as an assessment matrix and evaluation methodology for identifying at least ‘high’ and ‘outstanding’ 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 does **require the input of terrestrial, freshwater and marine ecologists** and other **natural scientists (e.g. geomorphologists)**, 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.

Evaluation of Natural Character

The degree or level of natural character will be, for the purposes of this study, rated on a seven-point scale: Very High (lowest amount of modification), High, Moderate to High, Moderate, Moderate to Low, Low and Very Low (greatest amount of modification). In accordance with the requirement outlined within Policy 13 of the 2010 NZCPS, **at least areas of high and very high natural character will be mapped**. Areas of Outstanding Natural Character will also be considered and where appropriate, these will be mapped (refer to Outstanding Natural Character paragraph later in this section). The overall natural character for each coastal area will be obtained by amalgamating the 'values' assigned to each of the components assessed.

Following the methodology used for the Marlborough Coastal Study, it is recommended that Nelson adopt a similar breakdown of 'areas' into Coastal Terrestrial Areas and Coastal Marine Areas. The input by the technical staff at Cawthron and DOC have enabled the study team to capture the necessary data which has informed the judgement of the natural character rating for each area. The extent of each Coastal Terrestrial Area and Coastal Marine Area has been determined based on differences in biophysical characteristics. Aspects for delineation of Coastal Terrestrial Areas included: landform composition, freshwater catchments, land use and land cover. For Coastal Marine Areas aspects include continuity of biotic patterns parallel to the shore, the extent of intertidal and subtidal zones, and influences of exotic species and water quality. Overall, a generally similar level of natural character homogeneity is sought.

A number of key attributes needs to be considered when assessing the natural character of the coastal environment. Through BML's experience, including the interpretation of the NZCPS 2010, the list of attributes outlined in the tables overleaf have been identified as a systematic way of considering the different aspects of natural patterns, processes and elements of the coastal environment and the degree of modification present. They have been developed through analysis of Policy 13(2) of the NZCPS and the understanding of the term 'natural', where the catalogue of matters contained in this list can be organised into three broad attributes, namely: Abiotic (non-living: geology/ climate); Biotic (living: ecology) and Experiential (i.e. those characteristics that are perceived/ experienced in the coastal environment).

The three attributes are described for each Coastal Marine Area and each Coastal Terrestrial Area identified in **Section D** and are assessed for their degree of natural character in a matrix/ evaluation table (refer to **Table 5**).

The list of attributes has been developed to avoid double-counting as much as possible and to ensure that the indicators for each attribute are mutually exclusive. They expand on the coastal environment diagram on **Figure 1**. As **Table 3 and Table 4** overleaf illustrate, the indicators of natural character for each attribute differ between the Coastal Marine Area and the Coastal Terrestrial Area. Perceptual and experiential attributes for each have a small degree of overlap, however, the descriptive approach allows for those overlaps to be clearly articulated. An overall level of natural character, combining both terrestrial and marine can then be determined by the user of this document.

The artificial division of attributes between the Coastal Marine areas and Coastal Terrestrial 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. 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 made for each Coastal Terrestrial Area and each Coastal Marine Area.

Scientific descriptions were prepared for the abiotic and biotic components of natural character. Cawthron described the abiotic and biotic characteristics for the Coastal Marine Areas and DOC and ecologist Mike Harding assisted Boffa Miskell describe the abiotic and biotic attributes of the Coastal Terrestrial Areas. Boffa Miskell described the human-based experiential characteristics for both the Coastal Marine Areas and Coastal Terrestrial Areas with assistance from Cawthron, DOC, Mike Harding and NCC.

It is important to note that 'experiential' aspects that are mentioned within Policy 13(2) of the NZCPS refer to the degree of naturalness of the coastal environment (as per the definition of natural character - *refer to earlier sections of this report*). Wider interpretations of experience (i.e. recreational activities) of a place are more associated with landscape assessments and for Nelson, are considered within the Landscape Study.

For an area to rate 'high' or 'very high' for experiential aspects of natural character, their intactness of biotic and 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 moderate/low in terms of the experiential attributes of natural character due to the lack of high degrees of naturalness (remoteness/ darkness of the sky etc.) and high level of modifications, despite the extensive range of available recreation



opportunities in the area. The shared and recognised aspects of available recreation infrastructure and activities are factored into landscape assessments as a positive contributor, while it is considered a detractor in natural character assessments.

Experiential descriptions for the marine areas have been generally restricted to ‘above-water’ experiences or activities. Where specific dive sites or notable underwater

experiences are recognised, these have been recorded. No community engagement or consultation has been undertaken within this phase of the project. Experiential characteristics and values are therefore those researched by the study team.

The Te Tau Ihu coastline (Top of the South) is an area which has played an important role in the shaping of the iwi of Te Tau Ihu history and identity. The iwi of Te Tau Ihu place

Table 3

Coastal Marine Areas – Zone A		
Attributes	Descriptors	Spectrum of naturalness*
 Abiotic Systems	Physical processes including tidal action (and range), currents, waves, water temperature, salinity, sedimentation, turbidity and climate (e.g. wind); - Geomorphology, topography and landform including headlands, bays, channels, coastal formations (e.g. rocks, reefs, stacks), bathymetry, seabed character (e.g. mud, sand, gravels, cobbles/ boulders, bedrock), aspect and exposure; - Erosion and depositional processes - Water Quality; - River mouth processes.	- The degree (very high to very low) to which physical modifications (e.g. trawling and dredging, major port structures, port dredging and dumping, reclamation, jetties, sea defences, groynes, aquaculture and land-derived sedimentation) affect this abiotic attribute;
	Marine Biotic systems	- The natural distribution and abundance of species, communities and habitats, including ecological processes; - The diversity and continuity of species, communities and habitats intertidally and subtidally (i.e. biotic patterns) including all marine biotia, reef and soft sediment communities, estuaries/ wetlands, marine mammals and sea birds; - The expression/ appearance of ecological features and processes.
 Experiential	- The experience in seeing, feeling and perceiving the natural environment of the Coastal Marine Area; - Aromas, visual, auditory, sense of wildness, remoteness, isolation, natural darkness of the night sky and its scenic values; - Access; - Ephemeral biotic activity (e.g. pods of dolphins, flocks of birds, schools of fish) - Natural movement of water and sediment; - Underwater experiences when swimming, diving and snorkelling; - Note heritage elements do not contribute directly to the naturalness experience.	- The degree (very high to very low) to which biotic and abiotic factors and their intactness (or conversely modification) are experienced - Experiential values may be influenced by factors such as structures (e.g. ports, marinas, jetties, moorings, aquaculture), exotic species, and the presence of human activity including recreational pursuits (e.g. diving, swimming, boating, jet skis) and commercial operations (e.g. commercial fishing vessels and servicing boats); - Note different people experience naturalness differently; - Cultural values from the Te Tau Ihu Statutory Acknowledgments have not been included..

* 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.

high cultural value on the foreshore, seabed, coastal and maritime waterways. No cultural input has yet been sought through consultation with iwi, nor has interpretation of the Te Tau Ihu Statutory Acknowledgements 2014 report been undertaken.

Further development of the experiential values within this report will be undertaken by Council in consultation with iwi, landowners, stakeholders and the general public.

It has only been possible to capture marine data where that data exists. There are, unfortunately, 'gaps' in the data, however, the mapped areas illustrate the existing knowledge and it is anticipated that as further information is collected, this mapping could be updated.

The Coastal Context (Zone C illustrated in Figure 1) is also considered, as elements within this zone can affect, or be affected by, the natural character of the coastal environment. No natural character rating is ascribed to Zone C, only a description.

Table 4

Coastal Terrestrial Areas – Zone B		
Attributes	Descriptors	Spectrum of naturalness*
 Abiotic Systems	<ul style="list-style-type: none"> - Climatic influences (wind, rain, exposure); - Geomorphology and identification of different types of landforms (i.e. peninsulas, cliffs, dunes, wetlands); - Terrestrial coastal processes, including erosion, river mouth processes including sedimentation (within the terrestrial zone); - Freshwater processes. 	<p>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.</p>
	Terrestrial Biotic systems	<ul style="list-style-type: none"> - The margins of estuaries, wetlands and terrestrial areas in Zone B including the intactness of their natural ecological processes, patterns and elements; - Extent of freshwater communities; - Land cover and associated land use, including the composition, distribution, and condition of land cover, and the presence of indigenous/exotic species; - Presence of indigenous fauna.
 Experiential	<ul style="list-style-type: none"> - The experience in seeing, feeling and perceiving the Coastal Significance and Active Coastal Interface; - Aromas, visual and scenic, auditory, sense of wildness, remoteness, isolation, natural darkness of the night sky; - Ephemeral biotic activity (i.e. seasonality of flora, presence of birds); - Ephemeral human activity affecting the naturalness (such as recreation, commercial activities); - Note, this attribute does not include heritage elements. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which abiotic and biotic modifications affect the perceived naturalness experienced. The highest degree of experiential naturalness is where there is least modification. - Influences reducing naturalness include the presence of physical structures including ports, reclaimed land, infrastructure, roading, lighting, industrial noises, and non-natural aromas; - Presence of exotic species also reduces naturalness; - Presence of humans, including recreational activities (driving, walking, camping, settlements) also reduces naturalness; - Note, different people experience naturalness differently, - Cultural values from the Te Tau Ihu Statutory Acknowledgements have not been included.

* 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.

The following table (Table 5) shows the matrix approach used to rank the level of natural character in relation to the natural character attributes at the Level 3 scale.

Table 5

Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High			
Moderate			
Moderate to Low			
Low			
Very Low			
	Overall Natural Character Rating		Moderate -High

Study Scale

As explained earlier, natural character assessments utilise 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 environment can be perceived as having different levels of natural character at different scales, depending on the level of detail gathered.

As the simplified diagram in Figure 2 illustrates, both a broad-scale (Level 1 and 2) and more detailed scales (Levels 3-4) are considered. The broader scale, which is essentially Te Tai-o-Aorere/Tasman Bay (Level 1) and the Nelson Region (Level 2), is described in Section C. In Sections D and E, the focus is on the Level 3 Coastal Terrestrial and Coastal Marine Areas, with, where appropriate, specific mention of areas at Levels 4. This hierarchy approach (depicted by Figure 2) has been useful in further identifying specific features or stretches of coastline holding higher levels of natural character than the remaining parts of the Coastal Marine and Coastal Terrestrial Areas.

Outstanding levels of natural character are dealt with separately in Section E of this study and outlined further in the next chapter.

Natural Character Scale

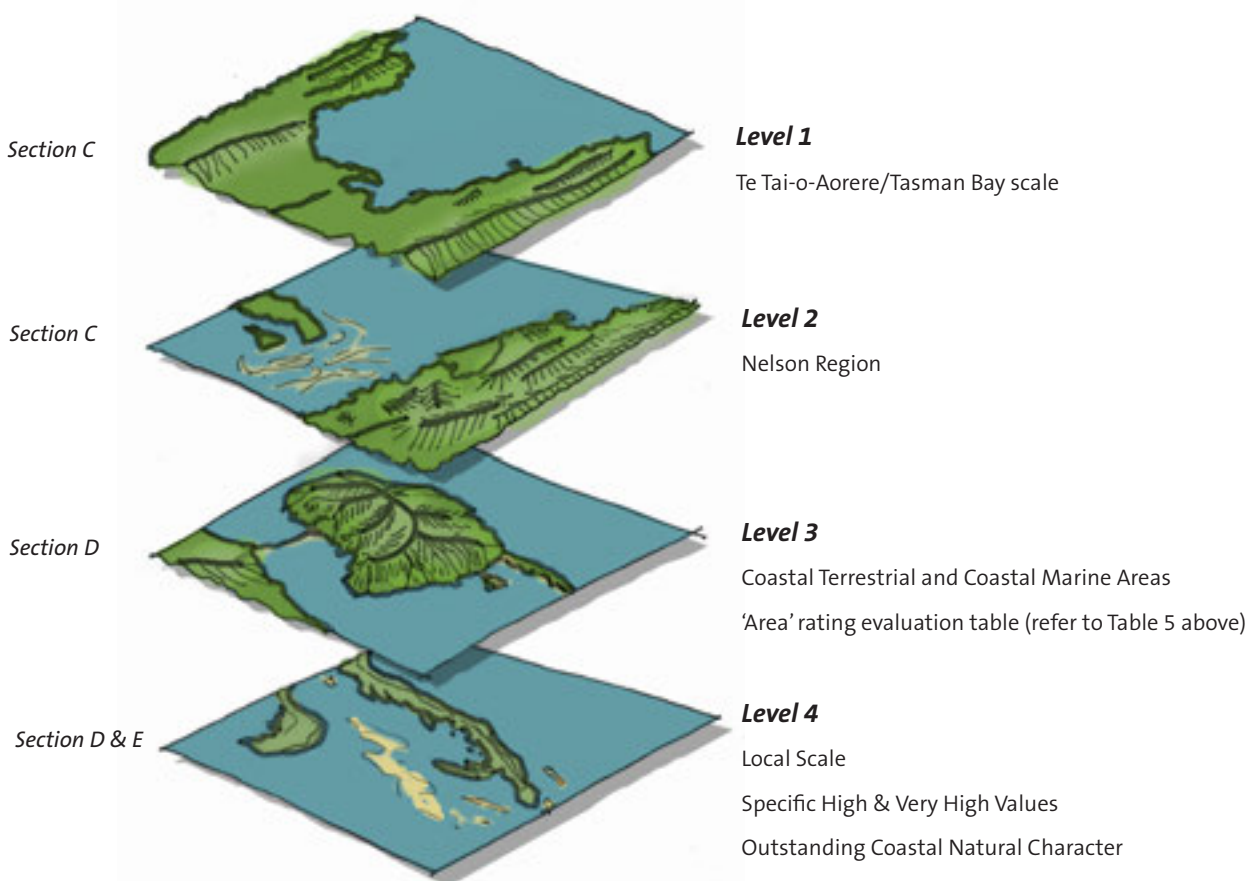


Figure 2: A diagram representing the range of scales of study for natural character related work as outlined in this study.

Outstanding Natural Character

Areas of Outstanding Natural Character have been identified through a detailed assessment process (at the Level 4 scale) and mapped in Section E of this study. Under RMA s6(a) it is necessary to determine the existing attributes and extent of natural character and assess how these may be affected by a specific planning regime or proposal. This approach is also required under the NZCPS 2010. 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 contains outstanding natural character:

“(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 which determines areas holding very low to very high levels of natural character (at Level 4). This decision to separate out this assessment from the main natural character study required a re-evaluation of the highest rated areas (i.e. high and very high) at the local scale (Level 4 for the purposes of this study). The re-evaluation of the high and very high areas means that only the highest rated areas of natural character will be considered. This approach is also consistent with studies identifying outstanding natural landscapes (i.e. a landscape or feature must be of sufficient naturalness to be considered outstanding).



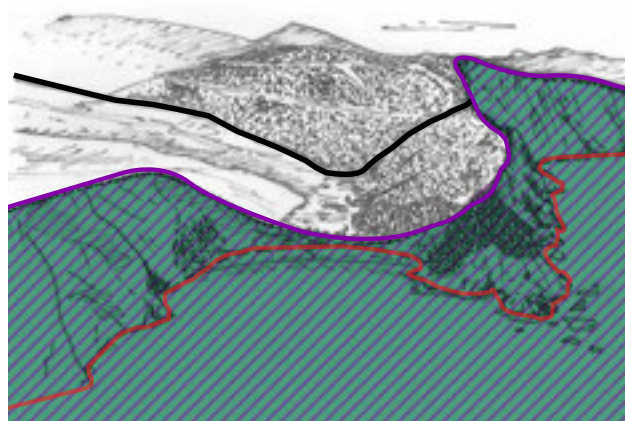
It was also determined that outstanding natural character should combine both terrestrial and marine components (as opposed to the Level 4 assessment which considers them separately) so that important sequences of ecological naturalness (such as from the top of a ridge above sea level to the bottom of the adjacent sea and interconnected systems) are considered.

Method

Under the 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 Nelson Region. (Boffa Miskell)

An assessment to establish whether all or parts of a coastal area contain outstanding natural character needs only be



Coastal Terrestrial and Coastal Marine Areas are separated by a red line. Both rate independently as Very High for Level 4 and both are considered to rate as outstanding natural character under separate analysis. The extent of the coastal environment is determined by the black line.

undertaken when an area rates high or very high at the most detailed mapping scale (i.e. Level 4). Where adjacent land and sea are mapped as either high or very high at the Level 4 scale, particular emphasis is taken to examine the sequential relationship of biotic patterns.

The evaluative study of outstanding natural character areas is undertaken at a regional or district scale, therefore comparison of other areas within the region or district is critical in understanding the outstanding values and characteristics that underpin these areas.

Digital Mapping

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 and Coastal Marine Areas have been mapped on 1:50,000 topographic maps. More detailed evaluation mapping in Sections D and E have been mapped at approximately 1:10,000 and 1:5,000 scale. Areas of Outstanding Natural Character have also been mapped at 1:5,000 scale.

The study team utilised the following GIS sources:

- Topo Maps (LINZ)
- Digital contour information at 20 metre intervals (LINZ)
- New Zealand Land Cover Database v3 (derived from the 2007-2008 LUCAS satellite imagery)
- DOC conservation units
- QE II covenants
- River Environment Classification (NIWA)
- Land Resource Inventory (Landcare Research)
- Draft Nelson Bays Habitat Map (Cawthron, April 2014)



Pied shag

New Zealand Land Cover Database (LCDB)

To assist in understanding the land cover for each Coastal Terrestrial Area, Boffa Miskell used the New Zealand Land Cover Database.

LCDB contains detailed information on classes of land cover and their boundaries and is a record of land cover changes over time. It is a digital map of the surface of New Zealand derived from satellite imagery. The first two editions, LCDB-1 and LCDB-2, show the state of New Zealand's land cover in 1996-1997 and in 2000-2001 respectively. These digital maps underpin much of the work of central and regional government, industry and research institutions. The information is used for land, water, and biodiversity management, pest control and monitoring, wildfire threat and risk analysis, and environmental monitoring and reporting.

The version used for this study is LCDB v3 (or LCDB-3) which contains 33 classes designed to be compatible with earlier LCDB versions. The polygon features contain a code and boundary representing the land cover type at each of three periods; summer 1996/97, summer 2001/02, and summer 2008/09. The data set was designed to be compatible in scale and accuracy with Land Information New Zealand's 1:50,000 topographic database. LCDB v3.0 was released in July 2012 and includes non-temporal edits to the summer 1997/97, summer 2001/02 time periods along with the new summer 2008/09 period.

Boffa Miskell amalgamated a number of vegetation types to best represent a 'snap shot' of percentages of different types of land cover. For example, for the Cape Soucis Coastal Terrestrial Area, each 'Biotic' subsection within Level 3 starts with an overview of that particular Coastal Terrestrial Area, followed by a percentage of the area's typical land cover, including:

- Native Forest (Broadleaved indigenous hardwood)
- Native Shrubland (Manuka/kanuka; matagouri or grey scrub; subalpine and shrubland)
- Native wetland (rushland, sedgeland and flaxland)
- Exotic treeland (Exotic forest; forest-harvested; deciduous hardwoods)
- Exotic Scrub (gorse and broom)
- Pasture (High producing exotic grassland; low producing grassland; short-rotation cropland)
- Bare or Lightly-vegetated surfaces

Refer to www.lcdb.scinfo.org.nz for further information on scales and mapping.



Native Forest and Native shrubland vegetation at Oananga Bay, Cape Soucis

Natural Character Assessments in Adjacent Regions

Natural Character Assessments have been carried out within the adjacent Regions of Marlborough and Tasman. Below is a précis of the methodology used for each region:

Marlborough Region

Marlborough District Council has recently undertaken a review of their coastal natural character documents in relation to their review of the Regional Policy Statement, the Marlborough Sounds Resource Management Plan and the Wairau Awatere Resource Management Plan. “The Natural Character of the Marlborough Coast: Defining and mapping the Marlborough Coastal Environment” was prepared by Boffa Miskell, the Department of Conservation, Landcare Research and Lucas Associates and is dated June 2014. This work was undertaken in light of Policies 1 and 13 of the New Zealand Coastal Policy Statement 2010.

The methodology for identifying the extent of the coastal environment is consistent with the methodology used for Nelson. For Marlborough it was decided that the entire Marlborough Sounds fell within the coastal environment and that a more slender area of land was included for South Marlborough. Nelson’s extent of the coastal environment is therefore ‘more’ consistent with the model undertaken within the South Marlborough context.

The extent of the coastal environment in relation to Nelson, extends up the ridge of Cape Soucis and follows the territorial boundary inland. In this respect, the extent of the coastal environment for Nelson follows the same alignment and matches that of Marlborough’s.

The terms of reference and methodology for undertaking the natural character for Marlborough is again similar for Nelson. For Marlborough, a land systems (or land type) modelling approach was used. The land systems approach is a nested hierarchical method, involving a systematic analysis of abiotic and biotic characteristics measured in terms of their spatial configuration, processes and present condition. Whilst underlying land types assisted in some way to determine ‘Coastal Terrestrial Areas’ for Nelson, due to the spatial extent of Marlborough, in particular the Marlborough Sounds, the extent of land system areas were used for determining terrestrial areas. Specialist input was provided by Landcare Research, the Department of Conservation, Lucas Associates and other consultants to document and tabulate these areas. Consequently, the assessment for each Coastal Terrestrial Area is comprehensive.

Scaling of mapping and ranking was determined using a five-level approach. This included level 1 being at the “regional” scale, Level 2 being at the “sub-regional” scale, level 3 being at the “Coastal Terrestrial/ Marine Area” scale (or land typing scale), and levels 4 and 5 were determined at the finer local scales. A similar form of scaling is used for Nelson, however due to its geographic extent, only four scales will be determined (Level 1: Te Tai-o-Aorere/Tasman Bay, Level 2: regional i.e. Nelson City Council extent, Level 3: Coastal Terrestrial/ Marine Areas and Level 4 the finer more local scale). Level 5 for Marlborough is the same as Level 4 for Nelson.

The evaluation and mapping at these scales is documented within the Marlborough Report. The Coastal Marine Area at the Level 3 ‘Area’ scale is rated as holding very high levels of natural character and extends from Cape Soucis to Greville Harbour in D’Urville Island. The Coastal Terrestrial Area at the Level 3 ‘Area’ scale is rated also rated as holding very high levels of natural character and extends from Cape Soucis in the south to the whole of D’Urville Island in the north. At the finer Level 4/5 scales, the waters of the Coastal Marine Area from Cape Soucis including the whole of Croisilles Harbour and north to D’Urville Island is rated as very high and the Coastal Terrestrial Area around Cape Soucis is rated as very high. These ratings are therefore consistent with those abutting Nelson.

Outstanding Natural Character is determined as a separate assessment on areas that hold high or very high levels of natural character at the level 4 and 5 scales. Again, this is consistent with the methodology used for Nelson, albeit that the outstanding natural character areas were determined at the level 4 scale for Nelson. The evaluation maps for Marlborough show Cape Soucis and the whole Croisilles harbour as holding outstanding natural character. This is consistent with the evaluation and mapping for this northern part of Nelson.



Jetty in the Marlborough Sounds

Tasman Region

In relation to Tasman District Council's review of their Regional Policy Statement, Pacific Eco Logic Ltd were contracted to map the inland extent of the coastal environment and to map and assess areas of high and outstanding natural character within the coastal environment. "Tasman District coastal environment inland boundary and natural character mapping: methodology and summary results" is dated June 2013. This work was undertaken in light of policies 1, 13 and 14 of the New Zealand Coastal Policy Statement. (NZCPS).

The extent of the coastal environment has been determined and mapped by a series of 'decision trees', which is based on previous case-law, ecological guidance and guidance from the NZCPS 2010. These decision trees are based on two types of coasts: open and sheltered. This along with contour data, aerial photography and GIS software has assisted determine a boundary. Broadly this method, whilst different from the one used for both Nelson and Marlborough appears reasonably sound and the draft mapped extent where it meets the Nelson boundary at Champion Road appears to connect.

The terms of reference and methodology used for undertaking the natural character assessment for Tasman is quite different than that used for Nelson. The methodology utilises the QINCCE methodology (Quantitative Index for measuring the Natural Character of the Coastal Environment). This methodology was developed using indicators (and environment-specific parameters) derived from the definition of natural character. A screening process

was undertaken to identify areas that did not reach high or outstanding natural character so these areas were not covered by the study.

The natural character units are based on environmental types and level of overall naturalness. The parameters for calculating the natural character of an area is dependent on a core set of attributes, namely: ecological naturalness, hydrological and geomorphological/ landform naturalness and freedom from buildings and structures. Each attribute has a number of indicators and how these will be measured (parameters).

This highly biophysically laden methodology mostly excludes experiential attributes, as set out within the NZCPS. On reviewing the available draft maps, the land adjacent to the Tasman/ Nelson boundary is defined in the report as AH19/01 and described as holding natural character that less than high. This is consistent with that of Nelson, where the land-based modifications to this part of Nelson sufficiently diminish the natural character to less than high. The coastal marine area adjacent to the Tasman Nelson boundary is defined in the report as AG20/01 and described as holding high natural character. Saxton Island (AH20/01) and Oyster Island (AH20/02) are in proximity to the Tasman / Nelson boundary. These also have high natural character. Again, this appears reasonably consistent with that of Nelson's evaluation of this area, understanding the fact that slightly higher natural character values are identified within the Tasman component of Waimea Inlet than within Nelson's.



Kaiteriteri Beach, Tasman

An aerial photograph of Nelson, New Zealand, showing the city built on a hillside overlooking a large harbor. The water is a deep blue-green, and the surrounding mountains are covered in green forest with some clouds. In the foreground, there is a small peninsula with a sandy beach and a dense forest of trees. The text "Section C: Nelson Coastal Environment" is overlaid in white on the water.

Section C: Nelson Coastal Environment

Introduction to the Nelson Coastal Environment

The Nelson Region is located and adjacent to the eastern part of the shallow waters of Te Tai-o-Aorere/Tasman Bay, a broad embayment that separates the Marlborough Sounds to the east from Golden Bay to the west and is illustrated with reference to Map 1: Location Plan (overleaf). Despite occupying only a portion of Te Tai-o-Aorere/Tasman Bay, the extent of the Region's landform is highly varied, ranging from mountains to coastal plains, foothills and estuaries. As a result of this varied landform, the Region's coastal environment is equally as diverse, where rocky coves and open estuaries provide sweeping vistas up and down the coastal waters of Te Tai-o-Aorere/Tasman Bay.

Extending from Cape Soucis in the north, to the Waimea Inlet in the south, the length of Nelson's coastline of approximately 96km is much shorter than its neighbours' of Marlborough and Tasman Regions. Nonetheless, the Nelson coast provides that integral link between these two larger territorial authorities, with the Nelson coastline holding a range of coastal environments that vary depending on their natural elements, patterns and processes at work.

Located within the central part of the northern coast of the South Island, the Nelson coastal environment retains a particularly complex geology, where continuous seismic and erosional forces have sculpted and formed the landscape of today. The principal feature of this area is the water body of Te Tai-o-Aorere/Tasman Bay, measuring at its widest point some 70km in width. Forming an arm of the Tasman Sea, the bay is contained by the craggy forested hills and sandy beaches of Abel Tasman National Park to the west and the steep rugged topography of the Bryant Range to the east. The land between these two areas is generally low lying and includes the coastal plains and estuaries of the numerous rivers that drain into the bay, including the Waimea and Motueka Rivers.

The entire bay was flooded some 6,000 years ago due to post-glacial sea-level rise, which has resulted in numerous impressive coastal landforms, including various sea cliffs, Rabbit Island and the numerous estuaries of which Waimea Inlet is the largest. The Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea lies to the north of Nelson City a 13km long barrier that separates Nelson Haven from Te Tai-o-Aorere/Tasman Bay.

The Te Tai-o-Aorere/Tasman Bay area supports the largest population of people in the northern part of the South Island. Towns include Richmond and Motueka as well as the city of Nelson. There are also numerous other smaller settlements that pepper the coastline, including Mapua and Glenduan. Land use is also varied, where large, more undulating areas of the broader bay are covered with indigenous broadleaved forest, while the lower, more settled plains and coast fringes support a mosaic of crops, grazing and forestry. Extensive areas of commercial pine plantations are noted within the foothills of the Bryant Range, north of the city of Nelson.

Nelson Region

Due to the diverse topography, which is the result of centuries of tectonic and erosional forces at work, the Nelson coastal environment is extremely varied. From the steep indigenous slopes of Cape Soucis to the north, to the wide, open mudflats of Nelson Haven, this region encompasses many coastal landforms that make this area distinctive. Of those areas, the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea which encloses Nelson Haven is regarded as internationally important for its landform (Geopreservation Site) and Back Beach is noted for its presence of threatened species (the endemic carabid beetle *Cillenum tillyardi*).

- Extent of Nelson Coastal Environment
- Nelson Region
- Settlement areas
- == Major Highways



Map 1: Location Plan

Land Types

As part of the Landscape Study for Nelson (Boffa Miskell, 2014), Landcare Research was commissioned to describe and map land types of the Nelson Region at 1:250,000 scale as well as at a finer scale of 1:50,000. Land Typing (or Types) is a classification approach based on geomorphological land characteristics used to describe the region's complex landscapes. Land types distinguish major physiographical landform units and are based on a range of data sources including published scientific papers, geological and topographical maps, joint earth science inventories and expert scientific knowledge.

For the entire Region, five land types were identified:

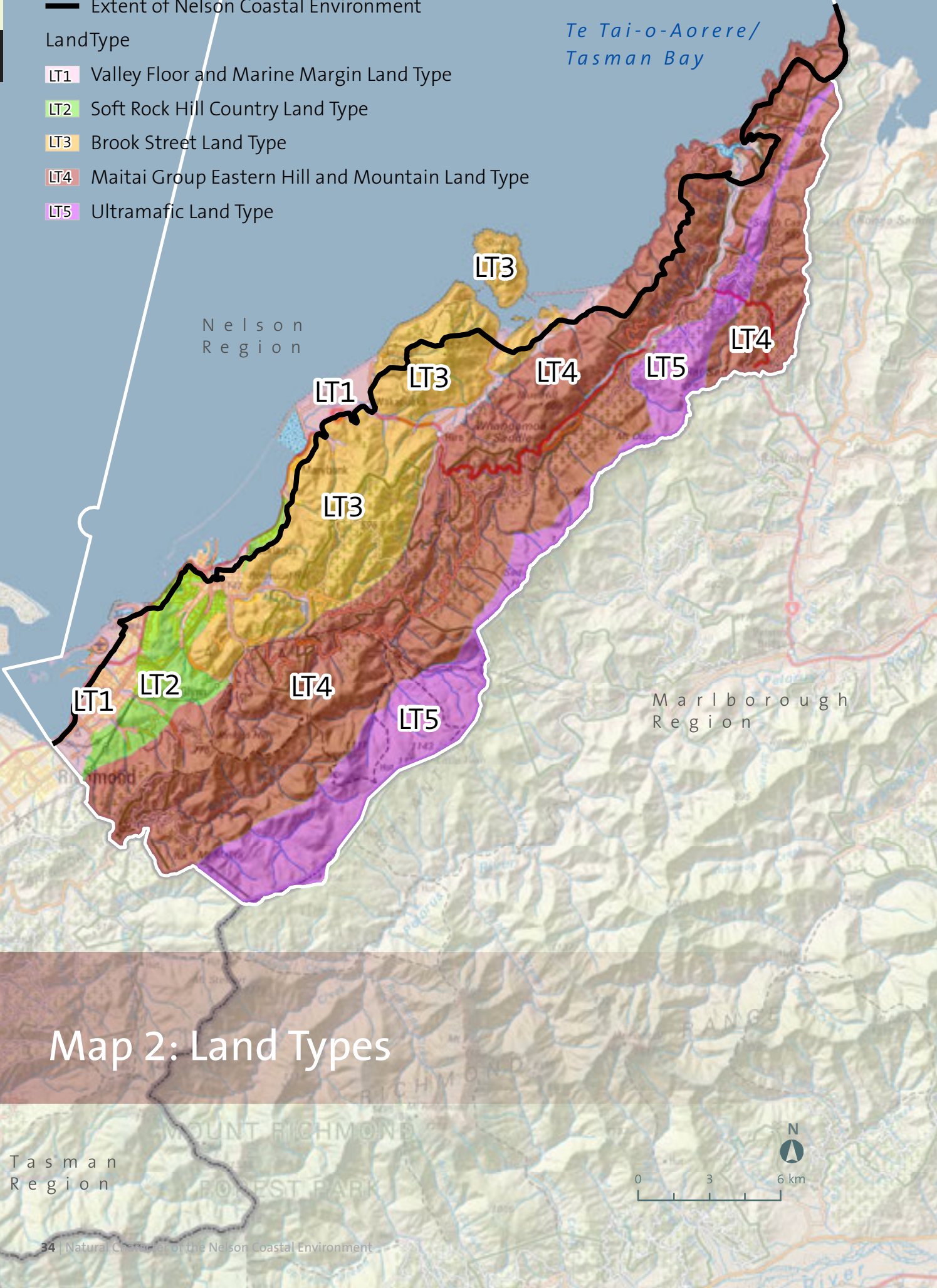
- Valley Floor and Marine Margin
- Soft Rock Hill Country
- Brook Street
- Maitai Group Eastern Hill and Mountain; and
- Ultramafic (outside of the coastal environment)

Of the five land types mentioned above, only four partly fall within the slender coastal environment, as all extend further inland. These are mapped with reference to Map 2: Land Types, overleaf.



The geologically striking cliffs at Cape Soucis clearly demonstrates its land typing

-  Nelson Region
-  Extent of Nelson Coastal Environment
- LandType
-  LT1 Valley Floor and Marine Margin Land Type
-  LT2 Soft Rock Hill Country Land Type
-  LT3 Brook Street Land Type
-  LT4 Maitai Group Eastern Hill and Mountain Land Type
-  LT5 Ultramafic Land Type



Map 2: Land Types

Broad Collective Characteristics

The coastal environment of Nelson comprises a relatively slender strip of land which varies considerably from its relatively natural original state in the north to areas that have been highly modified and reclaimed in the south. This section outlines the collective characteristics and values at the Level 1 and 2 scales. For the purpose of this report, only Level 2 (the Nelson-wide jurisdiction) will be rated at the end of this section.

The interplay of the various characteristics both on land and within the sea create a unique environment for its broad scale variability. The marine component is described first, followed by the terrestrial component.

Marine

Collective Abiotic Characteristics of Nelson's Coastal Marine Environment

Te Tai-o-Aorere/Tasman Bay is a relatively low energy wave environment, reflecting the moderate wind climate and semi-enclosed geography of the bay, which restricts fetch. Local winds are the major contributor to the wave climate in this region with Te Tai-o-Aorere/Tasman Bay most affected by winds from the north and north-east due to the large fetch from this direction.

Typically, tidally driven water currents dominate the transport of water in Te Tai-o-Aorere/Tasman Bay, but at times wave events or wind-driven currents may also have influence. The net tidal circulation within Te Tai-o-Aorere/Tasman Bay has been modelled and measured to be generally clockwise, with 'new' oceanic sourced water tending to enter on the north-western side of the bay and exiting in the north-east at French Pass. Water within Te Tai-o-Aorere/Tasman Bay appears to be isolated from the influence of the major current systems (the D'Urville Current) and frontal zones that characterise the greater Cook Strait/Taranaki Bight/Farewell Spit region. In summer, water within the Bay is usually warmer, less saline and shows a higher degree of stratification than more offshore areas.

Nearshore currents are highly variable depending on location and the state of the tide. Strongest currents occur near the estuary mouths (including The Cut), off major promontories and around the outside of Pepin Island.

Oceanic supply dominates the nutrient input to Te Tai-o-Aorere/Tasman Bay (90%) with the remainder contributed by rivers. Sedimentation rates in Te Tai-o-Aorere/Tasman Bay are relatively high compared to other shelf areas in New Zealand; sediment is supplied primarily by the Motueka

and Waimea Rivers, which collectively drain 65% of the catchment. The depositional footprint of the Motueka River plume typically extends in a northwest direction toward the Abel Tasman and during major flood events, suspended sediments from the Motueka catchment can affect the majority of the bay and extend around Separation Point into Golden Bay. Rivers can be conduits for the delivery of land-derived pollution and associated contaminants into the marine environment. Freshwater inputs into the Nelson Coastal Marine region are relatively minor, deriving mainly from the Maitai, Wakapuaka and Whangamoia rivers. These rivers feed the Nelson Haven, Delaware Inlet and the Whangamoia Inlet, respectively.

Water quality within the broader region is mostly high except in the vicinity of the major sea outfalls, Port Nelson and Nelson City generally.

Tidal ranges within the Bay, often greater than 4 m, are amongst the highest in New Zealand. These large ranges and the generally flat topography in the estuaries contribute to the extensive tidal flats characteristic of the region's estuaries. They also expose a wide intertidal zone along the outer coast of the Nelson Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea.

The Nelson coastal marine area is dominated by rocky shores (bedrock, boulders and cobbles) and sand beaches/barrier spits and barrier enclosed estuaries. Sheltered estuarine environments are located in Nelson Haven and Waimea, Delaware and Whangamoia Inlets. All of these are shallow-barrier enclosed estuaries with one or two entrances. They are stream or river fed and surrounded by agricultural or urban development or regenerating forest.

While both Delaware and Whangamoia Inlets remain relatively intact ecologically, the margins of Nelson Haven and the eastern side of Waimea Inlet have been significantly modified as a result of a combination of drainage, agriculture, reclamation, urbanisation, industry, and port development. Certain offshore areas in Te Tai-o-Aorere/Tasman Bay will be modified by trawling for flatfish and other demersal species.

Exposed rocky shores are a combination of bedrock, boulders and cobble, interspersed with small sand/gravel beaches. No truly exposed shores are located in Te Tai-o-Aorere/Tasman Bay, however, some shore types have a greater degree of exposure. The north-east Nelson coast, from Cape Soucis to Pepin Island, represents the most rugged and exposed coastline in Te Tai-o-Aorere/Tasman Bay, with small headlands and rocky reef platforms backed by sea cliffs. Steep cliffs and headlands also feature south of Rotokura/Cable Bay. Rock and boulders which fall from

these bluffs are thought to be transported in a southerly direction over time by wave action to form Nelson Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea.

The Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is approximately 13 km long extending from Mackay Bluff in the north to Haulashore Island in the south. It is about 50 metres wide at high tide but broadens to up to 240 metres at low tide. Mobile cobbles and boulders occur on the high shore, but lower down and subtidally there is a stable matrix of interlocking boulders cemented together with gravels, sand and finer sediments.

Rocky shores are generally restricted to the intertidal and shallow subtidal (< 15 m depth) terminating in soft bottom substrates dominated by combinations of sand, broken shell, silt and mud. Since sediment depositional patterns are enhanced by the relatively sheltered aspect (i.e. with little ocean swell effect and significant wave action restricted to major storms and northerly sea breezes), these soft bottom habitats cover most of Te Tai-o-Aorere/Tasman Bay. The resuspension and transport of bottom sediments is promoted by tidal currents and periodic wind/ wave generated currents, during northerly storms.

Notable coastal landforms in the Nelson coastal marine region include: the Nelson Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, estuaries and tidal flats (Nelson Haven, Delaware and Whangamoia Inlets); coastal cliffs along the north-east rocky shore; Pepin Island and the connecting gravel tombolo; Rotokura/Cable Bay; Haulashore Island and Arrow Rock; wave-cut platforms; Tahunanui Beach and Monaco Peninsula.

Collective Biotic Characteristics of Nelson's Coastal Marine Environment

Natural biodiversity of Te Tai-o-Aorere/Tasman Bay as a whole is relatively low due to the dominance of homogenous silt and mud habitats across much of the bay. These areas are relatively depauperate, characterised by soft sediment species such as polychaete worms, brittle stars and heart urchins. Biodiversity can be higher on a more localised scale, for example within estuaries and along rocky reef margins, especially in high current areas or where there is more complex topography, such as headlands and promontories.

