

An aerial photograph of a coastal region, showing a mix of green land and blue water. A teal-colored rectangular overlay is positioned in the lower half of the image, containing white text. The text is arranged in four lines: 'Section D' in a smaller font, followed by 'MARLBOROUGH SOUNDS' in a large, bold font, 'COASTAL MARINE &' in a large, bold font, and 'TERRESTRIAL AREAS' in a large, bold font.

Section D
**MARLBOROUGH SOUNDS
COASTAL MARINE &
TERRESTRIAL AREAS**

Coastal Terrestrial & Coastal Marine Areas of the Marlborough Sounds

As outlined in Section B, there are seven Coastal Marine Areas identified within the Marlborough Sounds and ten Coastal Terrestrial Areas. These are identified in the tables below, mapped on the adjacent plan and described in this section, Section D. (Section E describes the 'Areas' in South Marlborough.)

For each of the Coastal Marine and Coastal Terrestrial Areas the specific collective characteristics of the Area's abiotic, biotic and experiential attributes are described first. Then, each specific Area is discussed and evaluated. Freshwater aspects are covered within the Terrestrial Areas. An evaluation table at the end of each Area subsection summarises the values and ratings at the Level 3 scale. Following this, any specific values within the Area are listed, mapped and rated at the Level 4 & 5 scale. Refer to diagram on page 27 for an explanation of the Levels.

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

The seven Coastal Marine Areas and ten Coastal Terrestrial Areas are:



Jetty in the Marlborough Sounds

The Coastal Marine and Coastal Terrestrial Areas of the Marlborough Sounds

Coastal Marine Areas	
A	Tasman Bay- South Western D'Urville Island
B	D'Urville Island- Northern Cook Strait
C	Pelorus Sound (including Forsyth Bay)
D	Queen Charlotte Sound
E	Tory Channel
F	Port Underwood
G	Eastern Cook Strait & Outer Queen Charlotte Sound

Coastal Terrestrial Areas	
1	D'Urville
2	Cook Strait
3	Bulwer
4	Arapawa
5	Portage
6	Nydia
7	Robertson
8	Stokes
9	Pelorus
10	Kaituna

Legend

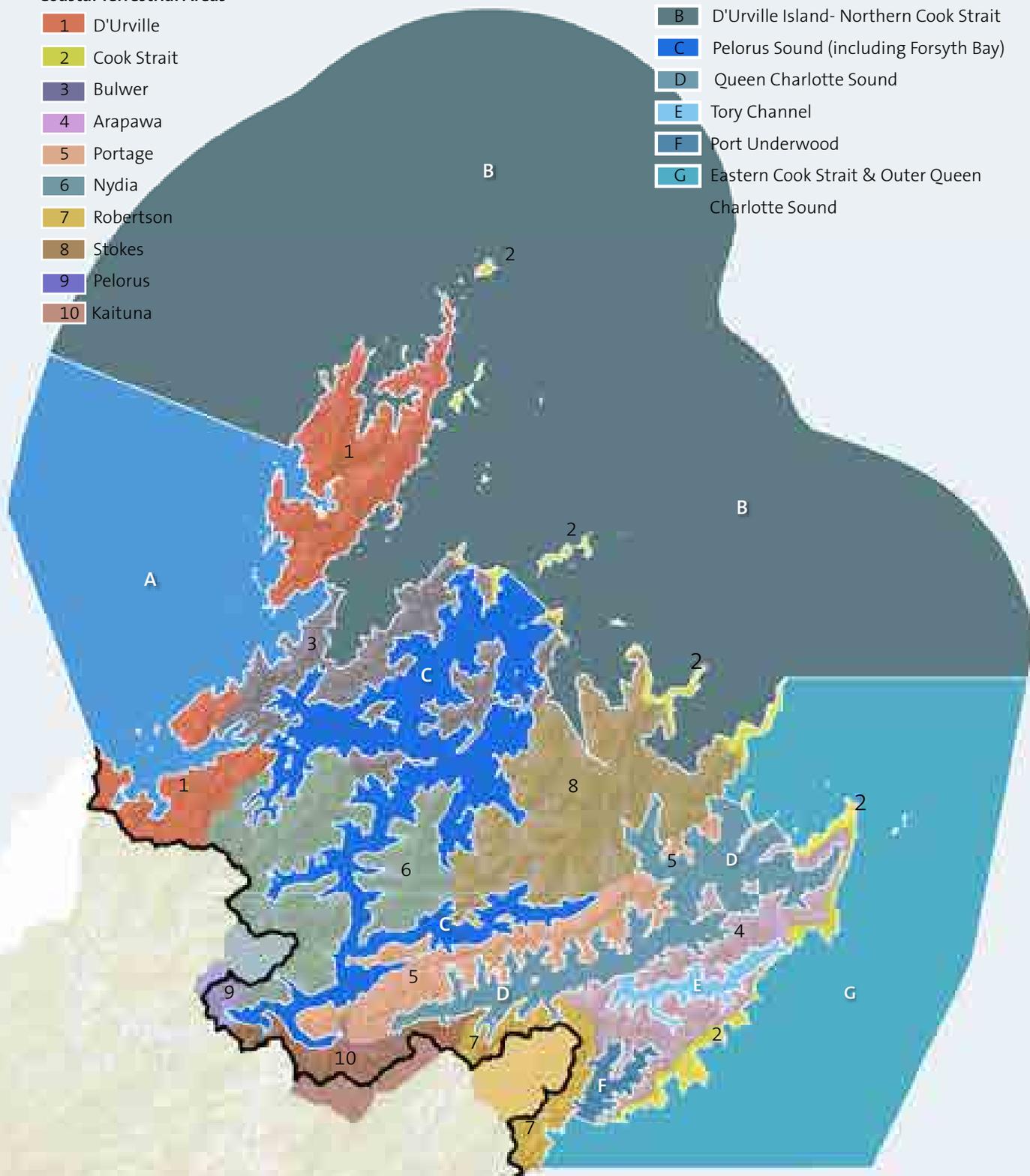
-  Extent of Coastal Environment
-  Marlborough District Boundary

Coastal Terrestrial Areas

-  1 D'Urville
-  2 Cook Strait
-  3 Bulwer
-  4 Arapawa
-  5 Portage
-  6 Nydia
-  7 Robertson
-  8 Stokes
-  9 Pelorus
-  10 Kaituna

Coastal Marine Areas

-  A Tasman Bay- Southwestern D'Urville Island
-  B D'Urville Island- Northern Cook Strait
-  C Pelorus Sound (including Forsyth Bay)
-  D Queen Charlotte Sound
-  E Tory Channel
-  F Port Underwood
-  G Eastern Cook Strait & Outer Queen Charlotte Sound



MAP 6: COASTAL TERRESTRIAL & COASTAL MARINE AREAS OF THE MARLBOROUGH SOUNDS

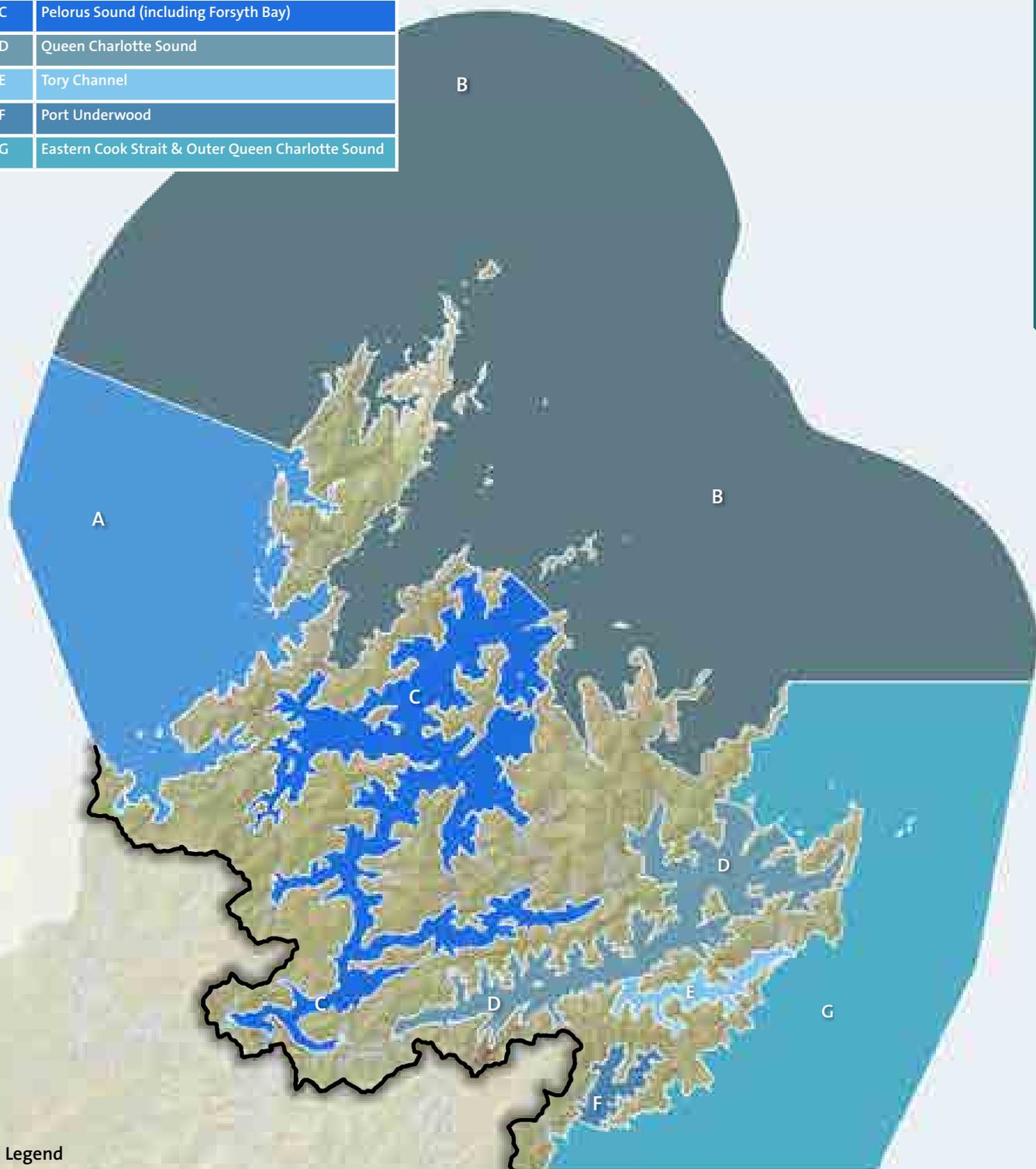




**MARLBOROUGH SOUNDS
COASTAL MARINE AREAS**

Coastal Marine Areas of the Marlborough Sounds

A	Tasman Bay- South Western D'Urville Island
B	D'Urville Island- Northern Cook Strait
C	Pelorus Sound (including Forsyth Bay)
D	Queen Charlotte Sound
E	Tory Channel
F	Port Underwood
G	Eastern Cook Strait & Outer Queen Charlotte Sound



Legend

 Extent of Coastal Environment

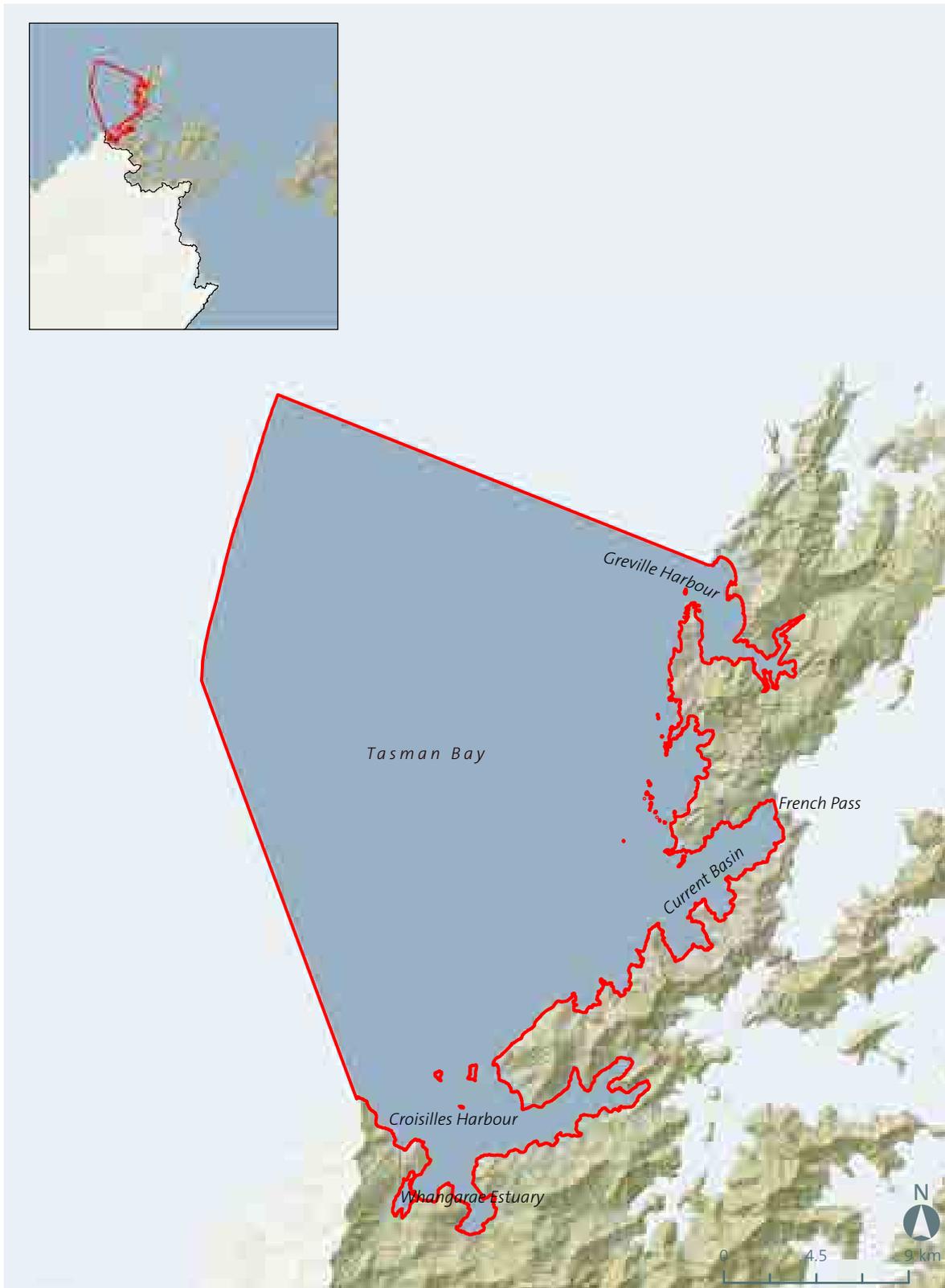


**MAP 7: MARLBOROUGH SOUNDS
COASTAL MARINE AREAS**

Coastal Marine Area A : Tasman Bay & Southwestern D'Urville Island

Collective Characteristics

Moderate turbidity; warm waters; open to the sea, but relatively sheltered; limited reef zone and generally sparse marine life; sands, gravels and muddy sediments offshore.



Abiotic

This irregular coastline is made up of numerous bays and inlets, including Croisilles Harbour, Current Basin and Greville Harbour. Three small islands are nestled in the entrance to Croisilles Harbour and numerous rocky outcrops are a feature at the south-western corner of D'Urville Island. Whangarae Estuary, the only spit-formed estuary in the Marlborough Sounds, is located in Croisilles Harbour.

While much of the coast is open to the sea, it is sheltered from large oceanic swells. The inner reaches of Croisilles Harbour, Current Basin and Greville Harbour are very sheltered compared to the remainder of the coast.

This Coastal Marine Area is bathed in relatively warm coastal waters derived from the D'Urville Current and outflows from Tasman Bay. Seasonal thermal stratification is also pronounced. Very strong currents occur in the vicinity of French Pass but are weak to moderate elsewhere. 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 20m to around 60m.

The shore is mostly rocky, interspersed by small sandy beaches at the heads of various bays. A relatively narrow near-shore bedrock/cobble reef zone extends down to between 6m and 20m depth. Offshore reefs are confined to south-western D'Urville Island. Gravels and sandy sediments occur below the reef zone, replaced by silts in deeper offshore areas. Extensive areas of sand/shell are found in some areas close to shore, in places sculpted into mega-ripples by wave action.

Commercial bottom trawling occurs offshore in Tasman Bay. Marine farms are common in parts of Croisilles Harbour and are present in two small embayments in the Current Basin. A large offshore mussel farm has also been approved south-west of D'Urville Island.

Biotic

This Coastal Marine Area is notable for a low biomass and diversity of macro-algae, mostly confined to a narrow band immediately below low water. Furoid algae (e.g. flapjack) are the most conspicuous seaweeds; laminarian kelps are mostly absent.

Sub-tidal 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 in the Sounds. The ambush sea star *Stegnaster inflatus* is particularly common.

Croisilles Harbour supports a unique shallow sand community notable for the presence of the New Zealand lancelet (the southern-most population of this patchily distributed species). A typical array of sediment dwelling species – shellfish, brittle stars, starfish, urchins, crustaceans – inhabits offshore gravels, sands and silts.

Despite a history of land clearance and farming around its margins, Whangarae Estuary is an excellent example of a relatively unmodified estuary in Marlborough. Two opposing sand spits shelter largely intact herb field and salt marsh communities, extensive sand/mud flat habitats and sinuous tidal channels. Regenerating native coastal forest surrounds much of the estuary.

Greville Harbour, located on the western side of D'Urville Island, represents a very good example of a sheltered inlet flanked by a relatively stable forested catchment. Much of the northern side of the harbour is protected as scenic reserve. Key biotic features include healthy populations of the nationally declining sea sedge in intertidal delta areas at the head of the harbour and fast flow boulder reef habitat separating the inner and outer sectors of the inlet.



Above: Sea urchin and star fish



Above: Pig fish

Coastal Marine Area A : Tasman Bay & Southwestern D'Urville Island

Various seabirds and marine mammals are seen in this area, especially in Current Basin (refer Collective Biotic Characteristics of the Marlborough Sounds Marine Environment). Bottlenose dolphins and dusky dolphins are regular visitors. Whangarae Estuary is habitat for several regionally rare birds including banded rail and fern bird.

Experiential

The open, unmodified waters of the Coastal Marine Area of Tasman Bay that extends up to and beyond Croisilles Harbour to south-western D'Urville Island

are expansive. Aquaculture or other coastal structures such as jetties and wharves are apparent in Croisilles Harbour, with the greatest concentration in Squally Cove. Many of the more exposed coastal waters are largely unmodified. Any boating activity tends to be concentrated nearer the coast. French Pass, where the currents in this marine area are the strongest, is a noted example of a submerged ridge forming a reef. The waters here are notorious and dangerous. Despite this there are areas close to French Pass that are popular for crayfish diving. Diving for scallops is also popular in Croisilles Harbour/ Okiwi Bay.



Moawhitu at Greville Harbour, D'Urville Island. Two Bay Point can be seen at the far left

Level 3: Overall Area Rating for Coastal Marine Area A: Tasman Bay & Southwestern D'Urville Island

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			Very High

Levels 4 & 5: Specific Parts within Coastal Marine Area A: Tasman Bay & Southwestern D'Urville Island Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Outer Croisilles Harbour – south western D'Urville Island	Very High	<p>Largely unmodified near-shore coastal marine environment ranging from semi-sheltered to very sheltered shores.</p> <p>Whangarae Estuary.</p> <p>Subtidal sand flat and boulder bank habitats/communities at the mouth of Croisilles Harbour.</p> <p>High flow habitats associated with Current Basin and French Pass.</p> <p>Greville Harbour and associated communities.</p> <p>D'Urville Island Scenic Reserve</p> <p>Offshore islands (Croisilles Harbour) and rocky outcrops (e.g. Paddock Rocks)</p> <p>Adjoins Coastal Marine Area B.</p>	<p>Excludes Squally Cove which has numerous marine farms.</p> <p>A small number of marine farms in two small bays in Current Basin.</p> <p>Certain offshore areas in Tasman Bay are commercially trawled.</p>

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 1: D'Urville Island,

Outstanding Coastal Natural Character Area 2: French Pass,

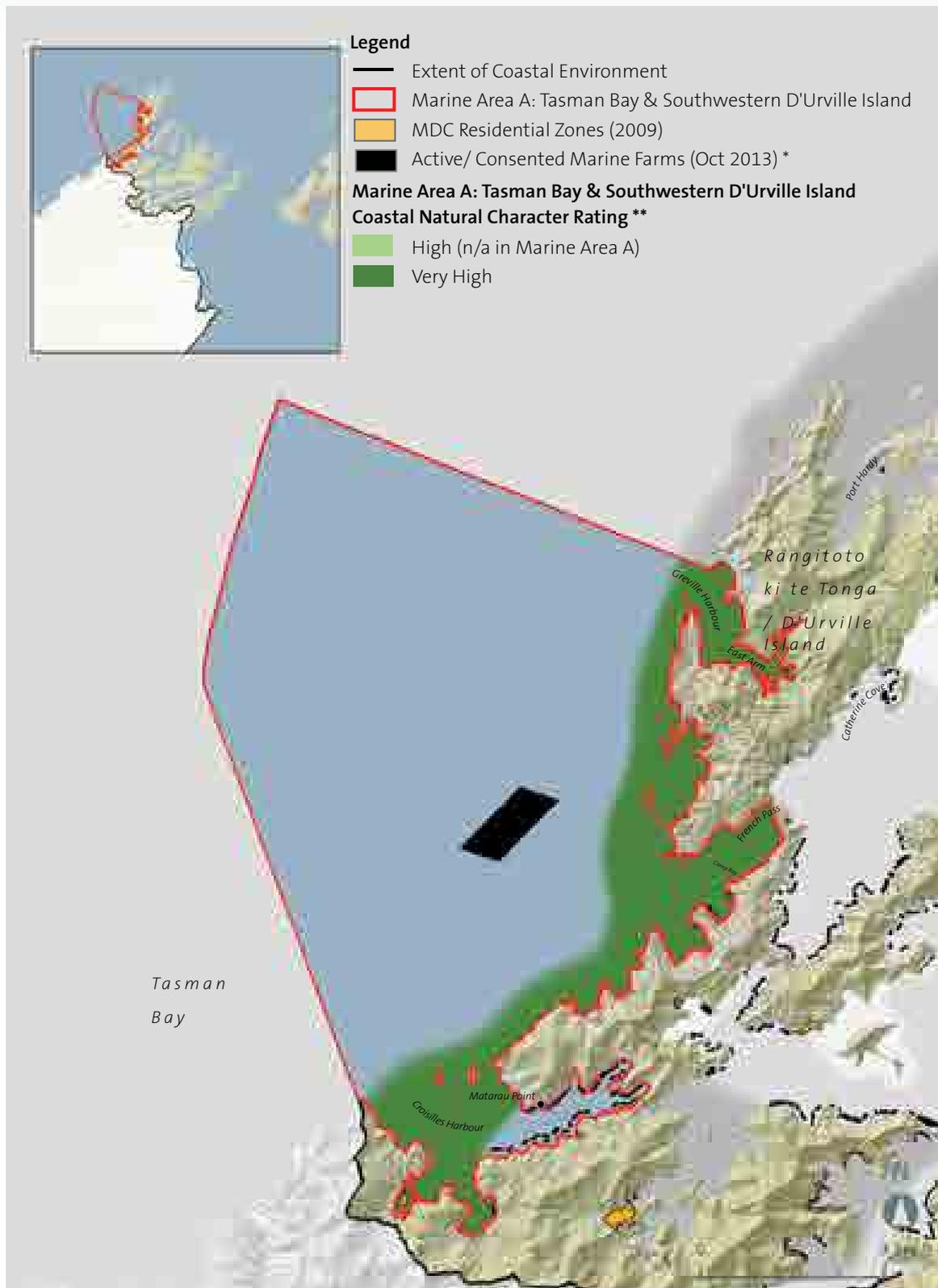
Outstanding Coastal Natural Character Area 6: Croisilles Harbour



Above: East Arm



Coastal Marine Area A : Tasman Bay & Southwestern D'Urville Island



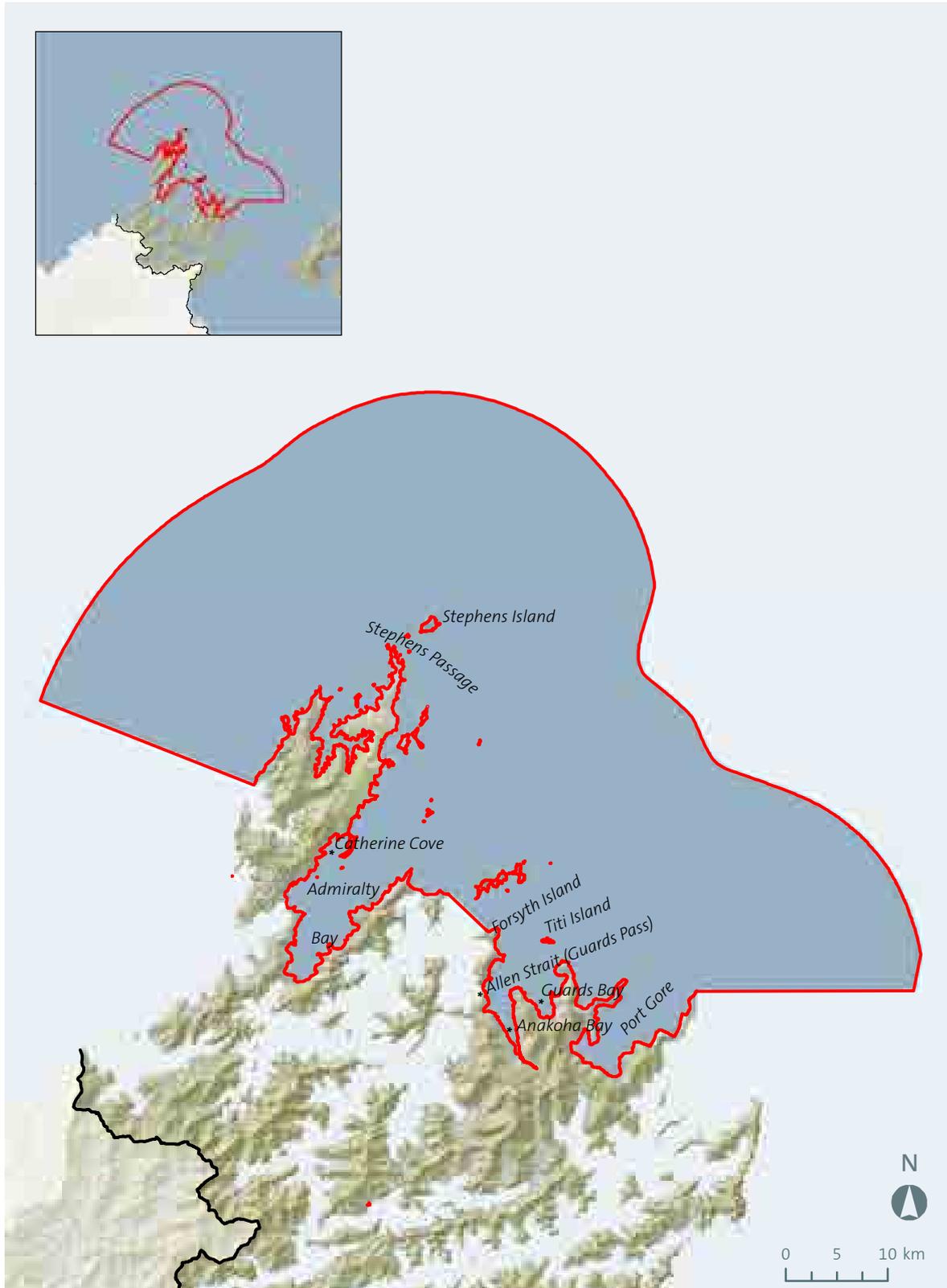
* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.