Key marine ecological features in the Nelson coastal marine region include: near-shore reef communities dominated by mobile and encrusting animals; relatively few conspicuous species inhabiting offshore sediment areas; limited large brown macroalgae (e.g. flapjack) along the north-eastern coast (Eastern Outer Te Tai-o-Aorere/Tasman Bay) and typically restricted to a narrow fringe at and immediately

below the low water mark; large eelgrass beds in Nelson Haven; and relatively unmodified estuaries in north-eastern areas. Te Tai-o-Aorere/Tasman Bay has supported commercial populations of mussels, scallops and flat oysters but over the last decade these fisheries have declined and commercial fishing for these species has all but ceased.

Combined with the Marlborough Sounds, Te Tai-o-Aorere/Tasman Bay is one of New Zealand's most diverse regions for marine mammal sightings and stranding's. While Te Tai-o-Aorere/Tasman Bay does not currently support a



Above: Bottlenose Dolphins



Above: New Zealand Fur Seal

year-round, resident population of dolphins like other South Island regions (e.g. Banks Peninsula or Fiordland) bottlenose dolphins from the wider Cook Strait population are regularly seen in the bay. Common and dusky dolphins are seasonal visitors and Orca periodically turn up to forage along the edges of the bay, including off Tahunanui Beach and inside The Cut. Pepin Island a seasonal fur-seal haul-out site.

Tidal wetlands are found at the heads of the major inlets, providing important ecosystem services such as storm protection, provision of habitat and sediment/contaminant filtration. Wetland extent has declined considerably over time, resulting in a corresponding deterioration in these

ecosystem functions. Collectively these coastal wetlands are crucial habitat for numerous wetland bird species, with Te Tai-o-Aorere/Tasman Bay considered to be a key region for breeding or wintering shorebirds. Te Tai-o-Aorere/Tasman Bay (Waimea Inlet) is the most important site in the world for the 'at risk' variable oystercatcher and eastern Waimea Inlet is an area of international and national importance for a number of shorebirds.

Collective Experiential Characteristics of Nelson's Coastal Marine Environment

The sheltered nature and accessibility of Te Tai-o-Aorere/Tasman Bay make it highly valued in terms of amenity and recreation. Long distance panoramic views are possible from many parts of the coastline and the convenience of the Haven, located on Nelson's doorstep, allows it to be highly utilized. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is recognised as a unique coastal feature and defines the Nelson seascape. Fishing, kayaking, diving and sailing are popular throughout the Bay, and despite its sheltered nature, the coastline has a number of popular surf breaks. Tahunanui Beach is Nelson's most frequented swimming beach and is popular for dog walking, kitesurfing, and standup paddle boarding. Rotokura/Cable Bay is also a popular destination for swimming, snorkelling, diving, kayaking and boating.

Ultimately the way people experience the waters of this part of Te Tai-o-Aorere/Tasman Bay will be highly dependent on the accessibility to the water itself. There will also be some cross over with the experiential characteristics outlined within the Coastal Terrestrial Areas, so this section will focus on the experiential indicators to the water form up to MHWS.

The Nelson Coastal Marine Areas include three broad types of waterbodies, which each reflect varying characteristics that contribute to people's enjoyment and use of the water. The sheltered and accessible coastal areas are more likely to attract a higher number of people than the exposed and remote areas.

As a consequence, the more sheltered (and more easily accessible) waters closest to the city of Nelson are the most popular locations for fishing, diving and recreational sailing; however all of these activities are more or less dictated by the weather conditions. Long distance panoramic views are available from the water to the horizon, where Abel Tasman National Park can be seen in the westernmost part of Te Tai-o-Aorere/Tasman Bay. Further north around the sheltered inlets and estuaries of Nelson Haven, Delaware and Whangamoia, fishing, kayaking, boating and other water activities are popular. In more open waters, yachting, wind-surfing, canoeing and jet-skiing are also popular.

The main areas of modification occurs around the region's southern waters which are highly developed and are generally perceived as least natural. This area contains Nelson city, the industrialised port, sewage outfalls and roads atop coastal walls. There is no aquaculture within Nelson City Council, however there is within western Te Tai-o-Aorere/Tasman Bay (Tasman Region). In those areas, aquaculture management areas have been designated, used for the long line culture of greenshell mussel (*Perna canaliculus*) and/or the collection of both mussel and scallop spat for commercial use. Trawling and some dredging also occurs within Te Tai-o-Aorere/Tasman Bay. Nelson Haven is the only estuary in the Nelson Region with port and marina developments



The marina close to Port Nelson

By contrast the more open north-eastern area of Te Tai-o-Aorere/Tasman Bay (Eastern Outer Te Tai-o-Aorere/ Tasman Bay) is less accessible and more rugged and wild than the remaining coastline. This less developed stretch of coastline contains some of the most pristine habitats in the region and has a sense of remoteness to it. The Horoirangi Marine Reserve is situated south of Rotokura/ Cable Bay and is popular for diving and snorkelling. Spearfishing is popular to the north and south of the reserve.

Terrestrial

Collective Abiotic Characteristics of Nelson's Coastal Terrestrial Environment

The Nelson Region lies adjacent to the active plate boundary that passes through the West Coast of the South Island into Marlborough and the Hikurangi Trough off the East Coast of the North Island. The region is part of the Australian Plate north-west of the boundary between the Australian and Pacific plates, which are converging at about 40mm per year.

The coastal landscape of the Nelson Region is highly influenced by the tidal range of the predominantly

sheltered waters of eastern Te Tai-o-Aorere/Tasman Bay. Topography is steep to very steep in the northern part of the district which is offset against the flat, valley floor and marine complexes associated with areas to the south. Erosion of the hard rock features has created precipitous cliff faces and boulder-strewn beaches. A reasonably complex system of river mouth – lagoon and estuary systems has formed in several places along this coastline, most notably associated with the Whangamoia and Wakapuaka rivers. Sand spits, tombolos and beach ridges and Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea are also prevalent. The Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, noted as New Zealand's best known, comprises a bank of granodiorite pebbles and boulders up to 0.8m in diameter. The boulders originate from Glenduan/ Mackay Bluff to the northeast and decrease in size and become more rounded towards the south-western tip of the spit.

Towards the southern part of the region, the abiotic characteristics have been heavily modified, by reclamation, sea walls and other coastal defences, including a port and marina. The coastal environment here is more heavily accessed, notably the sand deposited Tahunanui Beach.



Grasses assist in stabilising back dunes

Collective Biotic Characteristics of Nelson's Coastal Terrestrial Environment

The terrestrial coastal biota of Nelson Region ranges from relatively intact and extensive indigenous ecosystems in the north to highly modified and depleted ecosystems in the south. The northern coast from Cape Soucis to Delaware Bay is still dominated in most places by indigenous forest, scrub or coastal bluff vegetation. Delaware Bay, Pepin Island and Horoirangi/Drumduan are more modified though still retain important remnants of the original coastal vegetation and habitats. South of the Horoirangi/Drumduan hills, indigenous vegetation is scarce, especially in the vicinity of Nelson City where only scattered modified patches remain. However, the coastal margin along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and Waimea Estuary supports scattered indigenous vegetation and provides important habitat, especially for birds and lizards. Map 3 illustrates this broad land use.

The original vegetation on elevated coastal slopes was mixed beech-podocarp forest, with black beech, hard beech, matai, totara, rimu and a range of broadleaved trees. Closer to the coast, podocarp-broadleaved forest was dominant at most sites. Important species were matai, kahikatea, tawa, titoki, pukatea, mahoe and nikau. Low-stature shrubland and rockland communities were present on steep exposed coastal slopes and cliffs. Dominant species at these sites were kanuka, ngaio, akeake, tauhinu, taupata, wharariki and puka.

Gentler coastal country, on coastal plains and alluvial flats once supported a rich diverse forest dominated by lowland broadleaved species and towering emergent podocarps. Free-draining sites were dominated by totara, matai, titoki and tawa. Kahikatea, pukatea and nikau were common at wetter sites. River margins and deltas supported kowhai, lowland ribbonwood and narrow-leaved lacebark. Wetlands were dominated by harakeke, raupo and/or sedges and rushes. These communities graded from the estuary margins to shrublands of marsh ribbonwood, scrub pohuehue and rushes. Coastal dunes supported by pingao, sand tussock, sand sedge and spinifex. Stable rear dunes supported umbrella sedge, akeake, ngaio, tauhinu, wharariki, toetoe and scrambling pohuehue.

The extensive wetland habitats in the lower reaches of the river systems once supported abundant and diverse communities of indigenous freshwater fish including access to extensive intact spawning habitats. The now extinct grayling (*Prototroctes oxyrhyncus*) was known to be abundant in Nelson rivers, particularly the lower Maitai River. Migratory galaxiids comprising the “whitebait

species” – giant, shortjaw, and banded kokopu and the smaller koaro and inanga were abundant. Biomass was dominated by New Zealand longfin eel (the apex predator) and shortfin eels which provided a key food source for maori. Other fish included bully species of the genus *Gobiomorphus* including common, giant, redfin and bluegill bully), torrentfish, common smelt and lamprey with crustacean populations dominated by northern koura (*Paranephrops planifrons*) and freshwater shrimp (*Paratya*). While there are residual populations or records of these species in Nelson rivers today the decline in abundance is reflected in all the aforementioned species being classified as threatened with the exception of banded kokopu, common and giant bullies.

Coastal forests provided rich habitat for forest birds, including seasonal food sources for birds occupying inland habitats, such as kereru and tui. Coastal cliffs, rock stacks and beaches provided important roosting and breeding habitat for sea birds and haul-out sites for seals. Enclosed estuaries and bays, such as at Delaware Bay, Nelson Haven and Waimea Inlet, provide extensive habitat for wading birds. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and other rocky coastal sites provide important habitat for birds and lizards.

Relatively extensive areas of coastal forest remain in the north of Nelson Region, though these are modified in places. Important remnants are present further south, notably at Delaware Bay and Horoirangi/Drumduan. Coastal cliff vegetation is still present at most sites, though modified in many places by fire, grazing and naturalised exotic plant species. Indigenous vegetation on coastal flats is much more depleted, with only a few small modified patches remaining. Similarly, coastal wetlands and estuary margins are substantially depleted or modified. Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea plant communities remain, though are modified by naturalised plant species.

Remaining indigenous ecosystems of the Nelson Region support a diverse range of indigenous plant species, including a number near to their southern distributional limit, such as tawa and kohekohe. These coastal plant communities also support a number of nationally threatened or at risk species, such as fierce lancewood, inaka, coastal porcupine shrub, prostrate pohuehue, coastal peppergrass and gossamer grass. A large number of regionally threatened plant species are also present in coastal plant communities. Nelson Region's coastal ecosystems provide habitat for a number of threatened bird species including fernbird and bittern. A greater number of

threatened bird species utilise estuarine habitats such as variable oyster catcher, dotterels and terns.

Collective Experiential Characteristics of Nelson's Coastal Terrestrial Environment

Experiential characteristics of Nelson's Coastal Terrestrial Environment vary considerably depending which part of the coastal environment one is in. The more rugged and difficult to access northern part of the Region offers different characteristics to the more sheltered and heavily populated areas to the south. The diversity of the coastline, from its sheltered estuaries and beaches to its exposed cliffs present a unique coastal environment providing memorable experiences.

The populated southern parts, including Waimea Inlet, Tahunanui Beach, Port Nelson, the marina and Nelson

Haven are the most popular and most visited parts. Many houses have been built on adjacent hills and slopes to capitalise on the available views. Many visitors and locals holiday in the area, to enjoy the coast and its plentiful activities. Marine based experiences are covered off within the Collective Characteristics outlined earlier, with terrestrial based activities including picnicking, walking, shore-based fishing and sunbathing.

Towards the north, beyond Nelson Haven, the accessibility to the coast becomes more restrictive, with only a few roads and tracks available. Rotokura/Cable Bay is a popular area for more sheltered activities, such as picnicking and fossicking. The Rotokura/Cable Bay walking track offers more exposed experiences, extending from Rotokura/Cable Bay south towards Glenduan. Beyond this area to the north, the land becomes more remote as much of the



Delaware Inlet as seen through saltmarsh vegetation

coastal environment is contained within private ownership. Access to the Whangamoa River mouth/ estuary is gained via Kokorua Road which extends off SH6. There is no access (other than via boat) to Cape Soucis. Experiential values in these northern parts offer more remote-like experiences due to fewer built structures. Land use modifications such as pastoral farming and commercial forestry are, however, prominent in parts and delimit naturalness to some areas.

In summary, at the Level 2 scale, the entire Nelson Region holds Moderate to High levels of natural character. This comprises high levels of abiotic, moderate to high levels of biotic and moderate levels of experiential aspects of natural character. This broad level 2 rating takes into consideration the region's substantial levels of modification, such as around the southernmost part (for example Nelson City), as well as the less modified northern parts (for example Cape Soucis). Due to the scale of the assessment (the entire region) this summary represents a broad assessment. More detailed assessments of the region's areas are outlined within Section D of this report.

Summary of Level 2 Marine & Terrestrial Values			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>	✓		
<i>Moderate to High</i>		✓	✓
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
Overall Natural Character Rating			Moderate -High



Walking along Delaware sandspit with Bishop Peninsula in the middle distance



Section D: Nelson Coastal Marine and Coastal Terrestrial Areas

Coastal Marine and Coastal Terrestrial Areas of Nelson

The Study Team determined that within the Nelson Region there are three Coastal Marine Areas and ten Coastal Terrestrial Areas. These are identified in the tables and map overleaf and described in this section of the report. These Coastal Marine and Coastal Terrestrial Areas are essentially mapped at the Level 3 scale, as outlined within Section B, and Figure 2 of this report.

For each of the Coastal Marine and Coastal Terrestrial Areas the collective characteristics of the Area's abiotic, biotic and experiential attributes are described first. Following this, an explanation around the size of the Area is given, describing how the inland extent of the coastal environment was determined. A description of the adjacent Coastal Context follows which will provide relationships associated with the Areas' broader setting.

Following this, each specific Area is discussed and evaluated. Freshwater aspects are covered within the Coastal Terrestrial Areas. An evaluation table at the end of each Area subsection summaries the values and ratings at the Level 3 scale for Coastal Marine and Coastal Terrestrial Areas. Following this any specific values within the 'Area' are listed, mapped and rated at the Level 4 scale (or local/specific scale). Refer to Figure 2 for an explanation of the Levels. An overall evaluation map is provided at the end of this section, illustrating the ratings for the Levels 3 and Level 4 areas (refer again to Figure 2)

An overall summary of all values is presented at the end of this Section.













The junction of two Coastal Terrestrial Areas: Wakapuaka and Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea. Malvern Hills Coastal Terrestrial Area is also evident in the distance. The Coastal Marine Area is Southern Te Tai-o-Aorere/Tasman Bay

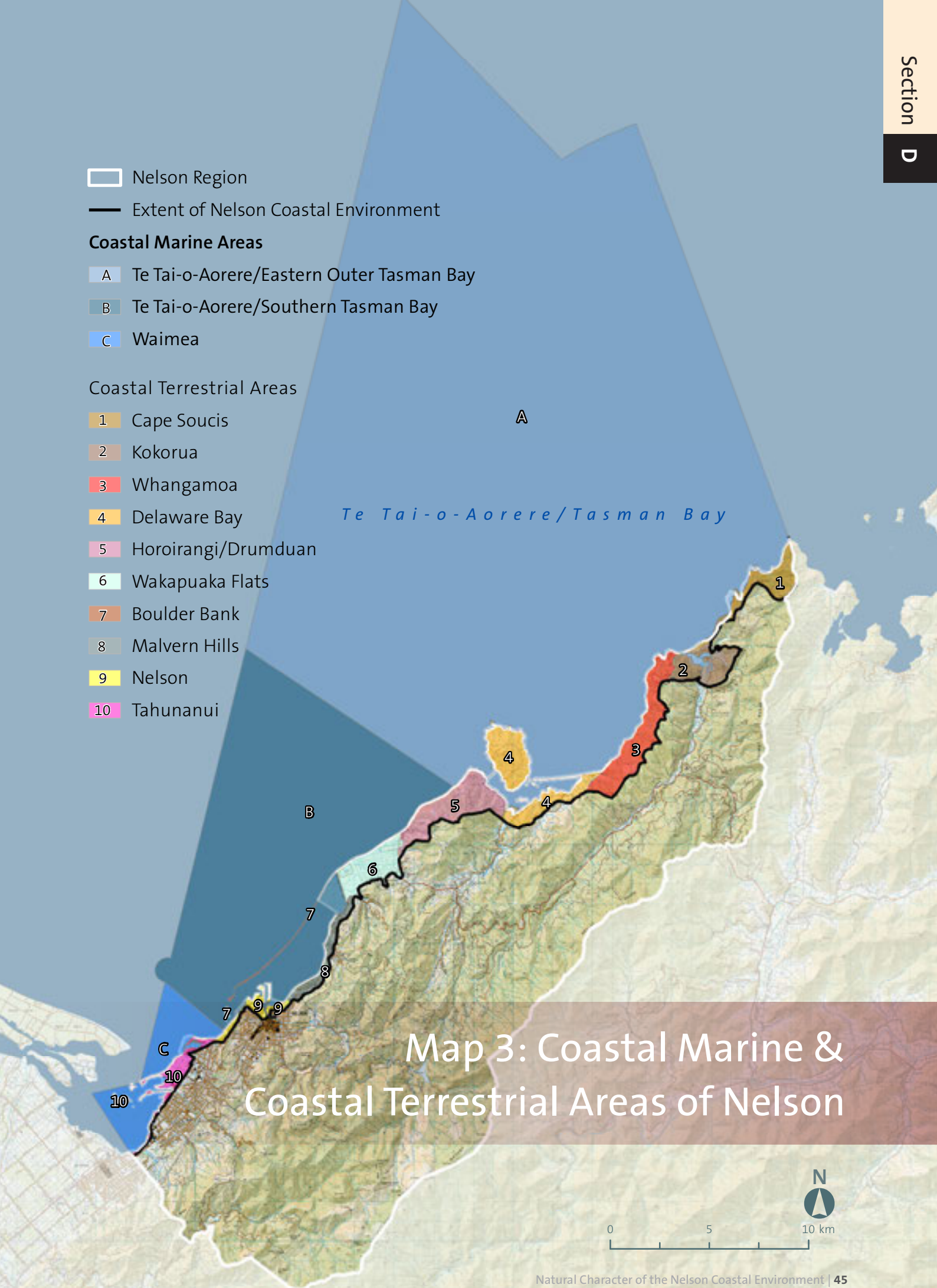
Coastal Marine Areas	
A	Eastern Outer Te Tai-o-Aorere/Tasman Bay
B	Southern Te Tai-o-Aorere/Tasman Bay
C	Waimea

Coastal Terrestrial Areas	
1	Cape Soucis
2	Kokorua
3	Whangamoia
4	Delaware Bay
5	Horoirangi/Drumduan
6	Wakapuaka
7	Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea
8	Malvern Hills
9	Nelson
10	Tahunanui

-  Nelson Region
 Extent of Nelson Coastal Environment
Coastal Marine Areas
 A Te Tai-o-Aorere/Eastern Outer Tasman Bay
 B Te Tai-o-Aorere/Southern Tasman Bay
 C Waimea

Coastal Terrestrial Areas

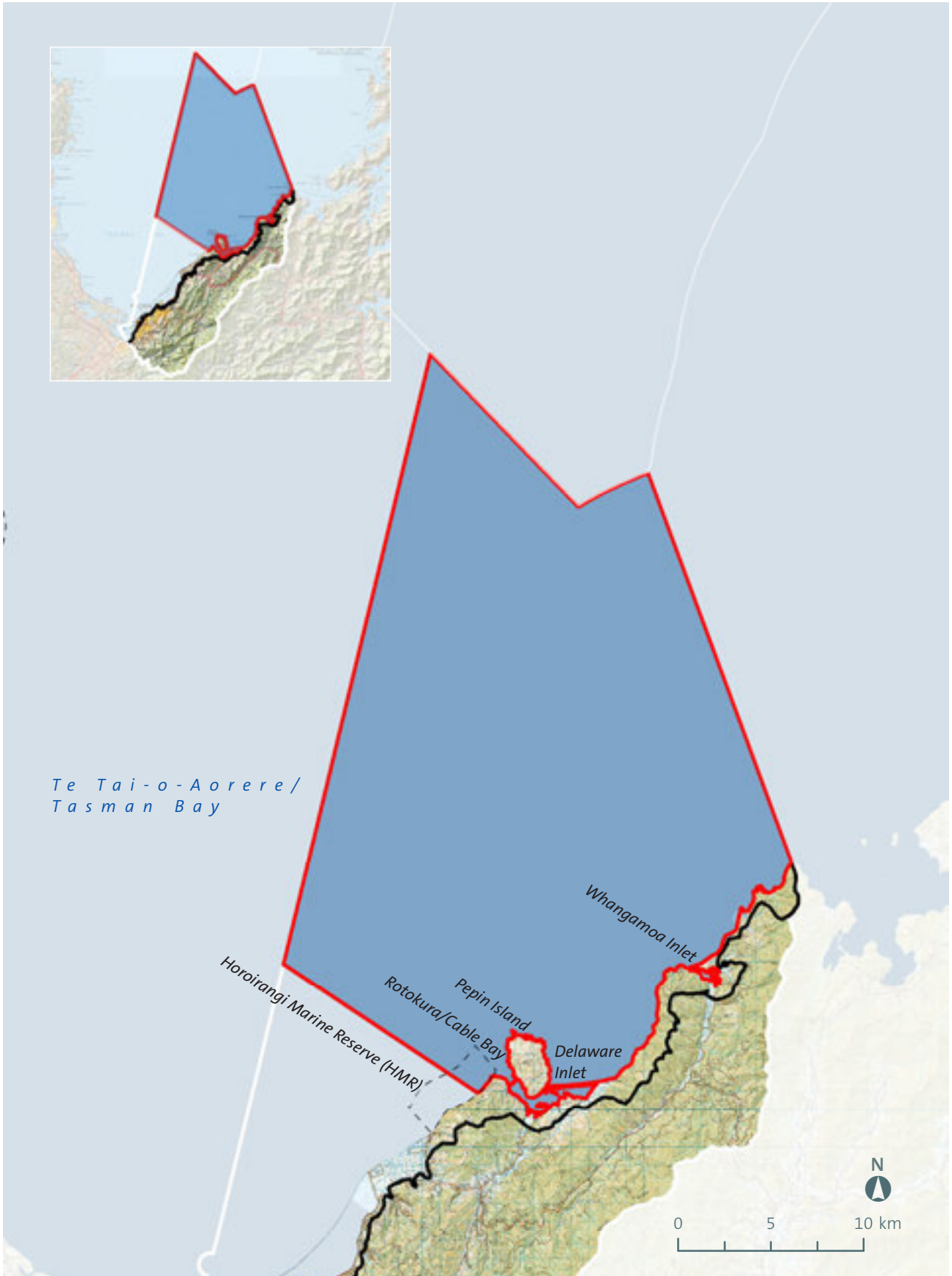
-  1 Cape Soucis
 2 Kokorua
 3 Whangamoia
 4 Delaware Bay
 5 Horoirangi/Drumduan
 6 Wakapuaka Flats
 7 Boulder Bank
 8 Malvern Hills
 9 Nelson
 10 Tahunanui



Map 3: Coastal Marine & Coastal Terrestrial Areas of Nelson

COASTAL MARINE AREA A:

Eastern Outer Te Tai-o-Aorere/Tasman Bay



Collective Characteristics

Moderate highly variable turbidity; temperate waters; open to the sea but relatively sheltered to high-energy wave/swell activity; limited rocky reef zone; sands and muddy sediments offshore; generally sparse marine life; Rotokura/Cable Bay, and Whangamoia and Delaware Inlets are important features.

Abiotic

The Eastern Outer Te Tai-o-Aorere/Tasman Bay coastline, between Cape Soucis and the beginning of the Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea (Mackay Bluff), is characterised by steep coastal cliffs and rocky shores interspersed by gravel or sand beaches. A relatively narrow near-shore bedrock and boulder/cobble reef zone extends down to between 6 m and 20 m depth. Sandy sediments occur below the reef zone, replaced by silts in deeper offshore areas.

While much of the coast is open to the sea, it is sheltered from large oceanic swells. The area is bathed in relatively warm coastal waters derived from the D'Urville Current and outflows from Te Tai-o-Aorere/Tasman Bay. Seasonal thermal stratification is pronounced and currents are weak to moderate offshore but stronger near shore and across subtidal reef habitat. Sedimentation/turbidity levels are moderate and a large tidal range exposes a wide intertidal zone at low water. Maximum depth offshore ranges from less than 20 m to 50 m and this is the only section of the Nelson coastline where depths of greater than 20 m extend to near shore.

Whangamoia and Delaware Inlets are important features within this Coastal Marine Area, providing a link between terrestrial and marine ecosystems, supplying critical habitat for a variety of plants and animals, maintaining coastal productivity and nourishing the marine food web.

Whangamoia Inlet is a relatively pristine estuary surrounded by steep hills and enclosed by a ridge of land along its northern side, which extends to a sand spit tidal barrier with a narrow opening to Te Tai-o-Aorere/Tasman Bay. With the exception of possible grazing effects along estuary borders, and some loss of land-sea connectivity due to small reductions of adjoining freshwater wetland areas,

the intertidal seabed of Whangamoia Inlet appears to be relatively unmodified. The inlet is located at the mouth of the Whangamoia River and is expected to have good water quality, reflecting the high water quality of this primary freshwater source. Extensive sand and mud flats characterise the benthos.

Delaware Inlet, located at the mouth of the Wakapuaka River, is representative of a functional but slightly modified estuarine system. Naturally high biodiversity is fostered by the complex mixture of intertidal habitats. However, over the past 160 years, Delaware Inlet and the surrounding catchment have been subject to modifications that are likely to have had some effects on the functional integrity of the estuary. The inlet is enclosed by a sand spit barrier along its eastern arm and a gravel tombolo, which connects Pepin Island to the mainland and isolates the estuary waters from Rotokura/Cable Bay. A narrow opening, between the eastern shore of Pepin Island and the sand spit barrier, provides the only access to tidal flushing from Te Tai-o-Aorere/Tasman Bay. Extensive mud and sand flats dominate the intertidal environment and the Rotokura/Cable Bay and Delaware sand spits provide important dune habitat. Water quality in the estuary is expected to be moderate, reflecting the slightly elevated nitrate and E. coli loadings in the lower Wakapuaka River.

This Coastal Marine Area also encompasses part of the Horoirangi Marine Reserve, which runs along the coastline from Ataata Point, near Rotokura/Cable Bay, to Glenduan. The near shore zone of the reserve is characterised by bedrock and boulder habitats. A mud/silt benthos typical of the remainder of Te Tai-o-Aorere/Tasman Bay becomes dominant from about 15 m depth. A number of rocky reefs are also scattered along this section of coast, including a complex reef at Ataata Point and reef formations around Pepin Island, at Whangamoia Head and toward Cape Soucis.

Commercial bottom trawling occurs in certain areas offshore in Te Tai-o-Aorere/Tasman Bay but no aquaculture currently occurs within this area. A taiapure exists between Ataata Point and Whangamoia Head, however, no fisheries regulations have been recommended by the management committee to date (NCC 2003).

Biotic

The Eastern Outer Te Tai-o-Aorere/Tasman Bay Coastal Marine Area is notable for low biomass and diversity of macroalgae, mostly confined to a narrow band immediately below low water, which is dominated by flapjack (*Carpophyllum flexuosum* and *C. maschalocarpum*). Subtidal reefs appear relatively barren, though there is often a high diversity of fish and encrusting animals (e.g. sponges, hydroids and ascidians) in outer rocky areas compared to other sheltered shores further south into Te Tai-o-Aorere/Tasman Bay. A typical array of sediment dwelling species – shellfish, brittle stars, starfish, polychaete worms, heart urchins, crustaceans – inhabits offshore gravels, sands and silts.

This Coastal Marine Area provides an important link between biological communities in Nelson and the Marlborough region. The longshore extension of unmodified habitats is critical for the sustainability (or recovery) of biological communities (e.g. as sources of larvae, eggs, plants, animals) to adjacent regions.

The Ataata Point reef supports large patches of common anemone, with a variety of sponges and cup coral (*Culicia rubeola*) common on underhangs and vertical rock faces. Species considered uncommon around much of the New Zealand coast (e.g. brachiopods, ambush starfish, window oysters) are found in profusion here, and on other reefs around Pepin Island, with the numerous caves and crevices providing excellent habitat for cryptic animals. Surveys over 1989-1995 reported fish abundance and diversity around Pepin Island, Rotokura/Cable Bay and Te Ataata to be relatively low with opal fish, spotties, yellow-eyed mullet and triplefins commonly observed and banded wrasse, red mullet, slender roughy and tarakihi present in lower numbers. Blue moki, blue cod, butterfly, eagle rays, marble fish, red rock cod and weedfish were also occasionally sighted. According to recreational fishers, however, this once highly productive recreational fishery is



now recovering from earlier fishing pressures.

Delaware and Whangamoa Inlets provide habitat for a variety of soft sediment species (e.g. cockles, crabs, polychaetes, pipi) as well as a range of saltmarsh and macroalgal species. Delaware Inlet has a significant eelgrass presence, however, biomass does appear to have declined since 1983. This estuary is an important breeding, feeding and nursery area for a variety of fish species and both the Whangamoa and Wakapuaka river mouth areas are likely to be important for inanga spawning (unpublished NCC data) as well as providing rearing habitat for juveniles.

The Kokorua sand spit, at Whangamoa Inlet, contains remnant populations of a variety of regionally threatened plant species (e.g. spinifex & pingao—refer to Coastal Terrestrial Area B). The exotic Pacific oyster is well established in Delaware Inlet and represents a significant departure from the natural character of the tidal flats.

Various seabirds and marine mammals are seen in this area, including the nationally vulnerable reef heron. Banded rail, banded dotterel and variable oystercatcher have been recorded breeding in coastal margins of Delaware Inlet and Whangamoa estuary provides excellent feeding grounds for threatened and at risk waders. Pepin Island and the rocks at Ataata Point provide roosting sites for 500-1000 spotted shags and the area has been ranked as a wildlife site of moderate to high importance. Pepin Island is also a breeding site for white-fronted tern, and probably reef heron, and used as a haul-out site by fur seals. Large pods of bottlenose dolphins are regularly seen along this coastline.

Experiential

The Eastern Outer Te Tai-o-Aorere/Tasman Bay Coastal Marine Area is less accessible than other parts of Nelson's coastline offering largely unmodified, open coastal waters. Boats and kayaks are able to be launched at Rotokura/Cable Bay and in Delaware Inlet.

Fishing is popular along the coastline (e.g. Pepin Island, Delaware Bay and Hori Bay), including diving for paua and crayfish. Due to its proximity to Nelson, Rotokura/Cable Bay is a high use recreational area, popular for swimming, fishing, diving/snorkelling, boating, kayaking and walking. Rotokura/Cable Bay and Delaware Bay are also popular for surfing.

Once away from Rotokura/Cable Bay, this stretch of coast has more of a 'wild' or remote feel to it than any other part of the Nelson Region.

Opposite: Paua

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>	✓	✓	✓
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
	Overall Natural Character Rating		High

Commentary of Level 3 'High' rating: The coastal waters of this Coastal Marine Area rate as holding high levels of abiotic, biotic and experiential aspects of natural character. This is principally due to the very low levels of modifications to this Coastal Marine Area. The inshore area of this Coastal Marine Area holds the highest part of this Level 3 Area and this is reflected within the Level 4 rating below (apart from those areas where trawling occurs). Part of the outer coast has experienced trawling, therefore at this 'area' scale analysis, a high rating is considered appropriate.



Whangamoa Head

Specific Values at Level 4

These are mapped with reference to **Map 4**.

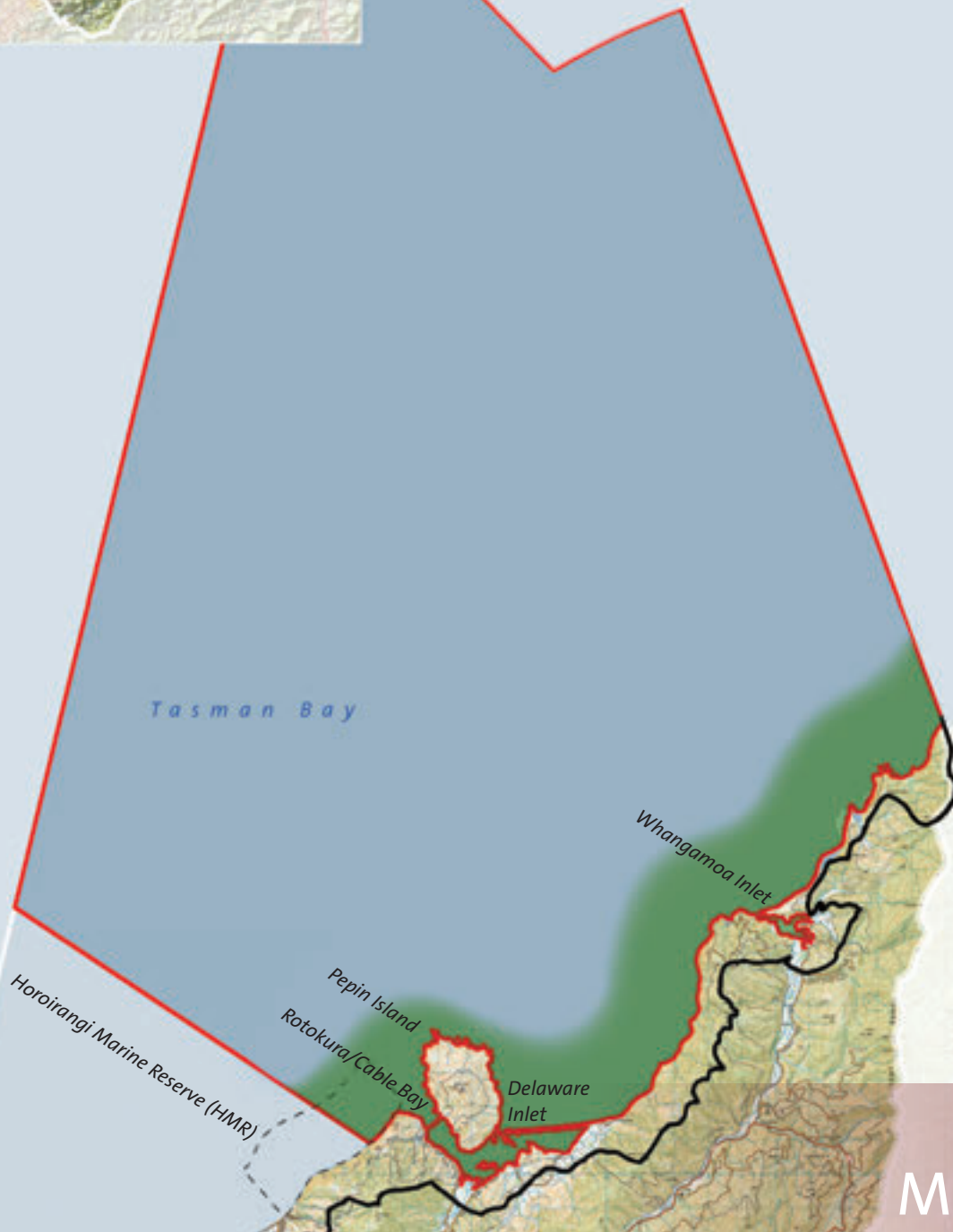
Sub Area	Rating	Key Values	Additional Comments
Coastal waters from Cape Soucis to Horoirangi Marine Reserve, including Whangamoia Inlet, Delaware Inlet and Rotokura/Cable Bay.	Very High	<p>Very high Intertidal and near shore, subtidal areas of inner Eastern Outer Te Tai-o-Aorere/Tasman Bay retain very high natural values:</p> <ul style="list-style-type: none"> • Whangamoia Inlet • Delaware Inlet • Pepin Island • Rotokura/Cable Bay • Horoirangi Marine Reserve (HMR) <p>Steep coastal cliffs, interspersed by spectacular rocky outcrops and small gravel or sandy beaches</p> <p>Very high levels of perceived naturalness due to lack of modifications along the coastal edge</p>	<p>Whangamoia and Delaware Inlets are of high value due to their relatively pristine condition. Habitat restoration progressing on the spit and flats at Delaware Inlet.</p> <p>Rotokura/Cable Bay is a highly accessible, important recreational area.</p> <p>There is strong potential/likelihood for habitat restoration and recovery within HMR that will enhance natural character.</p> <p>Offshore areas north and west of Pepin Island are commercially trawled.</p>



Coastal waters of Oananga Bay



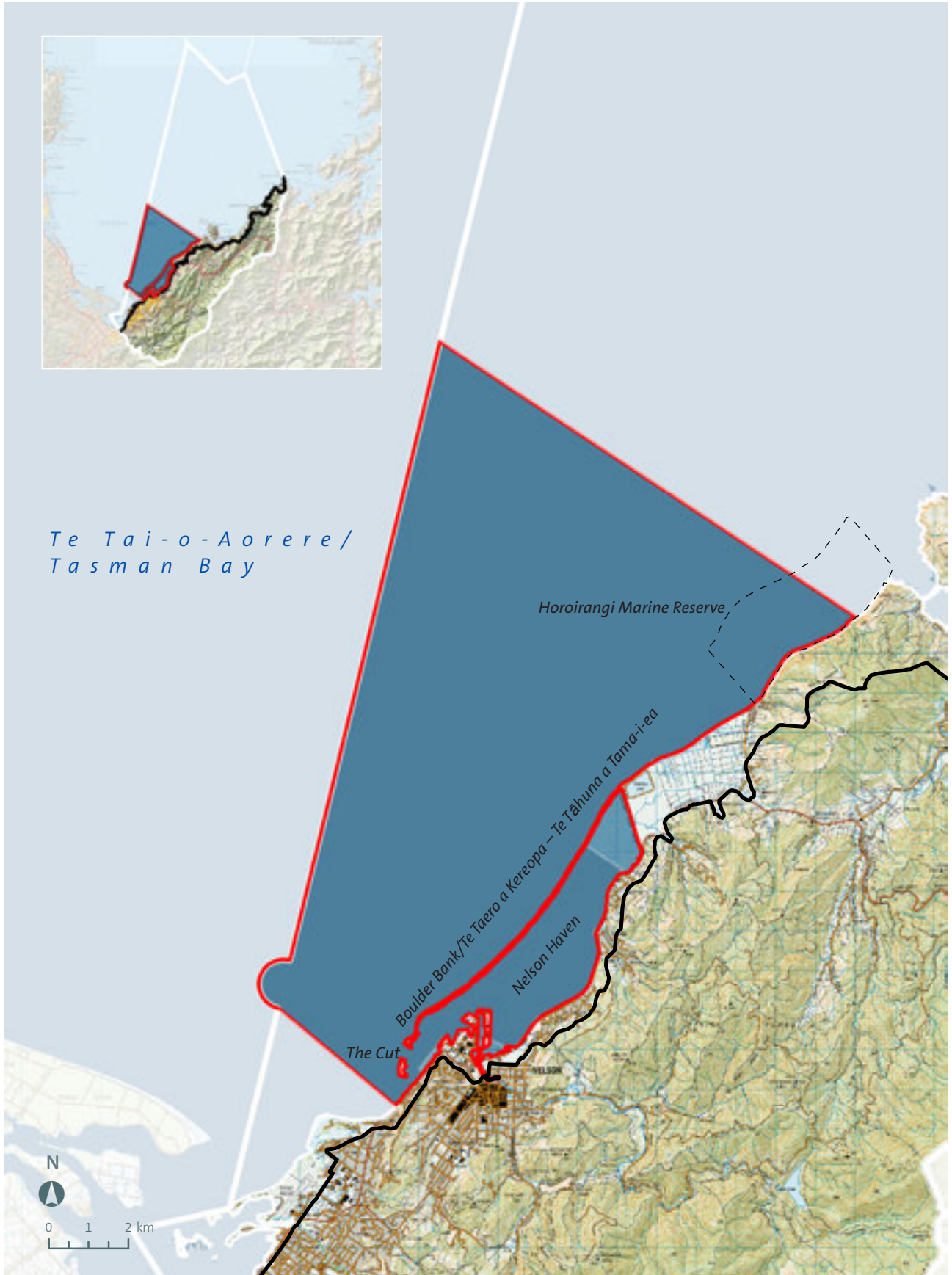
-  Nelson Region
 -  Extent of Nelson Coastal Environment
 -  Horoirangi Marine Reserve
 -  Eastern Outer Tasman Bay Coastal Marine Area
- Eastern Outer Tasman Bay Coastal Natural Character Rating**
-  High
 -  Very High



Map 4



4.3 COASTAL MARINE AREA B: Southern Te Tai-o-Aorere/Tasman Bay



Collective Characteristics

Sheltered; boulder coastline; sparse intertidal marine life; more prolific and diverse communities exist along the deeper subtidal fringe of the rocky habitat; muddy, relatively depauperate sediments offshore; Nelson Haven and the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea are important features.

Abiotic

The Southern Te Tai-o-Aorere/Tasman Bay & Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Coastal Marine Area is distinguished by the Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea, a unique coastal landform thought to be formed from the longshore drift of pebbles and boulders originating from Mackay Bluff. The Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is a landform of international significance and forms a barrier between Te Tai-o-Aorere/Tasman Bay and Nelson Haven, creating a sheltered harbour. The northern portion of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is bordered by steep hills and cliffs, transitioning to low-lying farmland, a land-based aquaculture development at Glenduan and eventually estuary where the Nelson Haven begins at Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Drive. The coastline is relatively sheltered, affected mainly by weather events from the north or north-east.

The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is made up of loose boulders on the high shore and a matrix of stable boulders below about the mid tide mark. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea extends subtidally to a depth of 15-20 m and up to 400 m offshore. Mixed sediments (mud, sand, shell and gravel, in places sculpted into mega-ripples where there is sufficient wave action) occur below the reef, grading into the extensive, and comparatively uniform, mud/silt bottom typical of much of offshore Te Tai-o-Aorere/Tasman Bay.

The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea provides the seaward barrier of the Nelson Haven, a sheltered estuary fed by the Maitai River. Sand/mud flats dominate the estuary, with patches of gravel and boulders in places. The main channel extends up the western flank of the Haven and various tidal channels intertwine across the tidal flats.

The estuary's eastern and southern margins have been heavily modified due largely to port development, urbanisation and roads. Shoreline hardening is present along almost the entire inner estuary margin, representing a significant deterioration of estuarine function. Boulder Bank Drive, along the northern end of the estuary, provides

a physical barrier separating the Wakapuaka Flats from the rest of the Haven, effectively erasing its former function as an interactive land/sea interface. Much of the area around the Nelson Haven has been reclaimed for farmland, residential areas and port development. Port Nelson is located near the entrance to the Haven (The Cut), which was opened through the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea in 1906 to allow more direct access for ships. The channel is regularly dredged to provide access for ships; the dredge spoil grounds are located within the seaward boundary of the Nelson City Council's jurisdiction, with approximately 50,000m³ of sediment dumped annually since 1974.

Despite these modifications to the estuary's southern, eastern and northern flanks, and the consequent loss of primary productivity, the central expanse of the estuary remains mostly intact and retains high natural values. The western side of the Haven in particular is relatively unmodified and includes the main channel and the natural shoreline of the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea.

Haulashore Island, formerly part of the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, was formed when The Cut was opened. The intertidal and shallow subtidal areas around the island are characterised by cobbles with Arrow (Fifeshire) Rock protruding as another notable feature nearby. The area to the south of Haulashore Island (along Rocks Rd) is dominated by wave-cut platforms, exposed during the region's large low tides. Despite modifications as a result of the construction of Rocks Road, the reefs are an important geological feature that demonstrates how sediments were deposited in deeper waters and how marine organisms affected them at the time of deposition. It is also one of the first areas where fossils were collected for scientific purposes. The area is popular for people exploring the reefs and associated rock pools.

Maximum depth offshore is less than 30 m. Bottom trawling and dredging occurs offshore from the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, although dredging has been infrequent since the collapse of the Te Tai-o-Aorere/Tasman Bay scallop fishery in 2005. No aquaculture occurs within Nelson City Council's jurisdiction (except the land-based aquaculture at Wakapuaka), although large mussel farms exist further out in Te Tai-o-Aorere/Tasman Bay. The Wakapuaka sewage treatment plant discharges treated sewage from an oxidation pond into Te Tai-o-Aorere/Tasman Bay at the north end of the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea. Several decades of effluent disposal has had little

discernable effect on the seabed, and impacts on water quality are highly localised. The Sealord fisheries outfall, approximately 5 km further south along the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, discharges fish processing effluent into Te Tai-o-Aorere/Tasman Bay but has not resulted in significant adverse effects to the benthic ecology of the wider area.

Biotic

Marine communities along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea resemble those found along the Eastern Outer Te Tai-o-Aorere/Tasman Bay coastline. Due to their mobility, boulders near the high shore are largely devoid of life. Between about mid-tide and the low water mark the boulder reef is inhabited by a relatively diverse assemblage of intertidal plants (e.g. flapjack and *Cystophora*) and animals (e.g. limpets, topshells), with diversity generally increasing towards the lower shore and where there is standing water.

At depths of around 4 m to 10 m the boulder habitat is sparsely populated with sea urchins, sea stars, sponges, paua, window oysters, ascidians and sea cucumbers. South of the Horoirangi Marine Reserve, a notable sponge garden habitat occurs at depths from 10 m to 15 m and includes several species of very large sponges and numerous finger sponges as well as small colonies of bryozoans, which provide important habitat and shelter for juvenile fish. Due to their large size, species diversity and accessibility McLean and Grange (1995) ranked the sponge gardens as likely to be of national significance.

Beyond approximately 15 m the soft sediment bottom provides habitat for species such as heart urchins, polychaete worms, small bivalves, whelks and mantis shrimp. Fish abundance and diversity along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea (1994-1995) is relatively low with opal fish, spotties and triplefins commonly observed in the area and butterflyfish, marble fish, tarakihi, banded wrasse, blue moki and kahawai occasionally sighted.

Nelson Haven is characterised by soft sediment species, such as cockles, polychaete worms and wedge shells. The western part of the Haven is less modified than eastern and southern portions and is a highly productive area. The Haven has lost almost its entire original saltmarsh habitat due to reclamation and development, resulting in a decline of important ecosystem functions (e.g. ability to intercept inorganic nutrients and trap fine sediments, productive contribution to the detrital food web). Distinctive supratidal biological communities occur along the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea; primarily mosses and lichens.

Although Nelson Haven has lost close to 60% of its eelgrass meadows, it still has the largest coverage of this vegetation type in Te Tai-o-Aorere/Tasman Bay. Eelgrass beds have high ecological and biodiversity values, providing a stable habitat and localised food source to support a diverse community of animals, including a variety of fish species (e.g. juvenile snapper). They also help to intercept nutrients and trap sediments, thereby enhancing water quality.

Nelson Haven is of national importance as a major feeding and roosting area for migratory waders and the threatened banded dotterel and bittern breed there. Variable oystercatchers, white-fronted terns, black-backed gulls and red-billed gulls nest along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and pied shags use Haulashore Island for breeding and roosting. Orcas periodically visit inner Te Tai-o-Aorere/Tasman Bay including the Port area to feed on stingrays. Dolphins are also occasional visitors, sometimes entering the estuary while hunting kahawai and yellow eyed mullet.

Pacific oysters are established within Nelson Haven and around the Port. *Undaria* is also well established around the Port and near The Cut. Mediterranean fan worm and clubbed tunicate have also been reported at Port Nelson.

Smaller waterways that retain flow throughout summer and have suitable habitat support banded kokopu, koaro,



White fronted terns

inanga, common and redfin bully and eels (NZ freshwater fish database, NCC data). Pockets of inanga spawning are also likely in the tidal reaches.

Experiential

This coast is readily accessible and forms part of Nelson's identity as a coastal city and destination.

The Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and Nelson Haven possess high recreational, scenic and amenity values. They provide an iconic view from the hills of Nelson, a constantly changing seascape owing to the ebb and flow of the tide across the mosaic of sand flats and tidal channels. Views over the Nelson Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea to Te Tai-o-Aorere/Tasman Bay towards the distant mountains are equally as impressive. Sightings of seasonal marine mammals entering these waters contribute to the naturalness of this Coastal Marine Area.

The Haven is also used for a variety of recreational activities, such as windsurfing, rowing, sailing, water skiing, and walking at low tide. Walking and bird watching along the ankle-testing Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea are also popular pursuits, as are fishing, boating, yachting and kayaking on the outer coast, accessed from Port Nelson, the water front, Glenduan or Rotokura/Cable Bay.

The Sea Scouts, Waka Arma, Rowing Club, Navy Cadets, Sea swimmers, coast guard are sited near the port area and many harbour-side restaurants capitalise upon the scenic location. Port Nelson is an important gateway for Nelson's forestry, fruit and wine products and is the largest fishing port in Australasia.

The Wakapuaka sandflats, located at the head of the Haven, are used for activities such as walking, dog exercising, model aeroplane flying and horse riding. The adjoining Wakapuaka Wildlife Reserve is managed by the Department of Conservation. Trout fishing and whitebaiting are undertaken in the lower Maitai River during the fishing season.

The unique coastal landform of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea (south from Glenduan) is managed as a scenic reserve by the Department of Conservation. It is home to several small cottages built in the early 1900s and the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea lighthouse. The entire spit is registered with the Historic Places Trust. Snapper Point, part way along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea, is Nelson's most popular surf break. Waves at The Cut and the Glen are also surfed.

The views from Rocks Road or more elevated lookout points across Tahunanui Beach, Haulashore Island, Arrow (Fifeshire) Rock and The Cut to Te Tai-o-Aorere/Tasman Bay and beyond are some of Nelson's most remembered and photographed vistas.

The sense of wildness, remoteness and perceived naturalness are less apparent within this centrally located Coastal Marine Area than within the more exposed Coastal Marine Area to the north, due to the reasonably high recreational use and adjacent land modifications.

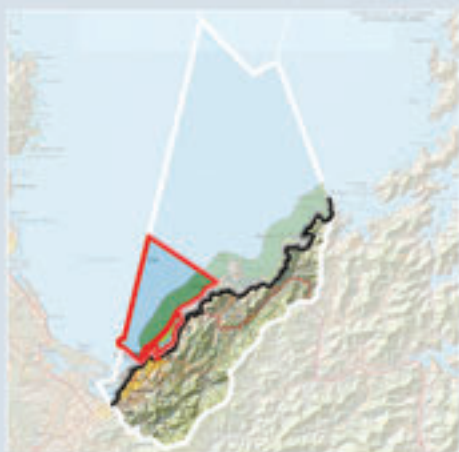
Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>			
<i>Moderate to High</i>	✓	✓	✓
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
Overall Natural Character Rating			Moderate to High

Commentary of Level 3 'Moderate to High' rating: The open coastal waters of this Coastal Marine Area rate as holding very high levels of natural character whilst the sheltered waters of the Haven are rated as holding moderately low levels of natural character, especially regarding biotic aspects. Consequently an overall rating of moderate to high was established for the biotic and abiotic attributes, despite this area being influenced by the heavily modified and partly reclaimed Nelson Port and coastal defences. Experientially, high levels of perceived naturalness were considered appropriate, due to the ebb and flow of the waters within the Haven and the semi-wildness and sense of remoteness on the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea overlooking the bay. Refer to Coastal Terrestrial Areas 5, 6, 7, 8 and 9 for more on the terrestrial aspects of this part of the Nelson coastal environment.

Specific Values at Level 4

These are mapped with reference to **Map 5**.

Sub Area	Rating	Key Values	Additional Comments
Southern part of Horoirangi Marine Reserve to exposed waters off Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea	Very High	<p>Southern part of Horoirangi Marine Reserve and intertidal and nearshore subtidal communities along much of the length of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.</p> <p>Transient coastal processes and visibility over water from exposed locations on Boulder Bank/ Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.</p> <p>Sightings of seasonal visitors, including marine mammals amplify naturalness of area.</p>	<p>Strong potential/likelihood for habitat restoration and species recovery within Horoirangi Marine Reserve that will enhance natural character.</p> <p>Natural character reduced at specific points due to two existing wastewater outfalls discharging to the bay; however, the effects of these outfalls are localised and limited ecologically. The potential to remove or open the flood gates at Boulder Bank Drive has been raised due to the ability restore saltwater wetlands around Boulder Bank Drive.</p> <p>Commercial trawling occurs offshore, especially in a region between The Cut and Motueka.</p> <p>Along-shore biotic patterns effectively truncated at The Cut.</p>
Western part of Nelson Haven	High	<p>Western part of Nelson Haven is relatively unmodified and retains high abiotic and biotic values.</p> <p>High experiential values due to the ebb and flow of the tidal and remote-like characteristics looking towards the Boulder Bank/ Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.</p>	<p>The whole of Nelson Haven retains moderate natural character. At a specific scale, the modifications to the east and south are more prolific (e.g. Port, dredging, shoreline hardening, land reclamation). Towards the west, these are less so, to the extent that parts remain virtually devoid of human modifications. Eelgrass meadows are interspersed with open expanses of sandflats and the natural shoreline of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is retained.</p>



- Nelson Region
 - Extent of Nelson Coastal Environment
 - Horoirangi Marine Reserve
 - Southern Tasman Bay Coastal Marine Area
- Southern Tasman Bay Coastal Natural Character Rating**
- High
 - Very High



Tasman Bay

Horoirangi Marine Reserve

Boulder Bank/ Te Taero a Kereopa – Te Tahuna a Tama-i-ea

Nelson Haven

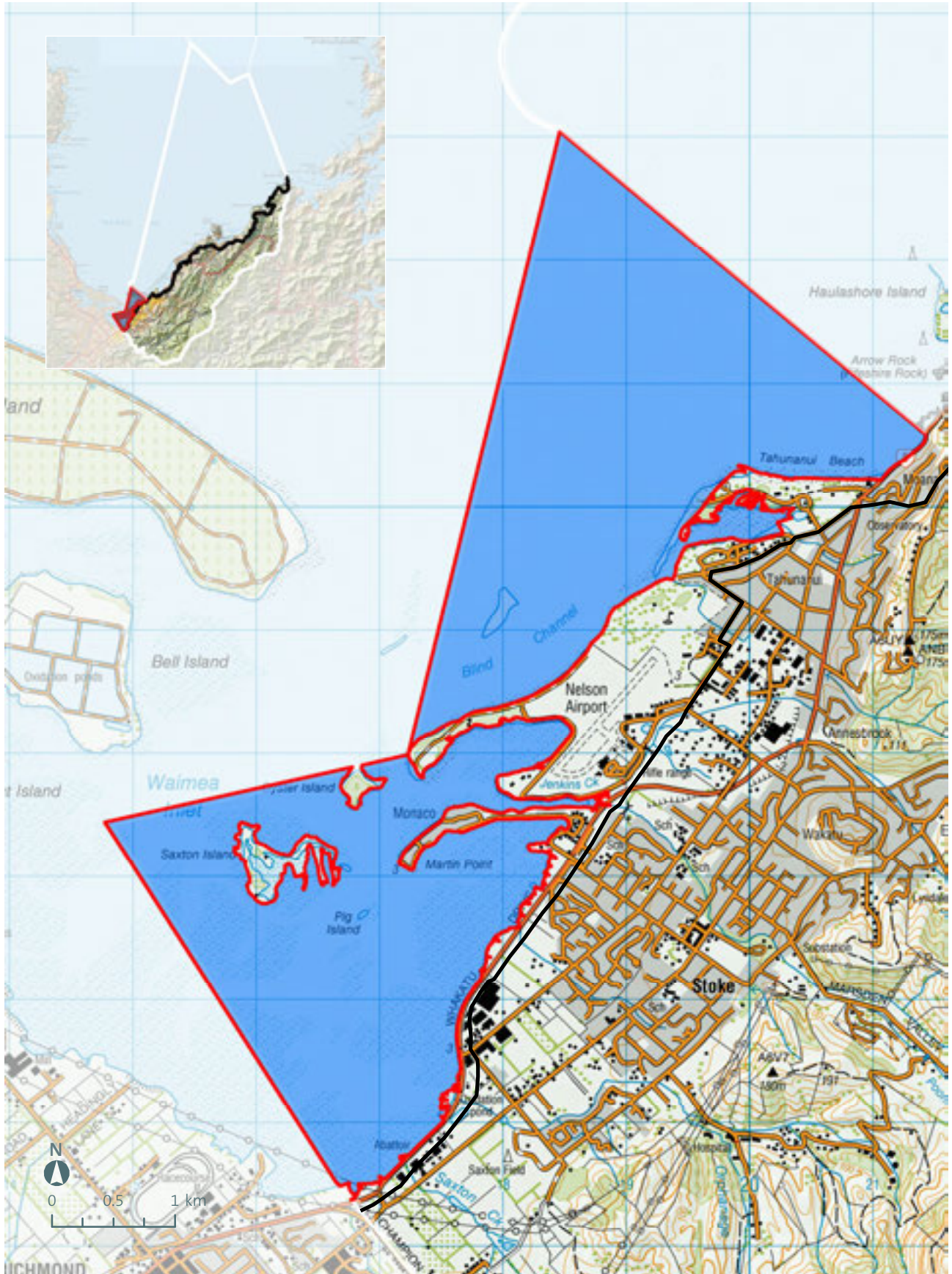
The Cut

NELSON

Map 5

COASTAL MARINE AREA C:

Waimea



Collective Characteristics

Very sheltered; primarily intertidal; extensive mud/sand areas; Tahunanui Beach and Monaco Peninsula are notable features; important area for birds.

Abiotic

The Waimea Coastal Marine Area is influenced by the western Waimea Inlet and encompasses the area from the end of the wave-cut platforms along Rocks Road to the eastern side of Waimea Inlet. Waimea Inlet is the largest enclosed estuary in the South Island and is close to the urban and industrial areas of Nelson, Stoke and Richmond. The margins of the inlet are prime sites for development and have been significantly modified over the last 150 years, particularly along the eastern shoreline. Waimea Inlet is representative of a relatively functional but partially modified estuarine system. Due to its size and variety of habitats the estuary is considered to be nationally significant. It is an important source of nutrients and organic matter for Te Tai-o-Aorere/Tasman Bay. Mud dominates the benthos, with sand and cobble also significant in some areas. Saxton, Oyster and Pig Islands are situated within the Nelson City Council's portion of Waimea Inlet and are also discussed within Coastal Terrestrial Area 10.

Other notable features within the Waimea Coastal Marine Area include Tahunanui Beach and Monaco Peninsula. Tahunanui, Nelson's main swimming beach, is shallow and relatively sheltered. It forms a spit near the eastern entrance to Waimea Inlet. Monaco is a small settlement at the end of a low lying peninsula, extending into Waimea Inlet and due to its low profile has extensive shoreline hardening.

Most of this Coastal Marine Area is relatively shallow (<5m), therefore, no commercial fishing or aquaculture occurs here, however, it is important for a variety of recreational uses, particularly during summer.

The Bells Island sewage treatment plant discharges treated sewage into Waimea Inlet on the outgoing tide and thence into Te Tai-o-Aorere/Tasman Bay. Although the outfall is outside the jurisdiction of the Nelson City Council, adverse effects could potentially occur within the Waimea Coastal Marine Area due to tidal transport of treated effluent. However, no evidence of over enrichment associated with the outfall is evident and faecal bacteria contributions from the discharge are minor compared to other potential sources (e.g. catchment runoff).

Biotic

Although the margins of Waimea Inlet have been significantly modified, areas within the inlet retain high biological importance. It has been ranked as an area of outstanding value to wildlife and the numbers of invertebrates, fish and birds using the estuary is relatively high compared with other New Zealand estuaries. Soft sediment communities are healthy and relatively diverse, containing animals such as polychaete worms, cockles and other small bivalves. The inlet is an important refuge and feeding area for juvenile flatfish and snapper and is also frequented by a number of other marine fish species (e.g. yellow-eyed mullet, kahawai). The lower Waimea River supports whitebait spawning as do many of the other inlet tributaries (TDC, DOC, NCC unpublished data).

Te Tai-o-Aorere/Tasman Bay is the most important site in the world for variable oystercatchers with Waimea Inlet an area of international importance for this species. This Coastal Marine Area is also regarded as internationally important for South Island Pied oystercatcher and wrybill and nationally important for red knot and bar-tailed godwit.

There is sponge garden habitat in the Saxton Monaco channel and, although small in comparison to the surrounding soft sediment and intertidal vegetation present in Waimea Inlet, it may be considered important in terms of the overall biodiversity of the estuary.

Despite its heavy modification, the estuary is considered to be of outstanding biological importance; particularly as the habitat for numerous estuarine bird and coastal fish species.

Experiential

The Waimea Coastal Marine Area is used for a variety of recreational activities including boating, kayaking, fishing, swimming, water skiing, duck shooting and walking. Waimea Inlet and Tahunanui Beach are an important part of the Nelson landscape, especially when viewed from adjacent hillsides. Extensive views across Waimea Inlet are also obtained from Whakatu Drive and the nearby walkway/cycleway. The area holds moderate to high perceived naturalness due to the ebb and flow of the water and the ever changing seascape as intertidal flats and tidal channels are covered and uncovered by the tide. There are limited areas where a sense of remoteness can be obtained.

Boat ramps at Nelson and a high tide ramp at Monaco provide boating access.



Sand islands in Waimea Inlet

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>		✓	
<i>Moderate to High</i>			✓
<i>Moderate</i>			
<i>Moderate to Low</i>	✓		
<i>Low</i>			
<i>Very Low</i>			
Overall Natural Character Rating			Moderate

Commentary of Level 3 'Moderate' rating: While the Waimea Coastal Marine Area is ecologically important for many species (i.e. birds) it is also heavily modified. The extent and scale of human modification to this Coastal Marine Area prevents this area as a whole from rating any higher for natural character. Modifications (including extensive shoreline harding, sewage treatment facility, reclamation) have attenuated the natural elements, patterns and processes sufficiently to rate this Coastal Marine Area as holding moderate levels of natural character. Refer to Coastal Terrestrial Area 10 for more information on the terrestrial aspects of this part of the Nelson coastal environment.

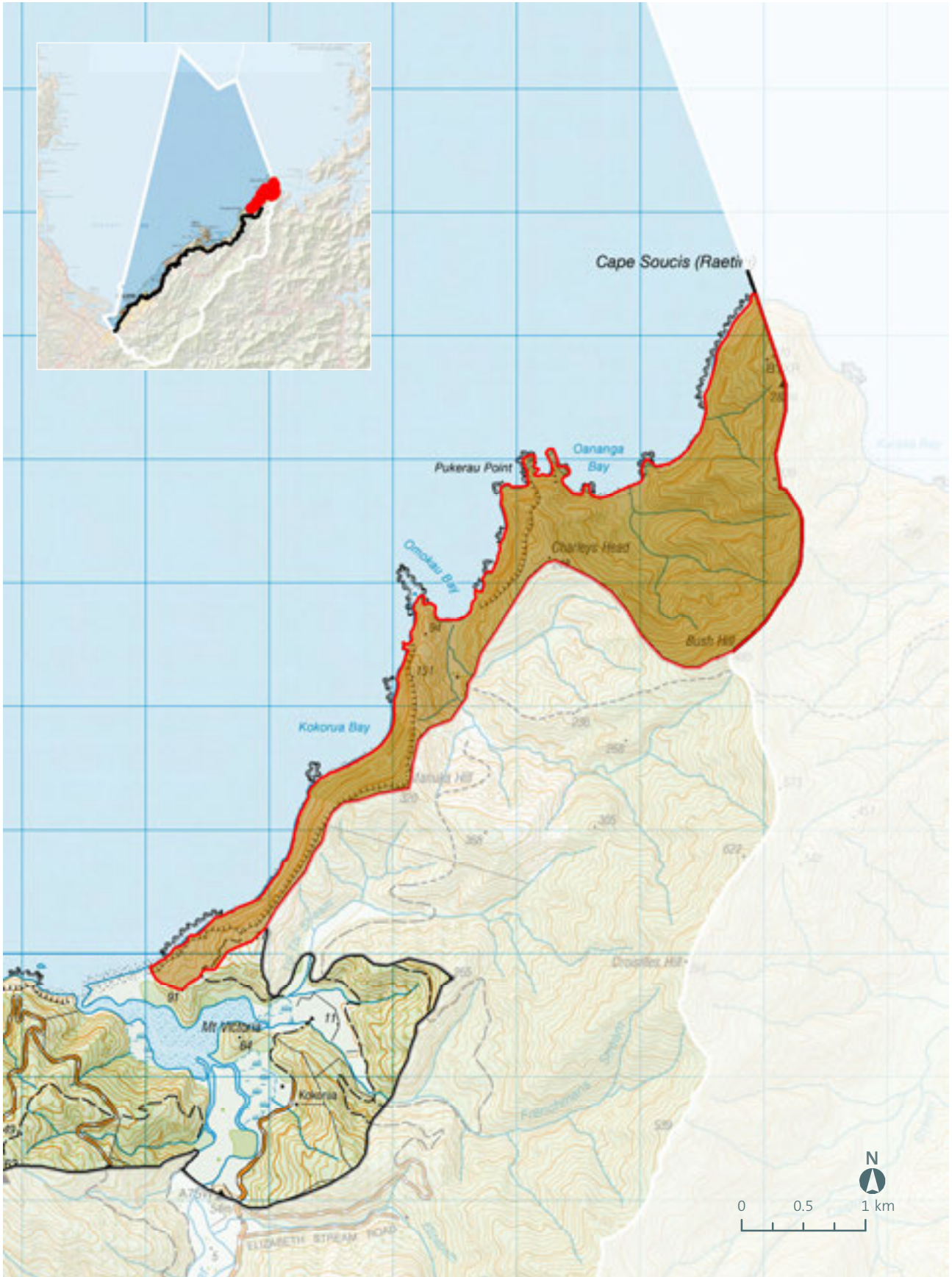
Specific Values at Level 4

There is no mapping at the Level 4 scale for this Coastal Marine Area.



Calm waters of Waimea Inlet close to Monaco

COASTAL TERRESTRIAL AREA 1: Cape Soucis



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is located at the northernmost part of the region and includes the steep, indigenous forest-clad slopes of Oananga Bay and the precipitous cliffs of Pukerau Point, Omokau Bay and Kokorua Bay. Key coastal characteristics include: the dramatic cliff edges and rock outcrops that assist in defining the coastal margins; a strong cohesive block of native forest; secluded bays with access obtained only by sea; high numbers of threatened and at-risk plant species; especially along the narrow band of coastal habitat, breeding habitat for several bird species and isolated human habitation.

The extent of the coastal environment for this Coastal Terrestrial Area follows the broad ridge extending from Cape Soucis to Charley's Head, then follows the top of the cliffs towards the southern part of Kokorua Bay. Hydrological and land use data has also assisted to determine the extent for this Area.

Beyond this Coastal Terrestrial Area the Coastal Context land rises to the ridge and peak of Croisilles Hill. This elevated and steep area is predominantly covered with indigenous forest and managed by the Department of Conservation. At lower altitudes, the land use changes to commercial pine plantations at varying stages of maturity and harvesting and scrub vegetation.

Abiotic

The Cape Soucis Coastal Terrestrial Area include the steep and very steep hill and mountainous slopes south-east of the Waimea-Flaxmere Fault System. This area is associated with Land Type 4 (Maitai Group Eastern Hill and Mountain Land Type). It includes the western face of the dominant landform of Cape Soucis itself, including the ridge and summit of Bush Hill to 485m and Charley's Head at 248m and the eroding cliff faces extending to the northern inlet of the Whangamoia River estuary.

The terrain is developed on indurated, predominantly late Permian and Triassic Maitai and Caples Group sedimentary rocks or sandstones and siltstones. The bold Cape Soucis headland acts as the region's northerly point and has resulted from localised bands of serpentinitic breccia and limestone which are exposed. The breccia are nationally rare and retain distinctive flora.

The beaches are dominated by boulders, rocky headlands, sand and mud. Pebbles and shells also make up some of the beaches.

Watercourses are steep and often short, with most being ephemeral. The northernmost area has high freshwater quality due to its forested catchment. Further south, some degradation has occurred due to the presence of coniferous pine plantations.

The area has a windy, strongly maritime climate, with warm summers and mild winters. Salt spray is a common occurrence due to the areas exposure. Rainfall is moderate to high, from 1200 to 2500mm, with high intensity rains common. Due to the reasonably high rainfall, slips and high erosion rates, especially associated with the cliffs, are apparent.

Elevation ranges from 0 to 485m.

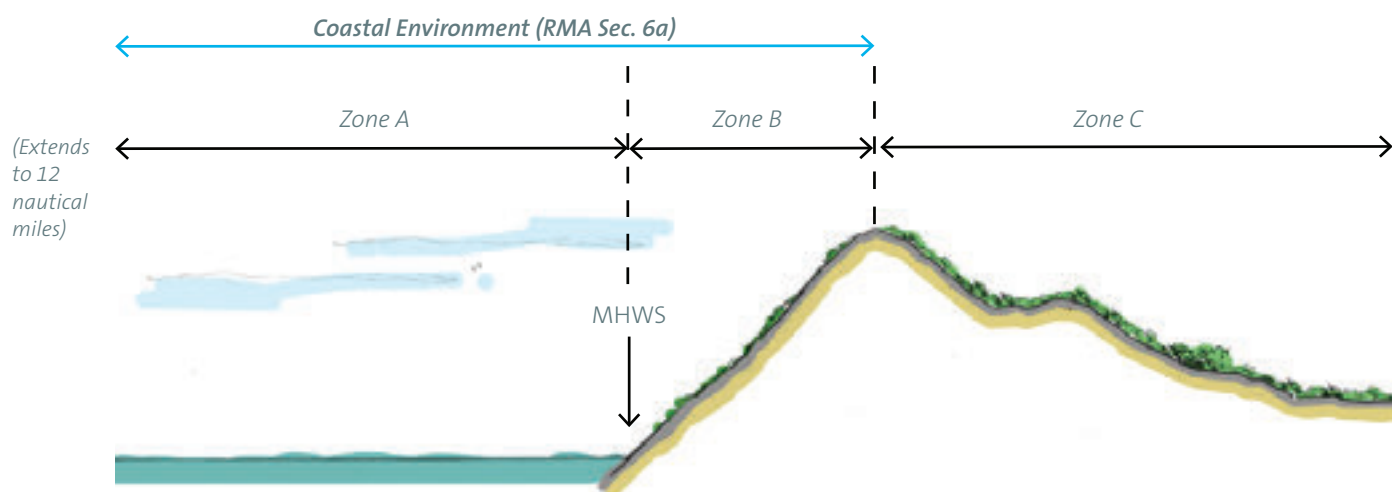


Illustration 1. Representative Coastal Environment Diagram of Cape Soucis, Raetihi

Biotic

Summary analysis: Total land area within the Cape Soucis Coastal Terrestrial Area is 483 ha, of which 28% is in native forest, 38% in native shrubland, 2% in bare or lightly-vegetated surfaces, 15% in exotic treeland, 9% in exotic scrub and 7% in pasture.

The lower and upper elevations would have originally been forested with mixed beech and tall podocarps, dominated by black beech and hard beech, with rimu, totara and matai. Gullies would have supported podocarps emergent over broadleaved trees such as tawa, titoki, pukatea and mahoe. Shrubland on steeper coastal slopes and cliffs would have been dominated by kanuka, ngaio, akeake, taupata and puka. Along the coastal dunes spinifex, pingao, sand sedge and sand tussock would have dominated the foredunes with umbrella sedge, akeake, tauhinu, wharariki, toetoe and scrambling pohuehue occupying the more stable rear dunes.

Much of this Coastal Terrestrial Area is now forested within a concentrated area of indigenous vegetation associated with Oananga Bay to the north and along the cliffs. Commercial pine plantation extends into more accessible and lower lying west areas although are reasonably contained. Along the steep eroding sea cliffs, vegetation is sparser though typical, supporting scattered indigenous shrubland and herbs, with occasional stands of remnant coniferous forestry which is too steep to yield and wilding pines on some upper slopes.

There are a number of distinctive biota, communities and habitats within this Coastal Terrestrial Area including mixed beech forests, podocarp-broadleaved forest, cliff vegetation and dune ecosystems. The northern part of Oananga Bay (including Cape Soucis) is contained within the Mount Richmond Forest Park. Distinctive flora occurs on Cape Soucis itself due to its unusual geology.

Intact indigenous sand dune communities are now extinct within Nelson City Council boundaries. A few small areas of coastal dunes are present in Oananga Bay and Omokau Bay, where small remnants of spinifex, wharariki, akeake, and potentially pingao are present. At more elevated levels coastal manuka – kanuka scrub is common and mixed podocarp forest is present in gullies.

This Coastal Terrestrial Area is the habitat for the threatened reef heron (*Egretta sacra sacra*).

Freshwater wetlands are rare in this Coastal Terrestrial Area and watercourses tend to have steep, short gradient stretches and are often ephemeral. Freshwater fish populations are poorly known in these smaller northern catchments towards Cape Soucis but kokopu, inanga koaro and bully and eel species are likely to be present where pockets of habitat are favourable. Freshwater invertebrate populations in these areas are likely to reflect high water quality with larvae of caddis, mayfly and stonefly species well represented.



Steep and eroding cliffs north of the Whangamoa River estuary

Experiential

With no tracks or roads, this Coastal Terrestrial Area is the most remote of the Region. Located at the northernmost part of the region, this area supports remarkably low levels of modification, despite the area to the south being mainly used for commercial forestry. Recreational use is therefore very low.

A small house is located within Oananga Bay and access is provided by boat. The numerous sequence of rocky small

bays and coves that extend from Cape Soucis southwards enable refuge from the often harsh climate this Coastal Terrestrial Area receives. Surrounded by almost entirely indigenous forest and vegetation, this Coastal Terrestrial Area holds high remote and wildness values, amplified by the dramatic coastal cliffs. Consequently, this area retains very high levels of perceived naturalness.



Exposed headland of Cape Soucis

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>	✓	✓	✓
<i>High</i>			
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
	Overall Natural Character Rating		Very High

Commentary of Level 3 'Very High' rating: This relatively exposed Coastal Terrestrial Area holds very high levels of abiotic, biotic and experiential aspects of natural character. This is principally due to the very low levels of modifications found within the vast majority of this Coastal Terrestrial Area. Whilst there is evidence of some commercial pine plantation, areas for grazing and a house, these modifications are relatively small in scale and do not override the very high levels of natural character found within the remaining part of this Coastal Terrestrial Area. Refer to Coastal Marine Area A for an assessment of the adjoining sea.

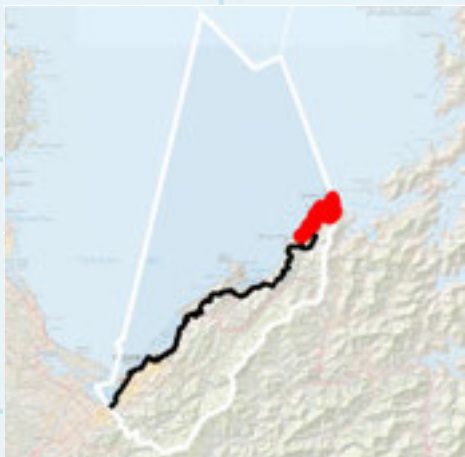
Specific Values at Level 4

These are mapped with reference to **Map 6**.