**Refer to page 23 and Appendix 6 for limitations on the offshore extent of biotic & abiotic assessments. Marine maps illustrate abiotic and biotic values only. Experiential values have been taken into consideration in the text and would represent a separate overlay on this map.

Opposite: Onetea Bay

Coastal Marine Area B : D'Urville Island - Northern Cook Strait

Variably exposed; waters relatively warm, clear, and nutrient-rich; strong currents; offshore reefs, stacks and islands; deep subtidal reefs; rich reef communities; bryozoan and horse mussel beds; tube worm colonies; extensive mud/sand areas offshore; highly diverse marine environment.



Abiotic

This Coastal Marine Area has a highly diverse marine environment due to its complex coastal topography, bathymetry and hydrology.

Sea conditions range from very exposed around north-western D'Urville and *Takapourewa* (Stephens Island) to very sheltered within the upper reaches of certain inlets and larger bays. Most of the region however, is moderately sheltered.

There is a moderate to high tidal range with complex circulation patterns and strong tidal mixing in open waters. Strong to very strong currents occur off headlands and between land masses, especially through French Pass, Stephens Passage and Allen Strait; currents are moderate to low elsewhere.

Waters are mostly clear with relatively low turbidity/sedimentation levels. Sea surface temperatures tend to be warm overall, though waters are generally cooler in the east compared to the west. Nutrient levels can be high due to upwelling through Cook Strait and strong tidal mixing.

This Coastal Marine Area is distinguished by its huge diversity in physical form and function including: exposed rocky headlands, islands and offshore stacks and rocks; high current areas; sheltered bays and inlets; a mixture of bed rock and cobble/boulder reefs fringing the shoreline; deep rocky reefs in places; intertidal sand/mud flats in the heads of some inlets; well sorted

gravel shores along north-eastern D'Urville Island; extensive subtidal areas of sand and mud offshore; and shelly gravels in some higher current areas. An extensive shallow (<30m depth) bank extends between Titi Island and D'Urville Island.

Maximum depth is generally around 60m, though deep "holes" between 100 and 300m occur in several places. Subtidal reefs generally extend to 12-18m depth, though greater than 60m off some pinnacles and steeper headlands.

Bottom trawling occurs through various parts of the offshore territory whereas commercial scallop dredging is more localised (e.g. Port Gore, the area between Guards Bay and Forsyth Island). Aquaculture is present predominantly in Admiralty Bay, Anakoha Bay, Catherine Cove and parts of Port Gore.

Biotic

A wide variety of marine communities are evident reflecting the diverse physical environment.

Habitats and communities in the most sheltered inlets and bays resemble those in Pelorus and Queen Charlotte Sounds, with a similar low diversity and abundance of macroalgae. Moderate to exposed coasts have contrastingly high seaweed diversity and cover, with conspicuous canopy forming species such



Above: Port Gore

Coastal Marine Area B : D'Urville Island - Northern Cook Strait

as narrow and flexible flapjack, *Marginariella spp.*, oak-leaf seaweed, paddle weed forming luxuriant beds from 3m to over 24m depth, and various other large brown and green seaweeds at more exposed sites. Colder water kelps (*Macrocystis*, bull kelp and strap kelp) are more restricted in their distribution.

A variety of encrusting and mobile invertebrates (e.g. sponges, ascidians, hydroids, anemones, crustaceans, echinoderms, and notably molluscs) inhabit the rocky reefs. The more sheltered bays and inlets support fewer conspicuous reef dwelling species though tube worm colonies are common in some sheltered reef sites. Diverse assemblages of sponges, ascidians, bryozoans and other encrusting animals inhabit the deeper reefs below the seaweed zone (>24m).

The outer eastern flank of Port Hardy, extending out to include Takapourewa (Stephens Island) and the northern parts of D'Urville Island is particularly noteworthy for its complex reef habitats and high diversity of macroalgae, invertebrates and fish. The inner regions of Port Hardy are more representative of sheltered Sounds conditions, with some good forested catchments in South Arm and Wells Arm.

Offshore sediments support a varied biota depending on depth, substrate type and hydrology. Three distinct community types are recognisable. Key conspicuous species include brittle stars, heart urchins, whelks, bivalve molluscs and brachiopods.

Isolated but relatively large areas dominated by bryozoan corals are a distinctive feature of the Coastal Marine Area. Horse mussel, brachiopod and dog cockle beds are also present in certain places and there

is a high diversity of coastal temperate fish species throughout the region.

Various seabird and marine mammal species utilise these waters (refer Collective Biotic Characteristics of the Marlborough Sounds Marine Environment). Of particular note is the presence of dusky dolphins in Admiralty Bay over winter and spring, the large fur seal breeding colony on Takapourewa (Stephen's Island), and the small number of king shag breeding sites in the outer Sounds.

Experiential

The waters of the Northern Cook Strait and D'Urville Island Coastal Marine Area reflect the diversity of the terrestrial areas and range from exposed to relatively sheltered. Numerous off shore islands and reefs pepper these waters, including D'Urville, the Chetwodes and Takapourewa (Stephens Island). Modification to these waters is limited, principally due to the exposed nature of the open water. These waters are infrequently visited and are amongst the most remote in the Sounds. Expansive open views of Cook Strait are dominated by weather. Open sea fishing and charter boats are evident in calm conditions, as are divers whose numerous dive sites include the sunken Mikhial Lermontov in Port Gore. Diving and fishing are also popular off the islands east of D'Urville Island, and around the Chetwodes. Aquaculture is mostly limited to some of the larger mainland bays notably Admiralty Bay, Anakoha Bay and parts of Port Gore.

Level 3: Overall Rating for Coastal Marine Area B: D'Urville Island - Northern Cook Strait

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

Levels 4 & 5: Specific Parts within Coastal Marine Area B: D'Urville Island - Northern Cook Strait Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Western D'Urville Island – Rangitoto Islands	Very High	<p>Largely unmodified and highly diverse near-shore coastal marine environment ranging from very exposed to very sheltered shores.</p> <p>Diverse rocky reef communities.</p> <p>High current habitats including areas dominated by byrozoan corals.</p> <p>Port Hardy and associated sheltered Sounds communities.</p> <p>D'Urville Island Scenic Reserve.</p> <p>Several offshore islands and rock stacks including Stephen's Island, the Rangitoto Islands and Jag Rocks.</p> <p>Adjoins Coastal Marine Area A.</p>	<p>One small marine farm in Port Hardy.</p> <p>Certain offshore areas in Tasman Bay and Cook Strait are commercially trawled</p>
Eastern D'Urville Island – Waitui Bay	High	<p>Near-shore areas, including around the Trio Islands, Chetwode Islands and Titi Island, retain high natural values.</p> <p>Variable exposure.</p> <p>Numerous ecologically significant marine sites.</p> <p>D'Urville Island Scenic Reserve; Chetwode Island Nature Reserve; Titi Island Nature Reserve.</p>	<p>Offshore banks between the island groups are commercially trawled, in places relatively intensively.</p> <p>Some commercial scallop dredging in Waitui Bay and northwest of Nukuwaiata Island.</p>
Cape Lambert-Cape Jackson	Very High	<p>Largely unmodified section of coast with exposed rocky bluffs, headlands and reefs.</p> <p>Cape Lambert Scenic Reserve</p> <p>Adjoins Coastal Marine Area G at Cape Jackson.</p>	<p>Some commercial trawling offshore.</p> <p>Offshore areas in Waitui Bay are commercially dredged for scallops.</p>
Inner Port Gore	High	<p>Relatively sheltered and largely unmodified intertidal and near-shore marine environment.</p> <p>Cape Lambert Scenic Reserve.</p> <p>Eastern and southern shores backed by regenerating scrub/forest.</p> <p>Some ecologically significant marine sites.</p>	

Table continued overleaf

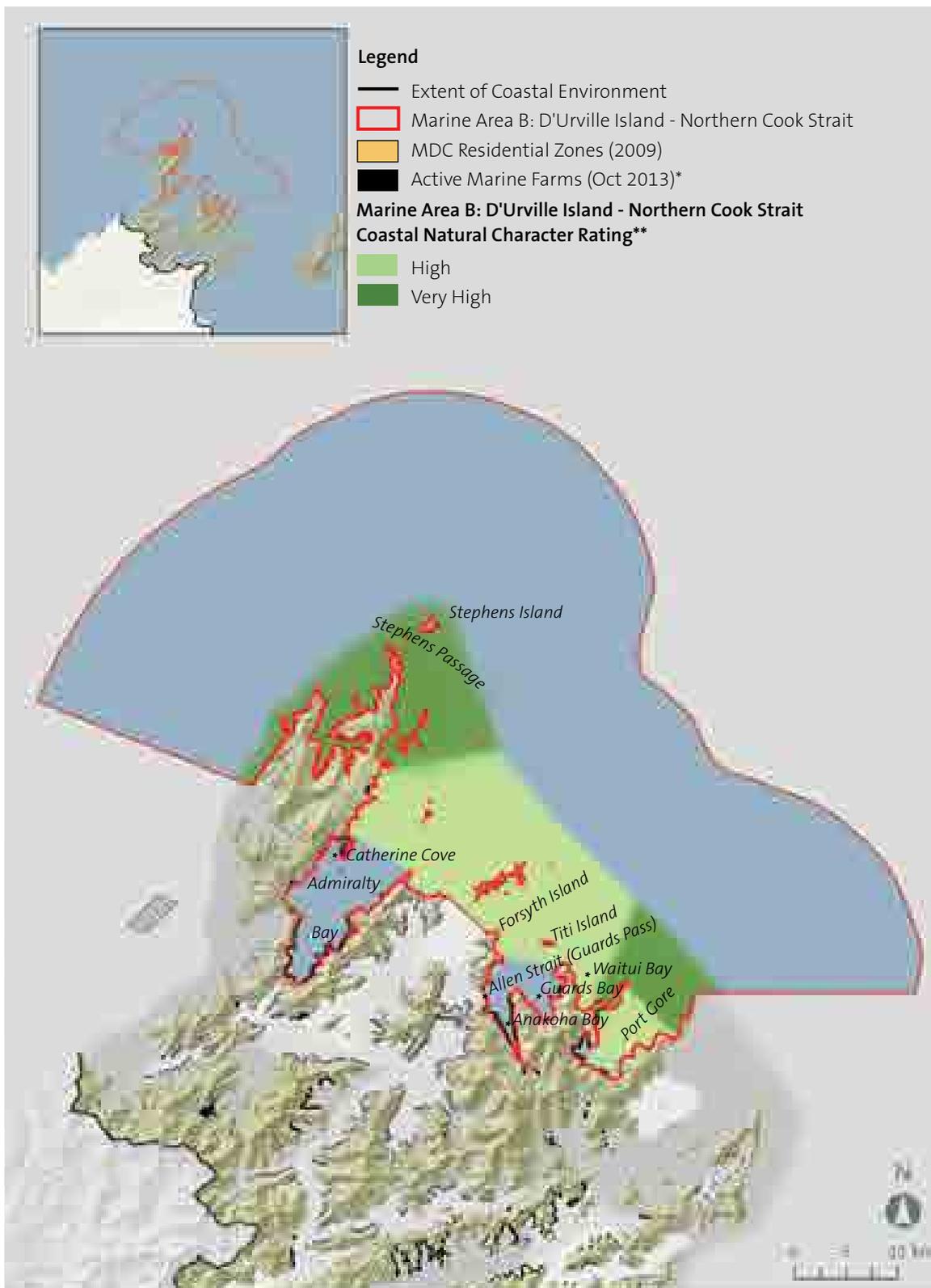
Coastal Marine Area B : D'Urville Island - Northern Cook Strait

Levels 4 & 5: Specific Parts within Coastal Marine Area B: D'Urville Island - Northern Cook Strait Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
<i>Refer also to Section F of this report for:</i>			
Outstanding Coastal Natural Character Area 1: D'Urville Island,			
Outstanding Coastal Natural Character Area 2: French Pass,			
Outstanding Coastal Natural Character Area 3: D'Urville Islands,			
Outstanding Coastal Natural Character Area 4: Chetwode and Titi Islands,			
Outstanding Coastal Natural Character Area 9: The Capes			



French Pass settlement



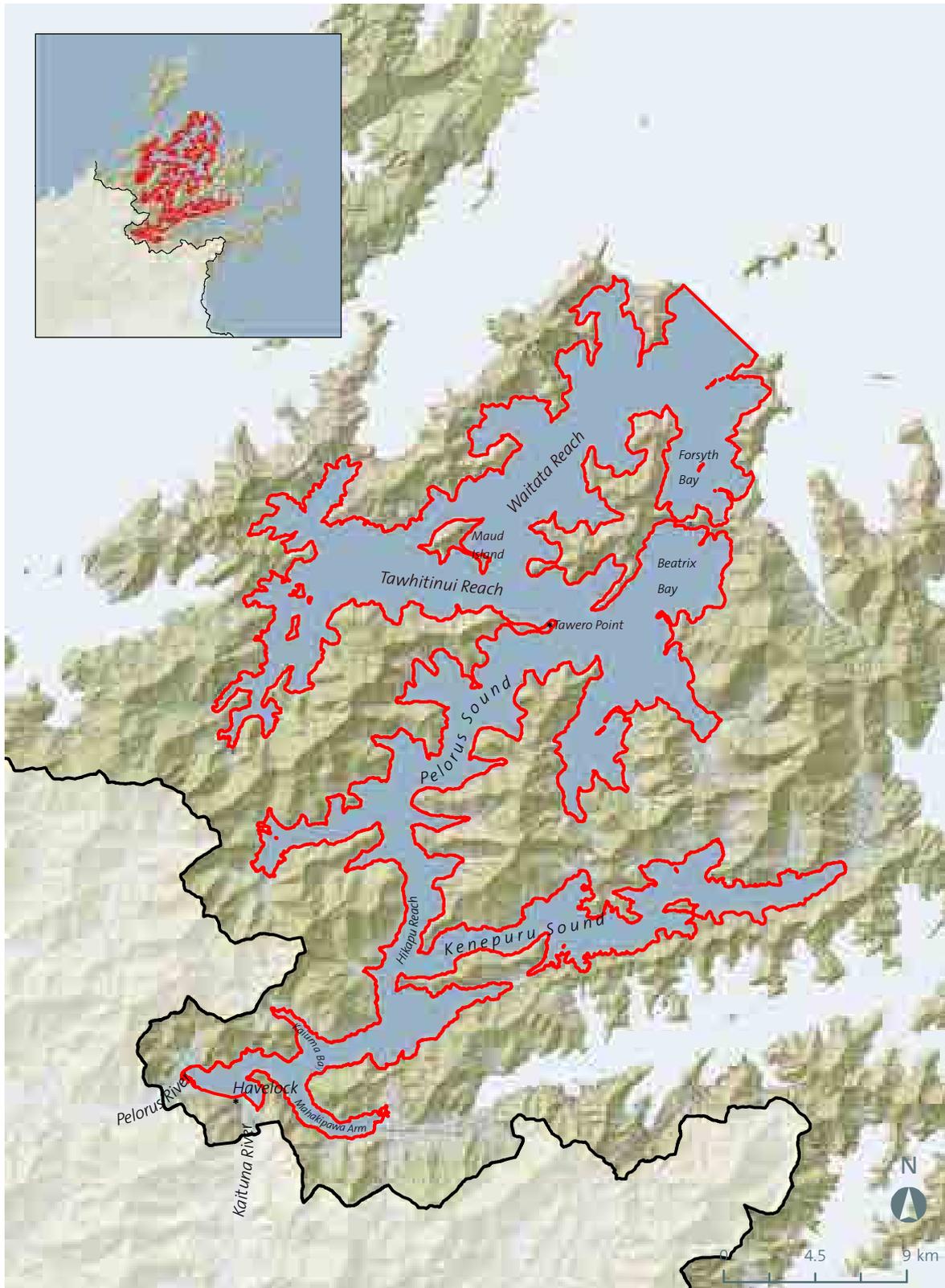
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Coastal Marine Area C : Pelorus Sound

Collective Characteristics

Sheltered and warm; turbid and estuarine in the inner Sound; narrow near-shore reef; sand/shell and then mud offshore; typical array of coastal species; reefs and sediments can often appear relatively barren; biogenic communities in places including rhodoliths, hydroids, tube worms, horse mussels and bryozoans.



Abiotic

Pelorus Sound (including Forsyth Bay) is notable for its enclosed and convoluted form, with numerous interconnected sounds, inlets, bays, reaches and channels. Various islands and offshore rocks add to this complexity. This topography means the area as a whole tends to be very sheltered from the effects of strong winds and oceanic swells. Wave fetch is limited in most places apart from down the lengths of Tawhitinui Reach and Waitata Reach.

There is a moderate tidal range and currents are variable, ranging from weak in enclosed bays to moderate-to-strong along the main channels and off certain headlands. Sea surface temperatures are relatively warm, particularly in the inner Pelorus, and waters can be highly stratified.

The Pelorus and Kaituna Rivers have a large influence, affecting salinities, turbidity, sediment loads and nutrient levels throughout Pelorus Sound. Estuarine conditions dominate the inner Pelorus, and freshwater influences extend throughout the Sound. Turbidity/sedimentation levels are variable, but generally there is a gradient of increasing turbidity towards the inner Pelorus; water clarity tends to be highest beyond Tawero Point. Water quality is relatively poor close to Havelock as a result of catchment management and specific discharges in the vicinity. Forestry on surrounding hills may also cause local sedimentation issues around Pelorus Sound.

Typically a narrow (10-50m) rock/rubble reef fringes the shoreline interspersed with occasional areas of sand and/or gravel. The intertidal and subtidal reef grades into sand/shell, followed by mud habitats with increasing depth and distance from shore. Reef habitat extends on average down to around 13m, though deeper off certain headlands. Extensive and uniform areas of mud/silt extend beyond the near-shore zones across most of the region's seafloor. Maximum depth ranges from around 20m to 80m.

Pelorus/Kaituna Estuary and neighbouring Mahakipawa Arm and Kaiuma Bay form a complex estuarine delta system at the head of Pelorus Sound, with extensive intertidal flats (fine sand/mud) and shallow subtidal areas, linked by tidal channels. Smaller tidal sand/mudflats are scattered throughout Pelorus Sound, typically at the heads of bays and inlets.

Occasional trawling occurs through the mid-outer Pelorus Sound. There is intensive commercial scallop dredging in certain areas through to Tawhitinui Reach,

Waitata Reach, including some of the side bays and Forsyth Bay. Aquaculture is common through many parts of Pelorus Sound and Forsyth Bay.

Biotic

There is generally a low diversity and coverage of macro-algae within Pelorus Sound, dominated by furoid species such as flapjack and *Cystophera sp.* These large brown seaweeds are normally confined to a narrow zone immediately below the low water mark though can extend deeper in higher current areas along the margins of the main channel. Deeper reefs off headlands in the mid-outer Pelorus can support good stands of flexible flapjack. Algal species diversity, plant size and abundance reduce with distance into the Sound and into bays and side arms.

Many subtidal reefs appear relatively barren, with crustose coralline algae and encrusting and mobile invertebrates (e.g. sponges, hydroids, anemones, crustaceans, echinoderms and various molluscs) the dominant organisms. Tube worm colonies occur in some places and deeper reefs can support a relatively diverse fauna dominated by sponges, hydroids, compound ascidians and occasionally bryozoan "corals". Kina and most other large echinoderms are mostly absent from reefs in the inner Pelorus Sound due to the low salinities and high sediment loads which prevail there.

Conspicuous surface organisms are relatively uncommon over deeper sand/shell and mud/silt substrata; many of the species are cryptic and/or burrow into the sediments. In certain places this pattern may reflect a long history of trawling and shellfish dredging. Various shellfish species and echinoderms dominate the soft sediment fauna. In places where environmental conditions are favourable, species such as rhodoliths, horse mussels, scallops, brachiopods, bryozoans, burrowing anemones and hydroid trees can occur, sometimes in high densities.

There is a typical array of coastal fish species; however, reef fish diversity and abundance is relatively low, especially within the inner Sound. Elephant fish spawn in the region of Fitzroy Bay and snapper are seasonally abundant.

The Pelorus/Kaituna Estuary and neighbouring bays at the head of the Pelorus supports extensive and productive salt marsh and invertebrate communities.

Coastal Marine Area C : Pelorus Sound

Dense cockle beds (inter-tidal and sub-tidal) occur at various locations. *Spartina* is being actively controlled in this area. The general area is important as a nursery and feeding ground for coastal fish, as well as habitat for various wildlife species. Several threatened birds are found here including banded rail, marsh crake, banded dotterel, and black-fronted, white-fronted and Caspian terns. The network of smaller intertidal wetlands scattered throughout the Pelorus Sound provide additional foraging areas for wildlife and act as important “stepping stones” for coastal birds moving through the Sounds.

Various other seabirds as well as some marine mammal species are seen throughout the Pelorus Sound (refer to the *Collective Biotic Characteristics of the Marlborough Sounds Marine Environment* earlier). Duffers Reef, a chain of small islands and stacks off the north-western tip of Forsyth Island, is a nationally significant nesting area for king shags.

Experiential

This Coastal Marine Area includes Pelorus Sound, Kenepuru Sound, Tawhitinui Reach, Waitata Reach and Forsyth Bay and represents the largest enclosed water body in the study area. Many of the waterways are broad, such as Tawhitinui Reach and Waitata Reach being approximately 3km in width, with Kenepuru Sound and Hikapu Reach being amongst the narrowest. Views, especially in more sheltered areas across the water channels are often foreshortened and channelled by interconnecting islands and peninsulas.