Sub Area	Rating	Key Values	Additional Comments
Cape Soucis to Whangamoia Inlet	Very High	<p>Steep, erosion prone cliff faces are unmodified;</p> <p>Extent of intact indigenous forest and coastal cliff vegetation;</p> <p>Distinctive vegetation occurs on Cape Soucis due to unusual geology;</p> <p>High numbers of threatened and at-risk plant species, especially along the narrow band of coastal habitat;</p> <p>Very low levels of modification;</p> <p>Very high wilderness, remote and experiential values associated with exposed undeveloped coastline;</p> <p>Limited access with low levels of recreation use.</p>	<p>Areas of commercial pine plantation on exposed ridges devalued natural character and has been excluded from the Level 4 rating and mapping.</p>

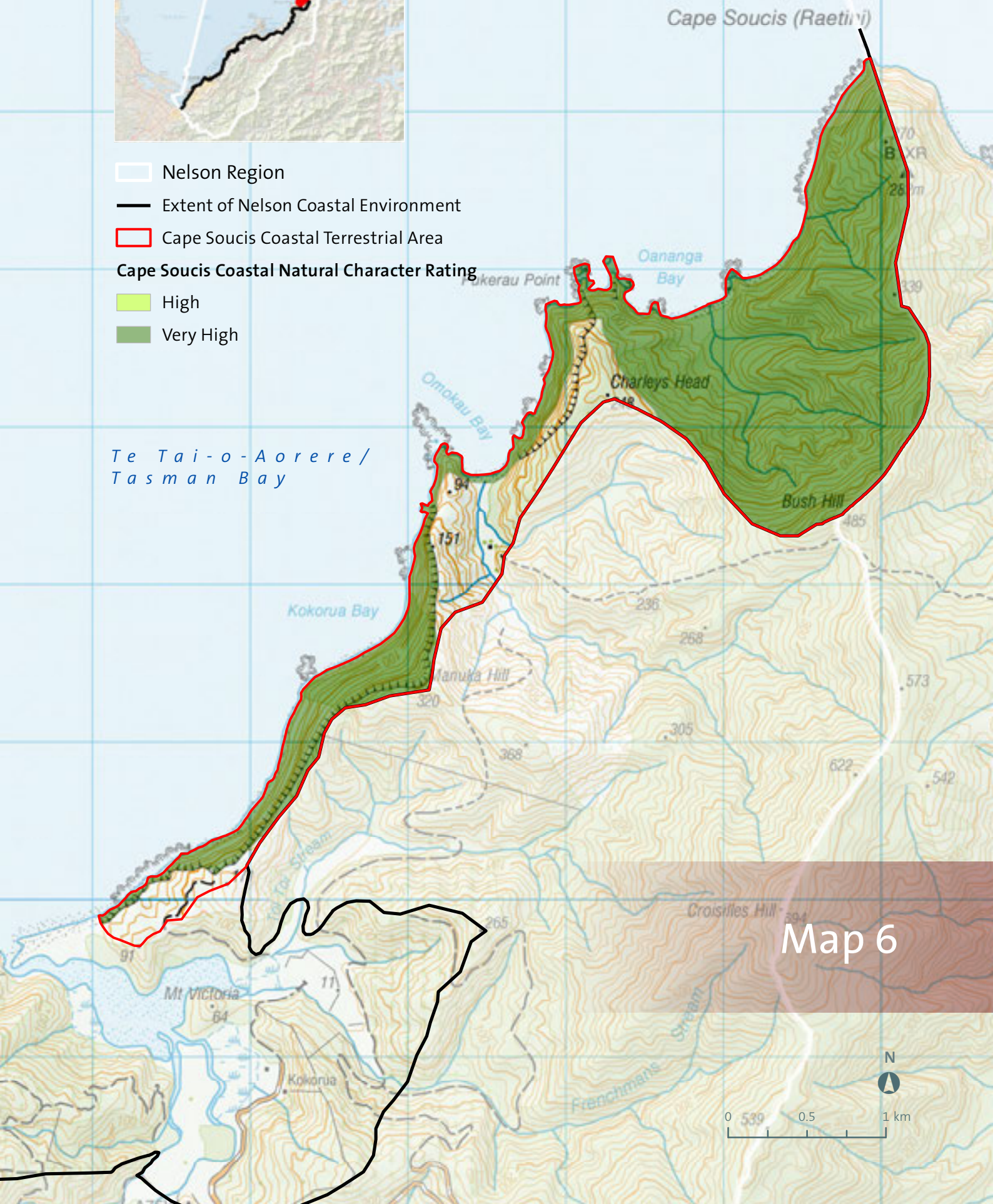


Remote and isolated experiential values at Oananga Bay

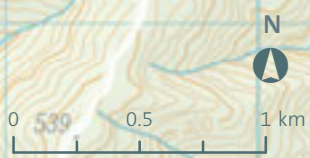


- Nelson Region
 - Extent of Nelson Coastal Environment
 - Cape Soucis Coastal Terrestrial Area
- Cape Soucis Coastal Natural Character Rating**
- High
 - Very High

*Te Tai-o-Aorere /
Tasman Bay*

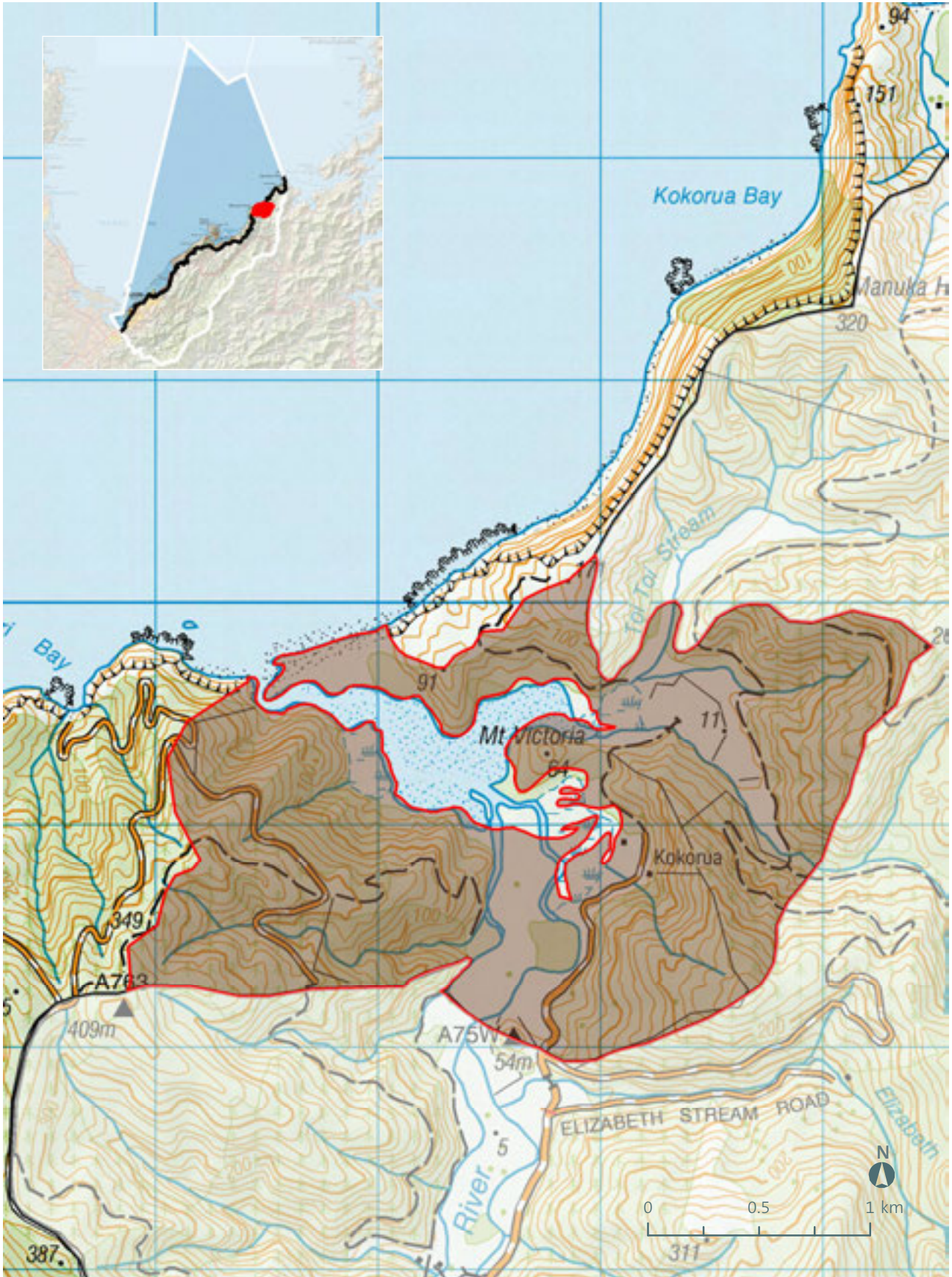


Map 6



COASTAL TERRESTRIAL AREA 2:

Kokorua



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is centred on the Whangamoa River estuary and its immediate hydrological catchment. This Coastal Terrestrial area includes the small hill of Mt. Victoria, the river flats and the steep hills that define this area. Key coastal characteristics include: An enclosed valley area containing the lower reaches and estuary along the Whangamoa River; areas of pasture contained along the valley floor and surrounded by mixed indigenous forest and plantation forestry on valley slopes; relatively unmodified estuary including areas of shrubland and forest remnants; and isolated farmsteads associated with rural land use established along the valley floor.

The extent of the coastal environment for this Coastal Terrestrial Area is centred on the Whangamoa River estuary and follows local steep ridges. Where the extent crosses areas of flatter land, such as the valley flats of Toi Toi Stream and the Whangamoa River, the extent of coastal processes on wetlands and tidal limits have assisted in the identification.

Beyond this Coastal Terrestrial Area, the Coastal Context Area extends into the steep sided Whangamoa River Valley southwards. Beyond this to the east are the hills and peaks associated with the Bryant Range and North and South Castor peak. Large areas of coniferous forestry cover the lower foothills of the Bryant Range whilst its upper parts are clad with indigenous forest and managed by the Department of Conservation.

Abiotic

The dominant landforms include the floodplain and the enclosing steep to very steep hills. This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type) and Land Type 4 (Maitai Group Eastern Hill and Mountain Land Type). It includes the Whangamoa River mouth and estuary and its associated surrounding hills and sandspit.

The valley floor consists of recent alluvial floodplains, low terraces, river channels and associated backswamp wetlands. The area is formed from the Recent and Holocene age comprising predominantly fine-grained alluvium and estuarine deposits and slightly to extensively weathered coarse-clay-bound aggradational and degradational terrace and fan gravels. The hill components of this Coastal Terrestrial Area include the steep and moderately steep sedimentary rocks.

The principal river is the Whangamoa River, which flows in a northerly direction. Numerous steep and small watercourses, which are often ephemeral feed into this river. Frenchman's Stream and Toi Toi Stream are the remaining two larger watercourses that drain into the estuary, both hold varying degrees of modification. The whole estuary is considered regionally important for its limited modification.

The area, due to its terrain is slightly more sheltered than the exposed Coastal Terrestrial Areas to the north and south. Annual rainfall is from 1000 to 1600mm with high intensity rains common.

Elevation ranges from 0 to 409m.

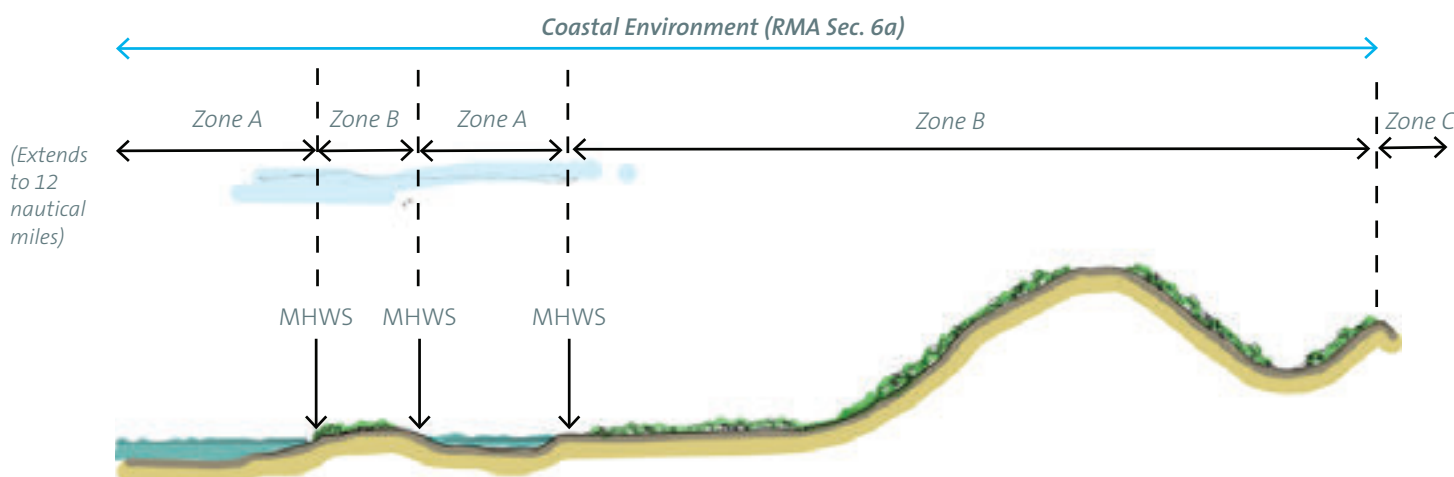


Illustration 2. Representative Coastal Environment Diagram of Kokorua

Biotic

Summary analysis: Total land area within the Kokorua Coastal Terrestrial Area is 452 ha, of which 1% is in native forest, 45% in native shrubland, 2% in wetland communities, 32% in exotic treeland, 0.3% in exotic scrub and 16% in pasture.

The upper elevations would have originally supported mixed beech-podocarp forest, dominated by black beech hard beech with rimu, totara and matai. Lower slope forest was dominated by titoki, tawa, mahoe, pigeonwood and karaka. Valley floor forests supported kahikatea and a range of broadleaved trees including tawa, pukatea, titoki, kaikomako and mahoe. Kowhai, lowland ribbonwood and narrow-leaved lacebark would have been present at river margins. Valley floor wetlands were dominated by rushes, sedges, harakeke, toetoe and, at damper sites, raupo. These graded at the estuary margin to marsh ribbonwood and scrub pohuehue.

Now, much of this has been cleared to make way for pastoral farming and commercial forestry purposes. Much of the hill sides are covered with regenerating manuka and kanuka with areas of gorse and broom evident. Areas of commercial forestry are evident on the area's southern slopes. Much of the lower lying area has also been drained for farming purposes, although a noticeable community of estuarine vegetation is prominent at the mouth of the Whangamoia River and Toi Toi Stream. The saltmarshes that fringe these estuaries provide habitats for a variety of shrubs, grasses, sedges, rushes, including marsh ribbonwood, estuary needle grass, three square sedge, lake clubrush, sea rush, jointed rush, sea celery, coastal buttons, shore primrose and remuremu. Areas of intact indigenous alluvial coastal forest are also evident beyond the immediate Whangamoia Inlet. The main body of the estuary is described within Coastal Marine Area A and is largely unmodified.

Some coastal duneland is associated with the beach enclosing the estuary to the north, where pingao (*Desmoschoenus spiralis*), scrub, dune slack, carex and danthonia grassland are present. Due to the unprotected nature of this estuary, grazing is damaging the saltmarsh community and riverbanks, as well as the sandspit. Marram grass is out-competing native vegetation on the spit. Furthermore, the spit has been used historically for grazing cattle and sheep but has now been excluded from farming practices. It is now gazetted as a scientific reserve and is considered a significant ecological site that remains relatively undeveloped compared to other river mouth dune systems.

This Coastal Terrestrial Area is of national importance for the presence of the threatened banded rail (*Rallus philippensis assimilis*) and banded dotterel (*Charadrius bicinctus bicinctus*), and the regionally threatened South Island fernbird (*Bowdleria punctata punctata*) and the rare variable oystercatcher (*Haematopus unicolor*). Further commentary on the area below mean high water mark is contained within Coastal Marine Area A.

The freshwater wetland remnants and mouth of the Whangamoia River provide important habitat for inanga spawning and the rearing of juveniles. Besides migrations of whitebait (which supports a local fishery) smelt, yellow eye mullet, longfin and shortfin eel, bully species and freshwater shrimp are often observed in the lower river zone. Brown trout are also present in low numbers with kahawai penetrating the lower river to feed on smelt, whitebait and juvenile mullet in the spring and summer (pers. obs.) Kokopu species such as banded kokopu and giant kokopu are possibly present in remaining tracts of optimum habitat in the lower river and tributaries which have not yet been surveyed.



Above: In the Whangamoia Inlet banded kokopu thrive.

Experiential

Access to this Coastal Terrestrial Area is via Kokorua Road and essentially leads to the small farmstead of Kokorua. Numerous forestry roads extend off this road into the adjacent hills. This Coastal Terrestrial Area is somewhat more sheltered from the harsh coastal weather, due to its enclosure provided by the coastal hills. It retains reasonably high experiential values due to its remoteness. The interplay of coastal landforms and native vegetation retains a very high level of perceived naturalness where the sequence of vegetation communities extends between the coastal edge and the more elevated backdrop.

Much of the area has been burnt off in the past and is now regenerating in gorse, manuka or tauhinu which affects naturalness. People numbers are low.

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>	✓		
<i>High</i>		✓	✓
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
Overall Natural Character Rating			High

Commentary of Level 3 'High' rating: This sheltered Coastal Terrestrial Area holds very high levels of abiotic and high levels of biotic and experiential aspects of natural character. The majority of the alluvial flats have been cleared of original cover and are grazed. Much of the enclosing slopes are used for commercial forestry, however there are large tracts of land that are regenerating or have original indigenous cover. The margins of the estuary are virtually unmodified. Refer to Coastal Marine Area A for an assessment of the adjoining sea.



Whangamoa River mouth and estuary

Specific Values at Level 4






These are mapped with reference to **Map 7**.

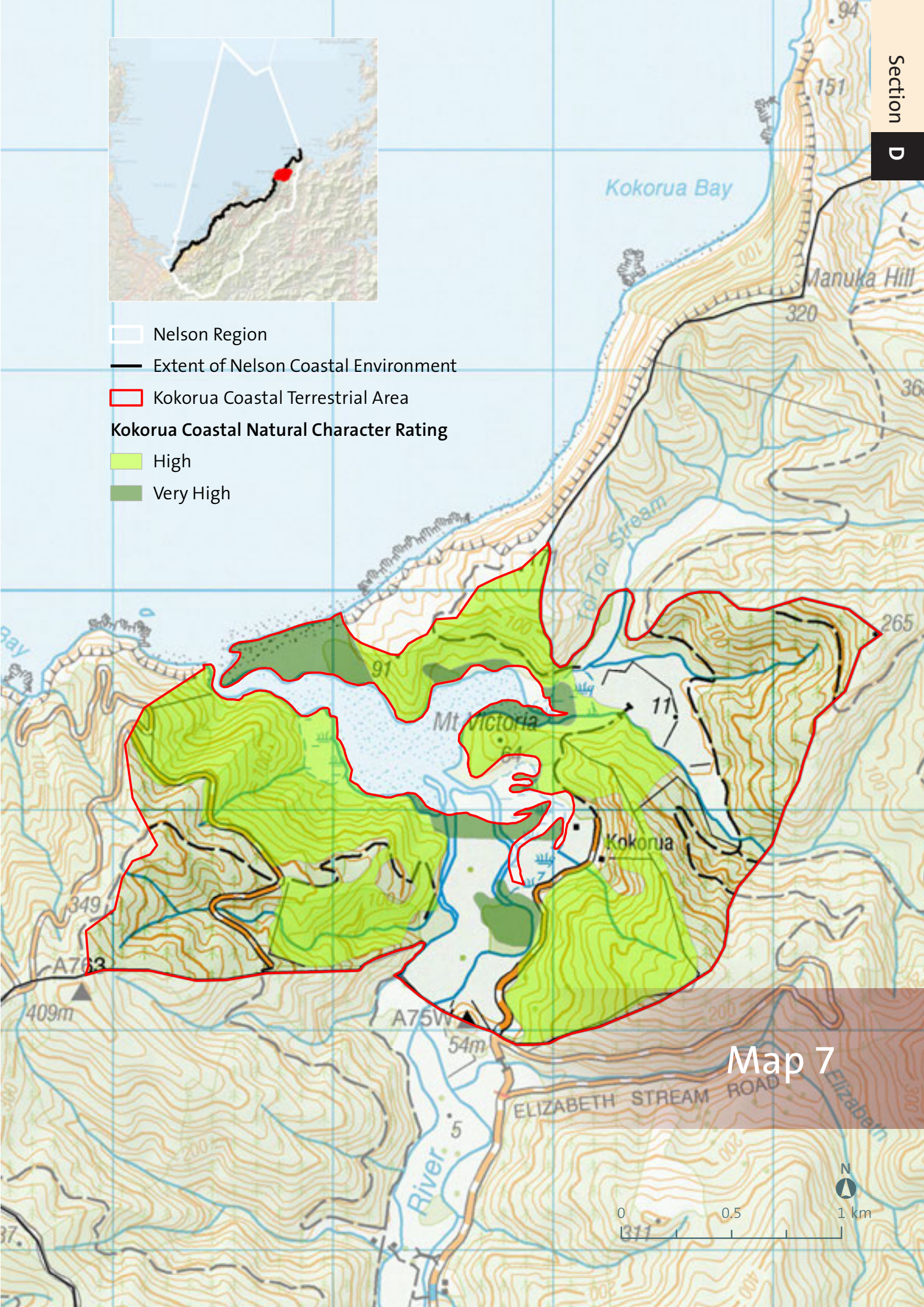
Sub Area	Rating	Key Values	Additional Comments
Estuarine margins and sand spit	Very High	<p>Estuarine margins and enclosing dune to north are relatively unmodified. Small but very important valley-floor forest and wetland remnants.</p> <p>The main body of the estuary is relatively unmodified and forms a significant ecological site that remains relatively undeveloped compared to other river mouth dune systems.</p> <p>Experiential values includes remoteness and high levels of perceived naturalness</p>	<p>Grazing has affected the saltmarsh community, riverbanks and part of the sandspit.</p> <p>Refer to Coastal Marine Area A for further values.</p>
Lowland alluvial forest	Very High	<p>Mature and regenerating coastal lowland alluvial forest</p>	<p>The majority of the alluvial plains are cleared of vegetation.</p>
Regenerating slopes flanking estuary	High	<p>Regenerating indigenous forest on coastal hill slopes.</p> <p>Experiential values includes remoteness and high levels of perceived naturalness</p>	<p>Commercial forestry is present on more elevated slopes.</p>



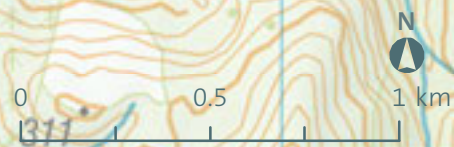
Entrance to Whangamoa estuary



-  Nelson Region
 -  Extent of Nelson Coastal Environment
 -  Kokorua Coastal Terrestrial Area
- Kokorua Coastal Natural Character Rating**
-  High
 -  Very High

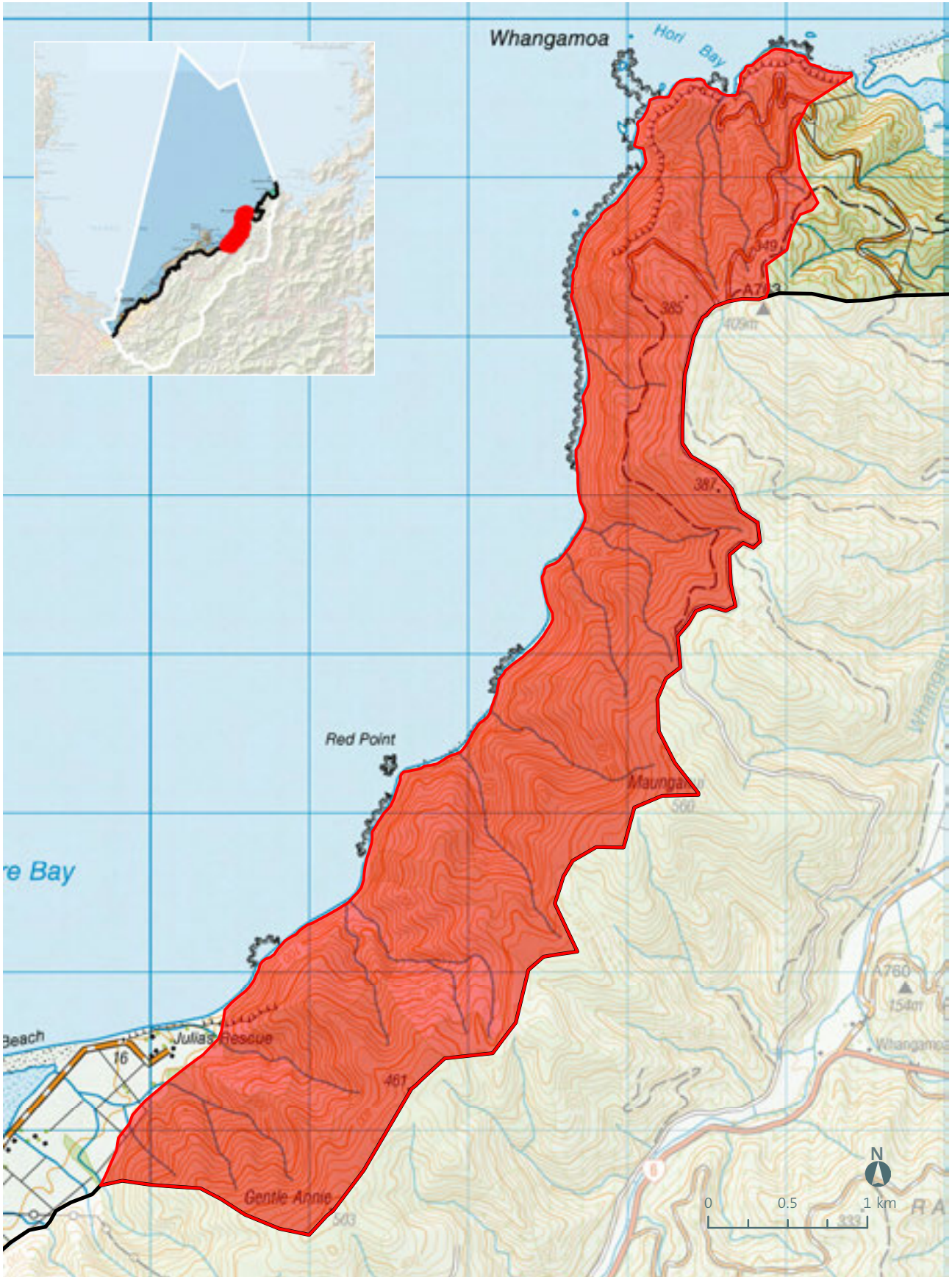


Map 7



COASTAL TERRESTRIAL AREA 3:

Whangamoā



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area occupies the western 'coastal' slopes of Maunganui and Gentle Annie. The steep and precipitous slopes retain a large amount of indigenous forest cover with only its northern part covered by coniferous pine plantation. Eroding cliffs and rocky beaches define the marine coastal edge of this Coastal Terrestrial Area. Key coastal characteristics include: Remnant indigenous forest and regenerating scrub contained on private and public land, a narrow linear rocky beach and rock outcrops backed by steep coastal steep cliffs and hill slopes; plantation forestry established at the northern end of the hills along the mouth of the Whangamoia River, with wilding pines also spreading onto adjoining steeper exposed coastal cliffs and no obvious or apparent residential development with limited recreation access.

The extent of the coastal environment for this Coastal Terrestrial Area follows the ridgeline of this landscape feature, including Maunganui (560m asl) to Gentle Annie (503 m asl) to the south.

Inland of this Coastal Terrestrial Area and beyond the ridge that defines this area is the Whangamoia River valley, where areas of indigenous forest and scrub define the western flanks of the valley while coniferous pine plantations associated with the foothills of the Bryant Range define the land use of the valley's eastern side. Areas of pastoral farming define the valley flats.

Abiotic

The Whangamoia Coastal Terrestrial Area includes the steep and very steep hill and mountainous slopes south-east of the Waimea-Flaxmere Fault System. This area is associated with Land Type 4 (Maitai Group Eastern Hill and Mountain Land Type). It includes part of the northern and all of the western face of the dominant ridge of Maunganui, extending south to the peak of Gentle Annie.

The terrain is developed on indurated, predominantly late Permian and Triassic Maitai and Caples Group sedimentary rocks or sandstones and siltstones.

Watercourses are steep and often short, with most being ephemeral. The majority of this area has high freshwater quality due to its forested catchment. Some degradation has occurred due to the presence of coniferous pine plantations to the area's north.

The area has a windy, strongly maritime climate, with warm summers and mild winters. Salt spray is a common occurrence due to the areas exposure. Rainfall is moderate to high, from 1200 to 2500mm, with high intensity rains common. Due to the reasonably high rainfall, slips and high erosion rates, especially associated with the cliffs, are apparent.

Elevation ranges from 0 to 560m at Maunganui.

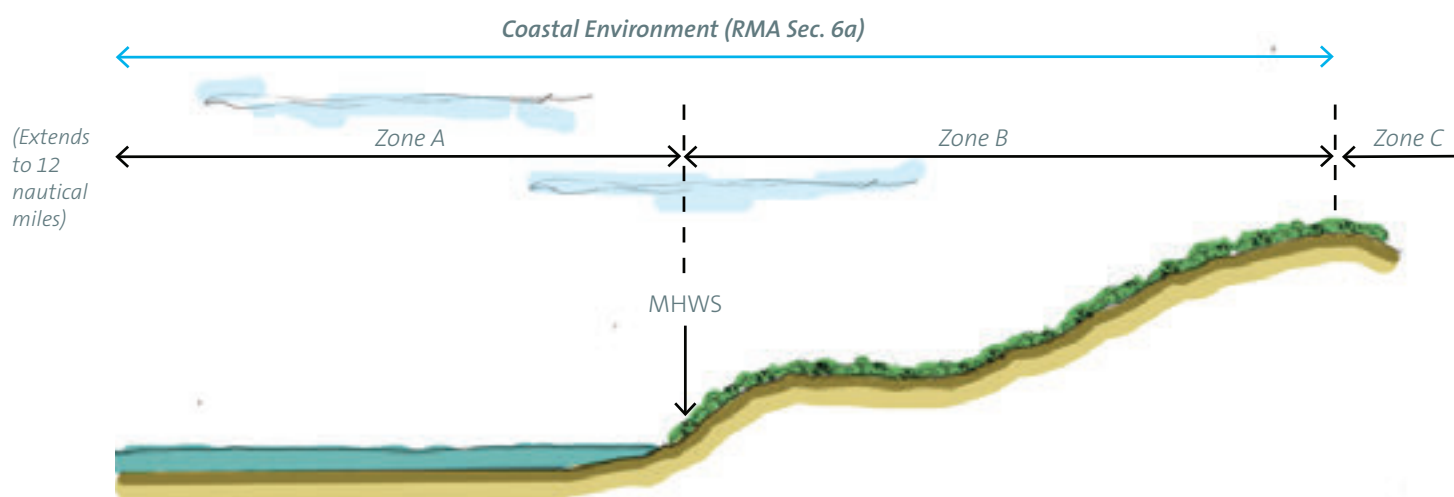


Illustration 3. Representative Coastal Environment Diagram of Whangamoia

Biotic

Summary analysis: Total land area within the Whangamoa Coastal Terrestrial Area is 883 ha, of which 39% is in native forest, 40% in native shrubland, 1% in bare or lightly vegetated surfaces 13% in exotic treeland, 1% in exotic scrub and 4% in pasture.

The upper elevations would have originally been forested with mixed beech and tall podocarps, dominated by red beech and silver beech, with rimu, miro, matai and some totara. Lower slopes were dominated by black beech and hard beech, with rimu, totara and matai. Gullies would have supported podocarps emergent over broadleaved trees such as tawa, titoki, pukatea and mahoe. Shrubland on steeper coastal slopes and cliffs would have been dominated by kanuka, ngaio, akeake, taupata and puka. Due to the

steepness and erosion-prone nature of the hillside there would also be numerous areas of slips and bare rock/ soil.

Today, much of this original forest cover is intact, with only a small area of commercial pine plantation located in the Coastal Terrestrial Area's northern part.

Freshwater wetlands are rare in this Coastal Terrestrial Area and watercourses tend to have steep, short gradient stretches and are often ephemeral. Their small size and often ephemeral nature limits native fish populations to areas of optimal habitat persisting under summer drying regimes. Koaro, banded kokopu, redfin bully, koura and eel species are likely candidates for such areas in these small unsurveyed streams.



Native bush clings to the eroding coastal cliffs

Experiential

Access to this Coastal Terrestrial Area is very limited despite it being mainly land managed by the Department of Conservation. A private road leads to 'Julias Rescue' to the south and within Coastal Terrestrial Area 4 and a forestry road in the north extends inland from the Whangamoa Valley to Hori Bay, where access to camping, beach and rocky cliff walks are possible.

The coastal cliffs and rocky outcrops are visually impressive and hold high perceived naturalness values, notably when viewed from a boat. Some commercial forestry towards the northern part of this area interrupts the regeneration of native vegetation on the slopes to the south.

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>	✓	✓	
<i>High</i>			✓
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
	Overall Natural Character Rating		Very High

Commentary of Level 3 'Very High' rating: This sheltered Coastal Terrestrial Area holds very high levels of abiotic and biotic and high levels of experiential aspects of natural character. This very high rating is principally due to the relatively unmodified nature of this Coastal Terrestrial Area, where large parts retain original forest cover. The most modified parts around the Whangamoa headland are relatively small in scale and relate mainly to commercial forestry and tracks. Refer to Coastal Marine Area A for an assessment of the adjoining sea.



Coastal cliffs near Hori Bay

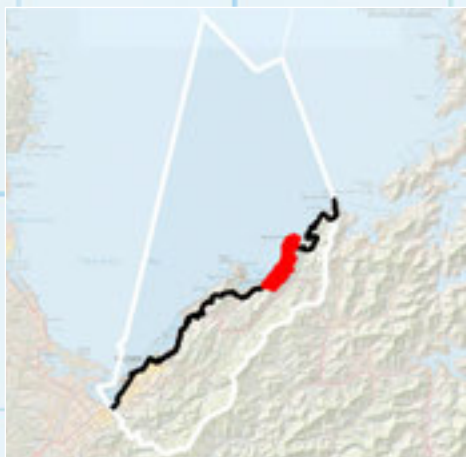
Specific Values at Level 4

These are mapped with reference to **Map 8**.

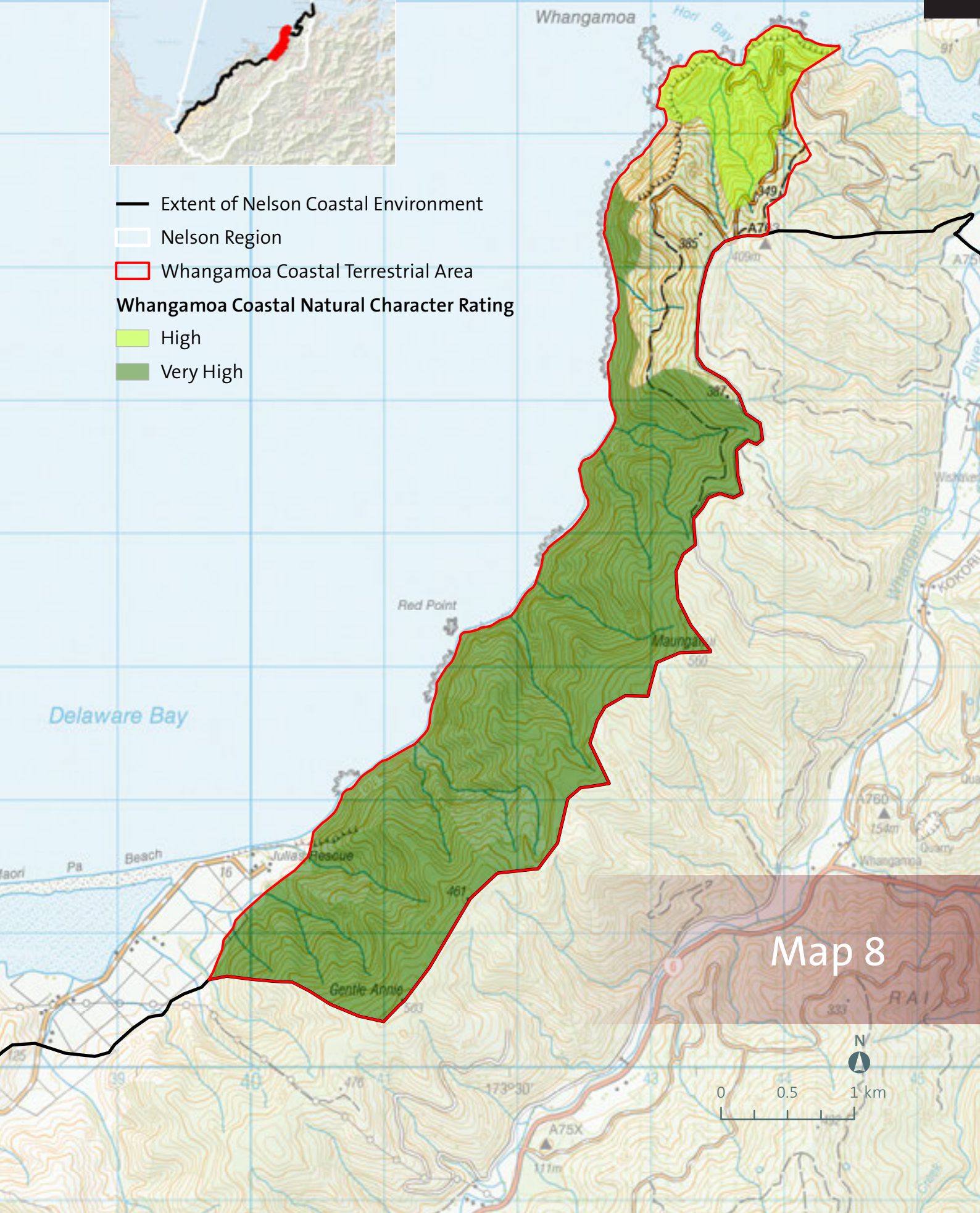
Sub Area	Rating	Key Values	Additional Comments
West facing slopes of Gentle Annie and Maunganui	Very High	Intact, large extent of original bush cover along slopes Impressive steep coastal cliffs No structures or building evident	Areas of pine plantation reduce levels of naturalness to the north. Occasional wilding pine present
Cliffs and regenerating area around Hori Bay.	High	Regenerating slopes of indigenous vegetation above Hori Bay contribute to perceived naturalness. Dramatic rocky and remote beach access to Hori Bay area	Pine plantation to higher elevations reduce naturalness.



Extensive areas of indigenous bush



- Extent of Nelson Coastal Environment
 - Nelson Region
 - ▭ Whangamoa Coastal Terrestrial Area
- Whangamoa Coastal Natural Character Rating**
- High
 - Very High



Map 8

COASTAL TERRESTRIAL AREA 4:

Delaware Bay



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area includes the margins of the estuary and flats associated with the Wakapuaka River and broader Delaware Bay. This Coastal Terrestrial Area also includes Pepin Island as well as the Rotokura/Cable Bay causeway and Maori Pa Beach spit which assist in defining the seaward extend of the estuary and lagoon. For the marine component, refer to Coastal Marine Areas C. Key coastal characteristics include: Varied coastal edge character containing a variety of river terraces, an inlet, a causeway, and sand beach and island; characteristic rising dome forms of Pepin Island; and rugged steep coastal cliffs defining an exposed coastal edge. Bands of rural lifestyle settlement extend along the western edge of the Inlet. Refer to Map 9.

The extent of the coastal environment for this Coastal Terrestrial Area is closely aligned with the margins of this lagoon and coastal estuary. Where possible the extent of the coastal environment follows the local landforms that assist in enclosing this area, including the small land undulations east of Maori Pa Road. Land based modifications have attenuated the natural biotic systems which have in places foreshortened the extent of the coastal environment, such as around the flatter parts of the valley floor, where tidal extents of river mouths have assisted.

Beyond this Coastal Terrestrial Area the Coastal Context Zone is centred on the Wakapuaka River valley. The valley sides are flanked by commercial forestry and areas of grazing. The valley flats are predominated by pastoral land uses which are accessed by Rotokura/Cable Bay Road. The more elevated parts of the valley are covered in indigenous forest. Numerous small farms and houses are peppered through this valley.

Abiotic

The Delaware Bay Coastal Terrestrial Area include the steep to moderately steep hill slopes north west of the Waimea-Flaxmere Fault System as well as the recent alluvial valley floor floodplains, low terraces, river channels and associated back swamps and wetland. This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type) and Land Type 3 (Brook Street Mountain Land Type). It includes the Wakapuaka River mouth and estuary, barrier boulder bars and spits and its associated surrounding hills. Pepin Island is also included within this Coastal Terrestrial Area.

The Wakapuaka valley floor consists of recent alluvial floodplains, low terraces, river channels and associated backswamp wetlands. Formed from Recent and Holocene aged, predominantly fine-grained alluvium and estuarine deposits and slightly to extensively weathered coarse-clay-bound aggradational and degradational terrace and fan gravels. A tombolo composed of hard boulders at Rotokura/Cable Bay connects Pepin Island to the mainland. The hill components of this Coastal Terrestrial Area include the steep and moderately steep sedimentary rocks.

The principal river is the Wakapuaka River, which flows in a northerly direction and drains into the estuary. Numerous steep and small watercourses, which are often ephemeral also flow into the estuary. Virtually landlocked by the Rotokura/Cable Bay tombolo and Pepin Island and Delaware spits, the estuary's opening to the sea is via a small inlet east of Pepin Island. All these coastal features are regarded as a "unique combination of features" (Kenny & Hayward 1993).

Annual rainfall is from 1200 to 2000mm with high intensity rains common.

Elevation ranges from 0 to 401m at Pepin Island.

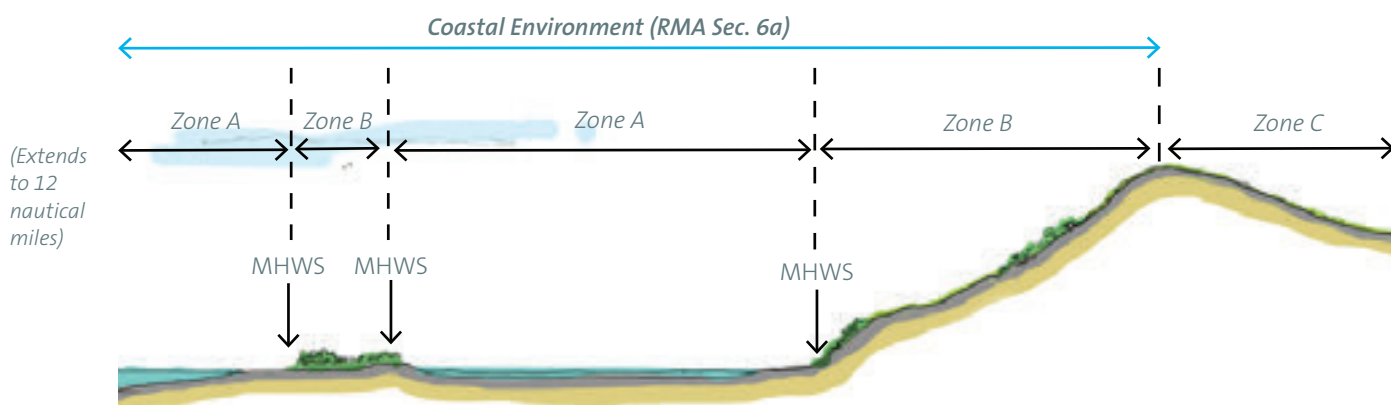


Illustration 4. Representative Coastal Environment Diagram of Delaware Bay

Biotic

Summary analysis: Total land area within the Delaware Bay Coastal Terrestrial Area is 977 ha, of which 0.1% is in native forest, 9% in native shrubland, 2% in wetland communities, 3% in exotic treeland, 8% in exotic scrub and 75% in pasture.

The upper elevations would have originally been forested with mixed beech and tall podocarps, dominated by red beech and silver beech, with rimu, miro, matai and some totara. Lower slopes were dominated by black beech and hard beech, with rimu, totara and matai. Gullies would have supported podocarps emergent over broadleaved trees such as tawa, titoki, pukatea, kohekohe and mahoe. Shrubland on steeper coastal slopes and cliffs would have been dominated by kanuka, ngaio, akeake, taupata and puka.



Female Spinifex

Forest on coastal flats supported kahikatea, totara, matai and a range of broadleaved trees including tawa, pukatea, titoki, kaikomako and mahoe. Kowhai, lowland ribbonwood and narrow-leaved lacebark would have been present at river margins. Valley floor wetlands were dominated by rushes, sedges, flax, toe-toe and, at damper sites, raupo. These graded at the estuary margin to marsh ribbonwood and scrub pohuehue. Dunes supported by pingao, spinifex, sand tussock and sand sedge. Stable rear dunes would have supported umbrella sedge, akeake, tauhinu, wharariki, toetoe and scrambling pohuehue.

Now the majority of this has been cleared to make way for pastoral farming and commercial forestry. Pockets of remnant vegetation are concentrated to localised gullies and around the Bishop Peninsula. Much of the lower lying valley area has also been drained for farming purposes, although noticeable communities of estuarine vegetation are prominent at the mouth of the Wakapuaka River and around the majority of coastal flats. These estuarine communities provide important habitats for a variety of shrubs, grasses, sedges, rushes, including marsh ribbonwood, estuary needle grass, three square sedge, lake clubrush, sea rush, jointed rush, sea celery, coastal buttons, shore primrose and remuremu. Intact vegetation sequences from saltmarsh to coastal forest exist on Bishop Peninsula.



The vegetated Bishop Peninsula

The dune ecosystem, located at Delaware and Pepin Island spits, whilst slightly modified retains shrub-sized native vegetation which is considered rare both regionally and nationally. Notable species include harakeke, akeake, kanuka, ngaio, spinifex and prostate matagouri.

The hard cobble tombolo (Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea) which connects Pepin Island to the mainland harbours very few vegetation communities. Notable species include ngaio and scrambling pohuehue.

Coastal and alluvial forest remnants on the cliffs and estuary are browsed by goats.

Twenty-seven bird species have been observed within the estuary. A number of these breed in the area, including the banded dotterel and white fronted tern (*Sterna striata*). A number of species migrate and include the royal spoonbill and well as the Australian bittern. The estuary provides an excellent feeding ground for threatened and at risk waders. Pepin Island is an important winter roost for spotted shag (*Stictocarbo punctatus punctatus*) and a breeding site for white-fronted terns and probably reef heron. Further commentary on the area below mean high water mark is contained within Coastal Marine Area A.

The Delaware estuary is described within Coastal Marine Area A, however its margins are largely unmodified and of scientific value. The freshwater environment has been degraded compared with its upper reaches by nutrient runoff. Like the Whangamoa River the lower Wakapuaka supports a whitebait run and fishery as well as a trout fishery. Inanga spawning and adult rearing habitat are present in the lower reaches. Smelt, yellow eye mullet, longfin and shortfin eel, bully species and freshwater shrimp are often observed in the lower river zone. Kahawai penetrate the lower river to feed on smelt, whitebait and juvenile mullet in the spring and summer. Upper reaches where faster water habitat is present supports species such as koaro and torrentfish.



Sea rush

Experiential

Access to this Coastal Terrestrial Area is gained via Rotokura/Cable Bay Road which leads to Rotokura/Cable Bay. Maori Pa Road branches off Rotokura/Cable Bay Road and extends towards Maori Pa Beach. Virtually all indigenous forest vegetation has been cleared from this area which is now used for pastoral farming. Recreation based activities include walking (and fossicking), picnicking, surfcasting, surfing, white-baiting and bird watching, however are not experienced in large numbers. Harakeke is gathered from near an areas at the base of Delaware Spit.



Coastal driftwood



Rotokura/Cable Bay tombolo as seen from the Rotokura/Cable Bay Walkway

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>	✓		
<i>High</i>			✓
<i>Moderate to High</i>		✓	
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
	Overall Natural Character Rating		High

Commentary of Level 3 'High' rating: This sheltered Coastal Terrestrial Area holds very high levels of abiotic, moderate to high levels of biotic and high levels of experiential aspects of natural character. Despite the grazed nature of Pepin Island and its immediate hinterland flanking the Delaware Bay to the south of this Coastal Terrestrial Area, there are areas of intact indigenous vegetation that positively contribute towards the areas high rating. These areas are predominantly contained around the margins of the estuary, including Bishop Peninsula. Furthermore, the diverse assemblage of land features within this Coastal Terrestrial Area further adds to the high rating. Refer to Coastal Marine Area A for an assessment of the adjoining sea.



Slips are evident along the lower coastal slopes of Pepin Island

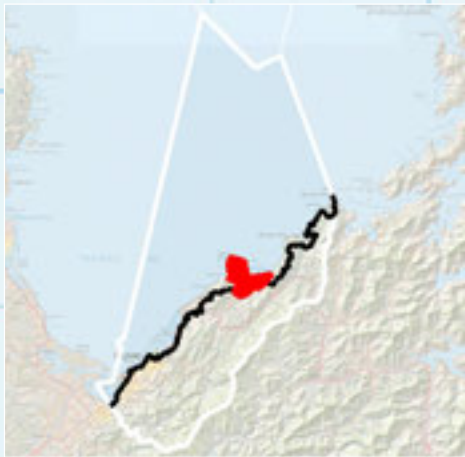
Specific Values at Level 4

These are mapped with reference to **Map 9**.

Sub Area	Rating	Key Values	Additional Comments
Estuarine fringes of Wakapuaka River	Very High	Estuarine fringes and mouth of Wakapuaka River contain rare communities of estuarine vegetation Numerous seabirds are present including many threatened or at risk waders.	Refer to Coastal Marine Area A for marine values of estuary
Bishop Peninsula	Very High	Impressive remnant vegetation on Bishop Peninsula	Access is provided via Maori Pa Road
Dune system on Delaware Spit and Pepin Island spit	High	Regionally rare plant communities along Delaware Spit Impressive landform features to estuary Shifting coastal processes lead to high experiential values	The majority of Delaware spit is grazed, however the western most part holds less modification.



Delaware Spit, Pepin Island Spit and the broader Delaware Inlet



Tasman Bay

Nelson Region

Extent of Nelson Coastal Environment

Delaware Bay Coastal Terrestrial Area

Delaware Bay Coastal Natural Character Rating

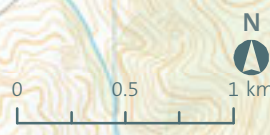
High

Very High



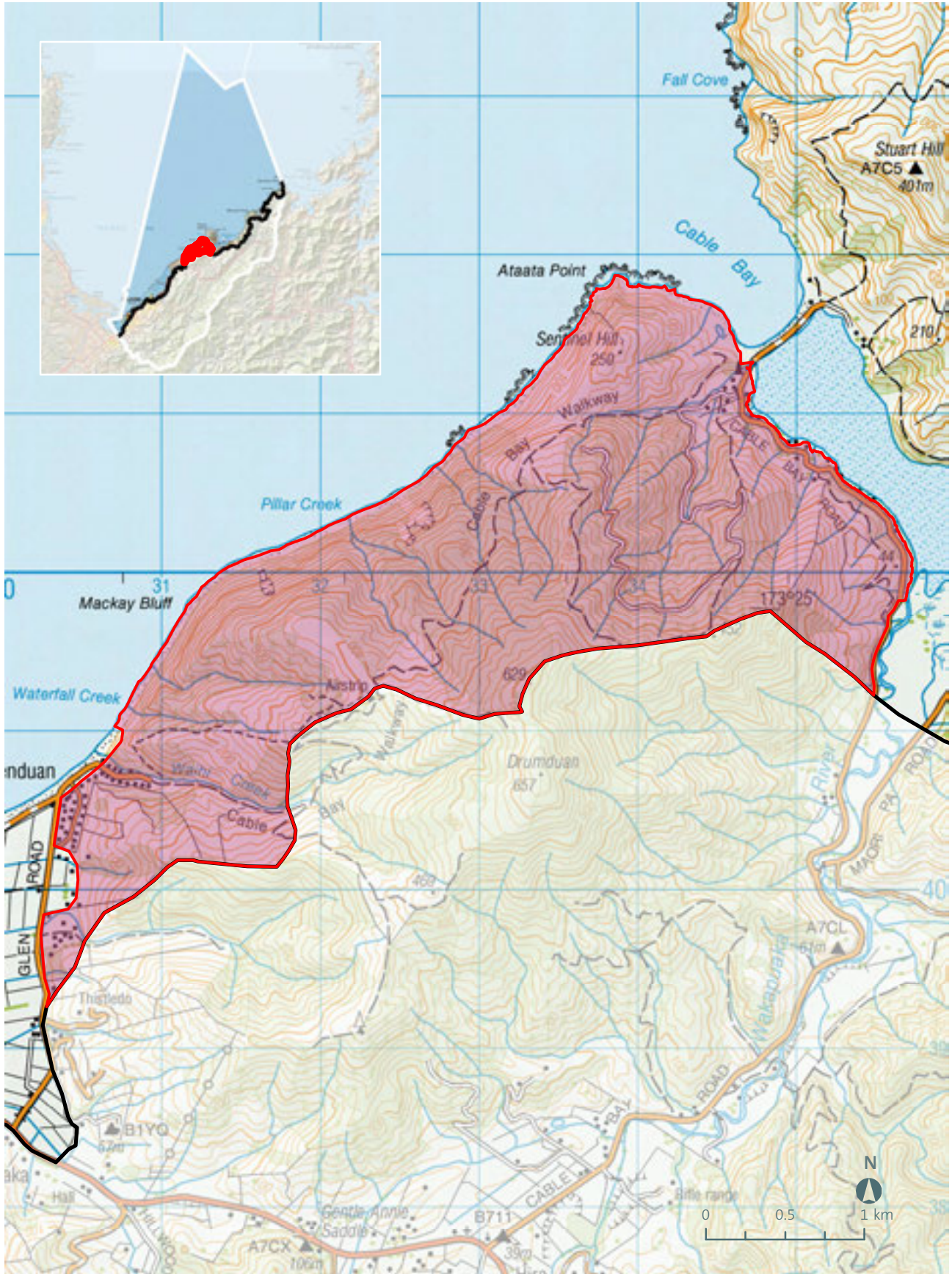
Delaware Bay

Map 9



COASTAL TERRESTRIAL AREA 5:

Horoirangi/Drumduan



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is located south of Pepin Island and immediately north of the Wakapuaka flats. It encompasses the steep northern slopes of the dome-shaped hill of Horoirangi/Drumduan and includes the small settlement of Glenduan as well as the Rotokura/Cable Bay Walkway and the numerous houses located alongside Rotokura/Cable Bay Road. Key coastal characteristics include: Steep exposed coastal cliffs at Mackay Bluff including visible granodiorite and andesite bands; a mosaic of vegetation types including mixed pasture, forestry, scrub and remnant native forest, some within gullies with significant conservation value. Refer to Map 10.

The extent of the coastal environment for this steep Coastal Terrestrial Area is generally aligned to follow the prominent ridge of Horoirangi/Drumduan. Due to the ridge being set back over one kilometre from the open coast coupled with the fact that much of the land has been modified for commercial forestry or pastoral farming purposes, significant elements, patterns and processes are somewhat tempered, especially within the southern part of the Area. The upper catchment of Waihi Creek, due to its sheltered aspect from the coast, is not considered to hold significant coastal influences, and has therefore been excluded from the coastal environment. The coastal environment descends towards the Wakapuaka Sandflats close to Glen Road.

Beyond this Coastal Terrestrial Area the Coastal Context Area extends inland to include the Wakapuaka River Valley where areas of valley settlement and large scale forestry and pastoral grazing are evident.

Abiotic

The Horoirangi/Drumduan Coastal Terrestrial Area includes the north and west steep to moderately steep hill slopes of Horoirangi/Drumduan. This Coastal Terrestrial Area is associated with Land Type 3 (Brook Street Mountain Land Type).

The geology expresses a broad legible dome shaped landform. The underlying geology comprises mixed sandstones, siltstones, mudstones, breccias, tuffs and basalt from mixed sedimentary and volcanic origin. The steep western coastal cliffs include distinctive areas of granodiorite and andesite intrusives reflecting areas of forced molten rock. Soils include a mix of steepland soils on the upper slopes which are shallow in places and characterised by scree slopes and slopes in some areas.

Annual rainfall is from 1200 to 2000mm with high intensity rains common.

Elevation ranges from 0m to a small peak of 629m, immediately north of the taller peak of Horoirangi/Drumduan.

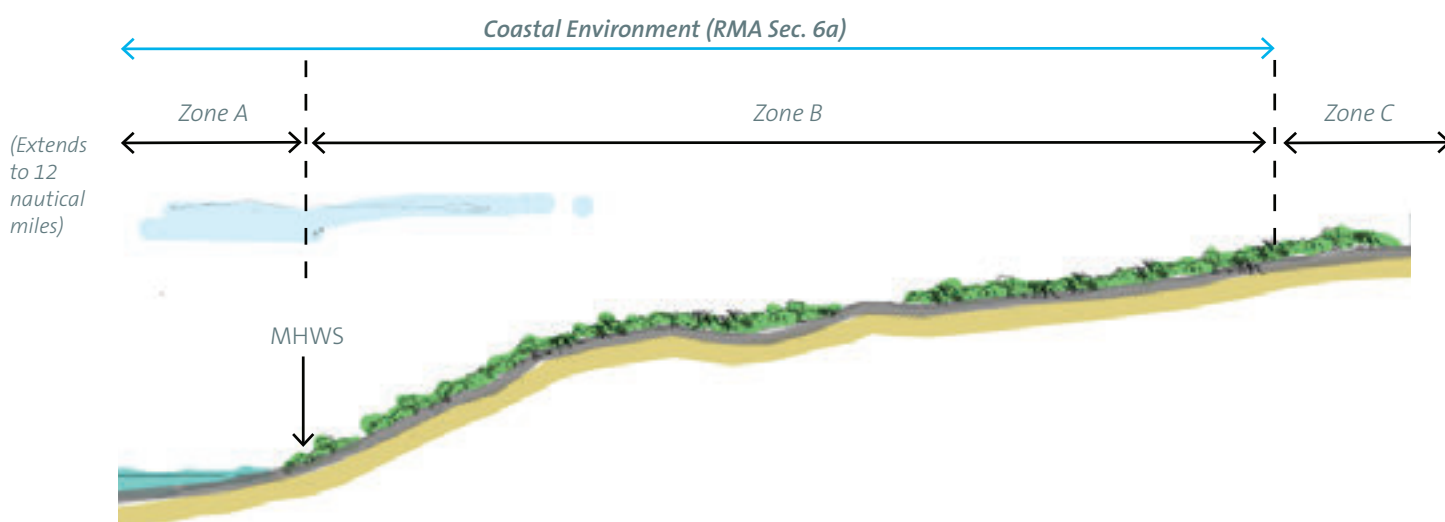


Illustration 5. Representative Coastal Environment Diagram of Horoirangi/Drumduan

Biotic

Summary analysis: Total land area within the Horoirangi/Drumduan Coastal Terrestrial Area is 841 ha, of which 13% is in native forest, 14% in native shrubland, 0.01% in wetland communities, 26% in exotic treeland, 6% in exotic scrub and 34% in pasture. The remaining areas comprise bare or lightly-vegetated surfaces.

Coastal hill country forest is generally confined to seaward-facing slopes up to the first major ridgeline. Common canopy and emergent species include matai, kohekohe (quite rare), tawa, titoki, mahoe and nikau on good soils. In gullies north of The Glen, coastal forest remnants with kahikatea, pukatea, hinau, karaka and nikau are present. On drier ridges with poorer soils black beech, hard beech, rimu, kanuka, akiraho, ngaio and akeake are also present. Vegetation on Mackay Bluff is sparse with windswept coastal plants present down to the rocky shore. The shrublands on the most extreme coastal slopes are dominated by kanuka, ngaio, akeake, tauhinu, taupata and puka. Areas of commercial forestry plantation are evident on the northern slopes opposite Pepin Island and to the south near Glenduan.

The small steep watercourses are not well surveyed, however, existing information suggests that the two largest catchments of the Rotokura/Cable Bay Stream and the Waihi Creek support koaro, redfin bully, eels, koaro and banded kokopu. The lower Rotokura/Cable Bay stream supports good numbers of inanga and spawning seems likely downstream of the ford. The smaller watercourses may support fish where there is sufficient residual water and habitat under summer low flows.

Goats graze the cliffs, causing damage to the vegetation and wilding pines are present on the cliffs. A large area of covenanted land (QE II) has been established on the slopes immediately below Horoirangi/Drumduan peak as well as a small wetland on the inside of Rotokura/Cable Bay.

The rocks near Ataata Point are an important roost for 2000 spotted shag (*Stictocarbo punctatus punctatus*).

This Coastal Terrestrial Area abuts Horoirangi Marine Reserve (HMR). Refer to Coastal Marine Area A for a description.



Sentinel Hill, The sheltered waters of Delaware Inlet can be seen at the background

Experiential

Rotokura/Cable Bay walkway, which extends from Rotokura/Cable Bay in the north to Glenduan in the south is a popular walking track. The complete walk takes about 3½ hours one way and offers panoramic coastal views of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea, Nelson City and Kahurangi and Abel Tasman National Parks. The middle section of the track passes through a patch of intact and varied native forest.

A sense of wildness and remoteness can be attributed to the majority of this Coastal Terrestrial Area due to its relative isolation from areas of settlement, despite its grazed landuse.

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>	✓		✓
<i>Moderate to High</i>		✓	
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			
<i>Very Low</i>			
	Overall Natural Character Rating		High

Commentary of Level 3 'High' rating: This moderately steep Coastal Terrestrial Area holds high levels of abiotic and experiential and moderate to high biotic aspects of natural character. Despite the grazing and commercial forestry occurring in the northern and southern parts of this Coastal Terrestrial Area, there are areas of covenanted intact indigenous vegetation that positively contribute towards the areas high rating. Abiotic aspects associated with Mackay Bluff also contribute positively to this overall rating. Refer to Coastal Marine Areas A and B for an assessment of the adjoining sea.



Erosion at Mackay Bluff

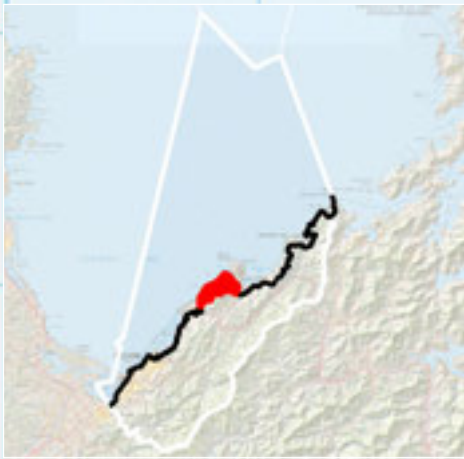
Specific Values at Level 4






These are mapped with reference to **Map 10**.

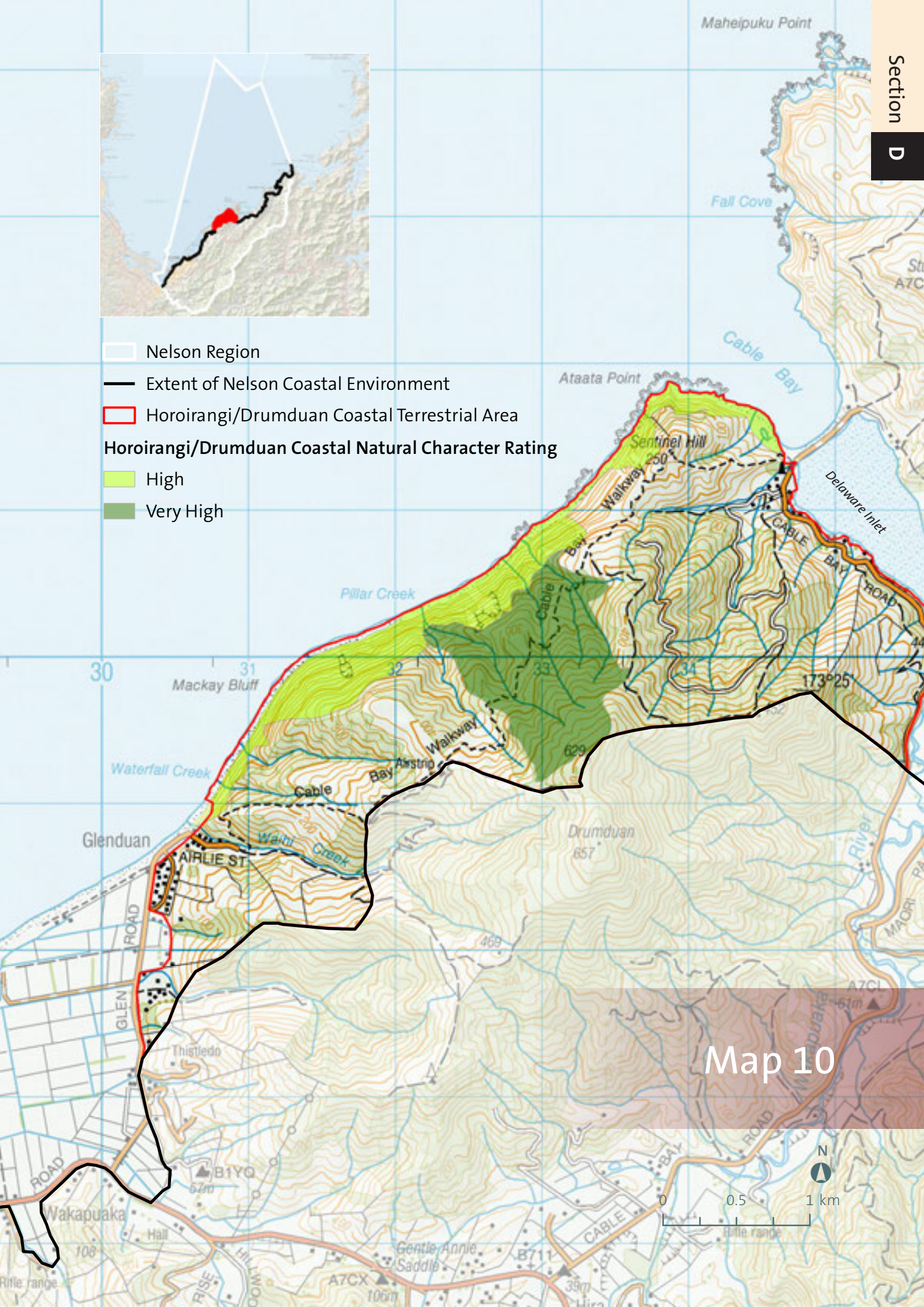
Sub Area	Rating	Key Values	Additional Comments
Protected Indigenous area of forest and QEII (Horoirangi/Drumduan)	Very High	<p>Notable areas of intact native forest present, with significant conservation value</p> <p>Impressive views from Rotokura/Cable Bay walkway from within area</p>	Much of this land is lightly grazed. Goats are also present.
Lower west facing coastal cliffs of Horoirangi/Drumduan	High	<p>Coastal erosion associated with Mackay Bluff expressive of formative abiotic process with Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.</p> <p>Sense of remoteness due to its isolation and exposure to the coast.</p> <p>Dramatic cliffs fronting beach with prominent bluffs</p>	Much of this land is lightly grazed. Goats are also present.



Steep eroding cliffs near Mackay Bluff



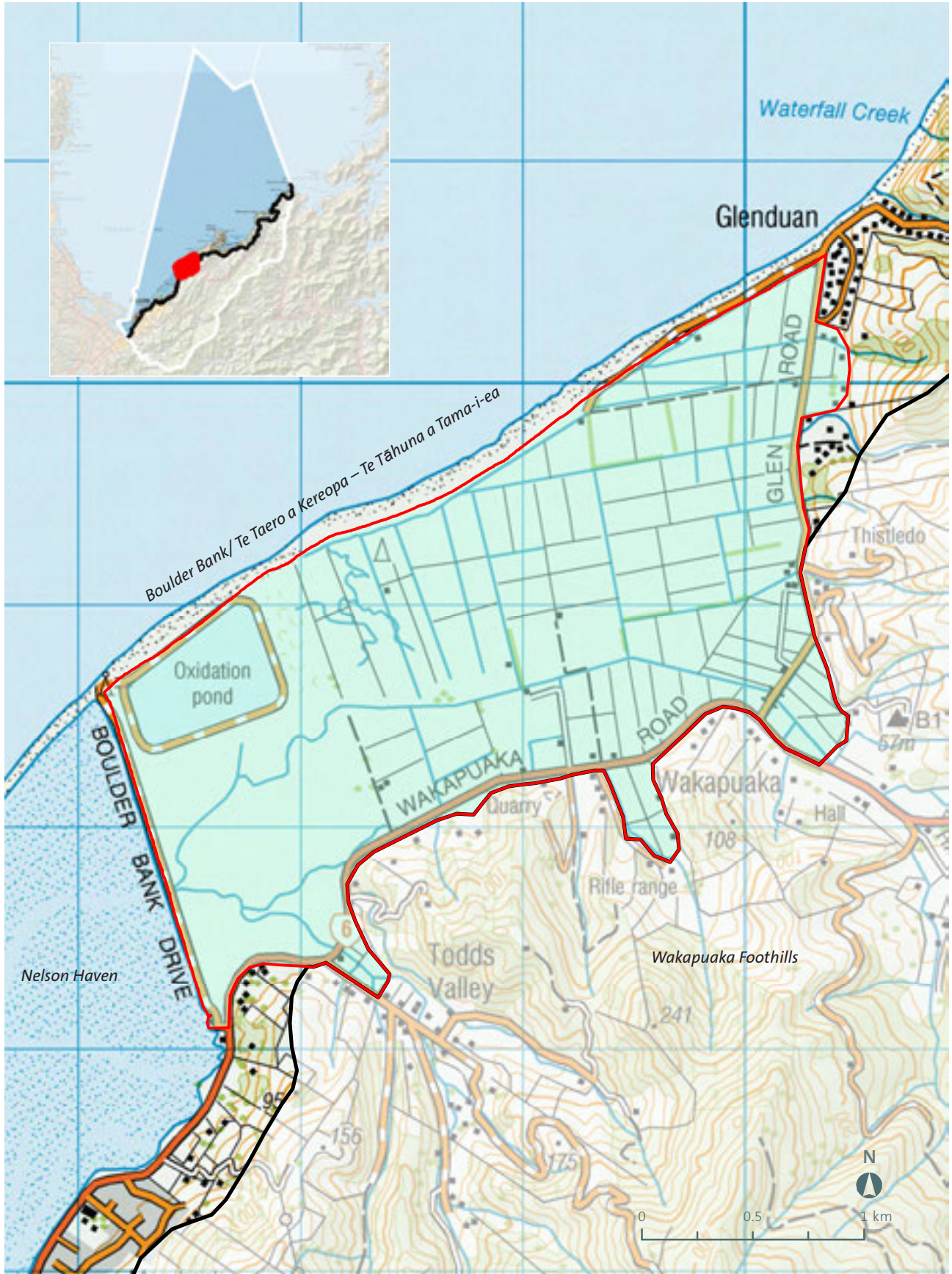
-  Nelson Region
 -  Extent of Nelson Coastal Environment
 -  Horoirangi/Drumduan Coastal Terrestrial Area
- Horoirangi/Drumduan Coastal Natural Character Rating**
-  High
 -  Very High



Map 10

COASTAL TERRESTRIAL AREA 6:

Wakapuaka



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is located at the northern end of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and adjoins Nelson Haven. The Coastal Terrestrial Area is open, flat and remains predominantly in rural use with mixed dairy and cattle grazing. Along the coastal edge, nodes of commercial and utility development have also established including the Cawthron Institute and a large visible transmission mast, however the overall settlement pattern remains sparse. Oxidation ponds are also present at the northern end of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Drive.

Key coastal characteristics include: the uniformly flat landscape accommodating strong rural elements such as fences and sporadic tree belts; reclaimed flat estuarine context with engineered stop banks, field drains and oxidation ponds retaining strong linear influences; mainly grazed exotic pasture with clustered macrocarpa, poplar and gum shelter belts with limited native plantings; sparse scattered settlement pattern across much of the flats including dispersed farm buildings and isolated commercial and utility built elements; and recreation tracks with local play areas located along northern coastal edge.

The extent of the coastal environment for this Coastal Terrestrial Area follows the inland edge of the coastal flats at the point where the topography rises beyond the Wakapuaka Flats. Despite many of the watercourses being channelised and diverted from their original course in this area, coastal elements, patterns and processes appear to remain significant to this point, principally due to its low-lying nature and relationship with Nelson Haven and the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea immediately south.

Beyond this Coastal Terrestrial Area the Coastal Context Zone becomes more elevated to form the Wakapuaka foothills to the south and the foothills associated with Horoirangi/Drumduan to the east. These lower hills accommodate a pattern of lower density rural residential and rural lifestyle development. Numerous valleys extend from these foothills, including Todds Valley and the larger Hira Valley, beyond the Gentle Annie Saddle.

Abiotic

The Wakapuaka Coastal Terrestrial Area includes the flat in-filled northern part of the Nelson Haven. This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type).

This Coastal Terrestrial Area is a flat coastal plain comprising mud, sand and gravels formed by swamp deposits. Alluvial deposits also adjoin the flats along the margins of the enclosing foothills and include mixed sand, mud, clay, boulders and peat. Soils (Richmond Peaty Clay Loam and Motukarara Silt Loam) are derived from alluvium derived from solidified molten rock and recognise a high salt content in western areas. Much of the land lies below high-tide level and encroachment from the sea is controlled by stopbanks and floodgates. The resultant field pattern retains a strong linear pattern of field drains and creeks. Some localised variation in topography is apparent along the northern edge of the flats where the landform rises in association with the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea along the coastal edge.

Annual rainfall is from 1000 to 1600mm with high intensity rains common.

Elevation ranges from 0m to 40m near the base of the westerly facing Wakapuaka foothills.

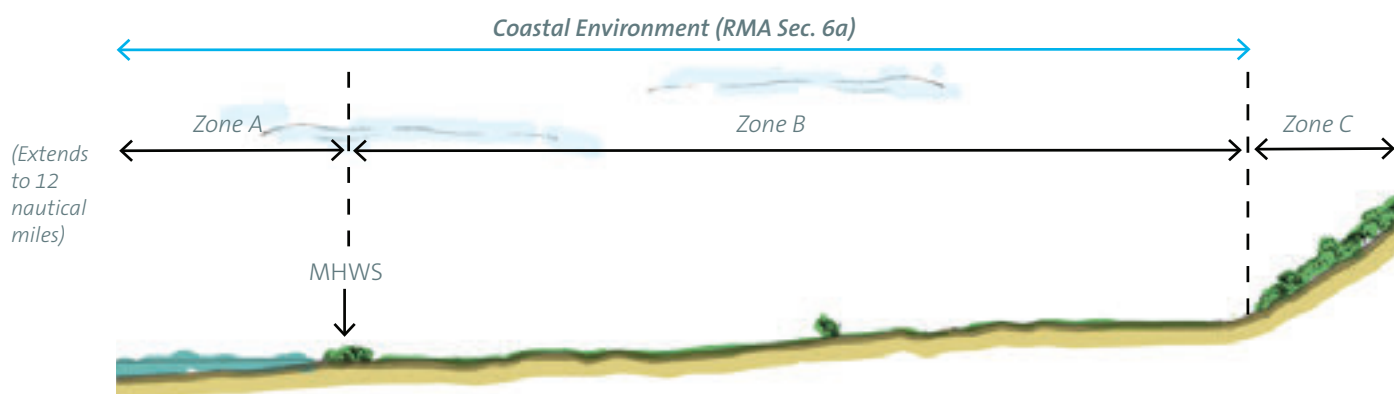


Illustration 6. Representative Coastal Environment Diagram of Wakapuaka

Biotic

Summary analysis: Total land area within the Wakapuaka Coastal Terrestrial Area is 530 ha, of which 0% is in native forest, 0.4% in native shrubland, 8% in wetland communities, 0.2% in exotic treeland, 0.01% in exotic scrub and 85% in pasture. The remaining areas comprise waterbodies and bare or lightly vegetated surfaces.

Originally harakeke swamp, this reclaimed land is predominantly used for dairy farming and land based aquaculture. Land cover is predominately pasture with macrocarpa, gum and poplar tree belts disbursed along field margins. Harakeke and ngaio are also common with marginal areas of saltmarsh and estuarine vegetation also established in combination with exotic grasses within Wakapuaka Sandflats and adjoining DOC/NCC Reserve to the south of the wastewater treatment Ponds.

Existing data suggests the catchment of the largest watercourses in this area Todds Valley stream supports koaro, banded kokopu, redfin bully, common bully, inanga, koura, freshwater shrimps and eels. Shortfin eels, inanga and common bullies are likely to be most prevalent at the mouth where it enters the Haven and in the drainage network interconnected with the residual wetland habitat. Inanga spawning may also occur in the lower reaches of the streams but has not yet been confirmed. NCC (2007) noted the degraded water quality and habitat in lower Todds valley Stream and in particular the Hillwood Valley stream.

Experiential

Access is derived to this Coastal Terrestrial Area via SH6 (Wakapuaka Road), Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Drive and Glen Road which leads to the small settlement of Glenduan. Numerous shore-based recreational activities occur in the area, including bird watching and walking along the coast (notably between the Rotokura/Cable Bay track to the north and the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea to the south). Due to the flatness of the topography and limited tree cover, experiential values tend to be accentuated, where views to the coast dominate.

Values at Level 3

Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>			
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>	✓	✓	✓
<i>Low</i>			
<i>Very Low</i>			
Overall Natural Character Rating			Moderate -Low

Commentary of Level 3 'Moderate to Low rating: This flat Coastal Terrestrial Area holds moderate to low levels of abiotic, biotic and experiential aspects of natural character. This is principally due to the relatively high levels of modifications found within the vast majority of this Coastal Terrestrial Area. Whilst originally harakeke swamp, this predominantly agricultural area supports little remaining indigenous vegetation. The small reserve within the Wakapuaka Sandflats increases naturalness in this confined part. Refer to Coastal Marine Area B for an assessment of the adjoining sea.

Specific Values at Level 4

No specific values of high or greater exist in this Coastal Terrestrial Area

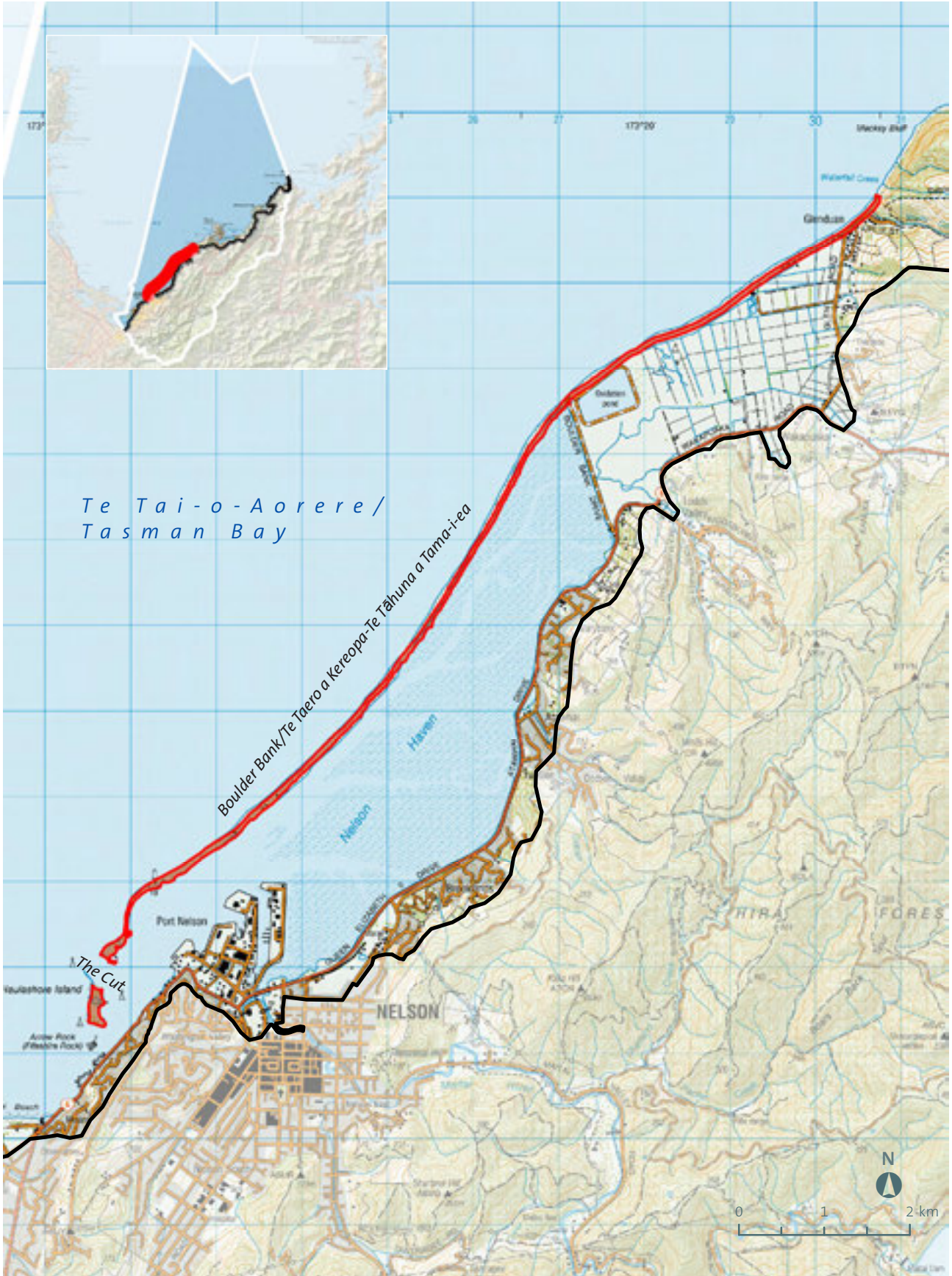


The flat topography of the Wakapuaka flats



Wakapuaka Sandflats and oxidation pond

COASTAL TERRESTRIAL AREA 7: Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area forms the seaward extent of Nelson Haven and is associated purely with the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and Haulashore Island. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is a slender natural spit of cobbles and boulders, extending 13.5km from near Mackay Bluff in the north to its southern tip. Beyond this, the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is in-filled although extending to Glenduan. Haulashore Island also forms part of this Coastal Terrestrial Area. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea contains a low horizontal landform of gravel ridges with limited visible development, with the notable exception of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Lighthouse and some small historic baches. Key coastal characteristics include: Iconic coastal feature along the southern entrance into Nelson City; limited built development within an estuarine and open ocean context.

The extent of the coastal environment for this Coastal Terrestrial Area follows mean high water springs mark.

This Coastal Terrestrial Area is virtually surrounded by Coastal Marine Area B, with the more exposed outer ocean to its west and the more sheltered estuary of Nelson Haven to the east. The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is connected to the mainland at its northernmost point and accessed via Boulder Bank Drive.

Abiotic

The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Coastal Terrestrial Area includes the 13.5km long barrier spit which encloses Nelson Haven and is considered an internationally important landform. This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type) and comprises a bank of granodiorite pebbles and boulders up to 0.8m in diameter. The boulders originate from Glenduan/ Mackay Bluff to the northeast and decrease in size and become more rounded towards the south-western tip of the spit. Haulashore Island was once part of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea, however due to the requirements of the Nelson Port, a cut was made through the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea due to the increasing demands of sea transportation.

This unique feature is likely to have been formed by longshore drift, however speculation exists over the reasonably weak wave action that Te Tai-o-Aorere/Tasman Bay receives to move such large boulders.

The climate of this Coastal Terrestrial Area is dry and highly exposed, although it does receive occasional high intensity rains.

Elevation ranges from 0-18m.