Aquaculture is apparent along much of this shoreline, notably within many of the large embayments, such as Crail and Beatrix Bays. There are two Salmon Farms present in the area, with a number also proposed. Boats within this area tend mainly to be servicing mussel farms, although the area is also popular for recreational boating especially over summer and commercial scallop dredging occurs in Tawhitinui and Waitata Reach. Various jetties and moorings are scattered around the Pelorus, though in much lower numbers than found in neighbouring Queen Charlotte Sound. Surface modification is therefore confined to the ‘edges’. Due to the scale of the waterways, surface modification appears small and experiential values are relatively high.

Crayfish diving is enjoyed in outer Pelorus Sound and in areas where the benthic environment is soft bottomed, Eagle Rays and Sting Rays are sighted.



Above: Snapper

Level 3: Overall Area Rating for Coastal Marine Area C: Pelorus Sound

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

Levels 4 & 5: Specific Parts within Coastal Marine Area C: Pelorus Sound Holding High or Very High Natural Character			
Sub Area	Rating	Key Values	Additional Comments
Pelorus Heads	High	<p>Largely unmodified section of coast extending into the entrance of Pelorus Sound to Kaitira and Te Akaroa.</p> <p>High current communities flanking the main channels.</p> <p>Includes the offshore main channel entering Pelorus Sound.</p> <p>Duffers Reef including its associated king shag nesting sites.</p> <p>Adjoins Coastal Marine Area B.</p>	Some marine farming north of Te Akaroa.
Maud Island to Yellow Cliffs, including Apuau Channel	High	<p>Near-shore areas retain high natural values.</p> <p>Sheltered indented coastline with multiple aspects.</p> <p>Tom Shand Scientific Reserve (Maud Island) and Deep Bay Scenic Reserve on the opposite mainland, separated by Apuau Channel.</p>	<p>Commercial scallop dredging in Tawhitinui Reach and Waitata Reach</p> <p>Three marine farms approved for the culture of sponges and seaweeds with limited effect on seabed values</p>
Fitzroy Bay and western Hallam Cove	High	<p>Near-shore and offshore waters mostly unmodified.</p> <p>Backed by Garne and Savill Bay Scenic Reserve.</p> <p>Elephant fish spawning grounds close to shore.</p>	Two mussel-spat marine farms.
Tennyson Inlet	Very High	<p>The largest marine area in Marlborough surrounded by protected native forest.</p> <p>Largely unmodified, very sheltered inner-Sounds marine environment.</p> <p>Low natural diversity.</p> <p>Convolute shoreline with three small offshore islands.</p> <p>Three small estuaries.</p> <p>Several scenic reserves.</p>	Moorings and a small port area are located in Elaine Bay. A number of moorings are also present in Penzance Bay.

Table continued overleaf

Coastal Marine Area C : Pelorus Sound

Levels 4 & 5: Specific Parts within Coastal Marine Area C: Pelorus Sound Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Nydia Bay – Tawero Point	Very High	<p>Largely unmodified section of coast extending over many kilometres from the head of Nydia Bay along the western side of Pelorus Sound to Tawero Point.</p> <p>Several small bays.</p> <p>Mostly sheltered but exposed to a wide range of tidal flow conditions including high flow communities.</p> <p>Large sections of this coast are backed by scenic reserves.</p>	Two small areas of mussel farms (Fairy Bay and west of Tawero Point).
Pelorus/Kaituna Estuary – Mahakipawa Arm – Kaiuma Bay	High	<p>The largest estuarine area in the Marlborough Sounds. Natural processes within the estuary are largely intact.</p> <p>Extensive saltmarsh beds, intertidal mud flats and other estuarine communities.</p> <p>Diverse avifauna.</p> <p>Despite modifications around parts of its perimeter, this large estuarine complex retains many of its natural qualities.</p>	<p>Excludes Port Havelock.</p> <p>Water quality modified by discharges, port activities and river inputs.</p> <p>Partly modified margins due to the port, an oyster farm, roading and agriculture.</p>

Refer also to Section F of this report for:

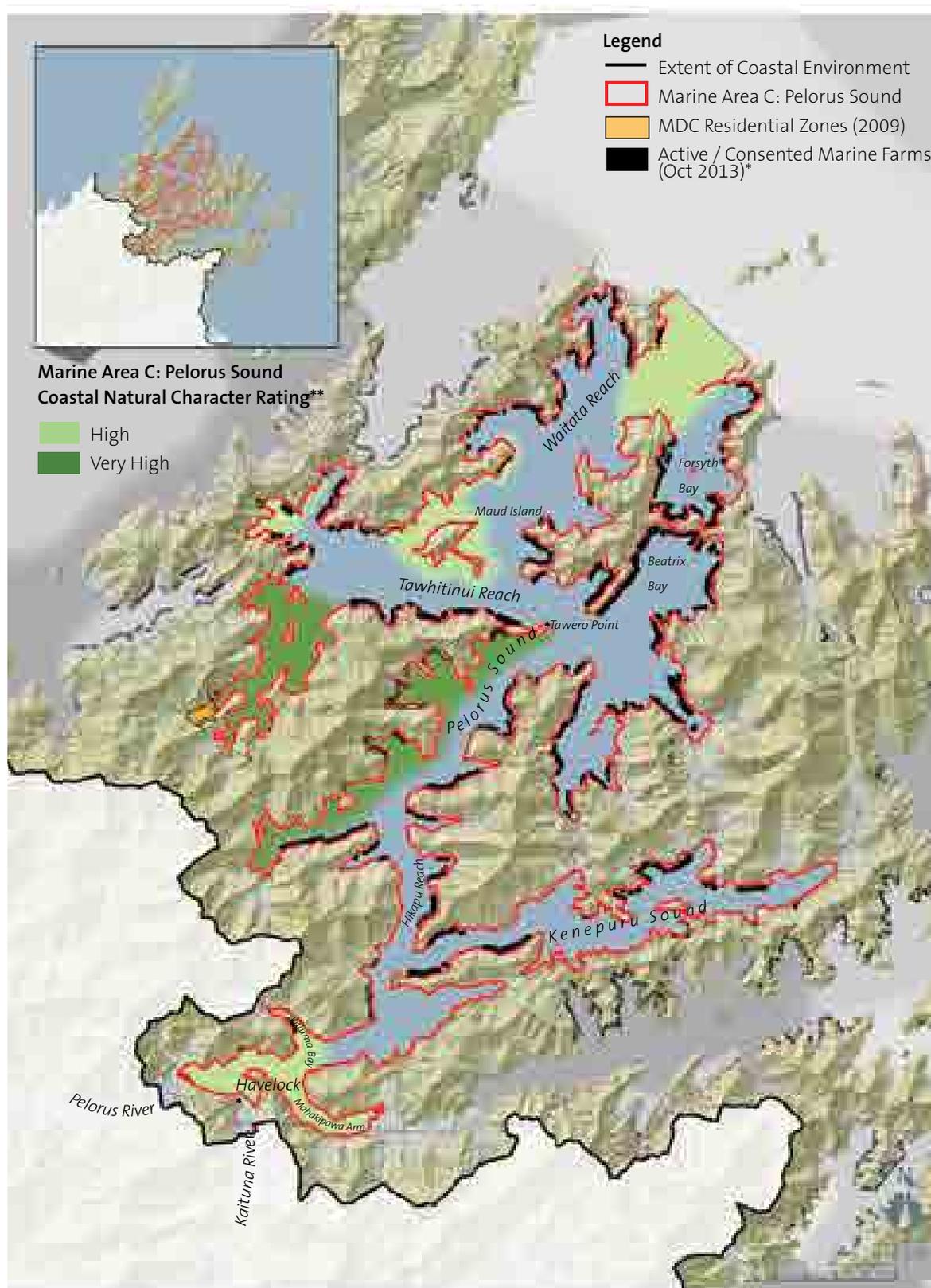
Outstanding Coastal Natural Character Area 7: Maud Island,

Outstanding Coastal Natural Character Area 8: Tennyson Inlet & Inner Pelorus Sound,

Outstanding Coastal Natural Character Area 13: Pelorus Estuary



White fronted terns



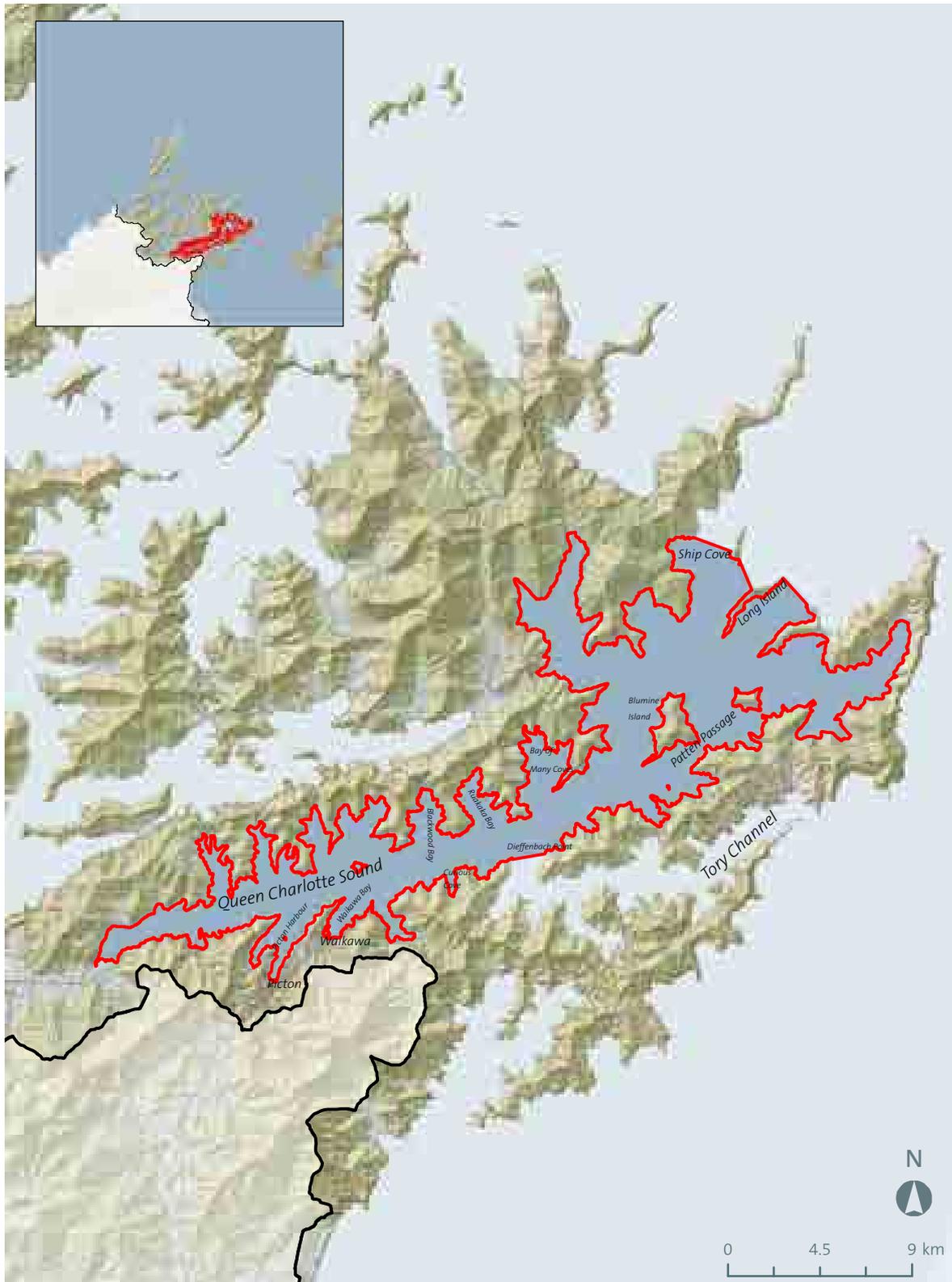
* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.

** Marine maps illustrate abiotic and biotic values only. Experiential values have been taken into consideration in the text and would represent a separate overlay on this map.

Coastal Marine Area D : Queen Charlotte Sound

Collective Characteristics

Sheltered; waters relatively clear and cool; narrow near-shore reef grading into sand/shell and extensive mud habitats offshore; typical array of species, though reefs and sediments can often appear relatively barren; biogenic communities in places including tubeworms, horse mussels, brachiopods and red algae beds.



Abiotic

Queen Charlotte Sound with its network of inlets, bays, islands and channels is distinguished by its convoluted coastline, enclosed waters and sheltered conditions. There is limited wave fetch except down the centre of the main Sound.

Currents are variable in strength, tending to be weak in enclosed bays and inlets and moderate along the sides of the main channel. Stronger currents occur near the confluence with Tory Channel and within Patten and Pickersgill Passages.

Unlike neighbouring Pelorus Sound, no major rivers discharge into the Queen Charlotte. As a consequence, salinities remain consistently high across the bioregion and turbidity and sedimentation levels tend to be low-moderate. Harvesting of exotic forests may cause local sedimentation issues. Water temperatures are mostly cool (especially in the vicinity of Tory Channel) though there is seasonal thermal stratification and the heads of major bays and inlets are noticeably warmer in the height of summer.

Water quality in Queen Charlotte Sound is generally very good. The key exception is near Picton, mainly due to stormwater runoff, port related activities and specific discharges in the vicinity. Water quality can also be reduced in some of the more populated side bays and inlets over summer due to poor water exchange and intensive holiday use.

Maximum depth generally ranges from 30-45m; deeper areas occur near Dieffenbach Point, Blumine Island and Patten Passage. There is a small tidal range (around 1.5m at Picton), resulting in a comparatively narrow intertidal zone.

A narrow (10-50m) rock and cobble/boulder reef typically fringes the shoreline interrupted by the occasional sand/gravel beach, especially near the heads of bays. There is a large intertidal sand flat at the head of Grove Arm. Reef habitat extends across the intertidal zone and subtidally on average down to around 12m and a maximum of around 33m. There is the occasional offshore reef/shoal. Reef gives way to sand/shell and then mud with greater depth. Mud dominates deeper offshore areas.

Commercial scallop dredging occurs where there is suitable habitat in some offshore areas (e.g. between Long Island and Ship Cove and in central Queen Charlotte Sound but is prohibited in inner Queen Charlotte Sound (west from Blackwood Bay and Curious Cove). Trawling is prohibited in all of Queen Charlotte Sound. Aquaculture is restricted to a single

salmon farm in Ruakaka Bay and a number of mussel farms in the southern and eastern sectors of East Bay.

Biotic

There is generally a low diversity and coverage of macro-algae (dominated by furoid species such as flapjack) in Queen Charlotte Sound, usually confined to a patchy fringe immediately below the low water mark. Some deeper reefs can support good stands of flexible flapjack. *Macrocystis* and paddle weed are confined to waters near the entrance to Tory Channel. The introduced kelp *Undaria* is sparsely distributed through parts of the Sound.

Crustose coralline algae and high densities of small kina dominate subtidal reef areas. Other conspicuous reef species include various encrusting and mobile invertebrates (e.g. sponges, hydroids, anemones, tubeworms, crustaceans, starfishes and notably molluscs). Large tubeworm colonies occur in places.

Conspicuous surface organisms are relatively uncommon over the sand/shell and mud/silt bottom. Various molluscs and echinoderms dominate the soft sediment fauna, many cryptic or living within the sediments. In places, where environmental conditions are favourable, species such as horse mussels, scallops, brachiopods, bryozoans and hydroid trees occur, sometimes in high densities.

Grove Arm is distinguished by some large red algae beds and a dense bed of *Neothyris lenticularis* (a rare brachiopod). *Neothyris* also occurs in lesser densities at a three other discrete locations including East Bay.

There are a few relatively small estuarine wetlands at the heads of major bays and inlets, the largest of which is located at the head of Grove Arm.

There is a typical array of coastal fish species present. Apart from spotty, variable and common triplefin, and small blue cod, reef fish abundance is generally low across the bioregion. Large schools of tarakihi may be found off prominent headlands and deeper reefs. Elephant fish and rough skate spawn in some inner bays.

Various marine mammal and seabird species are seen throughout the Queen Charlotte Sound (refer Collective Biotic Characteristics of the Marlborough Sounds Marine Environment). A small pod of Hector's dolphins are resident here, and bottlenose dolphins are commonly seen. Dusky dolphins also visit the Sound, mainly over winter.

Coastal Marine Area D : Queen Charlotte Sound

Historically, ferry wakes (especially those from fast ferries) had a significant adverse effect on the diversity and abundance of shallow subtidal and intertidal species adjacent to the ferry route. Following restrictions on ferry speeds and wakes introduced in 2000, a noticeable recovery of marine life occurred along the ferry route. However, for invertebrate communities inhabiting intertidal cobble and bedrock shores this recovery was reversed following the introduction of the Kaitaki in 2005; these particular communities continue to be adversely affected by ferry wash.

Experiential

This mainly sheltered and highly indented waterway is the most popular part for the Sounds for recreational activities and habitation. This is due to its location next to Picton and Waikawa and the terminus for the Cook Strait ferry. Many baches and houses line the coastline and many roads traverse the Sound where access and views are plentiful. Expansive views of the Sound are also available from small sections of the Queen Charlotte Walking Track. Jetties, wharves and moorings tend to be located within the many small embayments, notably along its western side. Boats and yachts are plentiful closer to the head of the Sound, dissipating further northwards towards Cook Strait.

Modification to the water is therefore highest around Picton, Waikawa and the south-western side of the Sound. Further northwards, beyond Tory Channel, the modification on the water is limited to small

areas, such as the head of East Bay. There is limited aquaculture present, with only the Ruakaka salmon farm in Ruakaka Bay and a number of mussel farms and one salmon farm in East Bay.

Scallop diving and spear fishing are also commonly enjoyed. Various sharks (e.g. carpet shark) are also seasonally evident in more open waters. Due to this, the Sound is extremely memorable.



Above: Bottlenose Dolphins



Above: Sea Perch are commonly caught in Queen Charlotte Sound

Level 3: Overall Area Rating for Coastal Marine Area D: Queen Charlotte Sound

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			Very High

Levels 4 & 5: Specific Parts within Coastal Marine Area D: Queen Charlotte Sound Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Outer Queen Charlotte Sound	Very High	<p>Largely unmodified and mostly sheltered near-shore and offshore marine environment with complex topography, multiple aspects and complex hydrology, leading to a wide variety of environmental conditions. Naturally low sedimentation levels.</p> <p>Long Island – Kokomohua Marine Reserve.</p> <p>Blumine and Pickersgill Islands. Fast flow habitats through Patten and Pickersgill passages.</p> <p>Several ecologically significant marine sites, including the entire northern flank of East Bay.</p> <p>A large proportion of the terrestrial environment is protected land (several scenic reserves)</p> <p>Adjoins Coastal Marine Area G.</p>	<p>Excludes an area around Motuara Island and offshore from Ship's Cove which is commercially dredged for scallops.</p> <p>Excludes Otanerau Bay and the eastern sector of East Bay which have a relatively high concentration of marine farms.</p>
Inner Queen Charlotte Sound	Very High	<p>Largely unmodified near-shore and offshore marine environment.</p> <p>Very sheltered with a highly indented coastline made up of numerous inlets and bays.</p> <p>Relatively low sedimentation levels due to the absence of any major rivers.</p> <p>Grove Arm supports the largest estuarine wetland in Queen Charlotte Sound.</p> <p>A large proportion of the surrounding terrestrial environment, mainly along the northern shores and in Grove Arm, is protected land.</p> <p>Several scenic reserves.</p> <p>Several ecologically significant marine sites</p>	<p>Privately owned jetties and moorings are common through various parts of this region, but these are considered to have only small localised effects ecologically.</p>
Tory Channel entrance to Umuwheke Bay	High	<p>Largely unmodified intertidal and near-shore marine environment</p> <p>Moderate-strong current communities near the entrance to Tory Channel grading to more typical inner Queen Charlotte Sound communities with distance away from Tory Channel.</p> <p>Backed by regenerating scrub/forest and in places scenic</p>	<p>Commercial scallop dredging occurs in places offshore.</p>

Table continues overleaf

Coastal Marine Area D : Queen Charlotte Sound

Levels 4 & 5: Specific Parts within Coastal Marine Area D: Queen Charlotte Sound Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Ship Cove – Motuara Island	High	<p>Largely unmodified intertidal and near-shore marine environment backed by significant naturally forested hill slopes.</p> <p>Motuara Island.</p> <p>Bordered by Long Island – Kokomohua Marine Reserve.</p> <p>Small areas of <i>Macrocystis</i> kelp near Motuara Island.</p> <p>Adjoins Coastal Marine Area G</p>	Offshore areas are modified by commercial scallop dredging between Long Island – Kokomohua Marine Reserve and the mainland at Ship Cove.

Refer also to Section F of this report for:

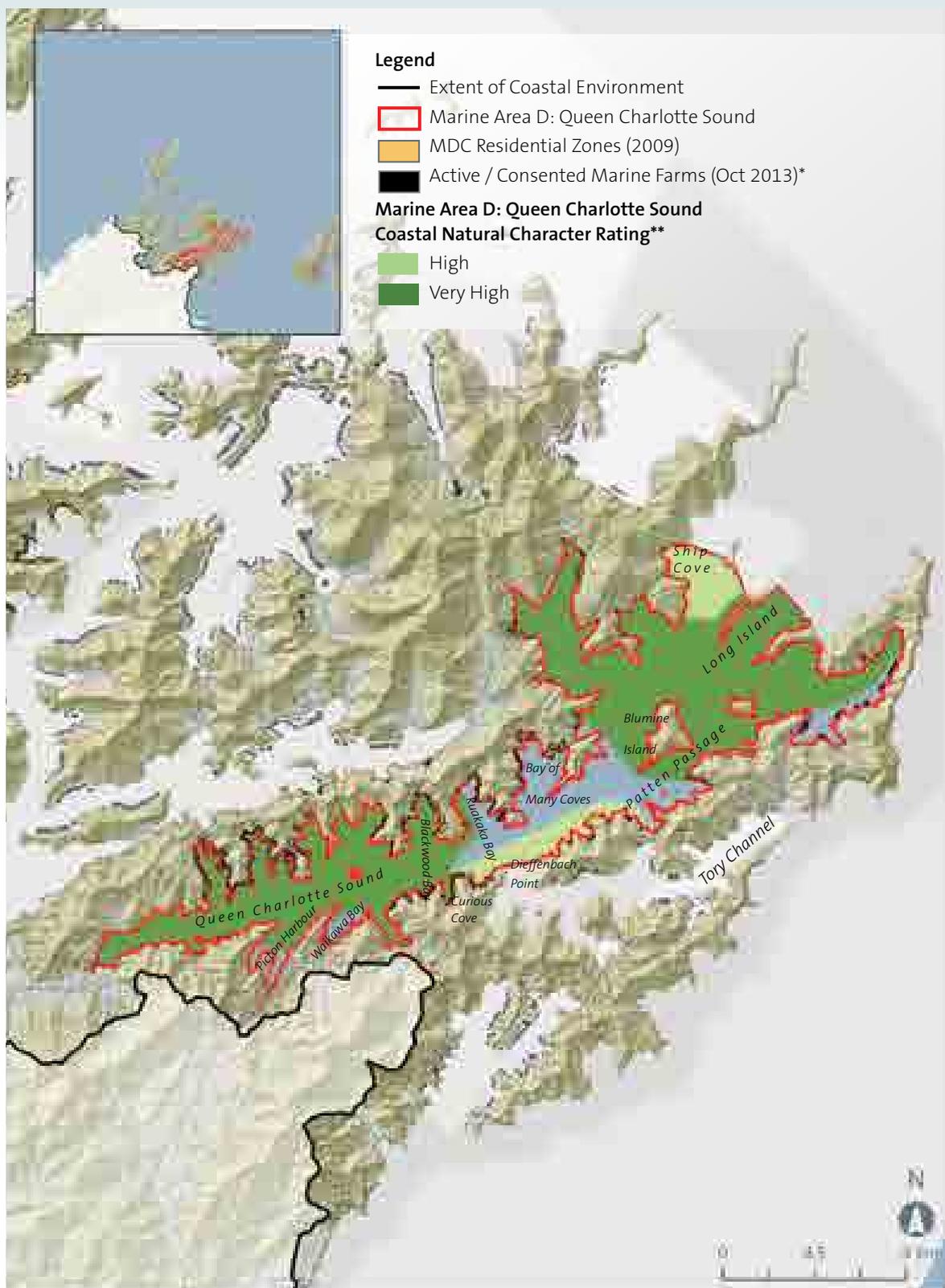
Outstanding Coastal Natural Character Area 10: Ship Cove & Resolution Bay,

Outstanding Coastal Natural Character Area 11: Islands of Queen Charlotte Sound,

Outstanding Coastal Natural Character Area 12: Mt. Stokes.