(Extends to 12 nautical miles)

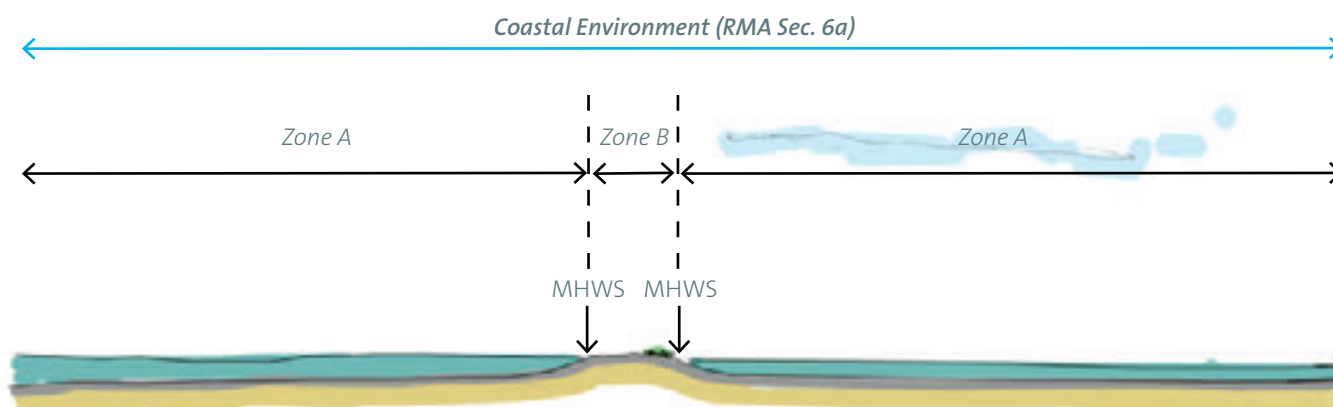


Illustration 7. Representative Coastal Environment Diagram of Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea.

Biotic

Summary analysis: Total land area within the Boulder Bank/ Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Coastal Terrestrial Area is 80 ha, of which 65% is in bare or lightly vegetated surface, 0.5% in native shrubland, 0.1% in wetland communities, 5% in exotic treeland, and 13% in pasture.

This Coastal Terrestrial Area harbours a distinct ecosystem. The majority of the vegetation is highly modified with the influx of introduced species. The natural components of this low-statured vegetation feature ngaio, coastal porcupine shrub, tauhinu, scrambling pohuehue and silver tussock. Distinctive supratidal biological communities occur along the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea; primarily mosses and lichens (Davidson et al. 1994)

Three lizards are known to inhabit the Boulder Bank/ Te Taero a Kereopa-Te Tāhuna a Tama-i-ea: the common gecko (*Hoplodactylus maculatus*), common skink (*Leiolopisma*

nigriplantare maccanni) and the spotted skink (*Leiolopisma lineocellatum*).

Birds associated with this Coastal Terrestrial Area include a small number of variable oystercatchers (*Haematopus unicolor*), the threatened banded dotterel (*Charadrius bicinctus bicinctus*) breed on the saltmarsh flats and the black-backed gull (*Larus dominicanus*) and red-billed gull (*Larus novaehollandiae scopulinus*) breed at varying numbers on an annual basis. Pied Shags (*Phalacrocorax varius varius*) breed in pine trees on Haulashore Island. Many ducks, during moult, seek shelter near the sewage ponds.

The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is managed as a scenic reserve by the Department of Conservation. The entire spit is registered with the Historic Places Trust.



Saltmarsh vegetation flanks the upper sheltered northern parts of the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea

Experiential

Access to the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea is gained via Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Drive to the north. A further track is also available from Glenduan. A number of small, historic baches and structures are located at its southern end as is a lighthouse, which was erected in 1862. This Coastal Terrestrial Area is popular for walkers.

The Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea and the Nelson Haven (which is incorporated within Coastal Marine Area B) hold considerable seascape value, especially when viewed from the Port Hills and from the air. It also holds very high auditory, visual and aromatic values as well as scenic values and a sense of wildness principally due to its exposed location.



A fisherman prepares his boat near Glenduan



Large boulders and cobbles form the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea

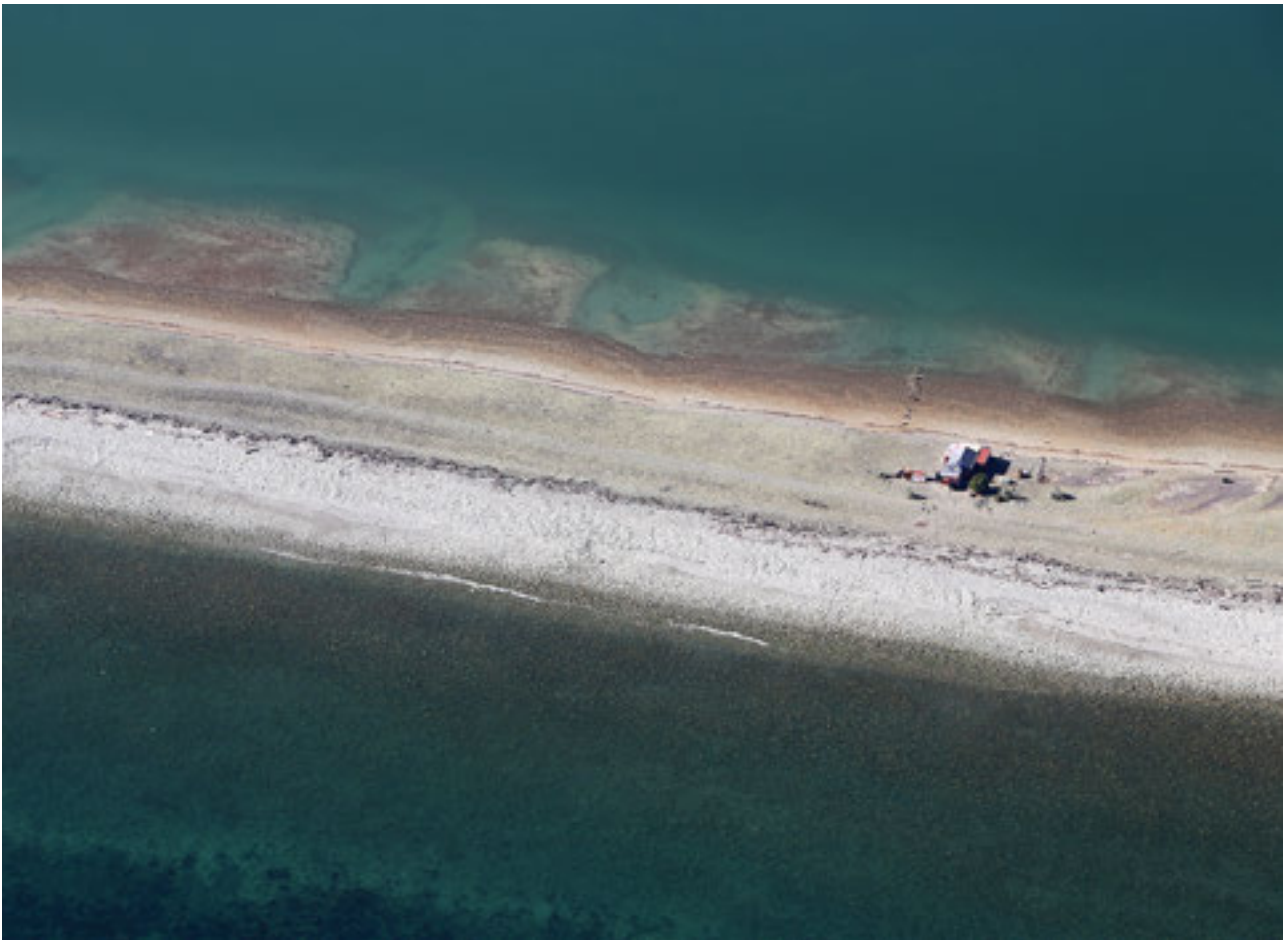
Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			✓
High	✓	✓	
Moderate to High			
Moderate			
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			High

Commentary of Level 3 'High' rating: This exposed Coastal Terrestrial Area holds high levels of abiotic and biotic and very high experiential aspects of natural character. The natural abiotic elements, patterns and process are very much still evident, and have been modified to small degrees by the presence of baches, the lighthouse, a small track, occasional exotic vegetation and the 'severing' of Haulashore Island from the spit. Experientially, remote and wildness values are very high, principally due to the Coastal Terrestrial Areas exposure to the coast and lack of shelter. Refer to Coastal Marine Area B for an assessment of the adjoining sea.

Specific Values at Level 4

These are mapped with reference to **Map 11**.

Sub Area	Rating	Key Values	Additional Comments
Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea spit	High	<p>Internationally recognised landform with good associated gravel ridges. Best known boulder spit in New Zealand.</p> <p>Important site for birds and lizards.</p> <p>Very high experiential values due to exposure.</p>	<p>Modifications such as some historic baches and a lighthouse are located within the southern part of the spit. Haulashore Island has also been 'severed' from the spit for shipping purposes.</p>



A bach located on the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea

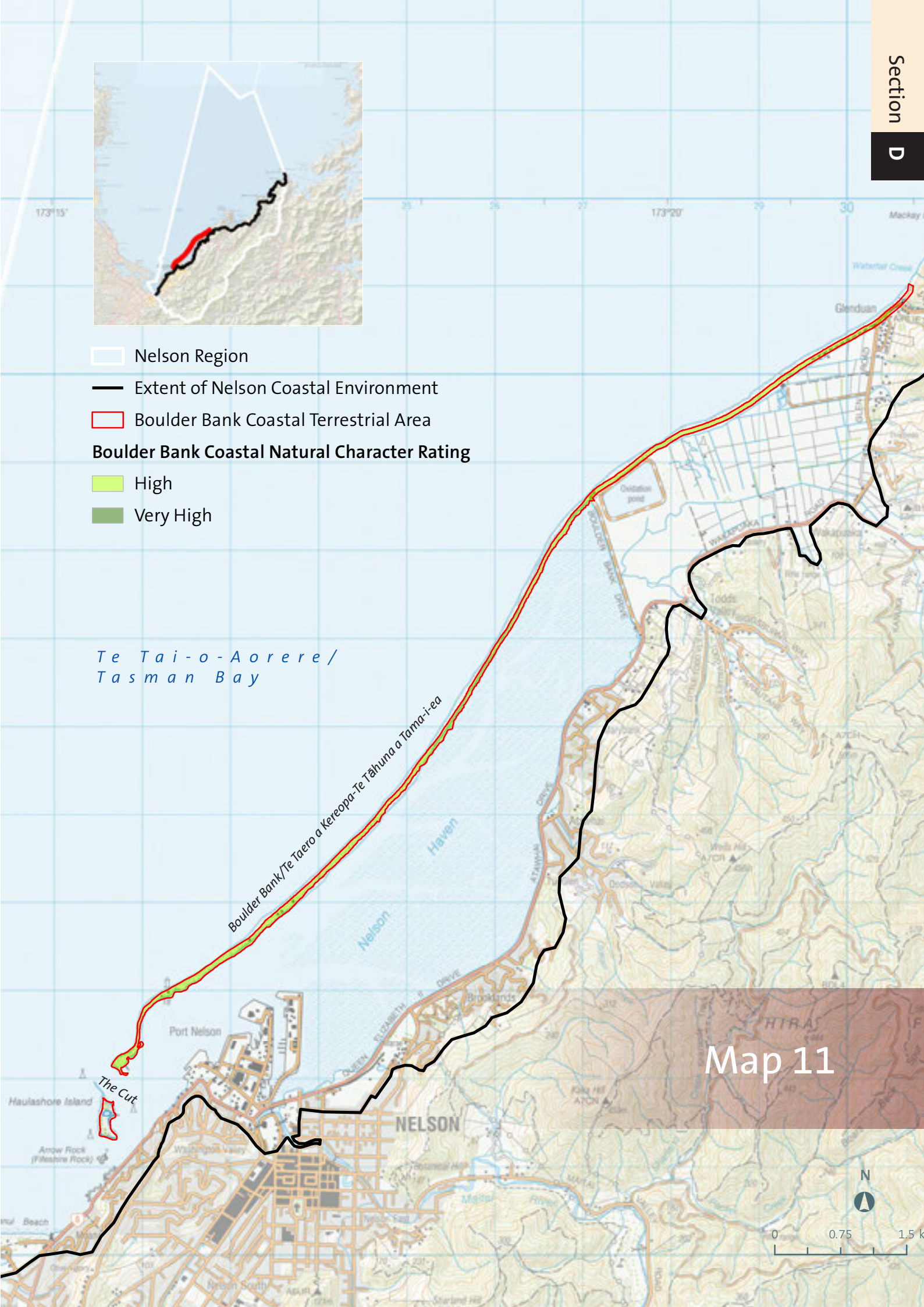


- Nelson Region
 - Extent of Nelson Coastal Environment
 - ▭ Boulder Bank Coastal Terrestrial Area
- Boulder Bank Coastal Natural Character Rating**
- High
 - Very High

*Te Tai-o-Aorere /
Tasman Bay*

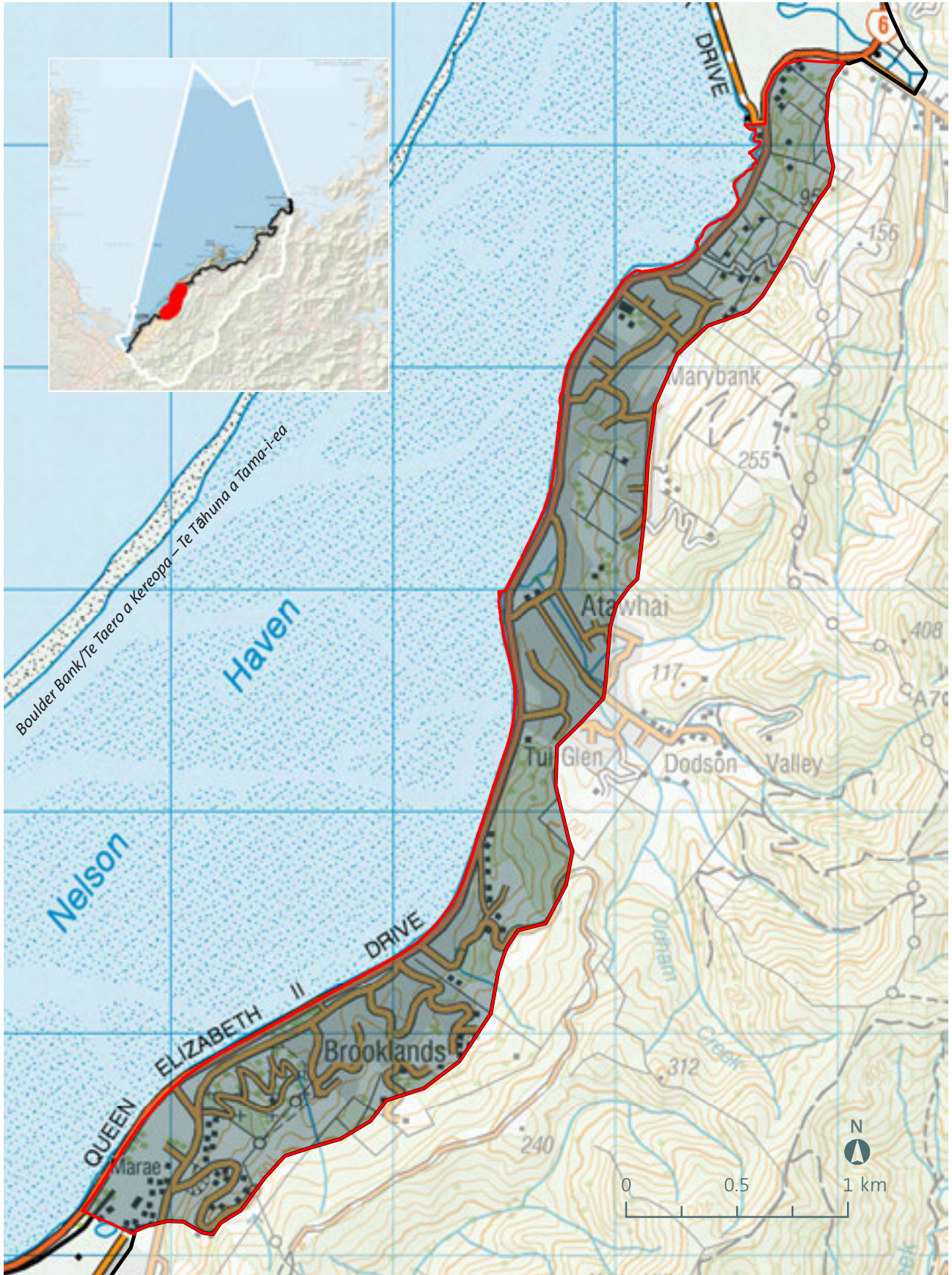
Boulder Bank/Te Taero a Kereopa-Te Tahuna a Tama-iaea

Map 11



Coastal Terrestrial Area 8:

Malvern Hills



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is located immediately above the mean high water springs mark east of Nelson Haven, and extends eastwards further to include the foothills that flank the estuary. Queen Elizabeth Drive extends alongside the estuary beyond which are the residential hillside areas of Marybank, Atawhai and Brooklands. Key coastal characteristics include: elevated residential areas, with views obtained over Nelson Haven, high levels of recreation use including links to one of Nelson's most popular walkways from Botanical Hill.

Due to the location of this Coastal Terrestrial Area being some 1-2km from the exposed part of the active coastal interface to the west of the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea, significant coastal elements, patterns and processes are somewhat attenuated. Therefore, the extent of the coastal environment extends only to a limited elevation into the Malvern foothills. Due to the modification provided by the roads, housing and other land use patterns, the extent of the coastal environment in this Coastal Terrestrial Area broadly extends to the 90 to 100 metre contour line. This includes the lower-elevated houses and roads. This area could be described as a coastal transition area, where detailed refinement of the extent of the coastal environment would need to be required for specific proposals to more accurately determine the extent in this area.

Beyond this Coastal Terrestrial Area the Coastal Context Area extends beyond the ridgeline of the Malvern Hills and into the Atawhai Hills. Much of this hinterland retains limited settlement, mostly restricted by the steepness of the terrain. There are however some rural lifestyle dwellings evident within areas of commercial pine plantation, gorse, manuka and kanuka scrub and some bush remnants. Grazed farmland also occurs on more gentle land.

Abiotic

The Malvern Hills Coastal Terrestrial Area is included within three Land typing areas. The main bulk is contained within the Soft Rock Hill Country Land Type 2 with the northernmost area (north of Atawhai) being included within the Brook Street Mountain Land Type 3. The coastal lowlands of Atawhai and a small part Queen Elizabeth Drive to the south are included within Land Type 1 (Valley Floor and Marine Margin).

Soils (mixed Atawhai Steepland Complex and Sunnybank Hill Complex) are derived from basic igneous (solidified molten rock) and altered sedimentary rocks (Chittenden et al., 1966). They are generally of low to moderate fertility and prone to drying off in summer.

Watercourses drain from the more elevated land and tend to be short and often ephemeral.

The climate of this Coastal Terrestrial Area is dry and highly exposed, although it does receive occasional high intensity rains.

Elevation ranges from 0- 255m at Marybank.

(Extends to 12 nautical miles)

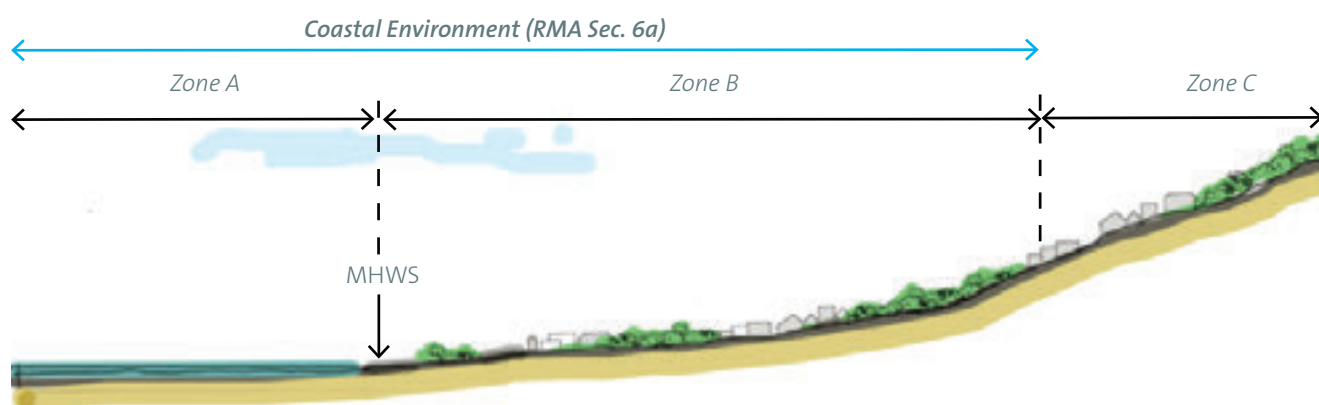


Illustration 8. Representative Coastal Environment Diagram of Malvern Hills

Biotic

Summary analysis: Total land area within the Malvern Hills Coastal Terrestrial Area is 276 ha, of which 3% is in native forest, 4% in native shrubland, 0.8% in wetland communities, 12% in exotic treeland, 1% in exotic scrub and 23% in pasture. The vast majority of this Coastal Terrestrial Area (59%) falls under artificial surfaces.

These lower slopes would have originally been forested with mixed beech and tall podocarps, dominated by black beech and hard beech, with rimu, totara and matai. Gullies would have supported podocarps, notably kahikatea and matai, emergent over broadleaved trees such as tawa, titoki, pukatea, kaikomako and mahoe. All except very small remnants of this forest has now been removed with the land cover today being pasture, areas of commercial pine plantation, scrub and residential development.

Exotic vegetation dominates the lower coastal slopes and is more prolific around the residential areas. Towards more elevated areas, patches of scrub include manuka and kanuka, with some areas of regeneration evident.

Oldham creek draining the Dodson Valley is the largest of the few small watercourses draining into this part of Nelson Haven. While not thoroughly explored the native fish present in the lower reaches are likely to include longfin eels, common bully and, inanga (and potential spawning) with redfin bully, banded kokopu, koaro and koura in upper reaches where suitable flows and cover exist. The ephemeral nature of the smaller streams means that fish are confined to the stretches where summer habitat refuge exists in small pools where banded kokopu, smaller shortfin and longfin eels and bullies may be found (pers. obs.)

Indigenous vegetation in this area would have provided rich habitat for forest birds, such as kereru, tui and fantail. It would have also provided an important seasonal food source for bird populations' normally resident further inland.



Development on the Malvern Hills



Atawhai settlement

Experiential

Due to the location of this Coastal Terrestrial Area adjacent to Nelson Haven, experiential indicators tend to relate to views out towards the coast. These views are experienced from users on Queen Elizabeth II Drive/Atawhai, glimpses from the numerous residential roads that extend off of SH6 and from the many residential dwellings.

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High			
Moderate to High			
Moderate			✓
Moderate to Low	✓		
Low		✓	
Very Low			
Overall Natural Character Rating			Moderate -Low

Commentary of Level 3 'Moderate to Low rating: This Coastal Terrestrial Area holds moderate to low abiotic, low biotic and moderate levels of experiential aspects of natural character. This is principally due to the built-up nature of this area. Very little indigenous vegetation and habitats are present. Whilst experiential aspects rate slightly higher, they are still attenuated by significant coastal influences due to the more sheltered nature of coastal process occurring within Nelson Haven and the distance to the more active exposure of the coast along the Boulder Bank/ Te Taero a Kereopa-Te Tāhuna a Tama-i-ea. Refer to Coastal Marine Area B for an assessment of the adjoining sea.

Specific Values at Level 4

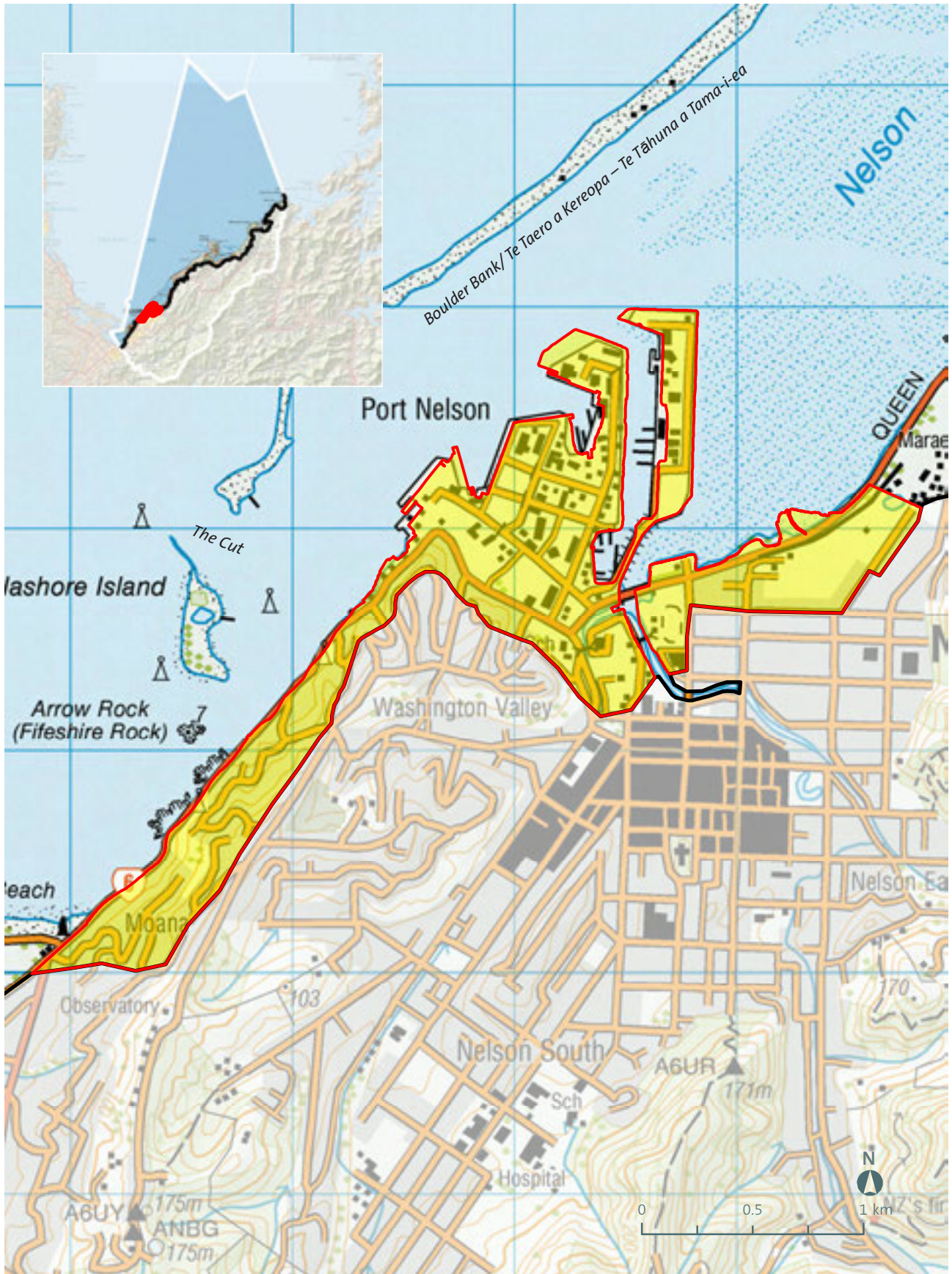
No specific values of high or greater exist in this Coastal Terrestrial Area



View of Port Nelson from Bay View Road

Coastal Terrestrial Area 9:

Nelson



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area includes the northern built up part of the city of Nelson, Port Nelson and the west-facing houses above SH6 which extends along the coastline. This Coastal Terrestrial Area is heavily developed holding limited natural elements, patterns and processes. Key coastal characteristics include: the reclaimed and industrial land associated with Port Nelson, the houses elevated above SH6 and the watercourses associated with the Maitai River mouth and Saltwater Creek.

Due to the heavily modified nature of this Coastal Terrestrial Area the extent of the coastal environment follows main urban delineations, including roads, open spaces and for the Maitai River Mouth, tidal changes. In some instances, the extent is very close to the coastal waters, due in part to the modifications that have attenuated the biophysical processes.

Commencing in the northernmost part of the Coastal Terrestrial Area, the extent of the coastal environment follows the back of the houses located on the eastern side of North Road to a point where houses commence on the western side. The line then continues down North Road to include those westerly located houses on North Road. The coastal environment then extends westwards along Weka Street and Wainui Street to Trafalgar Street, where it trends southwards to Hathaway Terrace. The extent then crosses the Maitai River at its tidal influence area then extends towards Paru Paru Road before joining Halifax Street. Where Halifax Street joins Haven Road, the extent of the coastal environment gains elevation to include the northerly flanks of the residential lower slopes of Britannia Heights. The extent then follows the north facing slopes directly above SH6 towards Moana, where it broadly

follows the 80m contour line. Detailed refinement of the line would be required to more accurately determine the extent in this area.

Beyond this Coastal Terrestrial Area lies the built up urban fabric of Nelson and the residential area of Britannia Heights and Moana. Occasional views towards the coast from more elevated areas are possible but coastal processes and patterns are not significant.

Abiotic

This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type) and Land Type 2 (Soft Rock Hill Country Land Type). It includes the reclaimed land associated with Port Nelson, the mouth of the Maitai River and the north and west facing hills associated with Britannia Heights.

The northern most part of this Coastal Terrestrial Area consists of highly modified recent alluvial floodplains, low terraces, river channels and associated backswamp wetlands of the Maitai River. The area is formed from the Recent and Holocene age comprising predominantly fine-grained alluvium and estuarine deposits and slightly to extensively weathered coarse-clay-bound aggradational and degradational terrace and fan gravels. The hill components of this Coastal Terrestrial Area include the steep and moderately steep clay-bound gravels. Arrow Rock, located immediately offshore from Rocks Road, represents an iconic exposed and isolated natural stack.

The Maitai River flows into Nelson Haven and is now a highly modified channel.

Annual rainfall is from 1000 to 2000mm per year, with high intensity rains common.

Elevation ranges from 0m to approximately the 80m contour line.

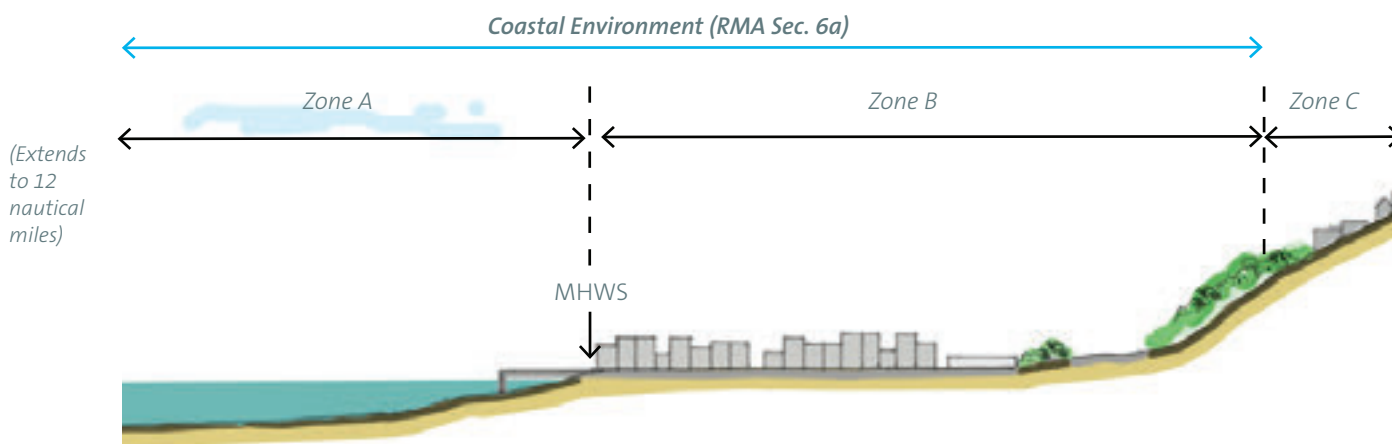


Illustration 9. Representative Coastal Environment Diagram of Nelson

Biotic

Summary analysis: Total land area within the Nelson Coastal Terrestrial Area is 209 ha, of which 3% is in native forest, 0% in native shrubland, 0.8% in wetland communities and 0.06% in exotic scrub. Overwhelmingly this Coastal Terrestrial Area comprises 92% artificial surfaces.

Originally, the flatter low-lying parts of this Coastal Terrestrial Area would have contained nikau, pukatea, kahikatea, kowhai, lowland ribbonwood and narrow-leaved lacebark. On more elevated land titoki, mahoe, tawa, totara and matai would be common. However today, almost no indigenous vegetation remains, and that which is present, has been highly modified or is dominated by exotic species.

Maitai River (Freshwater characteristics and values) flows from the Bryant Range and is dammed as to provide Nelson's main water supply. While modifying the hydrological and water quality features of the Maitai the river still supports a significant indigenous fish fauna

including several threatened species (refer to Appendix 4) and a brown trout population. Commonly found indigenous fish are common, giant and redfin bully, yellow eye mullet, inanga (including spawning areas in the vicinity of Collingwood Bridge)), smelt, short and longfin eels, koura and freshwater shrimp. (NCC data and pers. obs.). Landuse practices including forestry, farming and urban stormwater discharges alter nutrient, and sediment regimes with occasional faecal spikes recorded. Degraded water quality is reflected in the reduced diversity and abundance of sensitive invertebrates (Wilkinson 2007). Occasional cyanobacterial and periphyton blooms occur in the summer months.

The other small catchments intersecting the coastal marine area in this zone support inanga redfin and common bully, longfin and shortfin eels and banded kokopu in habitat refuges in the upper reaches.



View of Port Nelson

Experiential

The abiotic and biotic aspects of natural character of the coastal environment within this Coastal Terrestrial Area have been severely compromised by the modification that has occurred. Views of the coast and the smell and sound of the water are key values, much of which has been attributed to the naming of many motels, restaurants and bed and breakfasts (e.g. Harbour View, the Boat Shed). SH6 provides for transitory sea views and the hillside houses located above this road also provides panoramic views over towards Tahunanui Beach and Nelson Haven and over Haulashore Island and the Cut.

Arrow rock represents an unmodified natural isolated stack within a wider modified coastal environment.

Commentary of Level 3 'Very Low' rating: This partly reclaimed Coastal Terrestrial Area holds very low levels of abiotic and biotic and low experiential aspects of natural character. This low rating is due to the significant modification to this Coastal Terrestrial Area, where natural elements, patterns and process are virtually non-existent. Refer to Coastal Marine Areas B and C for an assessment of the adjoining sea.

Specific Values at Level 4

No specific values of high or greater exist in this Coastal Terrestrial Area

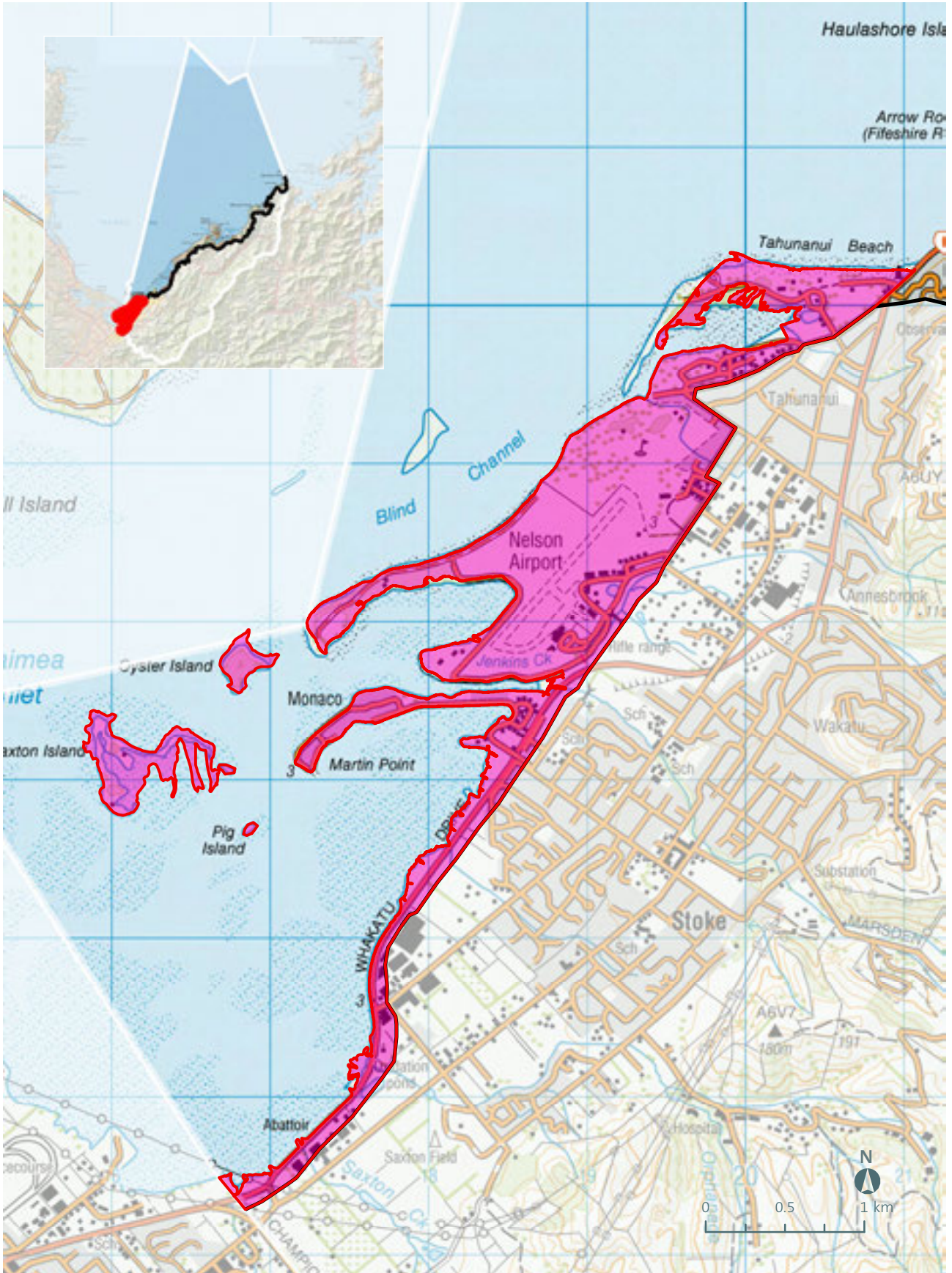
Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>			
<i>Moderate to High</i>			
<i>Moderate</i>			
<i>Moderate to Low</i>			
<i>Low</i>			✓
<i>Very Low</i>	✓	✓	
Overall Natural Character Rating			Very Low



View of Port Nelson from within Nelson Haven

COASTAL TERRESTRIAL AREA 10:

Tahunanui



Coastal Characteristics, Coastal Environment Extent and Coastal Context Area

This Coastal Terrestrial Area is located at the southernmost part of the Region and includes Tahunanui Beach, Nelson Airport, the Monaco peninsula and developed urban edge of Waimea Estuary. This Coastal Terrestrial Area also includes some of the Islands above the mean high water mark within the Waimea Estuary that fall within the jurisdiction of the Nelson Region and include Saxton Island, Oyster Island and Pig Island.

The area's key coastal characteristics include: The hard urban edge along Waimea Estuary; The use of retaining walls along some urban edges; Seaside baches established on the Monaco peninsula; Rocky and shingle edge coastline with limited areas of planting – the exception being part of an open space strip extending along part of Whakatu Drive; 'Back beach' includes areas of ngaio and pine planted for erosion control and a large tidal sandy mudflat; recreation opportunities associated with The Old Railway Route cycle/walkway along Whakatu Drive, a small number of islands including Saxton and Oyster Islands and the Monaco peninsula walking track.