Above: The main channel of Queen Charlotte Sound



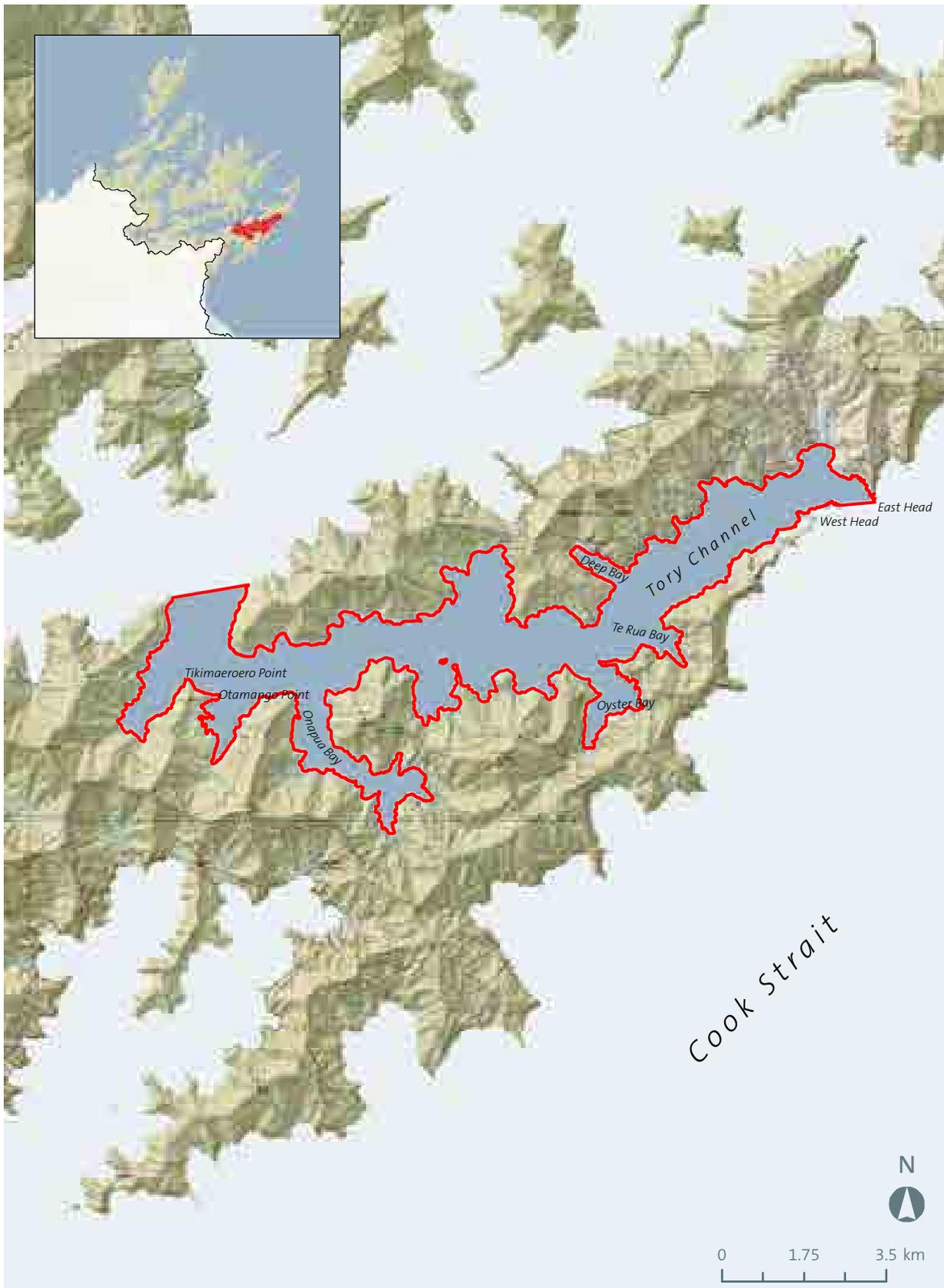
* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.

**Marine maps illustrate abiotic and biotic values only. Experiential values have been taken into consideration in the text and would represent a separate overlay on this map.

Coastal Marine Area E : Tory Channel

Collective Characteristics

Very sheltered; cold waters; strong currents; a narrow rock/cobble reef fringe bordered by well-sorted sands; silty sands and calcareous gravels in the bottom of the main channel; shallow muddy side bays; rich and abundant seaweed and invertebrate communities along channel margins.



Abiotic

Tory Channel is a narrow open-ended channel connecting Queen Charlotte Sound with Cook Strait. It is flanked by numerous shallow side bays and is very sheltered.

Cook Strait has a strong influence on Tory Channel's physical environment. In particular, Cook Strait drives the very strong tidal currents and strong tidal mixing which distinguish this area. Currents are strongest (up to 7 knots) between East and West Heads. Cook Strait is also the source of the cold, saline and nutrient-rich waters found within Tory Channel. Water clarity is generally good, though turbidity can be variable depending on sea conditions in Cook Strait and the size of the tide.

The tidal range is relatively small, exposing a narrow intertidal zone. Cobble, boulder and bedrock reefs fringe much of the channel's shoreline, interrupted by the occasional sand/gravel beach. Reefs extend subtidally for several metres before giving way to well-sorted sands and broken shell. Silt, muddy sands and calcareous gravels dominate the bottom of the main channel. Larger bays and inlets are dominated by mud/silt habitat.

Maximum depths in the main channel range from 30-75m. Side bays are much shallower (6-17m) and some have very shallow (1-3m) silt/sand bars extending across their mouths.

No commercial trawling or dredging occurs in Tory Channel. There is some aquaculture (salmon and shellfish farming) but it is mostly restricted to a small number of localities about half way along the channel. Forestry on surrounding hills may also cause local sedimentation issues.

Biotic

A comparatively rich and abundant macro-algae community – a mix of brown, green and red seaweeds – inhabits reef areas along the sides of the main channel. Neptune's necklace is common intertidally and stands of the giant kelp *Macrocystis pyrifera* are the most obvious below low water. Paddle weed and flexible flapjack are also abundant subtidally, as are various smaller green and red seaweeds beneath the kelp canopy. Paddle weed forms extensive forests on some moderately deep reefs and dense patches of the introduced North Pacific seaweed *Undaria* occur along the margins of the channel. Macroalgae give way to crustose coralline varieties on the deepest reefs.

Tory Channel also supports a diverse and abundant invertebrate community. Filter feeding species – anemones, sponges, ascidians and hydroids – are particularly noteworthy, especially on the deeper reefs. Numerous molluscs (e.g. chitons, paua, topshells, cats eye, turret shell) and echinoderms (e.g. kina, snake stars, sea cucumbers and several starfish), and a rich array of coastal fish species, are also present on the ►



Above: Tory Channel from Tikimaeroero Point and Otamango Point (foreground)

Coastal Marine Area E : Tory Channel

reefs and adjacent sediments.

Reef areas in the side bays support an array of invertebrates and algae similar to sheltered areas of Queen Charlotte Sound. Horse mussel and cockle beds occur in some side bays.

Various seabirds and marine mammals utilise Tory Channel (refer Collective Biotic Characteristics of the Marlborough Sounds Marine Environment). Bottlenose dolphins in particular are regularly seen feeding and travelling through this area. Large whales only rarely enter Tory Channel from Cook Strait.

Historically, ferry wakes (especially those from fast ferries) had a significant adverse effect on the diversity and abundance of shallow subtidal and intertidal species along Tory Channel. Following restrictions on ferry speeds and wakes introduced in 2000, a noticeable recovery of marine life occurred along the ferry route. However, for invertebrate communities inhabiting intertidal cobble and bedrock shores this recovery was reversed following the introduction of the Kaitaki in 2005; these particular communities continue to be adversely affected by ferry wash.

Experiential

This mainly sheltered waterway is moderately modified by a small number of salmon farms and mussel farms. Tory Channel is the main transportation route for the Cook Strait ferries offering a number of visitors their first close up view of the South Island when travelling from Wellington. Crayfish diving and spear fishing is also experienced in outer Tory Channel. The channel is reasonably narrow and there are a number of jetties and wharves located within more sheltered bays. Based on this, the waters of Tory Channel therefore display high experiential natural character values.



Above: Paua.

Level 3: Overall Area Rating for Coastal Marine Area E: Tory Channel

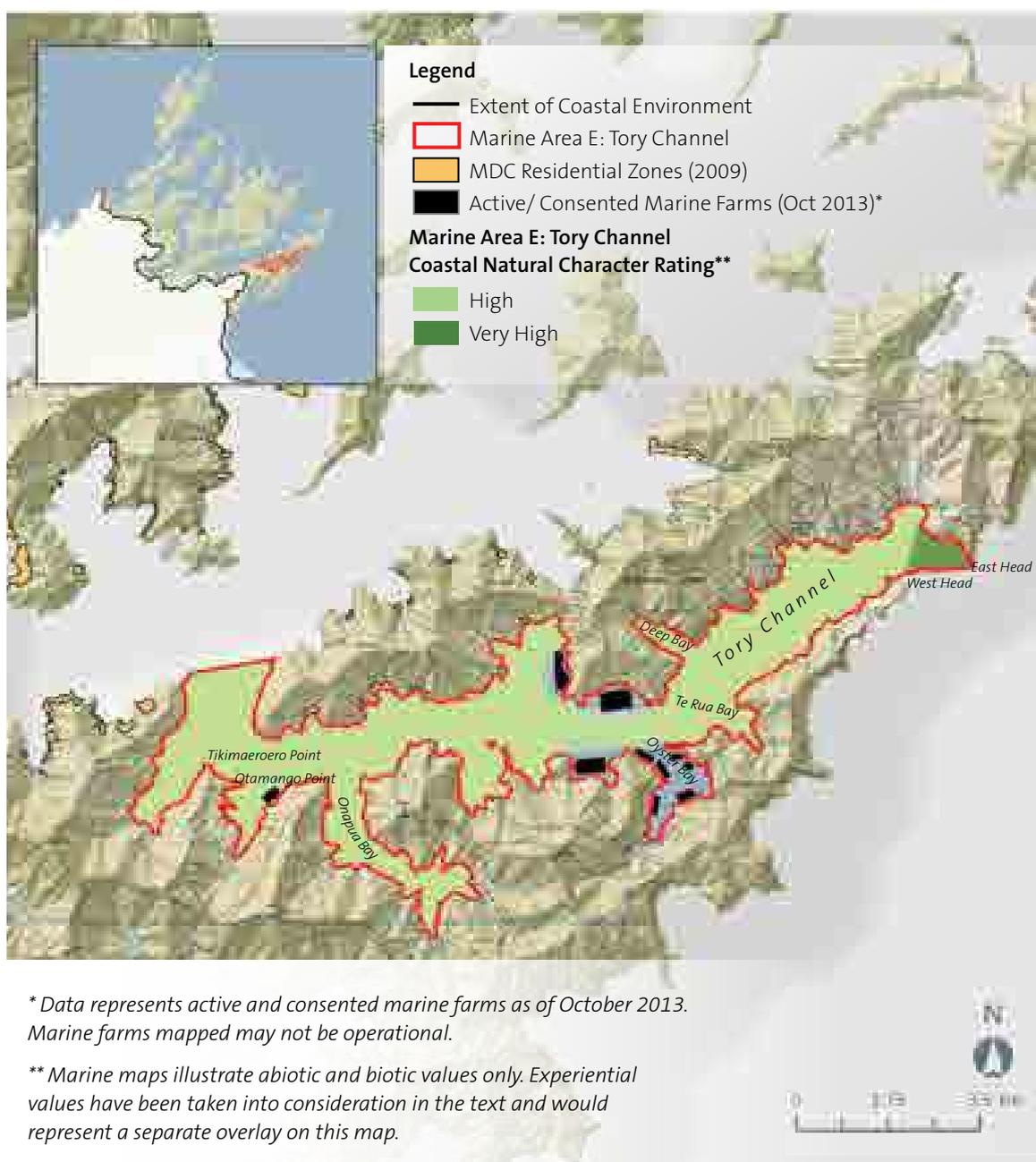
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High	✓	✓	✓
Moderate to High			
Moderate			
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			High

Levels 4 & 5: Specific Parts within Coastal Marine Area E: Tory Channel Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Eastern entrance to Tory Channel.	Very High	<p>Largely unmodified high current communities where Tory Channel meets the outer Cook Strait coast.</p> <p>Mostly protected from wave action except near the heads.</p> <p>Adjoins Coastal Marine Area G</p>	Extension of the Outer Queen Charlotte Sound – Eastern Cook Strait – Rarangi sub area (Coastal Marine Area G).

Levels 4 & 5: Specific Parts within Coastal Marine Area E: Tory Channel Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Tory Channel (excluding centrally located marine farming areas)	High	<p>Narrow deep channel dominated by strong tidal flows, sheltered wave climate and proximity to Cook Strait.</p> <p>Shallow side bays.</p> <p>Numerous ecologically significant marine sites distinguished by high current communities.</p> <p>Unique natural character area as a whole.</p> <p>Adjoins Coastal Marine Area G</p>	<p>The main marine farming areas in Tory Channel are excluded.</p> <p>Ferry wash continues to have an affect but is limited to exposed intertidal shores.</p> <p><i>Undaria</i> is widespread in shallow waters but is not considered to affect wider trophic/community structure and function significantly.</p> <p>Strong currents minimise sedimentation impacts along the main channel.</p>



Coastal Marine Area F : Port Underwood

Collective Characteristics

Mostly sheltered; often turbid; shallow waters; extensive mud bottom with narrow rock/cobble fringe; conspicuous brown seaweed community; offshore red algae beds; massive tube worm colonies in places.



Abiotic

Port Underwood has a highly indented coastline formed by two large bays at its head and numerous small bays around its perimeter. It is mostly sheltered, though the south-western shore is exposed to rough seas from the south. There is a small tidal range and while currents can be moderate in the outer regions of the Port, currents tend to be weaker in inner areas.

The water is generally cold. Water clarity is variable but can be particularly poor when southerly winds push turbid waters from Cloudy Bay into the Port, especially during flood events in the Wairau River. Sedimentation levels are correspondingly high at these times.

Port Underwood is relatively shallow (<20m). A narrow cobble and in places rocky reef fringes much of the shore, extending 10-40m offshore and to a depth of around 7m where a narrow band of silty-shell gravel normally takes over. An extensive and uniform mud/silt bottom dominates below about 9m depth. Small sandy beaches occur at the heads of several bays.

Some bottom trawling extends into Port Underwood and aquaculture is a significant feature around the central peninsula and along the eastern side of the Port. Forestry on surrounding hills may also cause local sedimentation issues.



Above: Aquaculture at Whangatoetoe Bay, Port Underwood.

Coastal Marine Area F : Port Underwood

Biotic

The area harbours a conspicuous brown seaweed community. Narrow flapjack fringes the shoreline at low water, with flexible flapjack, paddle weed and giant kelp dominating the deeper reef zone. Common reef invertebrates include paua and several other mollusc species, as well as numerous ascidians and a diverse array of anemones. Enormous tube worm mounds (*Galeolaria hystrix*) at two headlands along the south-eastern coast are notable features; these are by far the largest known colonies in Nelson and Marlborough.

There is generally a low diversity and abundance of conspicuous macro-organisms on the off-shore mud habitat, though red algae beds are a key feature in some bays.

A typical array of colder water coastal fishes inhabits the Port, along with some outer shelf and deep water species probably due to the proximity of Cook Strait. Port Underwood is also a rock lobster nursery area.

Various seabird and marine mammal species utilise these waters (refer to *Collective Biotic Characteristics of the Marlborough Sounds Marine Environment*). Of particular note are Hector's dolphins which visit the area from neighbouring Cloudy Bay. Port Underwood was also historically a Southern Right Whale calving area.

Experiential

This small, sheltered and highly indented water enclave harbours numerous mussel farms and small bach communities. Settlement occurs predominantly at the heads of many of the bays. Jetties and wharves are also present, as is an electricity transmission line, located predominantly along the western coastline, and all accessed via the Port Underwood Road. Views are foreshortened by the enclosing nature of the Port; however, vistas are gained looking southwards, beyond the Port entry.

Modification to the water in Port Underwood is moderate, and is amplified by its relatively enclosing form and numerous indented bays. Port Underwood is popular for holiday visits.



Above: Hakahaka Bay, Port Underwood

Level 3: Overall Area Rating for Coastal Marine Area F: Port Underwood

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

There are no specific parts of the Coastal Marine Area of Port Underwood that retain areas of High or Very High natural character at Levels 4 and 5

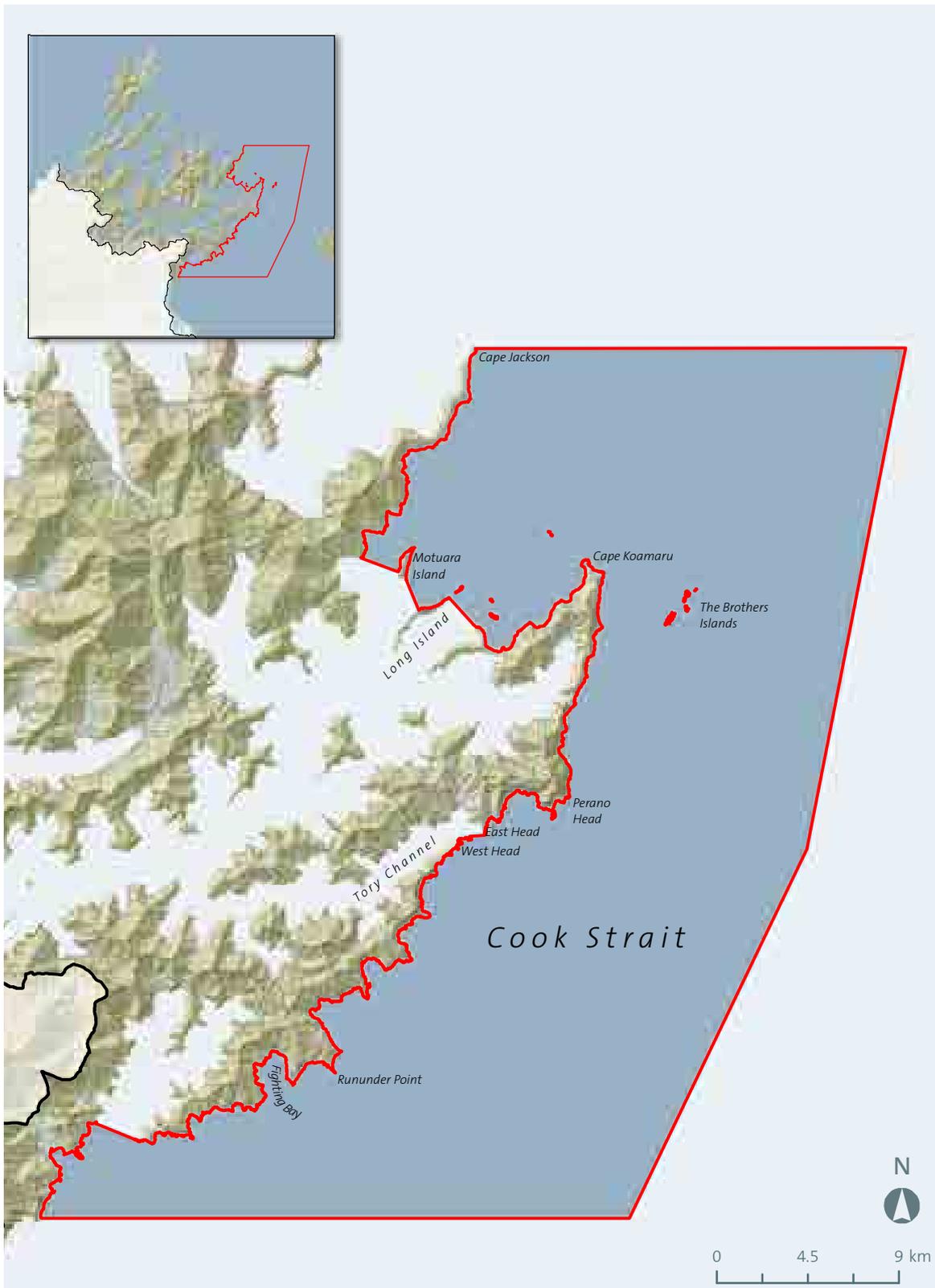


Above: Ocean Bay

Coastal Marine Area G : Eastern Cook Strait & Outer Queen Charlotte Sound

Collective Characteristics

Mostly very exposed; strong currents; cold, nutrient-rich waters; rich reef communities; kelp beds; mixed coarse sediments offshore; significant migratory route for whales.



Abiotic

This Coastal Marine Area on the western flank of Cook Strait is distinguished by a variably indented and mostly rugged coastline which is very exposed to winds and waves from the south and north-east. Southerly swells in particular drive into the exposed eastern shores, creating a very high energy coastline. Arapawa Island provides some protection to the northern entrance of Queen Charlotte Sound. Strong tidal currents are also a feature, especially off headlands, around offshore rocks and islands (e.g. the Brothers Islands) and near the entrance to Tory Channel.

Cold nutrient-rich waters bathe the region due to the influence of the Southland Current and upwelling within Cook Strait. Waters are generally well mixed. Turbidity is variable depending on location, sea state and the size of the tide, though water clarity tends to improve with distance away from Cloudy Bay.

Steeply sloping shores comprising bedrock and boulder reefs separated by gravel beaches dominate the near-shore environment. These are backed by high cliffs on the outer coast and steep hills in the mouth of Queen Charlotte Sound. There are also several offshore rocks, stacks and islands, the most notable being the Brothers Islands in Cook Strait.

Reefs generally extend down to 6-18m, though deeper than 60m off various headlands and offshore rocks and islands. Much of the deeper sea floor is

sandy gravels, medium-large cobbles and broken shell extending to more than 300m. Surface corrugations and mega-ripples distinguish the mobile sediments in shallower exposed places. A broad shallow (13-30m) sandy sill extends across the mouth of Queen Charlotte Sound. Silt is more prevalent towards the south of the bioregion.

Parts of the open eastern coast are trawled and commercial scallop dredging also occurs immediately to the north-west of Long Island. There is currently no aquaculture in this area.

Biotic

This marine area contains diverse and productive reef communities, with high macroalgae diversity.

Dense mixed stands of large brown seaweeds extend into relatively deep water (20m). Several large canopy forming species are present including strap kelp, oak-leaved seaweed, flapjack and *Marginariella spp.* in exposed sites, and paddle weed and *Macrocystis* in the more sheltered entrance to Queen Charlotte Sound. Numerous red, brown and green seaweeds are also present, often as a luxuriant sub-canopy.

Sessile filter feeding animals (e.g. sponges, anemones, zooanthids, hydroids and ascidians) thrive in reef areas below the seaweed zone, particularly where there are strong tidal currents. Awash Rock has a particularly diverse encrusting invertebrate community. ▶



Above: Sea Cliffs of Arapawa Island. Arapawa Island provides protection to the northern entrance of Queen Charlotte Sound (background)

Coastal Marine Area G : Eastern Cook Strait & Outer Queen Charlotte Sound

A range of seabed communities inhabit the offshore sediments depending on substrate, depth and exposure. Conspicuous invertebrates in silty/sandy sediments include various species of shellfish, brachiopods, echinoderms (brittle stars, starfish, and urchins) and crustaceans. Marine life is sparse on wave-worked gravels < 18m depth. Below this depth, stable gravels support up to 50% seaweed cover but a generally sparse invertebrate assemblage. Deeper still (170-200m) gravels and cobbles in Cook Strait are dominated by a brittle star species and an assemblage of sessile and encrusting invertebrates.

The area supports a wide variety of coastal and deeper water temperate fish, including some with a strong southern affinity. Various seabird and marine mammal species utilise these waters (refer Collective Biotic Characteristics of the Marlborough Sounds Marine Environment). Of particular note is Cook Strait's significance as a key migratory route for several species of large whale.

Experiential

This exposed and rugged coastline receives strong tidal currents with significant wave action. There is limited access to these parts and relatively limited recreational activity occurring. The open waters of Eastern Cook Strait and Outer Queen Charlotte Sound host numerous remote-related boating activities, including open-water fishing as well as acting as the principal shipping route between Picton and Wellington. The Brothers Islands act as a remote reference point for boaties. There are also memorable attributes relating to the expansive visual connection between the North and South Islands, particularly seen by passengers on the Cook Strait ferry.

There are no aquaculture related activities present. The submarine Cook Strait electricity and telecommunications cable stretches from Fighting Bay to Oteranga Bay (Wellington), however, it is unseen from the surface.



Above: The Brothers in Eastern Cook Strait

Level 3: Overall Area Rating for Coastal Marine Area G: Eastern Cook Strait & Outer Queen Charlotte Sound

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		Very High

Levels 4 & 5: Specific Parts within Coastal Marine Area G: Eastern Cook Strait & Outer Queen Charlotte Sound Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Outer Queen Charlotte Sound – eastern Cook Strait – Rarangi	Very High	<p>Largely unmodified coastal marine environment extending over many tens of kilometres.</p> <p>Semi-exposed to very exposed and subjected in places to strong tidal currents.</p> <p>Diverse and productive reef communities with high macroalgae diversity.</p> <p>Large whale (notably humpback whale) migration route.</p> <p>Several ecologically significant marine sites.</p> <p>Long Island – Kokomohua Marine Reserve.</p> <p>Scenic reserves in the outer Queen Charlotte and along the outer coast of Arapawa Island.</p> <p>Includes the Brothers Islands and the rugged outer coast bordering Cook Strait.</p> <p>Adjoins Coastal Marine Areas B, D, E, F and H.</p>	<p>Excludes an area around Motuara Island and offshore from Ship's Cove which is commercially dredged for scallops.</p> <p>Certain offshore areas in Cook Strait are commercially trawled.</p>
Ship Cove – Motuara Island	High	<p>Largely unmodified intertidal and near-shore marine environment backed by significant naturally forested hill slopes.</p> <p>Motuara Island.</p> <p>Bordered by Long Island – Kokomohua Marine Reserve.</p> <p>Small areas of <i>Macrocystis</i> kelp near Motuara Island.</p> <p>A significant horse mussel bed and reef community at the northern end of Motuara Island.</p> <p>Adjoins Coastal Marine Area D</p>	<p>Offshore areas are modified by commercial scallop dredging between Long Island – Kokomohua Marine Reserve and the mainland at Ship Cove.</p>

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 5: Eastern Arapawa & The Brothers,

Outstanding Coastal Natural Character Area 9: The Capes,

Outstanding Coastal Natural Character Area 11: Islands of Queen Charlotte Sound.





* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.

**Refer to page 23 and Appendix 6 for limitations on the offshore extent of biotic & abiotic assessments. Marine maps illustrate abiotic and biotic values only. Experiential values have been taken into consideration in the text and would represent a separate overlay on this map.

Opposite: West Head



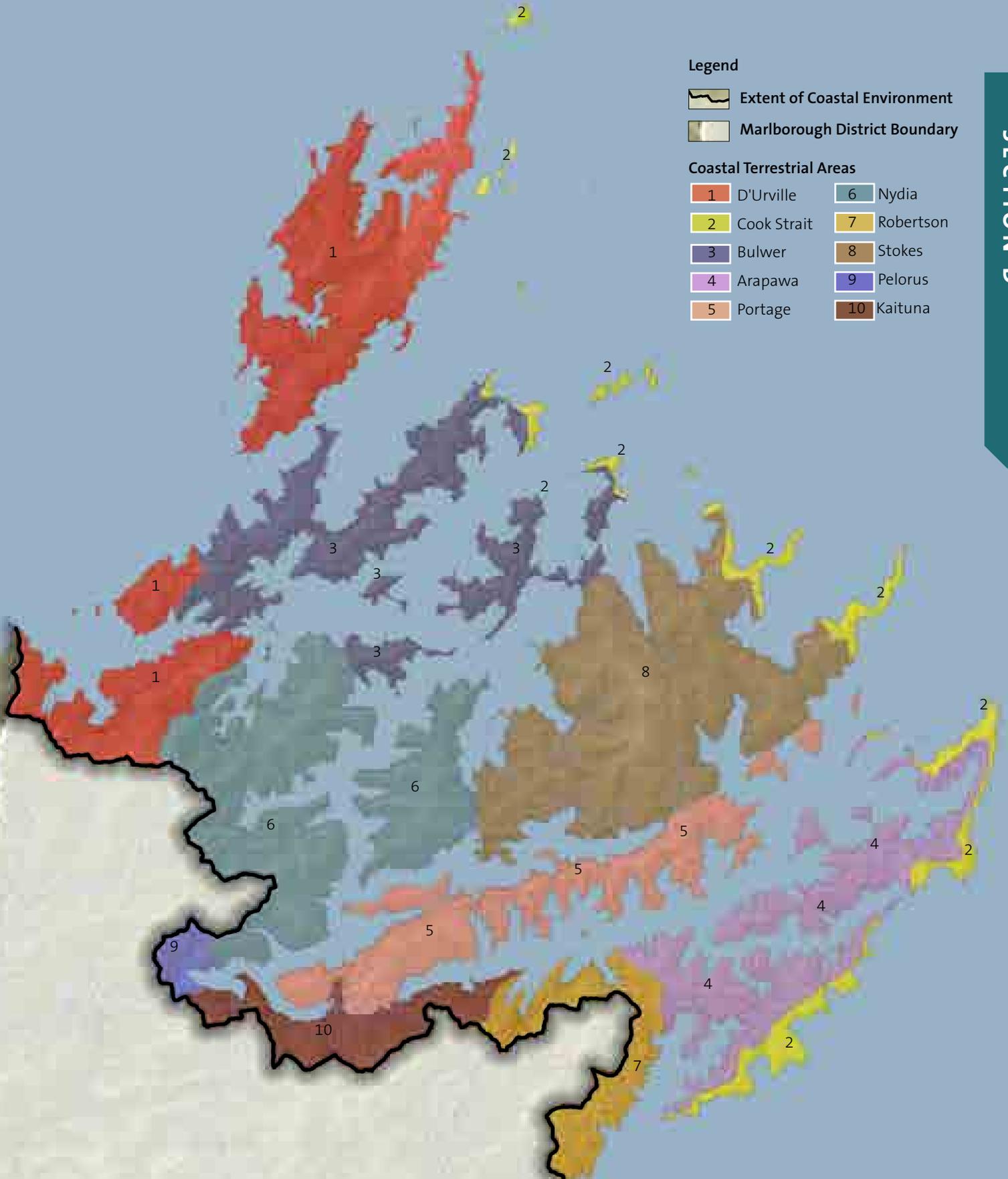
**MARLBOROUGH SOUNDS
COASTAL TERRESTRIAL
AREAS**

Legend

-  Extent of Coastal Environment
-  Marlborough District Boundary

Coastal Terrestrial Areas

- | | |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
|  1 D'Urville |  6 Nydia |
|  2 Cook Strait |  7 Robertson |
|  3 Bulwer |  8 Stokes |
|  4 Arapawa |  9 Pelorus |
|  5 Portage |  10 Kaituna |



MAP 8: MARLBOROUGH SOUNDS COASTAL TERRESTRIAL AREAS



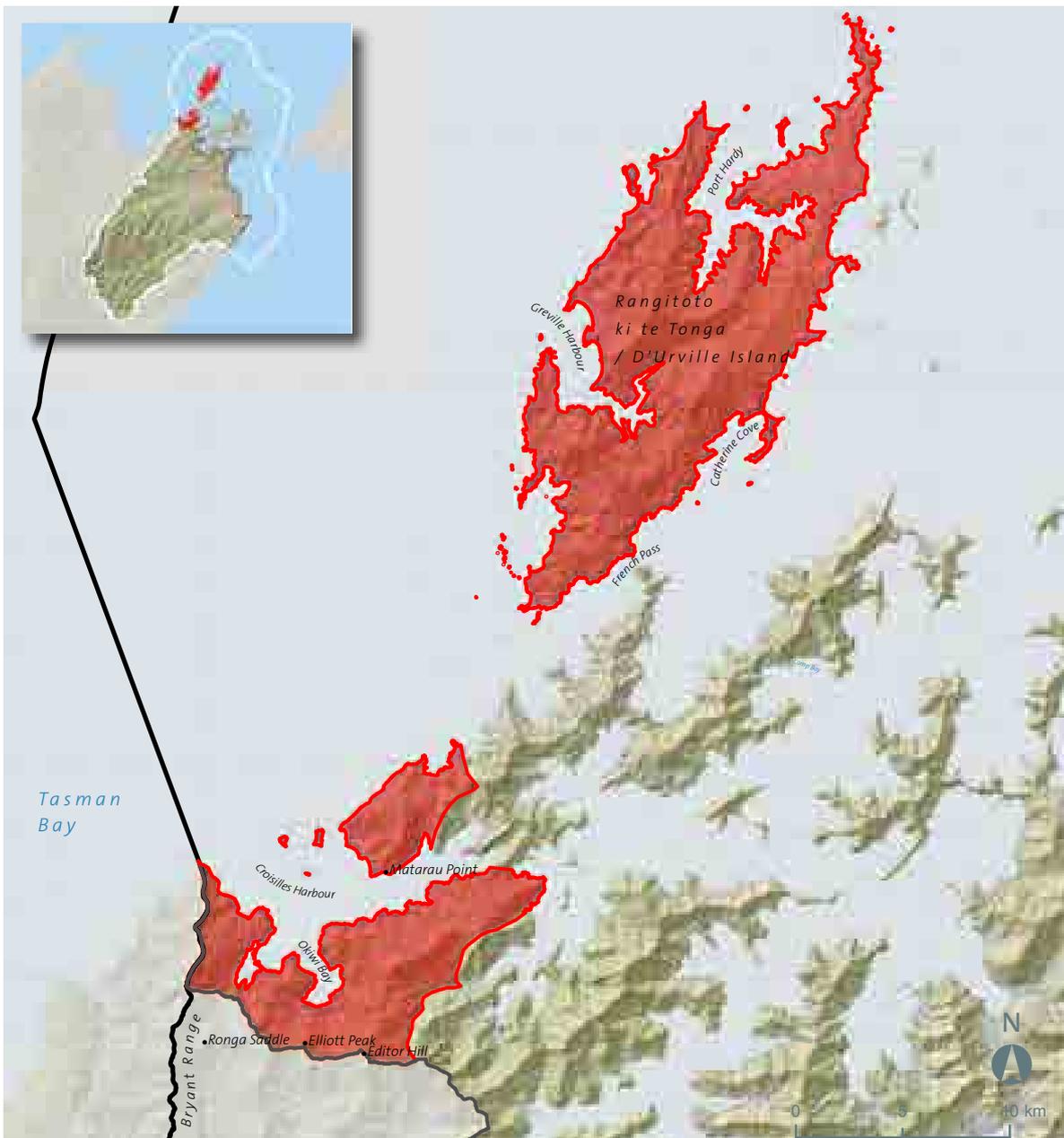
Coastal Terrestrial Area 1 : D'Urville

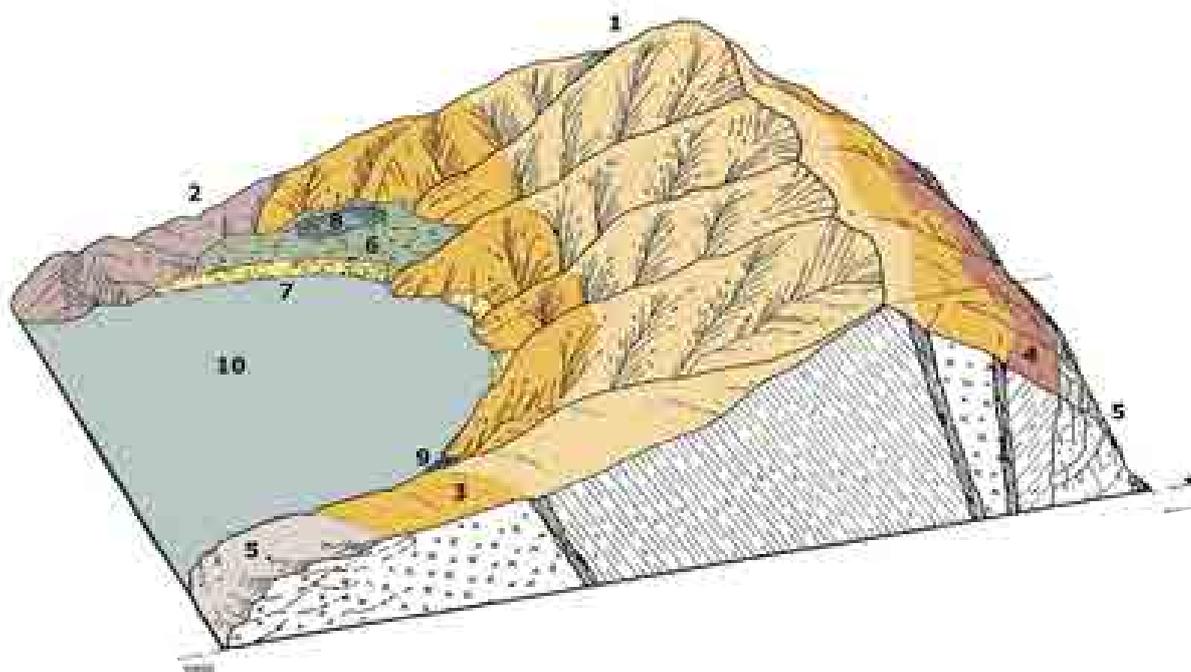
Collective Characteristics and Coastal Context

Hard Beech, Manuka, Weka, Bellbird, Coastal Ultramafic-Dominated Ecosystem

Steep hills and mountains typify this land ecosystem with bluffy sea cliffs and headlands in many places. Large drowned river valley harbours feature a varied array of coastal landforms including numerous inlets, spits, estuaries, beaches, lagoons and minor fans. Elevation is moderately low but rainfall moderately high in places as the landmass is being constantly buffeted on all fronts by the sea, has a strong maritime influence and is subject to frequent sea storms. Characteristic base-rich rocks eventuate from deep within the earth's mantle. Soils derived from these rocks lack many essential nutrients and have toxic concentrations of trace elements resulting in inhospitable conditions and unusual vegetation. There are many streams, some quite large and extensive tracts of native vegetation.

The coastal context extends south, beyond the Elliot Peak/ Editor Hill ridge, into the upper northern Pelorus catchment. River valleys here are typically modified close to the river on the flatter land. Agriculture and plantation forestry dominate. The mid and upper slopes are clothed with indigenous vegetation. The Ronga/Croisilles Road straddles the Ronga Saddle, connecting Okiwi Bay with the northern upper Pelorus. The Bryant Range forms the westernmost and territorial boundary.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper hill and mountain slopes on sedimentary rocks	Sandstone, siltstone and minor limestone and conglomerate of the Maitai Group	>500	Red beech-silver beech forest. Silver beech forest with halls totara, southern rata & miro.	Red beech-silver beech forest. Silver beech forest with halls totara, southern rata & miro.
2	Moderately steep to steep lower hill slopes on sedimentary rocks	Sandstone, siltstone and minor limestone and conglomerate of the Maitai Group	0–500	Forest Kohekohe-karaka forest. Kohekohe-tawa-nikau forest. Mahoe-mixed broadleaf forest. Hard beech forest with kamahi; hinau, tanekaha in places & scattered emergent rimu. Pukatea-mahoe, nikau-supplejack-mixed broadleaf forest. Kanuka forest with ponga, fivefinger, mingimingi, Gahnia, heketara Scrub Rewarewa-manuka scrub. Manuka scrub. Vineland Nikau-kiekie vineland.	Forest Kohekohe-karaka forest. Kohekohe-tawa-nikau forest. Hard beech forest with kamahi, hinau, tanekaha in places & scattered emergent rimu. Pukatea-mahoe-nikau-supplejack-mixed broadleaf forest.
3	Rolling, moderately steep to very steep lower hill slopes on ultramafic and serpentinic rocks [prone to slumps and earthflows]	Dun Mountain Ultramafic and Livingstone Volcanics Groups and Croisilles melanges	0–550	Hard beech-southern rata-kamahiri-rimu-lancewood forest and treeland. Manuka-southern rata-kamahiri-inaka shrubland. Manuka scrub. Manuka-square rush rush-shrubland. Manuka-inaka heathland.	Hard beech-southern rata-kamahiri-rimu-lancewood forest and treeland. Manuka-southern rata-kamahiri-inaka shrubland. Manuka scrub. Manuka-square rush rush-shrubland.

Coastal Terrestrial Area 1 : D'Urville

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
3				Coprosma-weeping mapou-inaka shrubland. Turfland, herbfield and boulderfield. Umbrella fern-comb sedge turfland. Raoulia-Epilobium open-herbfield	Manuka-inaka heathland. Coprosma-weeping mapou-inaka shrubland. Turfland, herbfield and boulderfield. Umbrella fern-comb sedge turfland. Raoulia-Epilobium open-herbfield.
4	Rolling, moderately steep to very steep low hill slopes on basic igneous rocks	Part Brook Street Volcanics Group	0–500	Hard beech-black beech-kamahi forest, with rimu, miro, hinau and other broadleaved trees. Kamahi-inaka-manuka-kanuka-fivefinger low forest and shrubland. Manuka-kanuka low forest and shrubland, with varying amounts of broadleaved species.	Hard beech-black beech-kamahi- rewarewa forest, with rimu, miro, hinau and other broadleaved trees. Kamahi-inaka-manuka-kanuka-fivefinger-rewarewa low forest and shrubland. Manuka-kanuka low forest and shrubland, with varying amounts of rewarewa and other broadleaved species.
5	Steep to precipitous eroding sea cliffs, [some large-scale slope failures]	Part Maitai, Brook Street Volcanics Dun Mountain Ultramafic, Livingstone Volcanics Groups and Croisilles melanges	0–250	Forest Akiraho-puka-wharariki-rangiora-kiekie forest on coast fringe. Scrub and Shrubland Taupata-ngaio scrub & shrubland. Tussockland Silver tussock and/or knot sedge tussockland. Herbfield and Rockland Wharariki-rengarenga-rauhua flax-herbfield coastal fringe. Horokaka rockland.	Forest Akiraho, puka-wharariki rangiora-kiekie forest on coast fringe. Scrub and Shrubland Taupata-ngaio scrub & shrubland. Tussockland Silver tussock - knot sedge tussockland. Herbfield and Rockland Wharariki-rengarenga-rauhua flax-herbfield coastal fringe. Horokaka rockland.

Above: *Raoulia 'hookeri' coast'*

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
6	Minor prograding inlet heads and fans	Recent alluvium from predominantly sedimentary rocks, swamp deposits	0–20	Forest and Treeland Tawa-mixed broadleaf forest. Swamp maire treeland. Kahikatea-pukatea mixed broadleaf tall swamp forest. Matai rimu miro kahikatea forest with scattered tawa, tanekaha, mahoe, kiekie. Rimu-matai-miro-hinau mixed broadleaf forest. Shrubland *Manuka/baumea shrubland.	Forest Kahikatea-pukatea mixed broadleaf tall swamp forest. Kahikatea-swamp maire-pukatea forest. Kahikatea-matai-totara-tawa forest. Matai-rimu-miro-kahikatea forest with tawa, tanekaha, mahoe, kiekie. Rimu-matai-miro-hinau mixed broadleaf forest.
7	Barrier spits tombolos, beach ridges and dunes	Recent marine sand and gravel	0–20	Raoulia sand flats. Pohuehue vineland on boulder bank.	Raoulia sand flats. Pohuehue vineland on boulder bank. Spinifex-pingao duneland.
8	Lagoons and estuaries	Recent fluvial and lagoonal deposits	0–3	Scrub Marsh ribbonwood-coastal shrub daisy- <i>Coprosma propinqua</i> estuary scrub. Rushland, Sedgeland and Reedland Giant spike rush rushland. Oioi-sea rush estuarine rushland. Raupo-pukio reedland. Rautahi-pukio sedgeland Herbfield Sea primrose-remuremu-glasswort- <i>Carex litorosa</i> herbfield.	Shrubland Marsh ribbonwood-coastal shrub daisy- <i>Coprosma propinqua</i> estuary shrubland. Rushland, Sedgeland and Reedland Giant spike rush rushland. Oioi-sea rush estuarine rushland. Raupo-pukio reedland. Rautahi-pukio sedgeland Herbfield Sea primrose-remuremu-glasswort- <i>Carex litorosa</i> herbfield.
9	Confined inlets [Okiwi Bay, Camp Bay]	na	sea level	na	na
10	Large drowned river valley harbours [Port Hardy, Greville and Croisilles harbours]	na	sea level	na	na

Coastal Terrestrial Area 1 : D'Urville

Abiotic

The D'Urville Coastal Terrestrial Area is characterised by a unique combination of ultramafic dominated basement rock types and a grouping of coastal erosional steepland and depositional landforms. The underlying geology comprises ultrabasic, intermediate, and acid intrusive and extrusive rocks, and serpentinitic melange (collectively known as the mineral belt rocks); associated hard and very hard poorly bedded and well bedded sandstone and siltstone sedimentary strata; with minor alluvium and dune sand. Soils derived from the ultrabasic rocks have severe nutrient imbalances and sometimes toxic levels of exchangeable magnesium, whereas those derived from Brook Street Volcanic Group rocks are of medium fertility, and those from siliceous sedimentary rocks range from low to medium fertility. Dominant landforms include coastal, steep to moderately steep, dissected hill and mountain slopes to 1,032m; very steep to precipitous sea cliffs and headlands; large sheltered drowned river valley harbours [Port Hardy, Greville and Croisilles harbours]; confined coastal inlets, barrier spits and tombolos, estuaries and lagoons, rolling beach ridges and dunes; and undulating to rolling fans and prograding inlet head deltas.

The sheltered coastal lagoons are regionally rare. Nationally important geological and landform features present in the D'Urville Coastal Terrestrial Area include the Matarau Point beach ridge gravel foreland, Greville Harbour boulder spit; and serpentinitic breccias along parts of western coast. Regionally important landforms include: Pakiaka Point barrier island and lagoon; the Greville Harbour barrier dune system, and associated lagoon and swamp; French Pass partly submerged ridgeline and reef; and the Whangarae and D'Urville Island limestone outcrops. Valley floor landforms and floodplains are a minor component of this area.

The area has a windy strongly maritime climate

with warm, summers and mild winters being largely surrounded by sea and exposed to salt spray from many directions. Localised frost-free ecological niches are common. Rainfall is moderate to high, 1,100 – 2,000 mm per year, increasing significantly with elevation and lowest at the northern end of D'Urville Island. Exposure to wind is high, severe gales, storms, and high intensity rainfalls are common and often result in severe localised mass movement erosion.

Low gradient streams with good pool-riffle structures and quality in-stream habitat and riparian cover are common. There are also numerous large, permanent-flowing freshwater streams with stable substrate. Water quality is excellent from streams draining from native forest.

Elevation ranges from 0 – 1,032 m, with a mean altitude 250 m.

Biotic

Summary analysis: Total area of D'Urville Coastal Terrestrial Area is 25,300ha, of which 37% native forest, 40% native shrubland, 6% exotic treeland, 16% pasture and 0.1% exotic scrub. This biotic environment forms part of the Department of Conservation's D'Urville and Sounds Ecological Districts.

Originally, this area was predominantly covered with indigenous forest. Indigenous vegetation loss has been largely on lowland, maritime peninsulas, west-facing slopes and gentle topography, especially alluvium. Upland vegetation largely is intact.

Original non-forest vegetation is confined to exposed or heavily mineralised ultramafic areas, estuaries, freshwater wetlands, dunes, spits and barrier beaches, coastal bluffs, exposed islands and stacks.

There are a number of distinctive biota, communities and habitats. Of the communities and habitats, coastal, lowland and upland ultramafic vegetation is



Above: The banded kokopu is a real signature species in the Sounds

extensive, very distinctive, and an important habitat which is vulnerable to disturbance and loss. It retains very low productivity with a low species diversity but is highly distinctive. Some communities, especially tussocklands, rocklands, shrublands and stunted forest are endemic to the mineral belt, due to the tolerance by their species to high levels of trace elements, especially nickel. These are nationally important, with the coastal ultramafic communities, being unique in New Zealand.

Other communities include dune, spit, beach, lagoon, freshwater wetland, estuarine and alluvial communities, which are all very distinctive and rare in the Sounds. They are all important habitats and add considerably to the biodiversity, biotic patterns, and productivity of the ecosystem. These areas include some of the most extensive and least modified freshwater wetlands in the Sounds.

Island communities here are nationally important. They are distinct and rare biotic assemblages, which are highly productive. Some predator-free, others free of major predators (e.g. no possums on D'Urville) allowing for survival of species, communities and processes now under threat on the mainland.

Forest communities, especially with kohekohe, titoki or southern rata, are nationally important due to their lack of possums. This area also contains one of the more extensive tracts of lowland forest remaining in Marlborough.