Due to the flat nature of this Coastal Terrestrial Area, the extent of the coastal environment follows urban definitions where coastal elements, patterns and processes appear significant. These characteristics can be heavily attenuated in areas with high or very high levels of modification. For this Coastal Terrestrial Area the coastal environment extent was delineated along the landward side of Nelson Airport, as coastal elements, patterns and processes were considered sufficiently significant despite the large modifications apparent. Further south, the extent of the coastal environment is broadly offset from Whakatu Drive. It was considered necessary to delineate the extent

of the coastal environment at an offset distance of 50-75m landward of Whakatu Drive, as significant coastal characteristics extend slightly inland from this road, due to the flat topography and openness of the landscape in this vicinity.

Beyond this Coastal Terrestrial Area the coastal context retains an established relationship with the adjoining estuary providing open coastal views. Changing tides and the reoccurring exposure of coastal edges and mudflats also provide strong transient influences.

Abiotic

The Tahunanui Coastal Terrestrial Area encompasses sand and dune deposits and forms a complex arrangement of spits, beach ridges and estuaries. This Coastal Terrestrial Area is associated with Land Type 1 (Valley Floor and Marine Margin Land Type).

A small area of boulders and gravel sand also passes through part of the airport runway however this remains indistinguishable along the surface from surrounding sandy areas. Soils are exclusively Tahunanui Sand; a dark grey fine sand. The Coastal Terrestrial Area is low lying and characterised by expansive modified dune fields which extend between the MHWS mark and the established urban edge. Erosion is occurring around the estuary side of Nelson airport, along the margins of the inlet from Monaco to the Craft Habit and periodically at Tahunanui Beach. Some erosion protection works have been carried out along the airport and golf course.

The area, due to its terrain is slightly more sheltered than the exposed Coastal Terrestrial Areas to the north. Annual rainfall is from 1000 to 1600mm with high intensity rains common.

Elevation ranges from 0 to 10m.

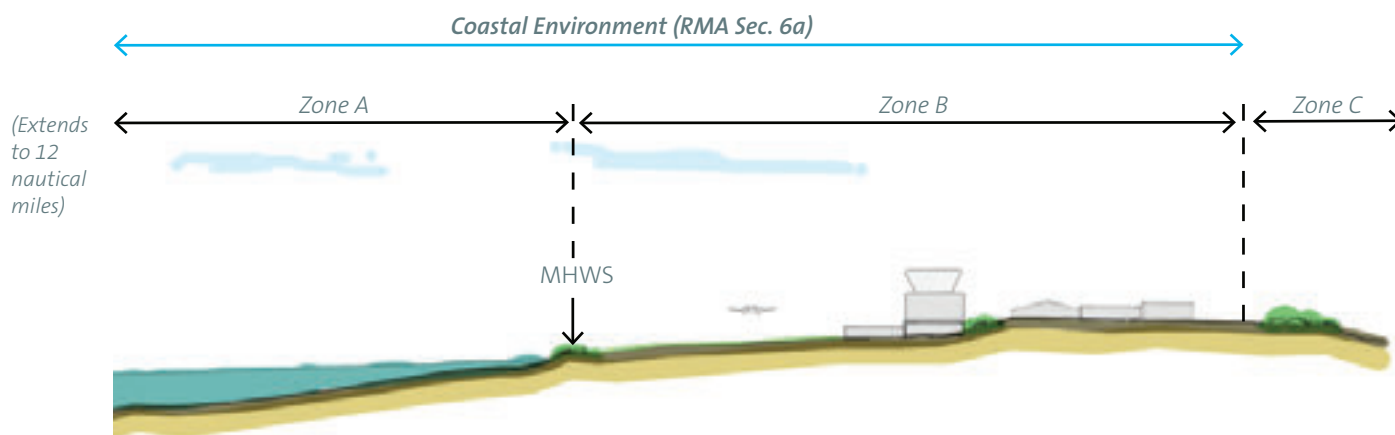


Illustration 10. Representative Coastal Environment Diagram of Tahunanui

Biotic

Summary analysis: Total land area within the Tahunanui Coastal Terrestrial Area is 360 ha, of which 0% is in native forest, 0% in native shrubland, 0.44% in wetland communities, 2% in exotic treeland, 3% in exotic scrub and 6% in pasture. As with the Nelson Coastal Terrestrial Area, this Coastal Terrestrial Area comprises 78% artificial surfaces.

Waimea Inlet (as a whole) is noted nationally as one large ecological unit supporting many endangered species. Refer to Coastal Marine Area C for further information relating to the water below mean high water.

Beyond a sandy coastal edge, grass covers most of this character area, particularly in southern areas accommodating the airport and most of the golf course. Planted areas of vegetation becomes more common in the northern part of the character area with structure and amenity planting providing enclosure and avenue planting associated with part of the camp ground, sports ground and fun park areas. Dune restoration with native dune grasses has been implemented along the dunelands of Tahuna beach. Phoenix palms are common through the northern area. The northern and western ends of Tahunanui beach include extensive areas of ngaio and pine in an effort to slow erosion. Small creeks with brackish water also occur throughout this area and contain coastal saltmarsh plants. Waimea Inlet is one of only two known sites where endangered peppergrass grows naturally and the endangered grey salt bush is also present.

Waimea Inlet has lost most of its original terrestrial vegetation and a significant proportion of some native saltmarsh habitats. However, numerous restoration projects have been undertaken or are in progress. A spraying programme commenced in the 1980s has effectively eradicated the exotic saltmarsh grass, *Spartina anglica* from Waimea Inlet.

Saxton Island represents a biologically rich and relatively isolated island, an area seldom found in New Zealand estuaries.

Streams draining the Stoke Fan including, Orphanage, Poormans, and Jenkins streams provide inanga spawning and rearing habitat in their lower reaches. Yellow eye mullet, smelt and bullies (including common, redfin and giant bully) have been recorded in lower reaches where habitat is suitable. Likewise, banded kokopu, koaro, koura and very occasionally shortjaw and giant kokopu occur in upper reaches of these small streams where pockets of good habitat occur (TDC, DOC, NCC unpublished data). The pest fish *Gambusia* (mosquito fish) has been eradicated from Orphanage Creek by DOC but further invasion of this species into Nelson waterways is an additional risk to indigenous fish populations. Invertebrate populations in the tidal lower stream reaches are degraded reflecting nutrient enrichment, sedimentation, periphyton blooms and elevated temperatures.



Nelson Airport and the Monaco peninsula

Experiential

As outlined above, there are high levels of modification associated with this Coastal Terrestrial Area. The urban centres of Richmond and Stoke form part of and abut in many cases the MHWS mark. Numerous industrial developments line Whakatu Drive, much of which is located on reclaimed land. The airport and the development on the Monaco peninsula and around Tahunanui Beach have also modified the northern part of this Coastal Terrestrial Area.

Car parking and access points established along Tahunanui Beach facilitate the most significant area of recreation activity along Te Tai-o-Aorere/Tasman Bay within Nelson. Adjoining fun park activities including a modeller's pond, BMX Track, Natureland, roller rink, hydro slide, bumper boats and playgrounds also introduce a strong carnival character associated with the use of this beach. Further to the south, more passive recreation activities occur in association with the camp ground and golf course with coastal walkways also connecting through these areas. Furthermore this Coastal Terrestrial Area is recreationally important to joggers, dog exercisers, duck hunters, fishers, whitebaiters and birdwatchers.

Within Waimea Inlet, numerous small islands and sand bars attract interest. It is these islands where experiential values are highest for this Coastal Terrestrial Area, due mainly to the ebb and flow of the tide and their separation from the mainland. Of note is Saxton Island, Oyster Island and Pig Island. All have varying degrees of modification, although Oyster Island is being regenerated and it is possible to camp there.

Values at Level 3			
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
<i>Very High</i>			
<i>High</i>			
<i>Moderate to High</i>			
<i>Moderate</i>			✓
<i>Moderate to Low</i>		✓	
<i>Low</i>	✓		
<i>Very Low</i>			
Overall Natural Character Rating			Moderate -Low

Commentary of Level 3 'Moderate to Low' rating: This sheltered Coastal Terrestrial Area holds low abiotic, moderate to low biotic and moderate experiential aspects of natural character. This is principally due to the high levels of modifications found within the vast majority of this Coastal Terrestrial Area. Of the whole Coastal Terrestrial Area, it is the islands within Waimea Inlet that hold the highest levels of naturalness, despite their varying degrees of modification. Refer to Coastal Marine Area C for an assessment of the adjoining sea.



Popular Tahunanui beach

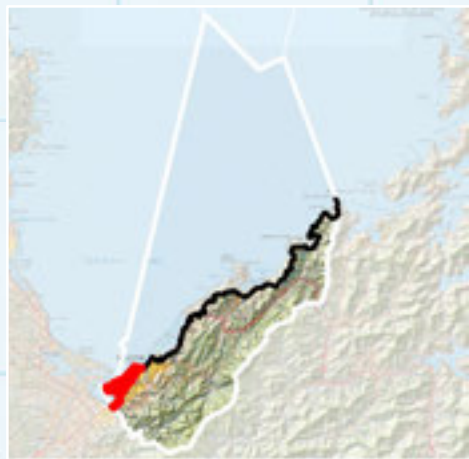
Specific Values at Level 4

These are mapped with reference to **Map 12**.

Sub Area	Rating	Key Values	Additional Comments
Saxton Island, Pig Island, Oyster Island	High	<p>All islands are formed from raised sand bars within the inlet. With the ebb and flow of the tide, the islands increase in size, promoting high levels of perceived naturalness.</p> <p>Semi-remote and scenic values are obtained on all islands.</p> <p>Saxton Island represents a biologically rich and relatively isolated island, an area seldom found in New Zealand estuaries.</p> <p>The inlet is an important site for rare and important seabirds.</p> <p>The small island of Pig Island supports some native flora.</p> <p>Oyster Island is currently regenerating.</p>	<p>Much of the original vegetation has been lost due to the urbanised edge of this Coastal Marine Area. Saxton Island has a restoration plan.</p> <p>Varying levels of modification on each island. Some regeneration has occurred on Oyster Island, including removal of wilding pines.</p> <p>Several structures are located on Saxton Island</p>



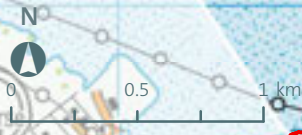
Waimea Inlet with Oyster Island and the Monaco peninsula in view



- Nelson Region
- Extent of Nelson Coastal Environment
- Tahunanui
- Tahunanui Coastal Natural Character Rating
 - High
 - Very High



Map 12



Overall Evaluation – Level 3

At the broader Level 3 'Area' scale, the Coastal Marine and Coastal Terrestrial Areas were found to hold broadly homogenous levels of natural character; from very low (i.e. Nelson) to very high (i.e. Cape Soucis). The more remote and isolated the area, for example Cape Soucis, the higher the degree of natural character due to the unmodified abiotic, biotic and experiential values.

Generally these areas either contain a large proportion of native vegetation and/ or particularly important habitat or landform values. These areas also hold strong remote and 'wildness' experiential values, where perceived levels of naturalness are high due to the lack of people and man made modifications. Some areas, which are typically more sheltered, hold higher degrees of modification (such as Delaware Bay) and this is reflected in each 'Area' rating. Some areas can also be relatively modified and also hold moderate to high levels of experiential values. Such an area is the Coastal Marine Area of Waimea. Whilst much of the inlet has been modified, there is still a strong presence of remoteness on many of the small islands.

More heavily modified areas such as Nelson and Tahunanui rate reasonably low, due to the modified nature of the environment and the attenuation of natural patterns and processes. Refer to Map 13 opposite for a collective overview of all rated Coastal Marine and Coastal Terrestrial Areas at the Level 3 scale. Level 4 values are summarised over the page.

— Extent of Nelson Coastal Environment

□ Nelson Region

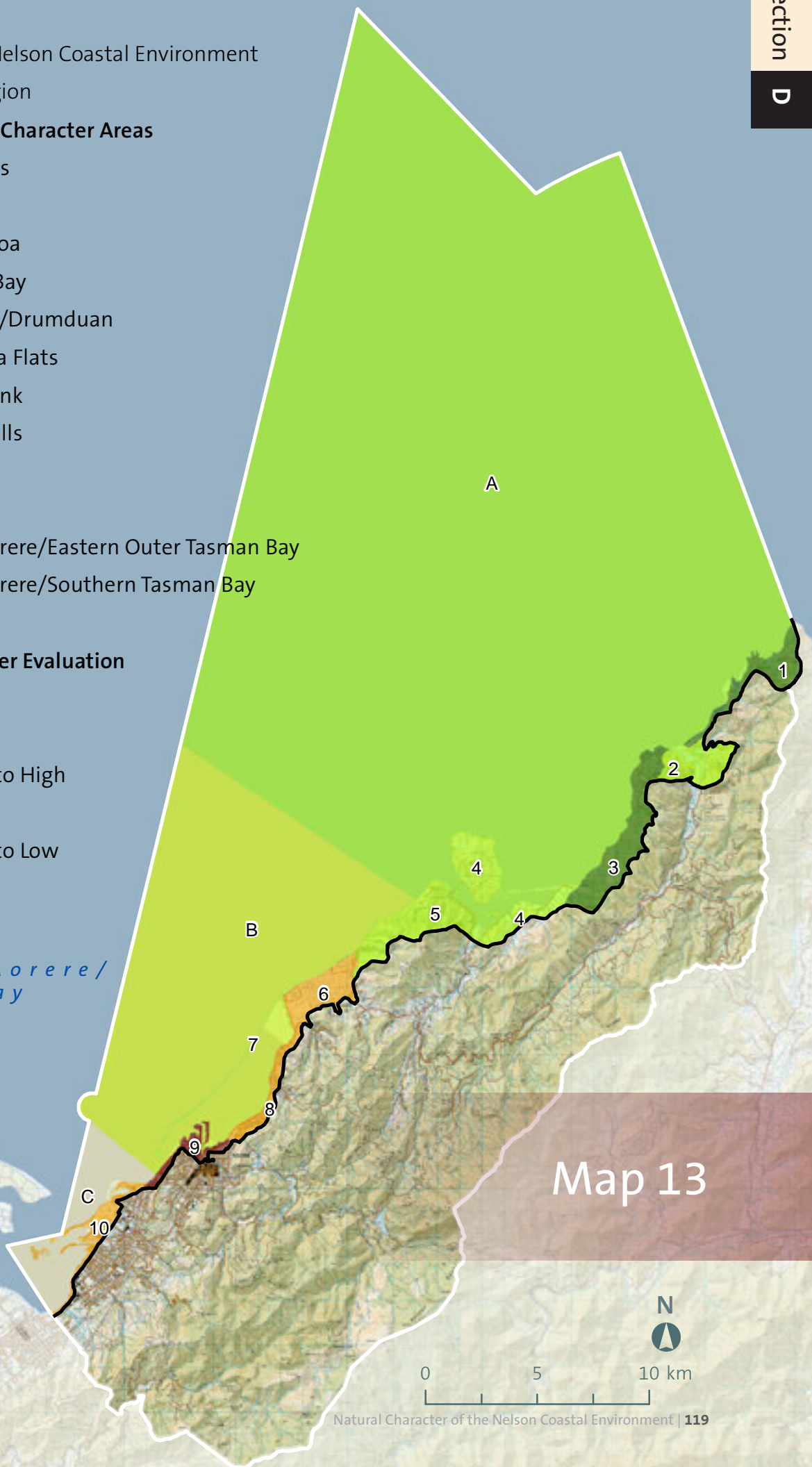
Coastal Natural Character Areas

- 1 Cape Soucis
- 2 Kokorua
- 3 Whangamoā
- 4 Delaware Bay
- 5 Horoirangi/Drumduan
- 6 Wakapuaka Flats
- 7 Boulder Bank
- 8 Malvern Hills
- 9 Nelson
- 10 Tahunanui
- A Te Tai-o-Aorere/Eastern Outer Tasman Bay
- B Te Tai-o-Aorere/Southern Tasman Bay
- C Waimea

Natural Character Evaluation

- Very High
- High
- Moderate to High
- Moderate
- Moderate to Low
- Very Low

*Te Tai-o-Aorere/
Tasman Bay*



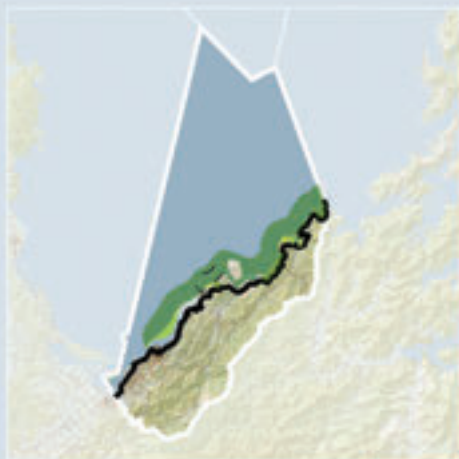
Map 13

Overall Evaluation – Level 4

At the more specific Level 4 scale, individual bays, estuaries, headlands and islands have been mapped to illustrate those areas holding high or very high levels of natural character. This more detailed mapping has only been undertaken where specific mention or detail has been included about a smaller area within the broader 'Area' descriptions and evaluations. For example, specific mention is made of the very high estuarine biotic values of the Wakapuaka River mouth, despite this feature being contained within the broader Delaware Bay Coastal Terrestrial Area and Eastern Outer Te Tai-o-Aorere/Tasman Bay which rate as both high at the broader Level 3 Area scale. Where this is highlighted the study team have mapped these areas at a scale of between 1:50,000 and 1:10,000 scale and followed as best as possible key environmental components, such as the limits of the estuarine margins (by mean high water springs), or limits of indigenous bush cover.

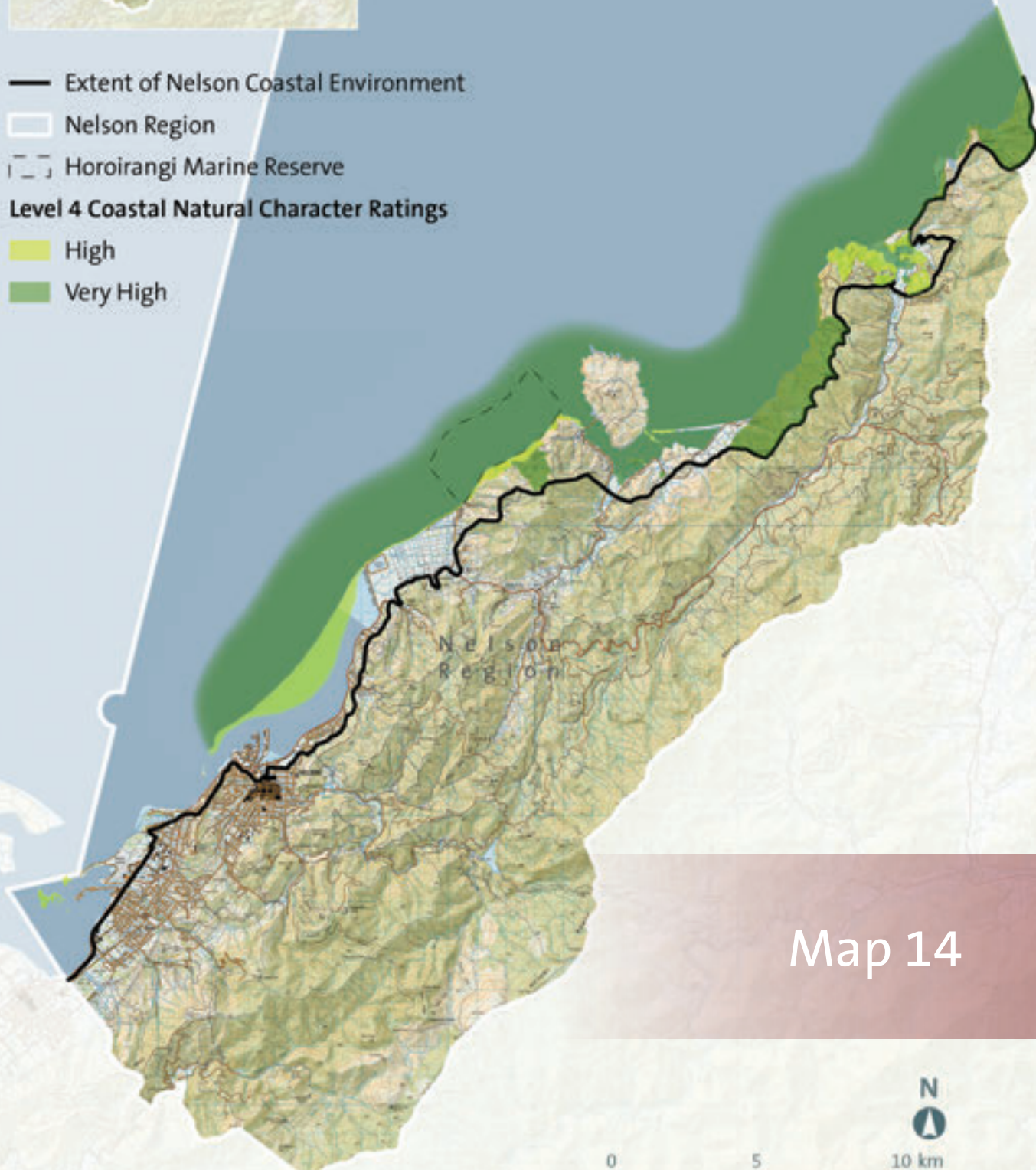
Within some of the more least modified areas, the extent of the high and very high mapped areas has been more straight forward. For example, in the northern Coastal Terrestrial Area of Whangamoia, the majority of the 'Area' is advanced regenerating indigenous bush, with pockets of mature intact indigenous forest and pine plantation. The mapping for this area included the indigenous mature and regenerating bush from the ridge to the beach, including all coastal cliffs. This area was rated very high, however excluded the small coniferous plantation to the north close to Hori Bay. A further smaller part just south of the pine plantation and around Hori Bay in the north was rated as high due to the regenerating bush and coastal interface. All of the areas that are mapped as high or very high natural character within the 13 different Level 3 'Areas', at the Level 4 scale, are shown collectively on the map (Map 14) opposite.

Refer to Section E of this study for the separate mapping of the Outstanding Natural Character Areas, which used this Level 4 mapping as a basis for further consideration.



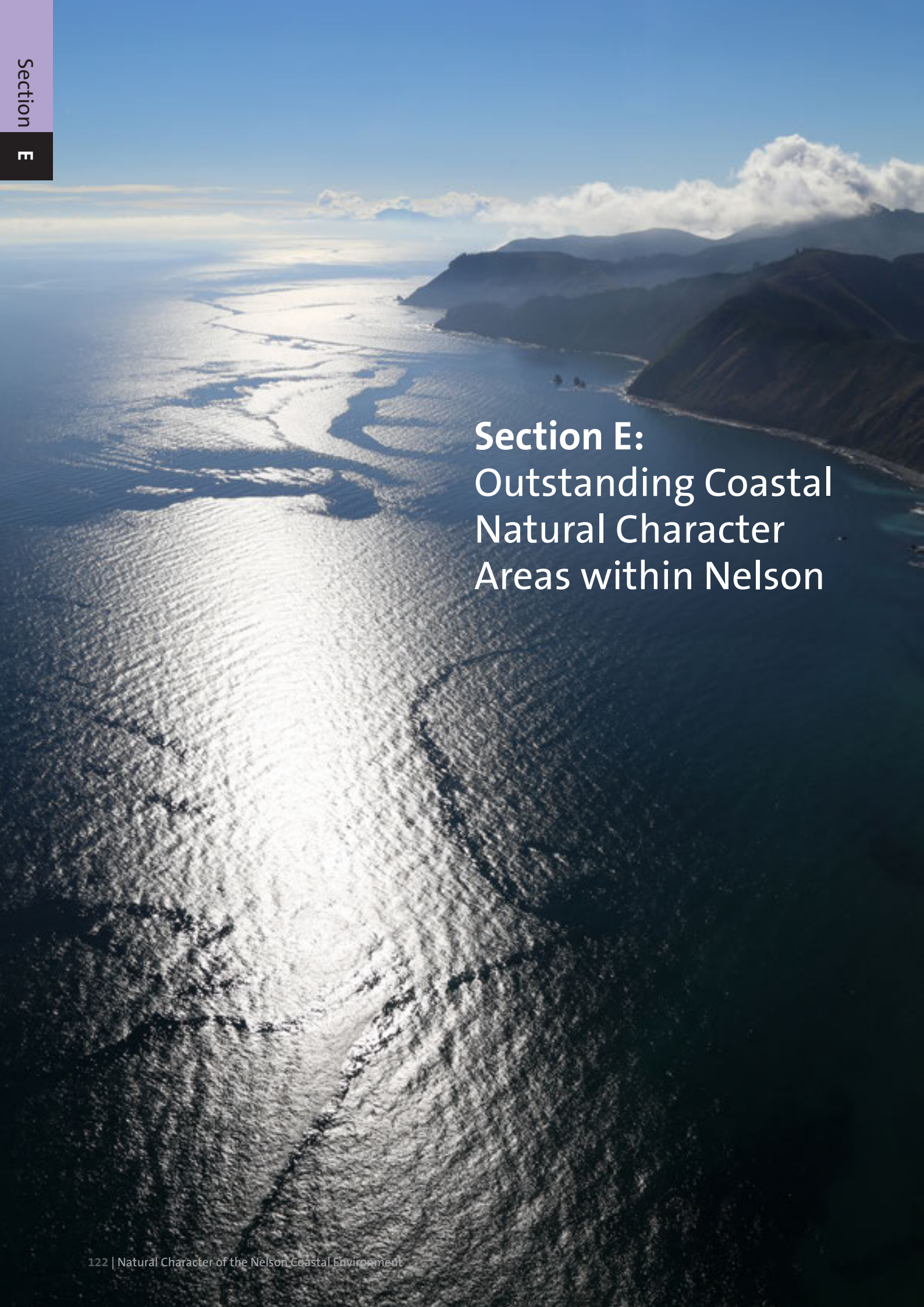
*Te Tai-o-Aorere/
Tasman Bay*

- Extent of Nelson Coastal Environment
- Nelson Region
- - - Horoirangi Marine Reserve
- Level 4 Coastal Natural Character Ratings**
- High
- Very High



Map 14



An aerial photograph of a coastal region. The foreground is dominated by a large body of water with a bright, shimmering reflection of the sun. The water transitions into a bay or inlet, surrounded by dark, forested hills and mountains. The sky is blue with scattered white clouds. The overall scene is a natural coastal environment.

Section E: Outstanding Coastal Natural Character Areas within Nelson

Introduction to Outstanding Coastal Natural Character

As outlined within Section B, under Policy 13 of the NZCPS 2010 there is a requirement that an evaluation is made as to whether the natural character in the existing coastal environment is at least high (Policy 13(1)(c)).

Following on from the evaluative work undertaken within Section D of this report, a further level of assessment was undertaken to determine which parts of the Nelson Coastal Environment would reach the high threshold of Outstanding Natural Character. This is outlined within the NZCPS Policy 13 (1)(a) *'avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character'*.

It was determined by the study team that outstanding natural character should be assessed separately, re-assessing the High and Very High's at the most detailed scale (i.e. Level 4). It should combine, where possible, both terrestrial and marine components. This is described further within Section B of this report. Combining both terrestrial and marine components means that where sequences of ecological naturalness are considered important in a regional context (such as from the top of a ridge above

ground to the bottom of the adjacent sea), these aspects are captured. Also, Outstanding Natural Character (referred to as ONC areas below), by its very term, determines the highest rated area, including systems that interconnect with each other.



Outstanding Natural Character was only considered at the most detailed scale (i.e. Level 4). Mapping ONC areas at this scale provides the council with greater certainty as to where these 'most highest rated' areas are located, as opposed to mapping ONC at the Level 3 'Area' scale, where greater levels of modification can be apparent.



Whangamoa River Mouth

Left: The open waters of northern Nelson, immediately north of the Whangamoa River mouth

Under the methodology an area of outstanding natural character must be:

‘those areas that 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 Nelson Region’. (BML statement)

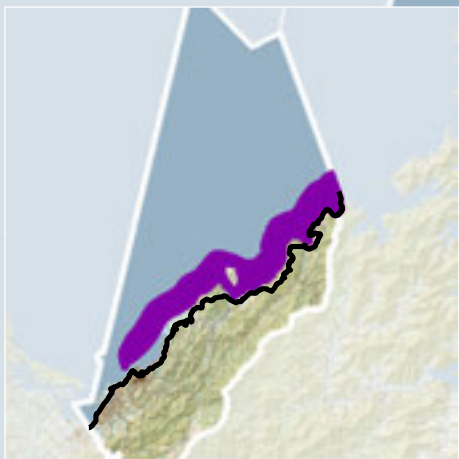
The following pages outline the result of this separate assessment. Of all of the areas holding high and very high levels of natural character at the Level 4 scale, only three areas were mapped as outstanding natural character. These three areas were considered by the study team to meet the threshold statement outline above. Their individual characteristics and values are listed on the following pages. There was of course debate around areas that did not reach this threshold, while rated as holding either high or very high levels of natural character.

One area that was discussed as potentially outstanding was the exposed cliffs of Whangamoa, immediately south of the Whangamoa headland. Whilst both the immediate waters and the land part of this area held a very high rating (at the Level 4 scale), only the water has been mapped as outstanding. It was considered that the landcover, despite holding pockets of indigenous hardwood forest, was mainly regenerating bush, and failed to hold an outstanding level of ‘exceptional’ intactness. The adjacent forestry also delimited this.

As explained, all areas hold very high or high natural character abiotic, biotic or experiential attributes. Map 15 provides an overview of all ONC’s for Nelson, with Maps 16-18 illustrating the three outlined below. The areas were mapped at a scale of 1:5,000 and therefore represent the more detailed level of assessment (i.e. Level 4), as opposed to the larger units of Coastal Terrestrial & Marine Areas (Levels 2 & 3).

Outstanding Natural Character Areas

1	Cape Soucis (Map 16)
2	Whangamoa River Mouth, Estuary & Whangamoa Rocks to Julia’s Rescue (Map 17)
3	Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea (Map 18)



Te Tai-o-Aorere/Tasman Bay

□ Nelson Region

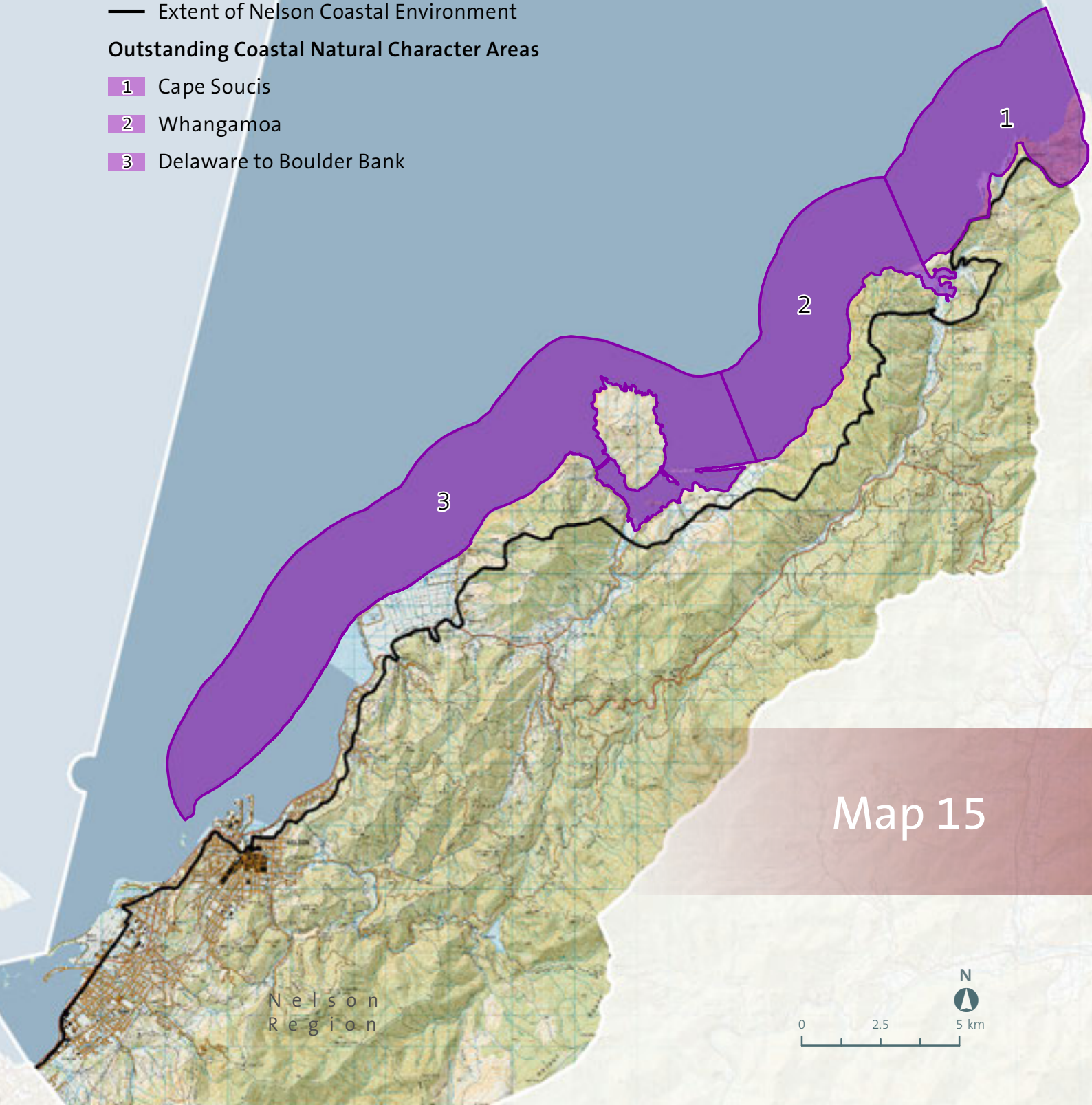
— Extent of Nelson Coastal Environment

Outstanding Coastal Natural Character Areas

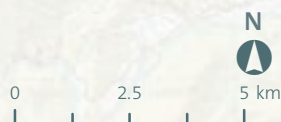
1 Cape Soucis

2 Whangamoia

3 Delaware to Boulder Bank



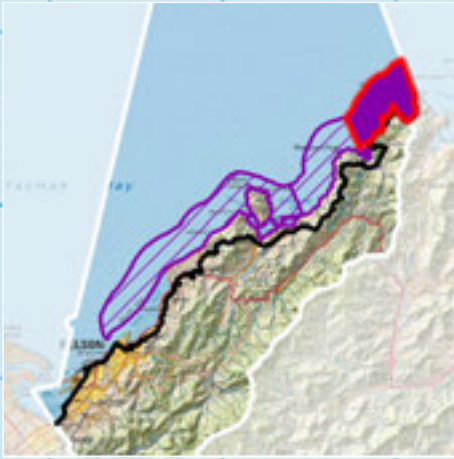
Map 15





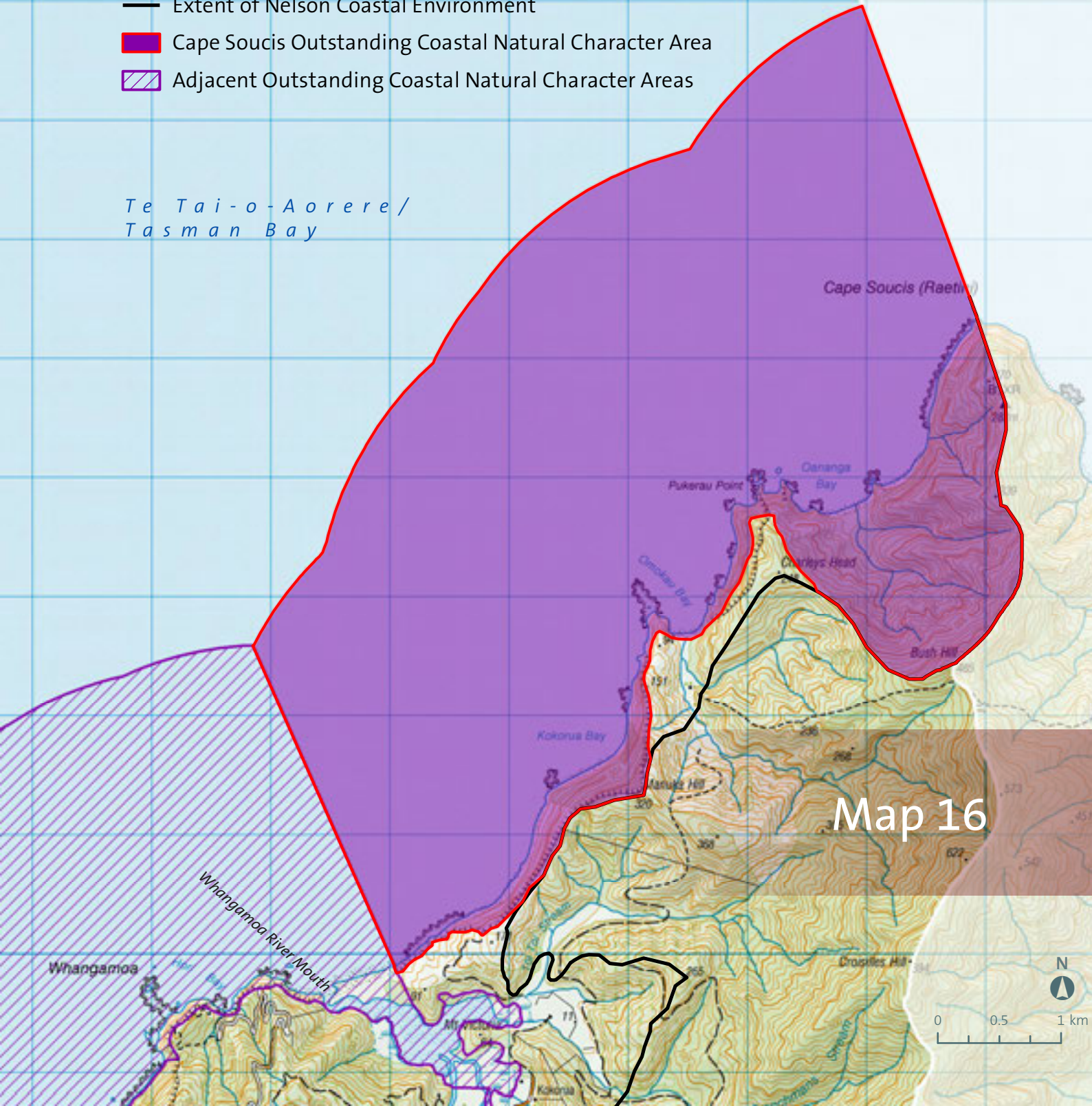
Cape Soucis

This area of Outstanding Natural Character includes the remote and unmodified parts of the northernmost part of the Region. Encompassing the steep and dramatic headland of Cape Soucis in the north and precipitous cliffs, rocky outcrops and sand coves southwards to the entrance of the Whangamoa River Mouth, this area contains the region's largest extent of intact indigenous coastal forest, harbouring distinct and threatened biota.