Coastal shrublands are also distinctive and endemic to Cook Strait.

Upland biotic patterns are still largely intact. Lowland and coastal patterns are often fragmented. There is still very good connections between some communities, allowing for movement of biota and buffering from threats.

Native fisheries values are very high with diverse assemblages of native fish species. There is an absence of introduced freshwater fish. Generally very good access for threatened fish species due to coastal their proximity. Shortfin and longfin eel populations occur in coastal lagoons with common bully and smelt and inanga often abundant.

Overall, natural biodiversity of communities and species is exceptional.

The following are notable plant species found in the D'Urville coastal terrestrial area: *Hebe rigidula* var. *sulcata* -t,ee; *Atriplex cinerea* -t; Cooks scurvy



Above: Kiekie, *Freycinetia banksii* fruit

grass -t; *Pterostylis tasmanica* -t; bamboo tussock -t; *Hebe urvilleana* -r; *Coprosma obconica* -r; white mistletoe -r; yellow mistletoe -r; sand coprosma -r; porcupine shrub -r; *Melicytus* aff. *obovatus* -r; *Olearia serpentina* -r; large-leaved milktree -r; *P. longifolia* -r; *Craspedia* 'ultramafic' -r; *Euphorbia glauca* -r; *Poranthera microphylla* -r; *Raoulia* aff. *hookeri* -r; *Tetragonia tetragonoides* -r; *Dichelachne inaequiglumis* -r; *Chionochloa defracta* -r; *Rytidosperma petrosum* -r; *Spinifex sericeus* -r; *Drymoanthus flavus* -r; *Carex devia* -r; *Carex litorosa* -r; pingao -r; *Adiantum formosum* -r; *Pleurosorus rutifolius* -r; matagouri; rewarewa; hangehange; tanekaha; hutu; raukawa; black maire; *Hebe elliptica*; *Pimelea gnidia*; *Gingidia montana*; *Euphrasia cuneata*; *Bulbophyllum pygmaeum*; *Corybas cheesemani*; *Gahnia lacera*; *Lepidosperma laterale*; *Machaerina huttonii*; *Schoenus nitens*.

The following are types of animals found:

Powelliphanta 'obscura' -r,e; South Island long-tailed bat -t; fernbird -r; king shag -t,e; pied shag -t; reef heron -t; spotless crane -r; sooty shearwater -r; fluttering shearwater; diving petrel; white-fronted tern -r; little blue penguin -r; western weka; spotted skink -r; Marlborough green gecko -r,e; NZ longfin eel -r; blue-gill -r and redfin bullies -r; shortjaw kokopu -r; giant kokopu -r; inanga -r; koaro -r; lamprey -r; dwarf galaxias -r; banded kokopu; common bully; shortfin eel; giant bully, smelt; *Wainuia nasuta* -t; D'Urville Island slug (*Pseudaneitea johnsi*) -ee.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

ee = endemic to D'Urville Coastal Terrestrial Area

Coastal Terrestrial Area 1 : D'Urville

Experiential

This Coastal Terrestrial Area is characterised by a unique combination of ultramafic dominated basement rock types and a grouping of coastal erosional steepland and depositional landforms. This includes D'Urville Island to the north and the majority of the land form surrounding Croisilles Harbour to the south.

With an area of 150km², D'Urville Island is the eighth largest island of New Zealand and the largest in Marlborough. Separated from the mainland by the tortuous passage of French Pass, the island is home to approximately 52 permanent residents. There are a few roads on the island with much of the modification restricted to the shoreline. The island holds extremely high experiential values, partially due to its semi-remoteness and dark, night-time skies, but equally due

to its perceived lack of modification. There are numerous campsite and visitor accommodation areas and the island boasts exceptional ecological and naturalness values as it is free of possums, feral goats and ship rats (kiore and Norwegian rat are present though).

At the southern end of this Coastal Terrestrial Area, the main area of settlement in Croisilles Harbour is Okiwi Bay. The area is accessed by the sinuous road extending to French Pass and Port Ligar in the north, beyond this character area. The higher elevated land tends to be covered with indigenous forests. Similar to D'Urville Island, this southern part of the character area is also known for its high experiential values, due to the relative lack of modification and high degree of naturalness.

Level 3: Overall Area Rating for D'Urville Coastal Terrestrial Area

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			Very High



Above: Whangarae Estuary, Pakiaka Point barrier Island and Lagoon. Croisilles Harbour. Moukirkiri Island and Otuhaereroa Islands are located at the far left

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 1: D'Urville Holding High or Very High Natural Character

General Values applicable to the whole Coastal Terrestrial Area

This area is characterised by a unique combination of ultramafic dominated basement rock types; The sheltered coastal lagoons are regionally rare

Upland vegetation is largely intact.

Sub Area	Rating	Key Values	Additional Comments
D'Urville Island	Very High with small parts High	<p>Nationally important geological and landform features including Greville Harbour boulder spit; and serpentinitic breccias along parts of western coast. It contains regionally important landforms including: the Greville Harbour barrier dune system, and associated lagoon and swamp; French Pass partly submerged ridgeline and reef; and the D'Urville Island limestone outcrops.</p> <p>Island communities here are nationally important with distinctive biota, communities and habitats. Some communities, especially tussocklands, rocklands, shrublands and stunted forests are endemic to the ultramafic "mineral belt" and nationally important, with the coastal ultramafic communities, being unique in New Zealand. Also present are dune, spit, beach, lagoon, freshwater wetland, estuarine and alluvial communities, which are all very distinctive and rare in the Sounds. Overall, natural biodiversity of communities and species is exceptional.</p> <p>D'Urville Island is a refuge for nationally threatened fauna and flora It is one of the largest areas that are free of possums and feral goats in New Zealand.</p> <p>D'Urville Island and its smaller islands hold extremely high experiential values, partially due to its semi-remoteness and dark, night-time skies, but equally due to its perceived lack of modification.</p>	Areas of pasture and commercial forestry included within 'High' rating

Table continues overleaf

Coastal Terrestrial Area 1 : D'Urville

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 1: D'Urville Holding High or Very High Natural Character

General Values applicable to the whole Coastal Terrestrial Area

This area is characterised by a unique combination of ultramafic dominated basement rock types; The sheltered coastal lagoons are regionally rare

Upland vegetation is largely intact.

Sub Area	Rating	Key Values	Additional Comments
Croisilles Harbour Area	Very High with small parts High	<p>Nationally important geological and landform features including Matarau Point beach ridge gravel foreland.</p> <p>Regionally important landforms including: Pakiaka Point barrier island and lagoon; Taipare and Whangarae limestone outcrops.</p> <p>Island communities here are nationally important with distinctive biota, communities and habitats. Some mainland communities, especially tussocklands, rocklands, shrublands and stunted forests are endemic to the ultramafic "mineral belt" and nationally important, with the coastal ultramafic communities, being unique in New Zealand. Also present are dune, spit, beach, lagoon, freshwater wetland, estuarine and alluvial communities, which are all very distinctive and rare in the Sounds. Overall, natural biodiversity of communities and species is exceptional.</p> <p>High experiential values due to lack of modification.</p>	

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 1: D'Urville Island,

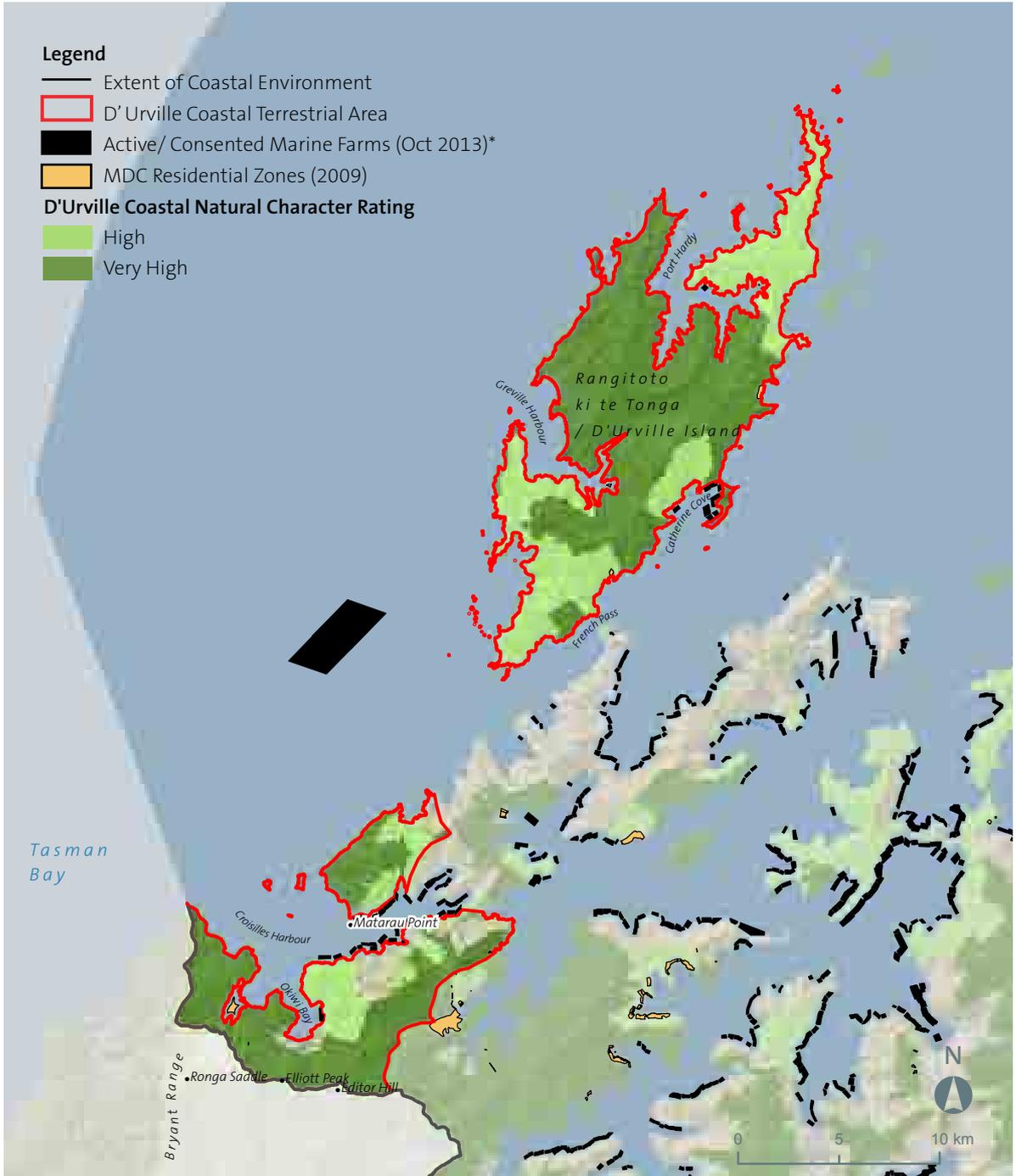
Outstanding Coastal Natural Character Area 2: French Pass,

Outstanding Coastal Natural Character Area 3: D'Urville Islands,

Outstanding Coastal Natural Character Area 6: Croisilles Harbour



Above: East Arm, D'Urville Island. Buildings at Camp Bay can be seen on the right



* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



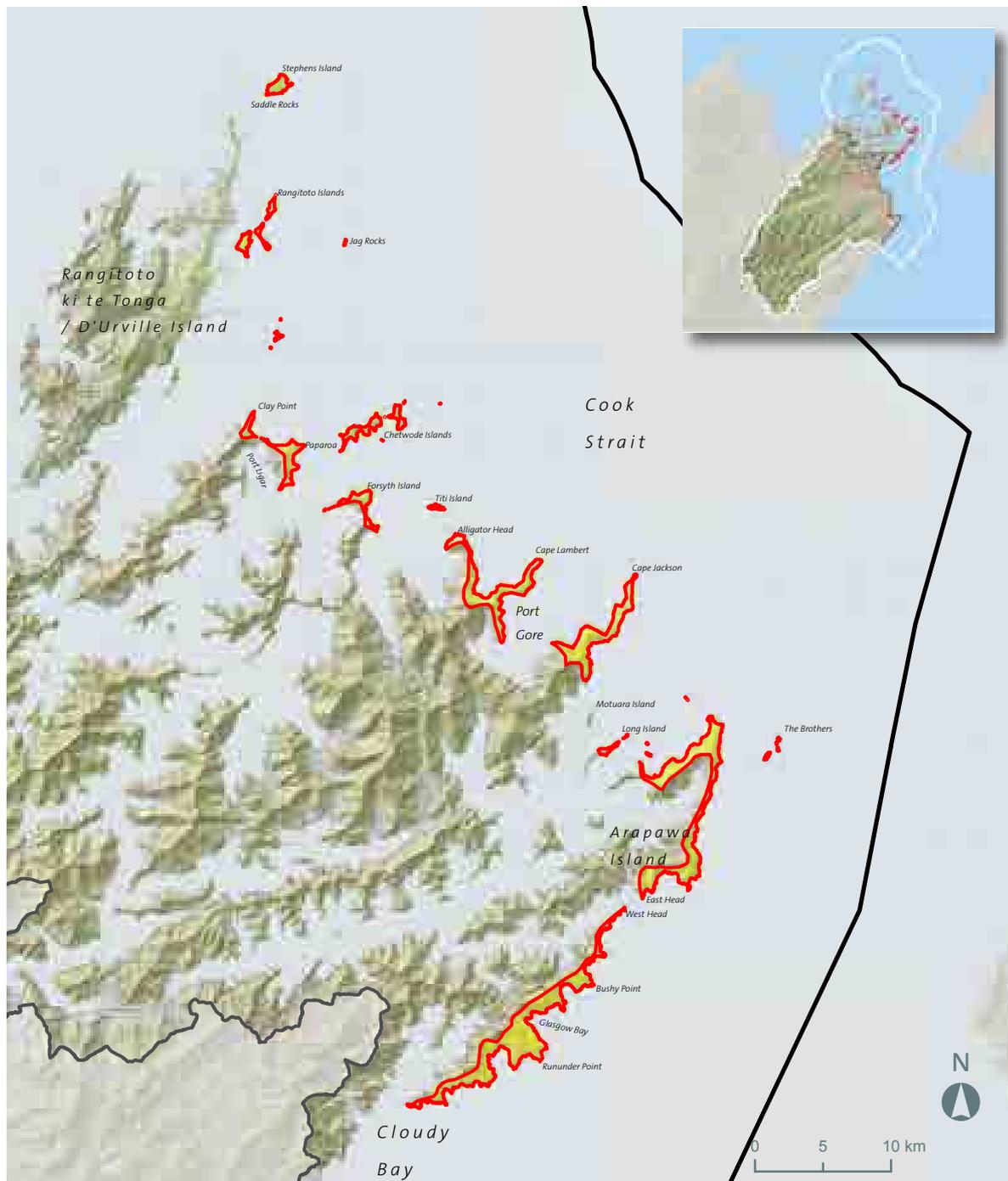
Above: Two Bay Point (left) and Moawhitu Wetland (centre) at the western side of D'Urville Island.

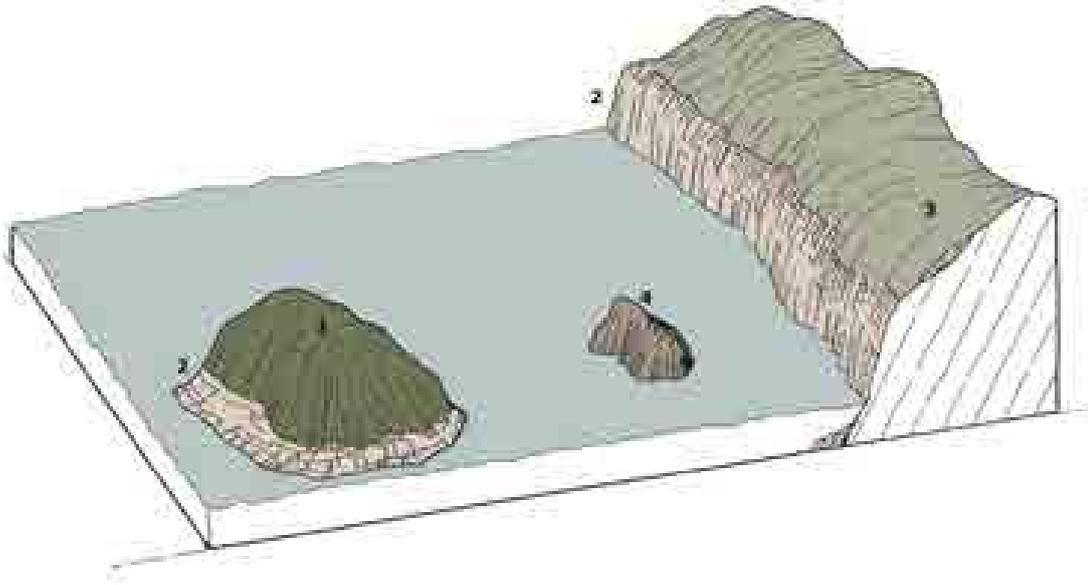
Coastal Terrestrial Area 2 : Cook Strait

Collective Characteristics

Taupata, Ngaio, Rengarenga, Tuatara, Diving Petrel, Exposed, Dry, Maritime Ecosystem

This Coastal Terrestrial Area is highly exposed and maritime with a high coherence of cliff face landforms and a collection of jagged stacks and harsh rocky islands. Steep, exposed and imposing sea cliffs, peninsulas and headlands are dominant landforms creating a wild and scenic sea coast. Dry climate is coupled with small catchment areas and few streams. Elevation is low and rocks are predominantly a range of schists and sedimentary strata. Exposure and maritime influence is extreme. Brutal exposure to maritime elements has shaped a unique Cook Strait vegetation. The sheer nature of the topography and its inaccessibility has left some areas, especially islands, predominantly in a natural state. There is a high aesthetic coherence of pastoral landcover. Numerous island sanctuaries (Stephens, Chetwode, Titi & Brothers Islands) supporting many nationally threatened species including tuatara on Stephens and North Brother Islands, and king shags on rock stacks.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep, dissected, cliff-bounded islands	Predominately t.z 11 and t.z. 111 schist of the Caples Group	0–280	<p>Forest and Shrubland Ngaio-taupata forest and shrubland. Kohekohe-karaka-nikau forest. Kohekohe-broadleaved milktree forest Vineland Pohuehue vineland.</p> <p>Herbfield Silver tussock-muttonbird groundsel tussock-herbfield. Glasswort herbfield.</p>	<p>Forest and Shrubland Ngaio-taupata forest and shrubland. Kohekohe-karaka-nikau forest. Kohekohe-broadleaved milktree forest.</p> <p>Herbfield Silver tussock-muttonbird groundsel tussock-herbfield. Glasswort herbfield.</p>
2	Very steep to precipitous sea cliffs with extensive rock outcrop	Predominately t.z 11 and t.z. 111 schist and sedimentary rocks the Caples Group	0–200	<p>Shrubland Cook Strait kowhai shrubland. Taupata shrubland.</p> <p>Herbfield and Rockland Sea blite-horokaka herbfield. Herb-rockland.</p> <p>Tussockland Silver tussockland.</p>	<p>Shrubland Cook Strait kowhai shrubland. Taupata shrubland.</p> <p>Herbfield and Rockland Sea blite-horokaka herbfield. Herb-rockland.</p> <p>Tussockland Silver tussockland.</p>

Coastal Terrestrial Area 2: Cook Strait

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
3	Steep to very steep sinuous headlands with extensive rock outcrop, and very steep coastal hill and mountain slopes	Predominately t.z 11 and t.z. 111 schist and sedimentary rocks the Caples Group	0–735	<p>Forest Ngaio-taupata forest. Kohekohe forest. Cook Strait mixed broadleaf forest.</p> <p>Shrubland Cook Strait shrublands. Tauhinu scrub and shrubland. Cook Strait kowhai shrubland. Taupata-ngaio shrubland. Wharariki flaxland.</p> <p>Herbfield and Rockland Herb-rockland.</p>	<p>Forest Ngaio-taupata forest. Kohekohe forest. Cook Strait mixed broadleaf forest.</p> <p>Shrubland Cook Strait shrublands. Cook Strait kowhai shrubland. Taupata-ngaio shrubland. Wharariki flaxland.</p> <p>Herbfield and Rockland Herb-rockland.</p>
4	Precipitous stacks	Predominately t.z 11 and t.z. 111 schist and sedimentary rocks the Caples Group	0–100	Herbfield and Rockland	Herbfield and Rockland

Abiotic

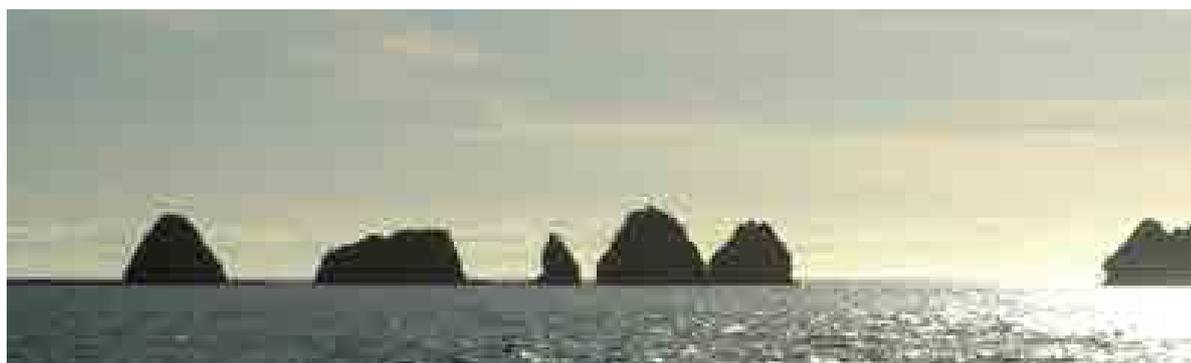
The Cook Strait Coastal Terrestrial Area is characterised by very exposed, very steep to precipitous coastal escarpments and sea cliffs with extensive bare rock, steep coastal slopes and sinuous headlands, cliff bound islands and stacks facing onto the Tasman Sea, Cook Strait, or the South Pacific Ocean. These erosional landforms result from and are continually rejuvenated by the high wave energy environment. Former drowned valley ridges form headlands, and depositional landforms and colluvial slopes are rare or absent. Regionally important geological features include the Fighting Bay schist sea cliffs.

The Cook Strait Coastal Terrestrial Area includes Stephens Island, Saddle and Tower Rocks, the Rangitoto, Trio, Chetwode and Titi Islands, the headlands north of Port Ligar (Clay and Paparoa Points), the northern

part of Forsyth Island, Alligator Head, Capes Lambert, Jackson and Koamaru, The Brothers Islands and the eastern cliffs of Arapawa Island including Perano Head to the Eastern Head of Tory Channel, and the south eastern cliffs and shoreline from West Head to Robinson Point in Port Underwood.

It is underlain by foliated textural zone (t.z.) 11A and 11B, with minor t.z. 111A, schist, well bedded sedimentary sandstones and, and minor igneous lithologies of the Caples Group. Shallow and stony skeletal soils predominate with deeper profiles restricted to rare gentler slopes.

Streams are ephemeral, have steep unstable beds lacking of good pool-riffle structures, low gradient stretches and floodplain sections are absent.



Above: Distinctive rocky outcrops

Freshwater quality is reasonable despite agricultural being present.

The area has an exposed dry, temperate, extreme maritime climate with a high wind-run and frequent gales. The region receives 800-1,200 mm annually and drought conditions are common. It is relatively frost-free due to the constant exposure to wind. Salt spray is a major influence over the whole ecosystem, with large swells and storm surges.

Biotic

Summary analysis: Total area of Cook Strait Coastal Terrestrial Area 6,471 ha of which: 2% native forest, 47% native shrubland, 15% exotic treeland, 0.5% exotic scrub and 33% pasture. There is extensive pasture cover. Mostly cleared except for some bluff communities and islands. This biotic environment forms part of the Department of Conservation's Cook Strait Ecological District.

Originally this area was a mixture of broad-leaved forests, especially kohekohe forest, and on exposed, dry, very steep or rocky sites: stunted forest, windshorn scrub and shrublands, tussocklands and herbfields - especially of succulents. Compared to other Coastal Terrestrial Areas, there is a high proportion of non-forest communities.

There are a number of distinctive biota, communities and habitats. Island communities are nationally important, with distinct and rare biotic assemblages, which are vulnerable to disturbance and loss and difficult to recover. These are vital habitats for

threatened species due to their lack of introduced predators. Several species now confined to this Coastal Terrestrial Area.