- Nelson Region
- Extent of Nelson Coastal Environment
- Cape Soucis Outstanding Coastal Natural Character Area
- ▨ Adjacent Outstanding Coastal Natural Character Areas

*Te Tai-o-Aorere /
Tasman Bay*



Map 16

Cape Soucis Outstanding Natural Character Attributes (Level 4)

CTA and rating (Level 3)	Cape Soucis (Very High)
CMA and rating (Level 3)	Eastern Outer Te Tai-o-Aorere/Tasman Bay (High)
Values	
Abiotic	<ul style="list-style-type: none"> • Prominent, distinctive and unmodified headland of Cape Soucis acts as the region's northerly point; • Steep and high quality freshwater watercourses; • Impressive rocky foreshore • Relatively unmodified marine environment
Biotic	<ul style="list-style-type: none"> • Large extent of intact indigenous forest with distinctive biotic communities; • Impressive sequence of vegetation communities extending from mountain ridge to sea floor. • Small areas of indigenous coastal dunes at Oananga and Omokau Bays which are rare in the Nelson Region; • Distinctive vegetation occurs on Cape Soucis due to unusual geology, • High numbers of threatened and at-risk plant species, especially along the narrow band of coastal habitat; • Very limited modification; • Reefs around Cape Soucis support cup corals and a range of uncommon species (e.g. ambush starfish, brachiopods) • Highest unmodified biodiversity within Te Tai-o-Aorere/Tasman Bay coastal marine environment • Important linkage of biological communities between Nelson and Marlborough regions
Experiential	<ul style="list-style-type: none"> • Very high levels of perceived naturalness due to lack of modification and extent of indigenous vegetation. • Limited access with low levels of recreation use. • Exposure to transitory nature of marine mammals • Wild, rugged and remote values with little in the way of human activity evident.
Mapped extent	
<p>The mapped extent of this Outstanding Natural Character Area is defined by the following:</p> <p>The marine component extends seaward to include the mapped area of very high natural character rated at the level 4 scale. The terrestrial extent follows the coastal environment around Oananga Bay to Charleys Head, then extends along the top of the steep coastal cliffs southwards to the mouth of the Whangamoa River. Areas of pine plantation and grazed land have been excluded.</p>	
Cape Soucis Rating	Outstanding



Oananga Bay

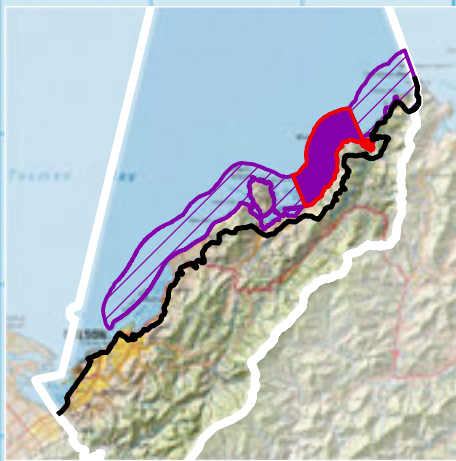






The dramatic exposed cliffs at Cape Soucis display the area's geology

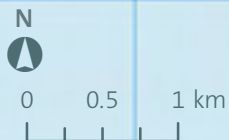


Whangamoana River Mouth, Estuary & Whangamoana Rocks to Julia's Rescue

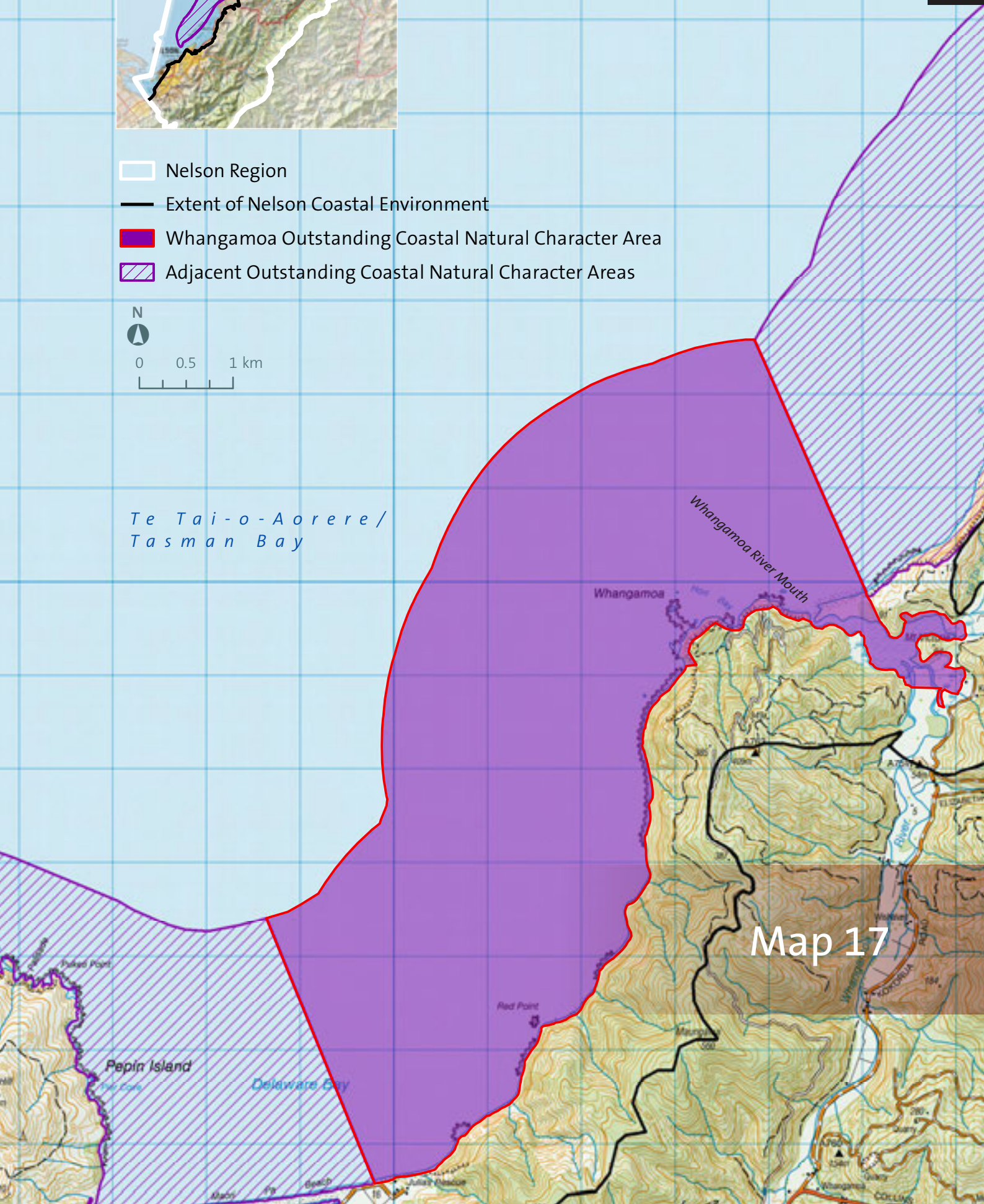
This area of Outstanding Natural Character encompasses the ecologically rich Whangamoana River Mouth and its associated coastal and alluvial unmodified features as well as the coastal waters and rocky bluffs that form part of the unmodified biological continuum from Marlborough Sounds to Horoirangi Marine Reserve.



-  Nelson Region
-  Extent of Nelson Coastal Environment
-  Whangamoia Outstanding Coastal Natural Character Area
-  Adjacent Outstanding Coastal Natural Character Areas



*Te Tai-o-Aorere /
Tasman Bay*



Map 17

Whangamoā River Mouth, Estuary & Whangamoā Rocks to Julia's Rescue Outstanding Natural Character Attributes (Level 4)

CTA and rating (Level 3)

Kokorua (High)

CMA and rating (Level 3)

Eastern Outer Te Tai-o-Aorere/Tasman Bay (High)

Values

Abiotic

- Limited modification to the abiotic attribute of this estuary is rare in Nelson,
- Inflowing stream retain moderate - high levels of water quality,
- Whangamoā Inlet provides important link for supplying nutrient rich waters for nourishing marine food web;
- Kokorua sand spit
- Unmodified rocky beach extending from Whangamoā headland to Julia's Rescue.

Biotic

- Sand spit bordering the inlet is gazetted as a scientific reserve and considered a significant ecological site;
- Estuarine margins, saltmarshes and enclosing dune to north are relatively unmodified.
- Small but very important valley-floor forest and wetland remnants.
- Regenerating indigenous forest on coastal hill slopes
- The Kokorua sand spit, contains remnant populations of a variety of regionally threatened plant species and is ecologically significant;
- Provides excellent feeding grounds for threatened and at risk waders.
- The main body of the estuary is relatively unmodified and forms a significant ecological site that remains relatively undeveloped compared to other river mouth dune systems.
- Central part of an unmodified rocky shore biological continuum from Marlborough, through to eastern Te Tai-o-Aorere/Tasman Bay to the Horoirangi Marine Reserve

Experiential

- High remote values, notably from the estuary itself and from Hori Bay;
- High perceived naturalness values due to unmodified nature of estuary and wild coastline from Whangamoā headland to Julia's Rescue.

Mapped extent

The mapped extent of this Outstanding Natural Character Area is defined by the following:

For Whangamoā estuary, the extent follows the very high marine mapping at the Level 4 scale. This area also includes the very high terrestrial sand spit. The sheltered margins of the estuary have been determined by the MHWs mark.

The exposed coastal waters and associated rocky cliffs and coves have been delineated by the extent of the very high marine coastal mapping at the Level 4 scale. The rocky coves, cliffs and bluffs around Hori Bay have been mapped following the cliffs extent as shown on the topographic map and high resolution aeriels.

Whangamoā River Mouth, Estuary & Whangamoā Rocks to Julia's Rescue Rating

Outstanding



Whangamoa River Mouth

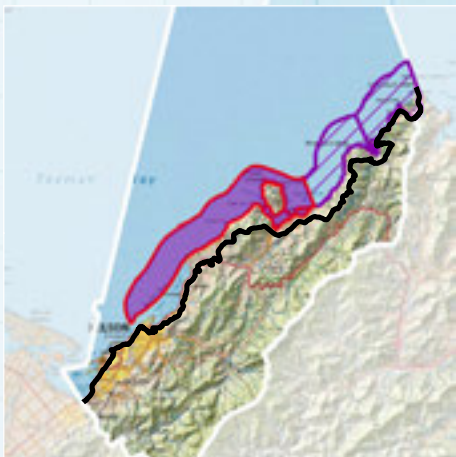


Rocky waters close to Red Point



Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea

Extending from the sheltered waters of Delaware Inlet in the north to the open coastal waters off the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea in the south, this area of Outstanding Natural Character holds an exceptional sequence of coastal landforms supporting a diverse range of habitat communities, many of which are uncommon. The extensively unmodified Delaware Inlet supports some of the region's best dune ecosystems extending out to the coastal waters of the Horoirangi Marine Reserve. This area of Outstanding Natural Character also includes the coastal waters associated with the elements, patterns and processes that formed New Zealand's largest boulder spit, the Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea.



- Nelson Region
- Extent of Nelson Coastal Environment
- Horoirangi Marine Reserve
- Delaware Bay to Boulder Bank Outstanding Coastal Natural Character Area
- Adjacent Outstanding Coastal Natural Character Areas

*Te Tai-o-Aorere /
Tasman Bay*

Boulder Bank / Te Taero a Kereopa-te Tāhuna a Tama-i-ēa

Horoirangi Marine Reserve

Delaware Inlet

Delaware Spit
Pepin Island Spit

Map 18



0 1.5 3 km

Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank/Te Taero a Kereopa-Te Tāhuna a Tama-i-ea Outstanding Natural Character Attributes (Level 4)

CTA and rating (Level 3)	Delaware Bay (High)
CMA and rating (Level 3)	Eastern Outer Te Tai-o-Aorere/Tasman Bay (High)
Values	
Abiotic	<ul style="list-style-type: none"> Impressive sequence of coastal landforms, including a tombolo, sand spit and small peninsulas; Extensive unmodified rocky areas dominate intertidal area, especially associated with Horoirangi Marine Reserve; Complex subtidal reef system at Ataata Point; A legible land system derived from material eroded from Mackay Bluff to form a slender natural spit of cobbles and boulders
Biotic	<ul style="list-style-type: none"> Ataata Point Reef supports large patches of common anemone, sponges and many uncommon species (including brachiopods, ambush starfish, window oysters); Nationally important dune habitats; Extensive unmodified mud and sand flats dominate intertidal area together with nationally important dune habitats Impressive remnant vegetation on Bishop Peninsula; Protected offshore Horoirangi Marine Reserve (HMR); Important feeding ground for threatened birds. Complex sub-tidal reef system and important relationship with aquatic habitats protected in Horoirangi Marine Reserve Pepin Island is a haul-out site for fur seals and provides breeding and roosting sites for a range of birds (e.g. spotted shags, white-fronted tern, reef heron) Pepin Island represents the western extension of the unmodified rocky shore continuum from Marlborough to Horoirangi Marine Reserve and enhances the productivity and is thus important for the restoration/recovery of biological communities. The land-sea interface of Delaware Inlet and the Wakapuaka River plume provides a source of nourishment for the Horoirangi Marine Reserve and enhances productivity and iwi kai moana values of the Delaware Bay taiapure area.
Experiential	<ul style="list-style-type: none"> Very high levels of perceived naturalness due to dominance of coastal processes and absence of buildings; Rich association with transient coastal experiences due to shifting tidal and wave patterns, light conditions and presence of marine mammals. Limited modification along coastal waters amplify remote like characteristics.

Mapped extent

The mapped extent of this Outstanding Natural Character Area is defined by the following:

For the marine area of Delaware Bay, the extent follows the very high marine mapping at the Level 4 scale. This area also includes the terrestrial end of the sand spit (rated as high), as well as Bishops Peninsula. The sheltered margins of the estuary have been determined by the mean high water spring mark.

The exposed coastal waters and associated rocky cliffs and coves around Pepin Island have been delineated along the extent of the very high marine coastal mapping at the Level 4 scale. This extent has been determined predominantly by trawling that occurs off Pepin Island (and hence the unequal offshore delineation than other offshore areas). The entire Horoirangi Marine Reserve is included and the boundary extends southwards to include the coastal waters off Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea, to capture the abiotic patterns and processes.

The mapped area does not include the more modified parts, which include the Rotokura/Cable Bay tombolo, the grazed part of the sand spit at Delaware Bay and the modified grazed terrestrial components of Pepin Island, Delaware Bay, Horoirangi/Drumduan and the Boulder Bank/Te Taero a Kereopa – Te Tāhuna a Tama-i-ea.

Delaware Bay, Horoirangi Marine Reserve & Coastal waters off Boulder Bank Rating

Outstanding



The vegetated Bishop Peninsula



The ebb and flow of coastal waters at Delaware Inlet

Section F: Appendices



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Appendix 2: Glossary

Name	Description
Active Coastal Interface	<i>Part of the Coastal Significance Zone (CSZ) (or Coastal Terrestrial Zone) that is generally a slender component of the CSZ where the sea is the dominant element and the primary or significant influence on landform, vegetation and perception.</i>
aggradational	<i>Is the term used in geology for the increase in land elevation due to the deposition of sediment. Aggradation occurs in areas in which the supply of sediment is greater than the amount of material that the system is able to transport. The mass balance between sediment being transported and sediment in the bed is described by the Exner equation. (Wikipedia)</i>
alluvium / alluvial	<i>Sediments such as sand, silt or gravel that have been deposited by streams, rivers and other running waters</i>
ascidians	<i>Sessile filter-feeding invertebrates. Also known as sea squirts or tunicates. May be solitary or colony forming.</i>
backswamp	<i>backswamps are wetlands, at or near mean sea level, that form part of the coastal floodplains</i>
barrier spit	<i>A long elongate sand and gravel ridge above the high tide and connected at one end to the mainland, extending generally parallel with the shore but separated from it by a lagoon</i>
benthic	<i>The surface of the seabed</i>
brachiopods	<i>Small clam-like animals which superficially look like bivalve molluscs</i>
brackish	<i>Water which is a mix of freshwater and saltwater; e.g. estuarine water</i>
basal	<i>Base as in basement rock</i>
bryozoans	<i>Colonial mound-forming animals which superficially look like corals but which belong to a totally different group of animals</i>
Carpophyllum	<i>Large brown macroalgae, also known as flapjack</i>
coastal environment	<i>An environment in which the coast is a significant part or element taking account of an assessment of Policy 1 of the NZCPS 2010 and includes: The coastal marine area; -Islands within the coastal marine area; -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) -Areas at risk from coastal hazards; -Coastal vegetation and the habitat of indigenous coastal species including migratory birds; -Elements and features that contribute to the natural character, landscape, visual qualities or amenity values; -Items of cultural and historic heritage in the coastal marine area or on the coast; -Inter-related coastal marine and terrestrial systems, including the intertidal zone; and -Physical resources and built facilities, including infrastructure, that have modified the coastal environment</i>

Name	Description
colluvium / colluvial	<i>A general term for weathered soil and rock material mantling slopes which has been transported primarily by gravity and sheet wash.</i>
cuestas	<i>Hill or ridge with a steep slope on one side and a gentle slope on the other – an asymmetric ridge</i>
Cuspate Forelands	<i>The largest sharp, seaward-projecting point of beach material, built up by wave action, occurring as a cape or as a broadly triangular point of sand or shingle</i>
Cystophora	<i>Large brown seaweed</i>
dendritic (drainage pattern)	<i>A drainage pattern in which the streams branch randomly in all directions and at almost any angle, resembling in plan the branching habit of certain trees</i>
depauperate	<i>An ecosystem that is lacking in numbers or variety of species, often because it lacks enough stored chemical elements required for life.</i>
dunes	<i>Dunes: An accumulation of sand built by wind or water. Fore dune: The more active part of dunes located closest to the sea Back dune: the backshore areas of a beach</i>
Eelgrass	<i>Marine plant that primarily grows in the intertidal zone. Also known as seagrass.</i>
echinoderms	<i>Includes species like starfish, brittle stars, urchins and sea cucumbers</i>
ecological naturalness (also indigenous nature)	<i>in relation to the understanding of the term ‘natural character’ and separate but complementary to landscape naturalness. Ecological naturalness is an understanding of naturalness based on the level of intactness of indigenous ecosystems. Refer to Section B.</i>
ephemeral	<i>Water ways or waterbodies that are not permanent. Their surface expression changes depending on rainfall events or groundwater levels.</i>
estuarine	<i>Pertaining to or formed or living in an estuary, especially said of deposits and the sedimentary or biological environment of an estuary</i>
eutrophication	<i>The process of excessively increasing nutrient levels in water bodies through natural or artificial means. Artificial elevation of natural nutrient levels may be caused by human activities- e.g. livestock defecating on river banks, septic tank discharges.</i>
fans	<i>Gently sloping, fan-shaped masses of material formed along the margins of hills and mountain ranges by streams that drain their slopes. A fan commonly occurs where there is a marked decrease in gradient, for example where a stream meets the gentler floodplain or river terrace</i>
fetch	<i>(Also called Fetch length) is the length of water over which a given wind has blown.</i>
foliation	<i>The planar arrangement of textural or structural features, especially that which results from the flattening of constituent grains of metamorphic rocks</i>

Name	Description
Geopreservation Inventory	<i>Inventory and Maps of Important Geological Sites and Landforms in the Nelson and Marlborough Regions, including the Kaikoura District. Compiled by the Joint Earth Sciences' Societies Working Group on the New Zealand Geopreservation Inventory. Lists the best examples of the wide diversity of natural and physical features and processes that characterise each part of New Zealand.</i>
galaxiids	<i>Native fishes belonging to the family Galaxiidae-consisting of migratory (whitebait species such as inanga, kokopu's) and non migratory species (e.g. dwarf galaxias)</i>
herbfields	<i>A plant community where herbs are the dominant life-form. Herbs are defined as non-woody plants other than grasses, sedges and rushes, and are usually small-leaved and prostrate.</i>
Holocene	<i>An epoch of the Quaternary period, from the end of the Pleistocene, approximately 8000 years ago, to the present time; also, the corresponding series of rocks and deposits.</i>
hydroids or hydroid trees	<i>Colonial animals related to jelly fish that form upright feather-like structures.</i>
Intertidal	<i>The area of the shore which is covered and uncovered by the rise and fall of the tide</i>
indurated	<i>To make harden (i.e. soils that had been indurated by extremes of climate.</i>
Lagoon	<i>A shallow body of water separated from a larger body of water by a barrier.</i>
Laminae	<i>The thinnest recognisable layers in a rock, differing from each other in colour, composition, and/or particle size</i>
landscape	<i>The cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations.</i>
landscape naturalness	<i>Also referred to as 'perceptions of nature' within the understanding of the term 'natural character'. Landscape naturalness refers to the experiential/ perceptual component of natural character (as interpreted by the study team). Essentially it is an understanding of naturalness based on the degree of visible human modification which is present in the landscape (i.e. the perception and appearance of naturalness rather than the more specific interpretation of indigenous). The remaining, yet complementary term 'ecological naturalness' is the (natural science) component of natural character. Refer to Section B of this study.</i>
Land Types systems	<i>Land types distinguish major physiographical landform units and are based on a range of data sources including published scientific papers, geological and topographical maps, joint earth science inventories and expert scientific knowledge.</i>
Lithology	<i>The nature and composition of rocks</i>
macroalgae	<i>Large seaweeds.</i>
macrocystis	<i>A very large brown seaweed also known as giant kelp or giant bladder kelp</i>
Mica	<i>A mineral group consisting of phyllosilicates with sheet-like structures and characterised by very perfect basal cleavage</i>

Name	Description
natural character	<i>is the term used to describe the natural elements of all coastal environments within the NZCPS. Refer to Section A of this report.</i>
naturalness	<i>A measure of the degree of human modification of a landscape/ seascape or ecosystem expressed in terms of:</i> <i>i) ecological naturalness (indigenous nature); and</i> <i>ii) landscape naturalness (perceptions of nature).</i>
offshore reef	<i>A ridge of rock with the top just below or just above the water surface which is located at some distance from the shore.</i>
outstanding natural character	<i>an area of outstanding natural character must be: 'those areas that 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 Nelson Region'. (BML statement)</i>
Pleistocene	<i>An epoch of the Quaternary period, after the Pliocene of the Tertiary and before the Holocene. It began 2 to 3 million years ago and lasted until the start of the Holocene some 8000 years ago</i>
Phyllite	<i>A metamorphic rock, intermediate in grade between a slate and a schist, in which minute grains of sericite and chlorite impart a silky sheen to cleavage and schistosity surfaces</i>
phyllosilicates	<i>Silicate structures in which the SiO₄ tetrahedra occur linked together in infinite two-dimensional sheets. An example is mica</i>
Prograding (Progradation)	<i>The building forward or outward toward the sea of a shoreline or coastline (as a beach, delta, or fan) by near-shore deposition of river-borne sediments or by continuous accumulation of beach material thrown up by waves or moved by long-shore drifting</i>
Regression	<i>is a geological process occurring when areas of submerged seafloor are exposed above the sea level. The opposite event, marine transgression, occurs when flooding from the sea covers previously exposed land. (Physical Geology: Exploring the Earth)</i>
relictual	<i>Of a natural area, community, vegetation type or population of species which is now remnant but which once had a wider, more continuous distribution, and/or greater numbers.</i>
remote-like	<i>As in 'retains remote-like characteristics', refers to a sense of isolation close to areas of civilisation.</i>
rhodoliths	<i>Unattached, branching, benthic red algae that superficially resemble coral.</i>
rocklands	<i>A plant community where exposed rock is the main cover over which plants are sparsely scattered, such as bluff faces and escarpments.</i>
segregation	<i>Compositional banding derived from an originally more homogeneous rock</i>
Serpentenite	<i>An ultramafic rock consisting almost wholly of 'serpentine' minerals which are formed by the metamorphic alteration of olivine and similar minerals</i>

Name	Description
shrublands	<i>A plant community where shrubs are the dominant life-form. Shrubs are defined as woody plants less than 5m high, and are usually multi-stemmed. Dense shrubland is also called scrub.</i>
Schist	<i>A strongly foliated regionally metamorphosed rock that can be readily split into slabs, and coarser grained than slate or phyllite; applies to t.z.III and IV subzones</i>
Schistosity	<i>The foliation ('fissility') in schist, often due to the parallel planar arrangement of micas</i>
Semi-schist	<i>An informal term applied to a foliated metamorphic rock intermediate in textural development between a sediment and a schist; applies to t.z.IIA and IIB textural subzones</i>
Spartina	<i>An exotic saltmarsh grass</i>
Subtidal	<i>The area below the intertidal zone which remains permanently covered in water.</i>
supratidal zone	<i>Pertaining to the shore immediately marginal to and above high-tide level.</i>
Taiapure	<i>Local fishery declared under the Maori Fisheries Act 1989, PartIIIA. Refers to local fishery areas that are recognised to be of special significance to hapu or iwi.</i>
tombolo	<i>A deposition landform in which an island is attached to the mainland by a narrow piece of land, such as a spit or bar.</i>
turbidity	<i>Discolouration of water caused typically by suspended sediment load.</i>
tombolo	<i>A sand or gravel bar or barrier that connects an island with the mainland or with another island</i>
ultrabasic	<i>Relates to igneous rocks with very high contents of dark-coloured minerals containing iron and magnesium and less than 44% silica. The term is frequently used interchangeably with ultramafic</i>
ultramafic	<i>Igneous rocks composed chiefly of mafic minerals</i>
Ulva	<i>A type of green seaweed, common in areas with elevated nutrients</i>
wave-cut platform	<i>Narrow flat area of rock often found at the base of a sea cliff, created by the erosion of waves.</i>
Wave-dominated beaches	<i>Beaches exposed to persistent ocean swell and waves and low tides (range <2m). Consist of 3 types; Reflective, Intermediate (longshore bar and trough, rhythmic bar and beach, transverse bar and rip, low tide terrace) and Dissipative.</i>
Wave swash	<i>A turbulent layer of water that washes up on the beach after an incoming wave is broken.</i>
Whelk	<i>Type of marine snail</i>

Appendix 3: Common Plant Names

Common Name	Latin Name
akeake	<i>Dodonaea viscosa</i>
akiraho	<i>Olearia paniculata</i>
black beech	<i>Fuscospora solandri</i>
broom*	<i>Cytisus scoparius</i>
cabbage tree	<i>Cordyline australis</i>
coastal buttons	<i>Cotula coronopifolia</i>
coastal peppergrass	<i>Lepidium banksii</i>
coastal porcupine shrub	<i>Melicytus aff. crassifolius</i>
coastal shrub daisy	<i>Olearia solandri</i>
crack willow*	<i>Salix fragilis</i>
danthonia	<i>Rytidosperma</i> spp.
fescue, hard tussock	<i>Festuca novae-zelandiae</i>
fierce lancewood	<i>Pseudopanax ferox</i>
glasswort	<i>Sarcocornia quinqueflora</i>
gorse*	<i>Ulex europaeus</i>
gossamer grass	<i>Anemanthele lessoniana</i>
gum*	<i>Eucalyptus</i> sp.
harakeke, swamp flax	<i>Phormium tenax</i>
hard beech	<i>Fuscospora truncata</i>
hīnau	<i>Elaeocarpus dentatus</i>
inaka	<i>Dracophyllum urvilleanum</i>
jointed rush*	<i>Juncus articulatis</i>
kahikatea	<i>Dacrydium dacrydioides</i>
kaikōmako	<i>Pennantia corymbosa</i>
kānuka	<i>Kunzea ericoides</i> agg.
karaka	<i>Corynocarpus laevigatus</i>

Common Name	Latin Name
kohekohe	<i>Dysoxylum spectabile</i>
kōwhai	<i>Sophora microphylla</i>
lake clubrush	<i>Schoenoplectus tabernaemontani</i>
lowland ribbonwood	<i>Plagianthus regius</i>
macrocarpa	<i>Cupressus macrocarpa</i>
māhoe	<i>Melicytus ramiflorus</i>
mānuka	<i>Leptospermum scoparium</i>
māpou	<i>Myrsine australis</i>
marram*	<i>Ammophila arenaria</i>
marsh ribbonwood	<i>Plagianthus divaricatus</i>
matagouri	<i>Discaria toumatou</i>
mataī	<i>Prumnopitys taxifolia</i>
narrow-leaved lacebark	<i>Hoheria angustifolia</i>
native ice plant, horokaka	<i>Disphyma australe</i>
ngaio	<i>Myoporum laetum</i>
nikau	<i>Rhopalostylis sapida</i>
red beech	<i>Fuscospora fusca</i>
Phoenix palm*	<i>Phoenix canariensis</i>
pigeonwood	<i>Hedycarya arborea</i>
pine*	<i>Pinus radiata</i>
pīngao	<i>Ficinia spiralis</i>
poplar*	<i>Populus</i> sp.
poroporo	<i>Solanum aviculare</i> var. <i>aviculare</i>
prostrate pohuehue	<i>Muehlenbeckia ephedroides</i>
puka	<i>Griselinia lucida</i>

Common Name	Latin Name
pukatea	<i>Laurelia novae-zelandiae</i>
raupō	<i>Typha orientalis</i>
remuremu	<i>Selliera radicans</i>
rimu	<i>Dacrydium cupressinum</i>
sand daphne	<i>Pimelea villosa</i>
sand tussock	<i>Poa billardierei</i>
scrambling pōhuehue	<i>Muehlenbeckia complexa</i>
sea celery	<i>Apium prostratum</i>
sea holly	<i>Eryngium vesiculosum</i>
sea rush	<i>Juncus kraussii</i> var. <i>australiensis</i>
shore convolvulus	<i>Calystegia soldanella</i>
shore primrose	<i>Samolus repens</i>
silver beech	<i>Lophozonia menziesii</i>
silver tussock	<i>Poa</i> aff. <i>cita</i>
spinifex	<i>Spinifex sericeus</i>
tawa	<i>Beilschmiedia tawa</i>
tauhinu	<i>Ozothamnus leptophyllus</i>
taupata	<i>Coprosma robusta</i>
three square	<i>Bolboschoenus pungens</i>
tītoki	<i>Alectryon excelsus</i>
toetoe	<i>Austroderia fulvida</i> , <i>A. richardii</i>
tōtara	<i>Podocarpus totara</i>
wharariki, coastal flax	<i>Phormium cookianum</i>

* = *adventive species*

Appendix 4: Common & Scientific names and threat status of indigenous freshwater fish

Common name	Species name	Threat status*
Yelloweye mullet	<i>Aldrichetta forsteri</i>	Not Threatened
Shortfin eel	<i>Anguilla australis</i>	Not Threatened
Longfin eel	<i>Anguilla dieffenbachii</i>	Declining
Torrentfish	<i>Cheimarrichthys fosteri</i>	Declining
Giant kokopu	<i>Galaxias argenteus</i>	Declining
Koaro	<i>Galaxias brevipinnis</i>	Declining
Banded kokopu	<i>Galaxias fasciatus</i>	Not Threatened
Inanga	<i>Galaxias maculatus</i>	Declining
Shortjaw kokopu	<i>Galaxias postvectis</i>	Nationally Vulnerable
Lamprey	<i>Geotria australis</i>	Nationally Vulnerable
Common bully	<i>Gobiomorphus cotidianus</i>	Not Threatened
Giant bully	<i>Gobiomorphus gobioides</i>	Not Threatened
Bluegill bully	<i>Gobiomorphus hubbsi</i>	Declining
Redfin bully	<i>Gobiomorphus huttoni</i>	Declining
Common smelt	<i>Retropinna retropinna</i>	Not Threatened
Kahawai	<i>Arripis trutta</i>	Not threatened
Brown trout	<i>Salmo trutta</i>	introduced sports fish
New Zealand grayling	<i>Protoctes oxyrhynchus</i>	Extinct
Northern koura	<i>Paranephrops planifrons</i>	Not threatened
Freshwater shrimp	<i>Paratya curvirostris</i>	Not threatened

* refer Goodman JM, Dunn NR, Ravenscroft PJ, Allibone RM, Boubee JAT, David BO, Griffiths M, Ling N, Hitchmough RA, Rolfe JR 2014: Conservation status of New Zealand freshwater fish, 2013. New Zealand Threat Classification Series 7. 12 p. Department of Conservation, Wellington, New Zealand

* Grainger, N.; Collier, K.; Hitchmough, R.; Harding, J.; Smith, B.; Sutherland, D. 2014: Conservation status of New Zealand freshwater invertebrates, 2013. New Zealand Threat Classification Series 8. Department of Conservation, Wellington. 28 p.

Appendix 5: Key threatened coastal birds in the Nelson region

Common name	Scientific name	New Zealand threat ranking
Bittern	<i>Botaurus poiciloptilus</i>	Threatened: Nationally endangered
Banded dotterel	<i>Charadrius bicinctus bicinctus</i>	Threatened: Nationally vulnerable
Reef heron	<i>Egretta sacra sacra</i>	Threatened: Nationally vulnerable
Red-billed gull	<i>Larus novaehollandiae scopulinus</i>	Threatened: Nationally vulnerable
Pied shag	<i>Phalacrocorax varius varius</i>	Threatened: Nationally vulnerable
Wrybill	<i>Anarhynchus frontalis</i>	Threatened: Nationally vulnerable
South Island pied oystercatcher	<i>Haematopus finschi</i>	At risk: Declining
White-fronted tern	<i>Sterna striata striata</i>	At risk: Declining
Variable oystercatcher	<i>Haematopus unicolor</i>	At risk: Recovering
Banded rail	<i>Gallirallus philippensis assimilis</i>	At risk: Naturally uncommon
Black-backed gull	<i>Larus dominicanus dominicanus</i>	Not threatened
Spotted shag	<i>Stictocarbo punctatus punctatus</i>	Not threatened
Bar-tailed godwit	<i>Limosa lapponica baueri</i>	Migrant
Red knot	<i>Calidris canutus rogersi</i>	Migrant

Miskelly, C., J. E. Dowding, et al. (2008). "Conservation status of New Zealand birds, 2008." *Notornis* 55: 117-135.

Appendix 6 : Potential for Restoration

Policy 14 of the New Zealand Coastal Policy Statement 2010 (NZCPS 2010) promotes the restoration or rehabilitation of the natural character of the coastal environment. Policy 14 directs the identification of areas and opportunities for restoration, and the inclusion of provisions in statutory plans. Direction is also given in relation to the use of restoration conditions when granting resource consents and designations.

Guidance on the implementation of Policy 14 is available from the Department of Conservation. <http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/coastal-management/guidance/policy-14.pdf>

In the context of Nelson, the potential for restoration is summarised in the **Table 1 below**.

Natural character restoration and rehabilitation can help address the effects of past management decisions. Restoration and rehabilitation can also assist with approvals for new resource uses in the coastal environment. Natural character restoration is also an important opportunity to benefit for human use, appreciation and enjoyment of the coast.

There are a number of practical measures to support ecological restoration that also benefit natural character restoration. Nelson District Council has provided practical guidance and other programmes to support biodiversity restoration in partnership with landowners, resource users, communities and others. Practical guidance on ecological restoration in Nelson is available from the Council:

<http://nelson.govt.nz/assets/Environment/Downloads/Nelson-Biodiversity-Strategy-2013-Review-FINAL-VERSION-A1126360-A1126385.pdf>

Terrestrial	<ol style="list-style-type: none"> 1. Re-establish natural patterns of indigenous vegetation. 2. Areas of secondary forest and regenerating shrublands provide excellent potential for lowland forest restoration. 3. Restoration of native duneland vegetation. 4. Potential for delta restoration to enhance estuarine margins, delta shrubland and forest communities, and whitebait spawning habitat. 5. Reduce weeds and pests so that the indigenous biodiversity elements can persist as significant components of natural character including: <ol style="list-style-type: none"> a. Reduce introduced pest mammals on islands where technically feasible. b. Maintain the absence of major mammal pests.
Freshwater	<ol style="list-style-type: none"> 6. Re-establish natural riparian margins around rivers, streams, coastal and other wetlands, and estuaries. 7. Restore compromised fish passage and hydrological connectivity between freshwater ecosystem types e.g. wetlands and running water systems
Coastal Marine	<ol style="list-style-type: none"> 8. Reduce disturbance to natural seabed communities particularly in various deeper areas of Nelson. 9. Reduce sedimentation and other contaminants entering the coastal marine area from point source and diffuse nutrient inputs from sources including river inflows, groundwater and general run-off.

Natural Character restoration priorities for Nelson

Appendix 7 : Marine Methodology

Marine ecological components of Natural Character

An assessment of the natural character of Nelson's marine environment was undertaken using several marine biophysical criteria outlined on the facing page. These criteria were used to establish an overall rating for the marine ecological components of natural character for the three marine natural character areas (at Level 3). Areas judged to be high or very high in natural character (from a marine ecological perspective) are mapped at the Level 4 scale at the end of each Coastal Marine Area.

Experiential attributes were not included in this particular assessment though have been assessed for the surface of the water and the land/sea interface in Sections C, D, E of this report. Much of the subtidal marine environment is hidden beneath the sea's surface and therefore unseen to many people. Most people's experience of the subtidal environment is generally limited to places where they go diving and snorkelling. Their choice of diving location often depends on factors such as accessibility and physical conditions at the time (e.g. sea state, currents and visibility), but also the presence of interesting underwater features (e.g. complex reefs, diverse species assemblages, marine protected areas, and ship wrecks) and harvestable species. Thus while people's experience of the underwater environment is patchy, it is also very rewarding.

The criteria are not independent of each other and many are closely linked. For example, horizontal and vertical biotic patterns are closely interlinked and are influenced by sedimentation and human activities such as trawling, dredging and aquaculture. Notwithstanding these linkages, it was helpful to consider them separately to ensure the multi-dimensional nature of natural character was fully considered and assessed. However, it also meant that the assessment of an area's overall rating could not be an additive numerical approach, but rather required a broad qualitative judgment across all the criteria.

Criteria: marine ecological components of natural character

1	<p>Continuity of natural biotic patterns parallel to the shore – horizontal patterns in biophysical features, including natural habitats and their associated flora and fauna.</p> <p>i) High: natural biotic patterns extend horizontally with limited or no interruption over several kilometres or more, (including where intertidal and near-shore biotic patterns remain largely intact but values further offshore may be adversely affected);</p> <p>ii) Medium:</p> <ul style="list-style-type: none"> - natural biotic patterns extend horizontally with some interruption over several kilometres or more; and/or - natural biotic patterns extend with limited interruption over a few (3-5) kilometres; <p>iii) Low:</p> <ul style="list-style-type: none"> - natural biotic patterns extend with some interruption over a few (3-5) kilometres; and/or - natural biotic patterns extend with limited interruption over one-two kilometres or less;
2	<p>Continuity of natural biotic patterns down the intertidal zone and sub-tidally (vertical zonation patterns) to a distance/depth offshore reflective of the local topography and bathymetry:</p> <p>i) High: biotic patterns extend offshore with limited or no interruption;</p> <p>ii) Medium: biotic patterns extend offshore with some interruption (e.g. intertidal and near-shore biotic patterns remain largely intact but values further offshore may be adversely affected);</p> <p>iii) Low: biotic patterns extend offshore but with significant interruption</p>
3	<p>The presence of special marine community assemblages/associations which are notable or distinguishing features of the wider natural character area (including transition zones between adjoining natural character areas, and rare or atypical communities):</p> <p>i) High: special community association/s are a key feature;</p> <p>ii) Medium: special community association/s are a moderate feature;</p> <p>iii) Low: special community association/s are not a feature;</p>
4	<p>Influence of marine-based human activities (e.g. major structures, port dredging and dumping, aquaculture, commercial bottom fishing) on biological and physical processes and trophic/community structure and function:</p> <p>i) High: human activities have little or no influence;</p> <p>ii) Medium: human activities have a moderate influence;</p> <p>iii) Low: human activities have a significant influence;</p>
5	<p>Influence of land-derived sedimentation on trophic/community structure and function:</p> <p>i) High: sedimentation has little or no influence (e.g. catchments and adjacent lands are stable; or are naturally unstable; or the marine environment is naturally resilient to sedimentation (e.g. certain high energy coastlines));</p> <p>ii) Medium: sedimentation has a moderate influence;</p> <p>iii) Low: sedimentation has a significant influence (e.g. catchments and adjacent lands are unstable due to human activities, and marine communities are sensitive to excess sedimentation);</p>
6	<p>Influence of exotic species on trophic/community structure and function:</p> <p>i) High: exotic species have little or no influence;</p> <p>ii) Medium: exotic species have a moderate influence;</p> <p>iii) Low: exotic species have a significant influence;</p>
7	<p>Influence of water quality (other than sedimentation) on trophic/community structure and function:</p> <p>i) High: Water quality is high or has little or no influence;</p> <p>ii) Medium: Water quality has a moderate influence;</p> <p>iii) Low: Water quality is low and has a significant influence;</p>
8	<p>Protective status of the adjacent terrestrial environment (for certainty of protection of terrestrial values, including natural biotic patterns which extend across the land/sea interface):</p> <p>i) High: much of the terrestrial environment is formally protected;</p> <p>ii) Medium: some of the terrestrial environment is formally protected;</p> <p>iii) Low: little of the adjacent land is formally protected</p>