The unique animal and plant communities which are dependent on seabirds are nationally important. Seabirds have a major influence on community composition, structure and processes. Their high fertility/high acid guano input from the marine environment and major physical disturbance effects of burrowing and trampling result in a highly productive ecosystem with high nutrient turnover.

Shrublands, herbfields and tussockland communities are nationally important habitats as they are highly distinctive and endemic to Cook Strait.

The eastern flanks of Arapawa Island support some of the best remaining examples of Cook Strait mixed broad-leaved forests and are nationally important, especially as possum-free environments.

Frequent swells and surges have a profound influence on coastal communities.

For a Coastal Terrestrial Area it has exceptional biodiversity, but relative to other land ecosystems its natural biodiversity is moderate due to the extreme environmental conditions and narrow range of landforms, altitude, and water regimes.

Biotic patterns are generally very fragmented and difficult to interpret; exceptions are the eastern flanks of Arapawa Island, Cape Lambert and a few islands (Trios, Titi, Chetwodes). ►



Above: Marlborough Green Geko, *Naultinus manukanus* on tauhinu, Stephens Island



Above: *Kirkianella 'glauca'*, North Brother Island

Coastal Terrestrial Area 2: Cook Strait

Several otherwise southern and subantarctic species occur here at or near their northern limits, e.g. *Puccinellia walkeri*, *Carex trifida*, *Crassula moschata*.

There is a pronounced lack of introduced freshwater fish. There is good fish access from sea but unsuitable in-stream habitat due to steep topography and lack of low gradient stream areas. The coastal location of streams facilitate good access for juvenile whitebait (e.g. banded kokopu). Generally there is low native fish diversity.

The following are notable plant species found in the Cook Strait Coastal Terrestrial Area : *Anemanthele lessoniana* -t; *Atriplex buchananii* -t, Cooks scurvy grass -t; *Melicytus* aff. *novae-zelandiae* -t; *Pimelea tomentosa* -t; fierce lancewood -r; large-leaved milktree -r,

Melicytus aff. *obovatus* -r; *Sophora molloyi* -r; *Kirkianella 'glauc'* -r; *Microseris 'Brothers'* -r; muttonbird groundsel -r; *Euphorbia glauca* -r, *Carex testacea*; *Scandia geniculata*; *Hebe stenophylla* var. *oliveri* -r,ee; Cook Strait bristle tussock -r; *Puccinellia walkeri* ssp. *walkeri* -r; *Trisetum antarcticum* -r; *Hebe elliptica*; *Hebe parviflora*; *Asplenium appendiculatum* ssp. *maritimum*; *Asplenium obtusatum*; *Crassula moschata*; seablite; *Aciphylla squarrosa*; *Craspedia uniflora* var. *maritima*; rengarenga; *Carex trifida*.

Cook Strait Coastal Terrestrial Area also supports a nationally high concentration of rare, relictual and endemic fauna which is vulnerable to predation and/or collection. Typical animals found include: tuatara -r,ee; king shag -t,ee; pied shag -t; reef heron -t; fluttering



Juvenile Little Blue Penguin



Tuatara, *Sphenodon punctatus* on Stephens Island



Above: Cook Strait giant weta, *Deinacrida rugosa* on Stephens Island



Above: Stephens Island weevil, *Anagotis stephenensis*



Above: The exposed islands and outer headlands of Cook Strait typify the rugged character of this area

shearwater; fairy prion; diving petrel; sooty shearwater -r, flesh-footed shearwater; white-faced storm petrel; little blue penguin -r; Hamiltons frog -t,ee; speckled skink -r; duvaucels gecko -r; striped gecko -t,e; spotted skink -r; Marlborough green gecko -r,e; flax weevil -r; ngaio weevil -r,ee; Cook Strait click beetle -t,e; Cook Strait giant weta -r; *Mecodema c. costellum* -t, ee; *Odontria nesobia* -e; peripatus; *Rhytida stephenensis* -t; kakariki (yellow-crowned parakeet) -r; South Island robin; slug (*Pseudaneitea schauinslandi*) -e; Trios slug (*Reflectopallium delli*) -ee.

Experiential

These exposed islands and outer headlands of Cook Strait typify the rugged character of this area. Rocky peninsulas, rocky platforms, windswept headlands and steep cliffs are but a few of the numerous characteristics of this most exposed of

the Marlborough Sounds terrestrial areas. Access is primarily by boat, although a privately maintained track (known as the Outer Queen Charlotte Track) extends from Ship Cove to the Cape Jackson lighthouse and provides direct contact with this exposed coastline. Due this, the islands and outer peninsulas hold very high experiential values due to the remote expansive seascape vistas. Many islands are sanctuaries and hold very high biotic values. Modifications to these areas are low with most forms of development tending to be concentrated in a small number of more enclosed bays. The night skies here are some of the darkest in the country and add to the remote-like experience.

- t = threatened nationally
- r = at risk nationally
- e = endemic to Marlborough Sounds
- ee = endemic to Cook Strait Coastal Terrestrial Area

Level 3: Overall Area Rating for Cook Strait Coastal Terrestrial Area

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			Very High

Coastal Terrestrial Area 2: Cook Strait

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 2: Cook Strait Holding High or Very High Natural Character

General Values applicable to the whole Coastal Terrestrial Area

Island communities are nationally important, with distinct and rare biotic assemblages, which are vulnerable to disturbance and loss and difficult to recover. These are vital habitats for threatened species due to their lack of introduced predators

Shrublands, herbfields and tussockland communities are nationally important habitats as they are highly distinctive and endemic to Cook Strait

The Area also supports a nationally high concentration of rare, relictual and endemic fauna which is vulnerable to predation and/or collection.

The islands and outer peninsulas hold very high experiential values due to the remote, rugged and expansive seascape vistas. The weathered sea-cliffs and hardy vegetation tilted from the wind are characteristic of their exposed maritime position.

Remoteness values amplified through natural darkness of the night sky

Sub Area	Rating	Key Values	Additional Comments
Cape Lambert & Cape Jackson	Very High	Exceptional biodiversity at Cape Lambert. Threatened plants, remnant forest and regenerating native vegetation at Cape Jackson.	
Western Cook Strait, Port Underwood to Tory Channel	Very High	Intricate bluff system between Robertson Point (Port Underwood) and Tory Channel Regionally important geological features including the Fighting Bay schist sea cliffs	Much of the upper slopes beyond the bluffs are commercial forestry
Western Cook Strait, Arapawa Island	Very High & High	Towering cliffs and native vegetation sequences of the Cook Strait narrows. Exceptional natural biodiversity. The eastern flanks of Arapawa Island support some of the best remaining examples of Cook Strait mixed broad-leaved forests and are nationally important, especially as possum-free environments.	

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 3: D'Urville Islands,

Outstanding Coastal Natural Character Area 4: Chetwode and Titi Islands,

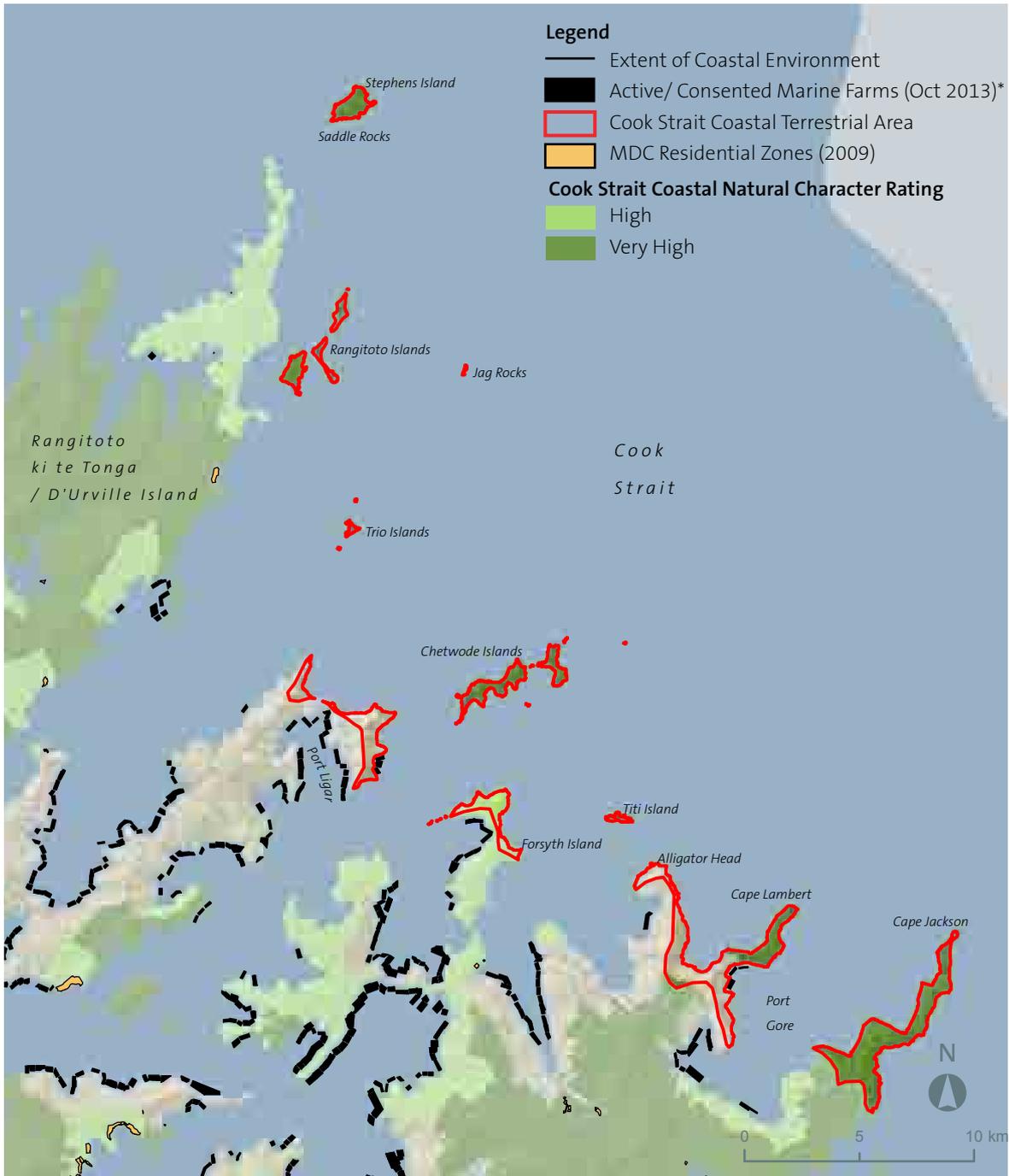
Outstanding Coastal Natural Character Area 5: Eastern Arapawa & The Brothers Islands,

Outstanding Coastal Natural Character Area 9: The Capes,

Outstanding Coastal Natural Character Area 11: Islands of Queen Charlotte Sound

Opposite: Rangitoto Islands off the eastern coastline of D'Urville Island





* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



Opposite: Rangitoto Islands off the eastern coastline of D'Urville Island. Tinui Island (left), Puangiangi Island (centre) and Wakaterepapanui Island (right)



* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



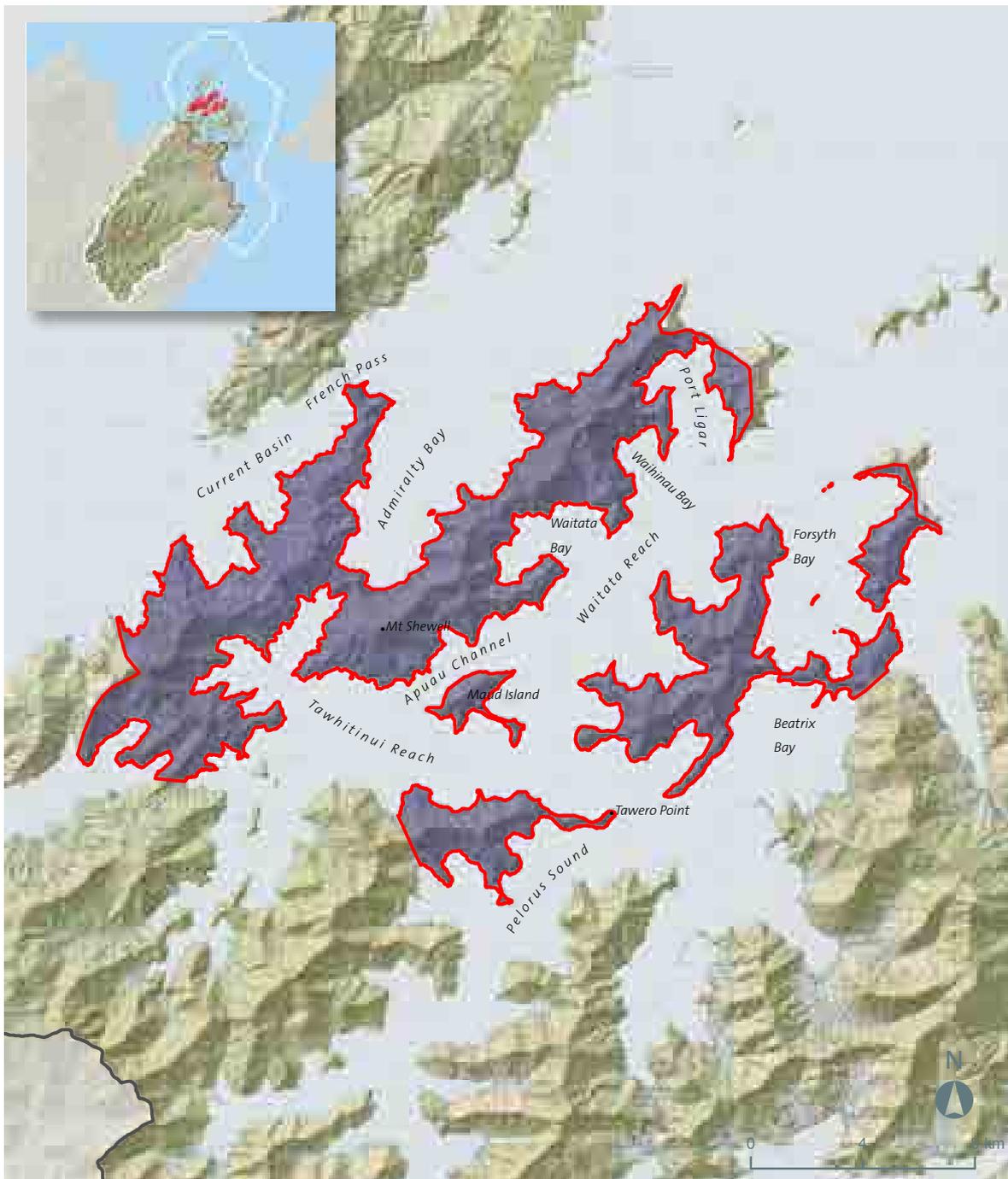
Opposite: Sea cliffs flanking the exposed eastern coastline of Arapawa Island, the sheltered waters of Onaiku Bay can be seen in the background

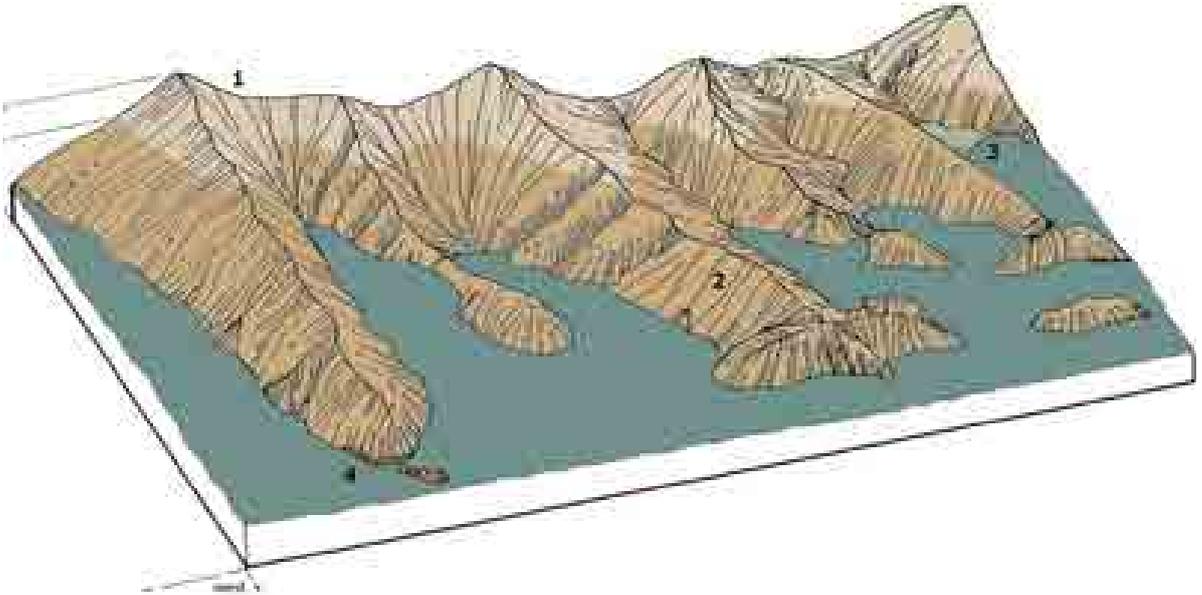
Coastal Terrestrial Area 3 : Bulwer

Collective Characteristics and Coastal Context

Kohekohe, Wharariki, Blue Penguin, Western Sounds, Dry, Non To Weakly Schistose Ecosystem

This Coastal Terrestrial Area is characterised by steepish, dissected, climatically dry coastal hill slopes which stretch fingers at random into the sea, forming many bays and coves, the landmass itself being the most submerged of the Marlborough land ecosystems. Inside these splayed fingers the sea abuts the land abruptly, with few beaches. Rocks are sedimentary and weakly developed schist. Maritime influence and exposure is high and elevation generally low. Vegetation patterns are fragmented with much scrubland.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper hill and mountain slopes	Siliceous, sedimentary rocks and t.z. 11A schist of the Caples Group	500–775	Forest Silver beech-hard beech-miro forest, Mt. Shewell Summit. Rimu-red beech-miro, kamahi forest. Tussockland Silver tussockland.	Forest Silver beech-hard beech-miro forest, Mt. Shewell Summit. Rimu-red beech-miro, kamahi forest
2	Moderately steep to steep lower hill slopes	Siliceous, sedimentary rocks and t.z. 11A schist of the Caples Group	0–500	Forest Kohekohe-tawa-nikau forest (with karaka in places). Kohekohe forest. Hard beech-kamahi forest with scattered emergent rimu. Secondary broadleaf forest (mahoe, wineberry, mamaku, putaputaweta, pigeonwood, mamaku). Kamahi-hinau-miro forest. Mamaku treefernland. Scrub and vineland Manuka scrub with Pinus radiata emergent in places. Tauhinu scrub and shrubland. Kiekie vineland.	Forest Kohekohe-tawa-nikau forest (with karaka in places). Hard beech-kamahi forest with emergent rimu. Kamahi-hinau-miro forest. Pukatea-tawa mixed broadleaf forest

Coastal Terrestrial Area 3 : Bulwer

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
3	Minor prograding inlet heads and fans e.g P26/733188	Recent alluvium from predominantly sedimentary and schist rocks, minor swamp deposits	0–20	Podocarp–broadleaved forest, kahikatea, rimu, matai, miro	Forest Kahikatea-pukatea-nikau forest. Kahikatea-pukatea-tawa-kohekohe forest.
4	Minor steep to precipitous eroding sea cliffs	Siliceous, sedimentary rocks and t.z. 11A schist of the Caples Group	0–250	Hard beech-kamahahi forest with rimu. Black beech forest. Akiraho-wharariki-fivefinger flax-treeland coastal forest and shrubland. Kiekie vineland. Herb-rockland (just above sea level)	Forest Akiraho-wharariki-fivefinger flax treeland coastal forest and shrubland. Kiekie vineland. Hard beech-kamahahi forest + rimu. Black beech forest.

Abiotic

The Bulwer Coastal Terrestrial Area includes the mainland north of a line between Whakitenga and Elaine Bay, Maud Island, through to Tawero Point and north-westwards to Beatrix Bay then north to include the southern part of Forsyth Island. This Coastal Terrestrial Area also includes land within Port Ligar, Waihinau Bay, Waitata Bay and Admiralty Bays to French Pass.

The dominant landforms include steep to moderately steep dissected coastal hill and mountain slopes to 775 m, [Mt Shewell]; and confined indented coastal inlets with prominent peninsulas and headlands and minor undulating to rolling fans and prograding inlet heads. Steep rocky shore lines are common but precipitous sea cliffs are not a prominent feature.

The Bulwer Coastal Terrestrial Area is developed on poorly bedded and well bedded sedimentary sandstone and siltstone sedimentary rocks and foliated t.z. 11A schist of the Caples Group. Alluvial and colluvial depositional landforms are of limited extent.

The area has a moderately dry, warm-temperate maritime climate with rainfall between 1,200 and 1,500 mm per year and summer droughts are common. Salt spray is a major coastal influence, especially along the more exposed and windy Cooks Strait aspects of the region where many places are frost-free. The less exposed inland regions are characterised by sheltered bays and inlets.

Streams are generally small and steeply graded with many being ephemeral in summer due to the dry

climate and low relief. There is some water quality degradation associated with farming, forestry and subdivision settlements.

Elevation ranges from sea level to 775 m with a mean altitude of 200 m.

Biotic

Summary analysis: Total area of Bulwer Coastal Terrestrial Area is 15,534 ha of which 15% in native forest, 47% in native shrubland, 9% in exotic treeland, 0.1 % in exotic scrub and 29% in pasture. This biotic environment forms part of the Department of Conservation's Sounds Ecological District.

Originally, all of this area was vegetated with indigenous forest, except for small areas of rock and gravel shore fringe communities, bluffs, exposed, rocky or dry headlands, and estuaries at inlet heads. There is a small amount of remaining forest which is largely confined to the upper slopes or south-facing aspects. Indigenous vegetation has, however, been lost over most of the coastal and lower altitude zones, especially north and west-facing aspects. Kohekohe and mixed broadleaf forests which were once dominant are now greatly diminished.

There are a number of distinctive biota, communities and habitats. Island communities (e.g. Maud Island) are distinctive, rare and nationally important due to its predator-free status. These provide a vital habitat to numerous endangered biota and is an important marooning island for nationally threatened species



Above: There are small amounts of remaining forest which are largely confined to the upper slopes or south-facing aspects

such as takahe, Cook Strait giant weta and titirangi for which safe mainland habitats are limited.

Natural biodiversity is moderately high due to island contributions and warm-temperate nature of the ecosystem providing for northern species.

Productivity is moderate.

Biotic patterns are disrupted and fragmented, especially over the warmer and drier aspects, and coastal zone.

Due to the presence of marine farming in the area there are typically limited undisturbed natural gradients between terrestrial and marine ecosystems.

There is however a good habitat for migratory fish species. Although large areas are still unsurveyed, there is potential for high native fish diversity, with good access for threatened native fish species. Species recorded include redfin -r and giant bully -r, shortjaw kokopu -r, koaro -r, inanga -r, dwarf galaxias -r and koura.

The following are notable plant species found in Bulwer Coastal Terrestrial Area: large-leaved milktree -r, *Danhatchia australis* -r, rewarewa, wharangi, rengarenga; *Adiantum viridescens*; *Arthropteris tenella*, *Lastreopsis velutina*.

Notable animal species found in Bulwer Coastal Terrestrial Area are: Maud Island frog -t,ee; striped gecko -t,e; little blue penguin -r; pied shag -t; reef heron -t; western weka; *Powelliphanta 'obscura'* -r,e; Cook Strait click beetle -t,e; *Odontria nesobia* -e; *Rhytida stephenensis* -t.



Above: *Leiopelma pakeka*, Maud Island frog

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

ee = endemic to Bulwer Coastal Terrestrial Area

Coastal Terrestrial Area 3 : Bulwer

Experiential

This north-western part of the Sounds encompasses a network of slender peninsulas, islands and broad bays. The land comprises a mix of land uses, including forestry, pastoral farming and areas of regenerating bush. Maud Island is a sanctuary within Pelorus Sound/ Waitata Reach. There are a number of residential dwellings in the area with access to the majority gained via boat. The Port Ligar

Road, which extends from Okiwi Bay is one of a few roads and tracks in the area. The land is reasonably steep, with the ridges and peaks often clothed in indigenous vegetation. The area is not as popular as Queen Charlotte Sound to the east for holidaying and recreating, however, there are a number of locations where visitors would experience a more remote setting. Due to this, experiential values are high.

Level 3: Overall Area Rating for Bulwer Coastal Terrestrial Area

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



Above: This north-western part of the Sounds encompasses a network of slender peninsulas, islands and broad bays



Above: The waters of Allen Strait separate Forsyth Island (foreground) and the bays and peninsulas of the Mainland (background)

Coastal Terrestrial Area 3 : Bulwer

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 3: Bulwer Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Land to west of Waitata Reach	Very High and High	<p>Whilst some land has been cleared for pasture, there are limited structures on the land, especially around northern Port Ligar and land west of Waitata Reach.</p> <p>Of the remaining indigenous forests within the Area, much appears on more elevated slopes (Mt. Shewell, Mt. Drew, Bobs Peak, Okuri Peak), but with substantial tracts at lower coastal altitudes, especially east and south aspects (Apuau Channel, Fitzroy Bay).</p> <p>Very High perceived naturalness values</p>	Many bays contain houses, jetties and wharves
Maud Island	Very High	Maud Island is distinctive, rare and nationally important due to its predator-free status and nationally threatened fauna.	
Eastern Waitata Reach, Forsyth Island and land south of Allen Strait	High (small part Very High at Kauauroa Bay)	<p>Relatively low levels of modification and extensive areas of regenerating bush, especially on Forsyth Island.</p> <p>Largely-intact podocarp-broadleaved forest at Kauauroa Bay.</p>	Also contains low intensity grazed pastoral land
North West Bay	Very High & High	Indigenous forested peninsula at Stafford Point	Modification to the immediate north

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 2: French Pass

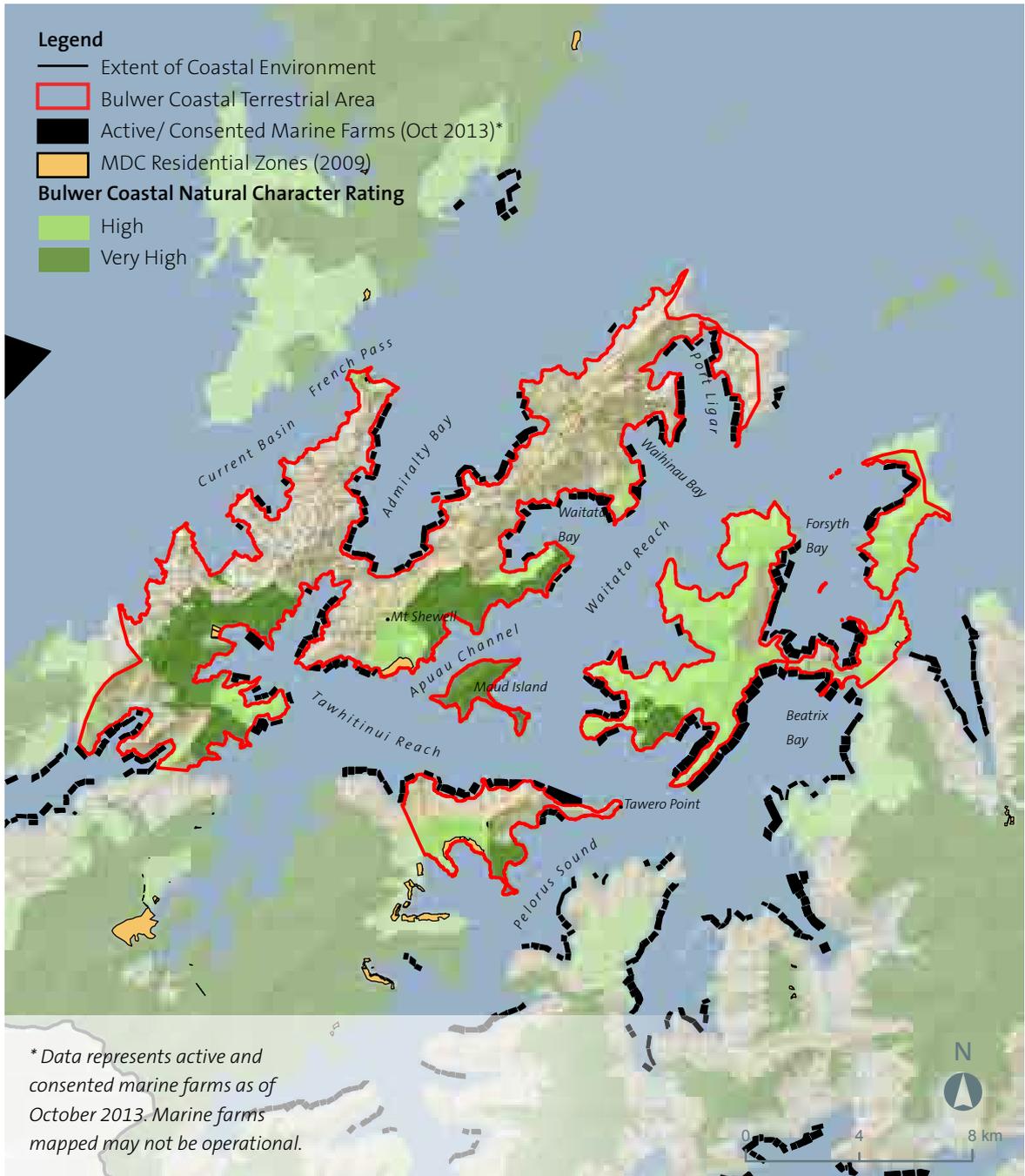
Outstanding Coastal Natural Character Area 7: Maud Island

Outstanding Coastal Natural Character Area 8: Tennyson Inlet & Inner Pelorus Sound



Above: The waters of Apuau Channel between Mt Shewell (left) and Maud Island (right).

Opposite: The slender forms of Tawero Point (foreground) and Whakamawahi Point (background). Indigenous forest at Kauauroa Bay and the distinctive rounded headland of Tapapa Point can be seen at the centre of this photograph.

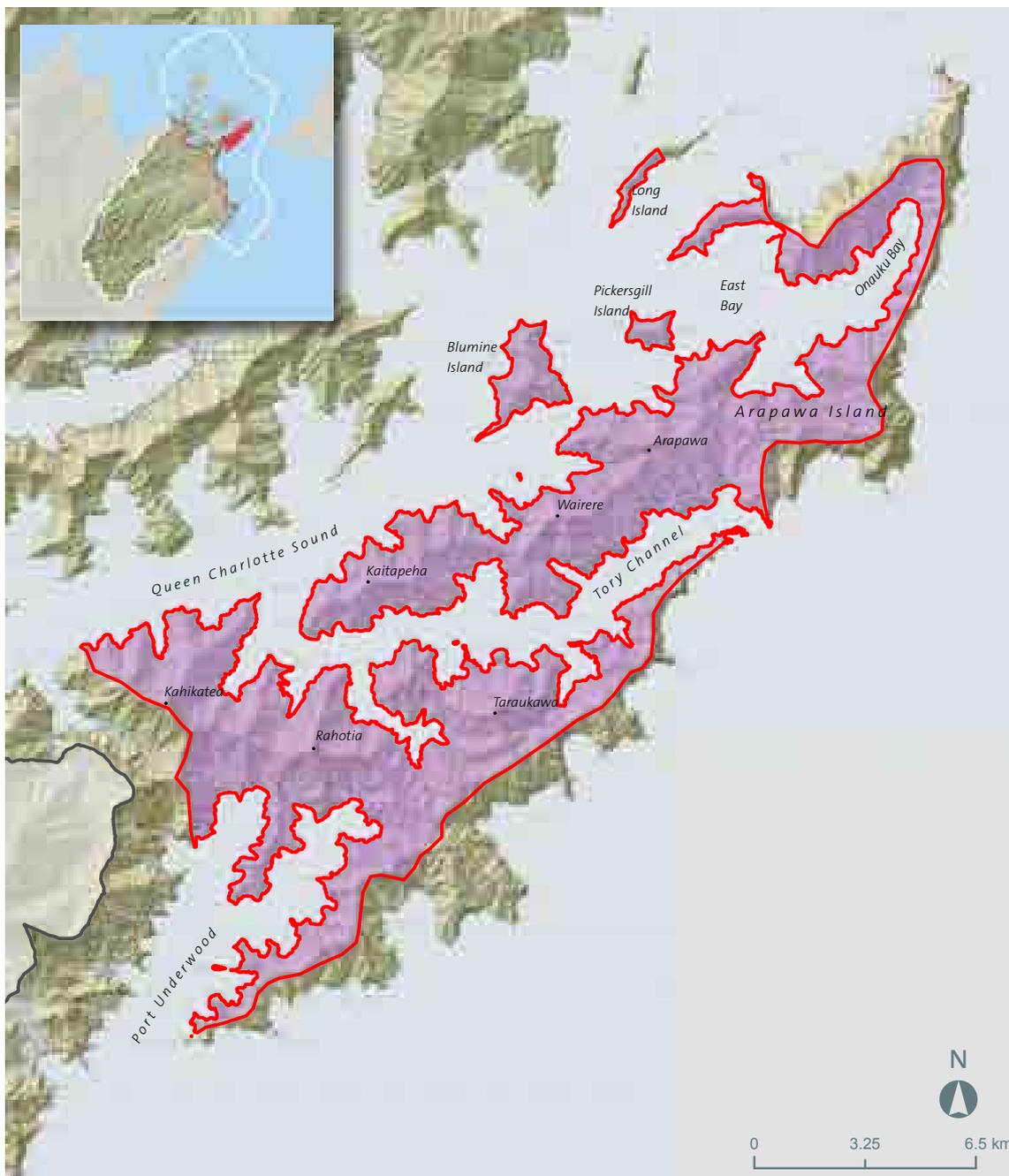


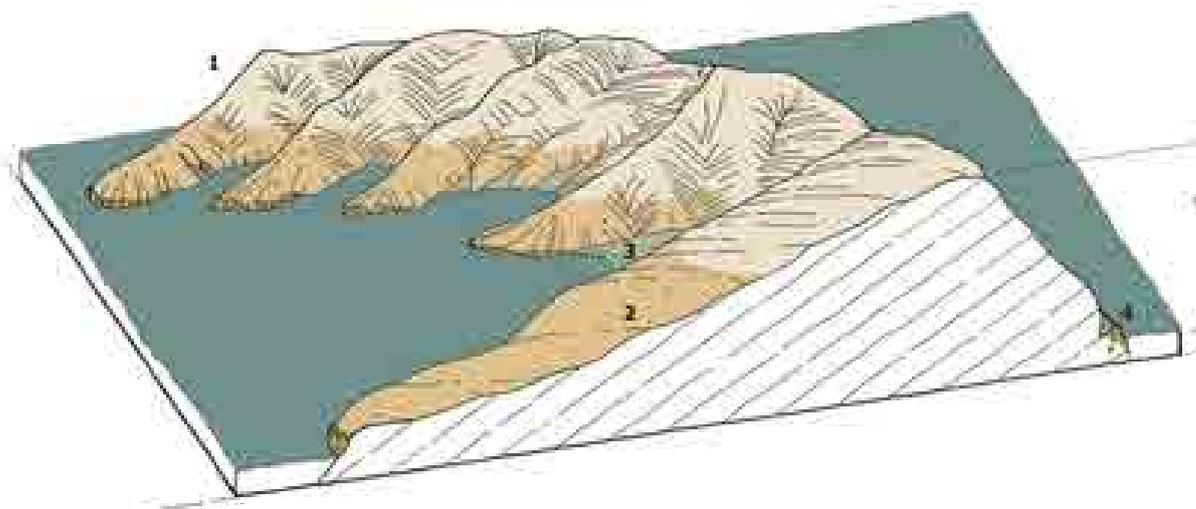
Coastal Terrestrial Area 4 : Arapawa

Collective Characteristics and Coastal Context

Tauhinu, Black Beech, Fluttering Shearwater, Powelliphanta 'bicolor', Eastern Sounds, Dry, Weakly Schistose Ecosystem

Steep to moderately steep dry dissected coastal hill slopes are a feature of this coastal terrestrial area with several islands, a highly indented coast, with confined coastal inlets, beaches and undulating to rolling prograding inlet heads, and minor fans filling the valley floors. Base rock is weakly developed schist with minor sedimentary layers, with a valley overlay of alluvium in a few places. Exposure and maritime influence is generally high due to the landmass being surrounded by sea, while low relief is due to excessive drowning of the landmass. Vegetation patterns are fragmented, with much scrubland.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper hill and mountain slopes	Siliceous, weakly foliated t.z. 11A and t.z. 11B schist and sedimentary rocks of the Torlesse Supergroup	500–640	Forest Red beech forest. Kamahi-hinau-toro-miro-mountain totara-southern rata forest.	Forest Red beech forest. Kamahi-hinau-toro-miro-mountain totara-southern rata forest.
2	Moderately steep to steep lower hill slopes	Siliceous, weakly foliated t.z. 11A and t.z. 11B schist and sedimentary rocks of the Torlesse Supergroup	0–500	Forest Kohekohe-nikau-tawa forest. Tawa-hinau-mixed broadleaf forest. Kohekohe-mahoe-broadleaved milk-tree forest. Hard beech-kamahi-hinau-miro forest. Kanuka/manuka-fivefinger-mingimingi-shining karamu forest. Black beech forest. Shrubland Manuka scrub.	Forest Tawa-hinau-mixed broadleaf forest. Kohekohe-nikau-tawa forest. Kohekohe-mahoe-broadleaved milk tree forest. Hard beech-kamahi-hinau-miro forest. Black beech forest.
3	Minor prograding inlet heads and fans	Recent alluvium from predominantly schistose rocks, minor swamp deposits	0–20	Shrubland Marsh ribbonwood-coastal shrub daisy estuary scrub. Forest Tawa-titoki mixed broadleaf forest. Tawa-kamahi-mamaku mixed broadleaf forest.	Shrubland Marsh ribbonwood-coastal shrub daisy estuary scrub. Forest Kahikatea-pukatea-matai-tawa-titoki forest
4	Steep to precipitous eroding sea cliffs, minor component	Siliceous, weakly foliated t.z. 11A and t.z. 11B schist and sedimentary rocks of the Torlesse Supergroup	0–250	Shrubland and Herbfield Coastal bluffs herbfield. Wharariki-tauhinu-coastal shrub daisy-akiraho scrub. Rengarenga lily cliff herbfield.	Shrubland and Herbfield Coastal bluffs herbfield. Wharariki-tauhinu-coastal shrub daisy-akiraho scrub. Rengarenga lily cliff herbfield.

Coastal Terrestrial Area 4 : Arapawa

Abiotic

The Arapawa Coastal Terrestrial Area includes Arapawa, Blumine, Pickersgill and Long Islands, and the peninsula separating Tory Channel and Port Underwood east of a line between Hakahaka and Motueka Bays.

The dominant landforms include very steep to moderately steep dissected, moderate relief, coastal hill and mountain slopes to 640 m, [Kahikatea], and confined coastal inlets with undulating to rolling prograding inlet heads e.g., Ruapara and Ngakuta Bays, minor beaches and fans. The partial drowning of the dendritic drainage network by subsidence and marine incursion has resulted in an intricate array of small inlets, coves, headlands, peninsulas and deeply recessed bays. Steep rocky shore lines are common but precipitous sea cliffs are not a prominent feature. Ocean sea cliffs to the east are included in the Cook Strait Coastal Terrestrial Area. The Long Island gravel cusped foreland is considered a regionally important landform feature.

The Arapawa Coastal Terrestrial Area is developed on siliceous, weakly foliated t.z. 11A, and t.z. 11B schist and well to poorly bedded sandstone-siltstone sedimentary rocks of the Torlesse Supergroup. Colluvial and alluvial deposits and landforms are limited.

There are numerous steep, small to moderate-sized stream catchments, with some low-gradient stream stretches and few freshwater wetlands (e.g. in Port Underwood). Water quality is generally not an issue even during summer low flows, and some streams are ephemeral during dry spells.

The area has a dry, temperate maritime climate, with rainfall between 1,200 and 1,800 mm per year, common summer droughts and moisture deficient's possible at any time of the year. Salt spray is a major coastal influence in exposed situations, especially in Port Underwood and the outer Queen Charlotte Sounds which are exposed to strong winds and occasional gales. Inner Queen Charlotte Sound and Tory Channel and associated bays are generally sheltered. The summits of the higher peaks are very exposed to wind.

Elevation ranges from sea level to 640 m with a mean altitude of 170 m.

Biotic

Summary analysis: Total land area of Arapawa Coastal Terrestrial Area is 11,417 ha, of which 4% in native forest, 47% in native shrubland, 41% in exotic treeland, 4% in exotic scrubland and 4% in pasture. This biotic environment forms part of the Department of Conservation's Sounds Ecological District.

Originally, predominantly indigenous forest covered the area, except for rock and beach shoreline fringes, bluffs, and estuarine embayment heads. Now, this is mostly cleared of indigenous forest with only small scattered pockets remaining, generally at higher elevations and steeper slopes, or on islands. Fan and alluvial forests communities are almost entirely absent. The same can also be said for coastal forests, save from those on smaller islands.



Above: Motuara Island, Long Island and Cape Koamaru

Freshwater wetlands are naturally rare in this Coastal Terrestrial Area and form a distinctive element with only a few still remaining, mainly in Port Underwood. All swamp forests have disappeared. However, regenerating shrublands now form a significant component of the landscape.

There are a number of distinctive biota, communities and habitats. Dry beech forest and mixed broadleaf forests of this Coastal Terrestrial Area are distinctive and regionally important, and possums are not present on any islands. Deer are absent from Arapawa Island.

Island refuges support communities with an absence of major introduced mammals, and are regionally and nationally important. Some of these communities, such as kohekohe forest, are now becoming threatened on the mainland from historic clearance and ongoing possum impacts.

Productivity is generally, low to moderate due to environmental constraints, especially dry conditions.

Biodiversity is moderate due to the range of island, coastal, lowland, sheltered /exposed communities. There is a limited range of landforms, altitude and geology.

Biotic patterns are very fragmented and difficult to interpret, with little connection and intact gradation amongst various communities. Dynamics and process

functioning is incapacitated or severely compromised in many natural areas.

Smaller islands are very important for their uninterrupted natural sequences from ridge top to sea floor, and relatively intact coastal communities.

Freshwater low gradient stretches have the potential to support diverse native fish populations. There is good access for threatened native fish species due to coastal proximity.

Notable plant species found in Arapawa Coastal Terrestrial Area are: *Kirkianella 'glauca'* -t; *Hoheria 'Tatarua'* -r; sand spurge -r; *Olearia solandri*; white mistletoe -r; large-leaved milktree -r; *Melicope ternata*; *Hebe parviflora*; *Senecio rufiglandulosus*; *Asplenium lamprophyllum*; *Collospermum microspermum*.

Notable animal species include: *Powelliphanta 'bicolor'* -r,e; little-spotted kiwi -r; western weka; little blue penguin -r; pied shag -t; reef heron -t; Eastern Sounds carabid beetle (*Megadromus* sp.) -r,e; *Wainuia nasuta* -t; longfin eel -r; shortfin eel; koaro -r; redfin bully -r; banded kokopu; common bully; inanga -r.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds



Above: *Peripatus* sp., Arapawa Island.



Above: *Inanga*, the mainstay of the whitebait fishery.



Above: Onaku Bay

Coastal Terrestrial Area 4 : Arapawa

Experiential

This Coastal Terrestrial Area occupies the mid to north eastern side of Queen Charlotte Sound and the northern and eastern sides of Port Underwood. Tory Channel bisects this area in two. The majority of Arapawa Island to the north, including Blumine Island, Pickersgill Island and the southern extents of Long Island are also contained under this Coastal Terrestrial Area. Roads in this area are restricted, with only Tumbledown Bay Road providing vehicular access to northern and eastern areas in Port Underwood. Other than forestry and farm tracks, the remaining areas of land are accessed via boat. The land use is

predominantly exotic forestry, especially south of Tory Channel with the remaining areas being regenerating scrub and pasture. Any residential areas are restricted to the shorelines. Other modifications in the area include powerlines, historic whaling stations and navigational aids. The constrained nature of Tory Channel offers passengers on the Cook Strait ferries an opportunity to view and experience this terrestrial area either side of Tory Channel at close proximity, and many for the first time. Therefore experiential values are reasonably moderately high.

Level 3: Overall Area Rating for Arapawa Coastal Terrestrial Area

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

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 4: Arapawa Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Blumine, Pickersgill and Long Islands	Very High	<p>The Long Island gravel cusped foreland is considered a regionally important landform feature.</p> <p>Island refuges support communities with an absence of major introduced mammals, and are regionally and nationally important. These islands are also important for their uninterrupted natural sequences from ridge top to sea floor, and relatively intact coastal communities.</p> <p>Very high perceived naturalness values</p>	

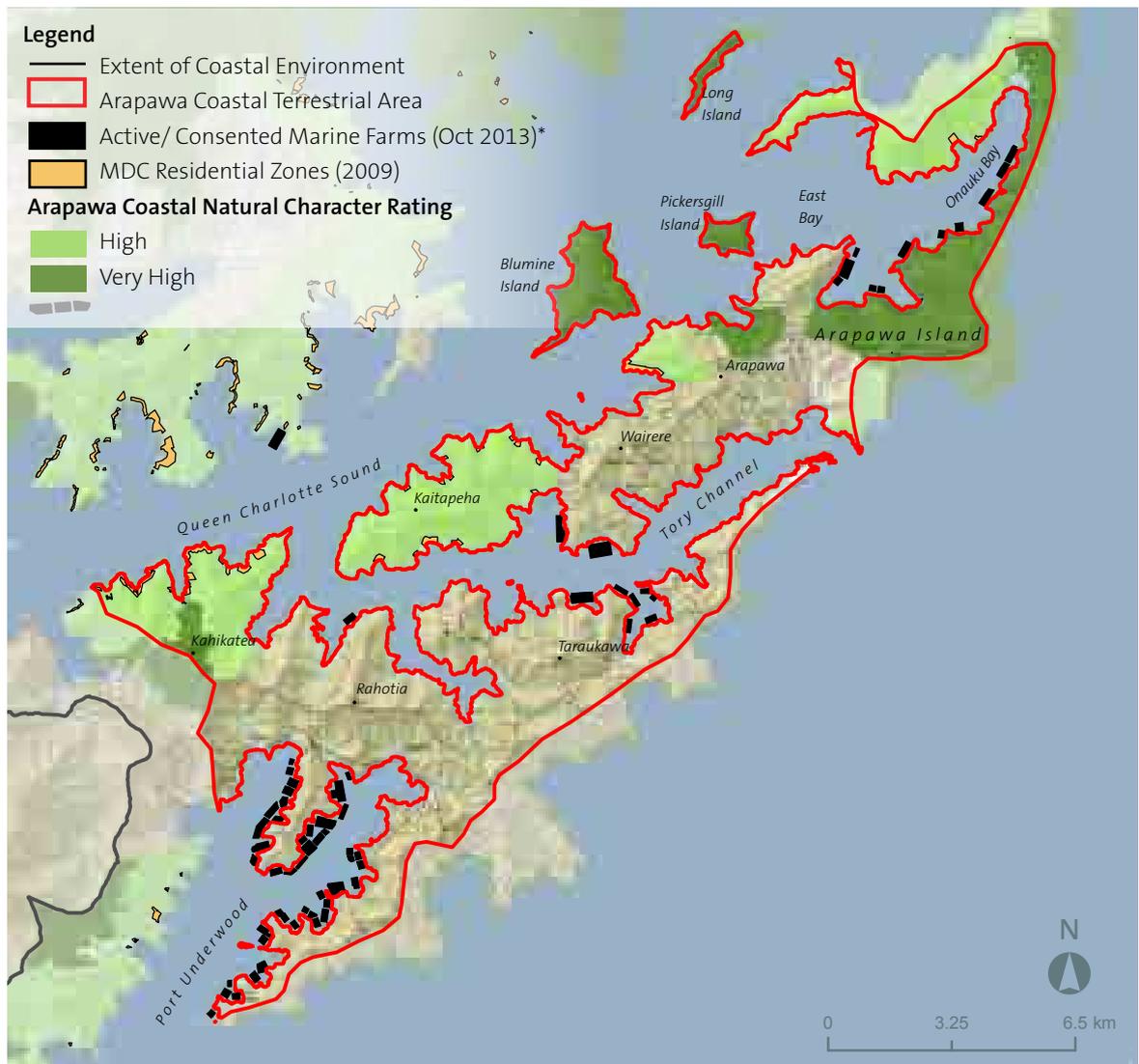
Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 4: Arapawa Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Remaining areas of Arapawa	High	<p>Extensive areas of regenerating bush;</p> <p>Extensive area of indigenous forest at Wharehunga Bay;</p> <p>Experiential values are high along parts of Queen Charlotte Sound, the Kaitapeha peninsula, parts of northern Arapawa Island, including East Bay and western parts of Tory Channel due to the numerous indented bays holding limited modification.</p>	Occasional house and pastoral land included within rating

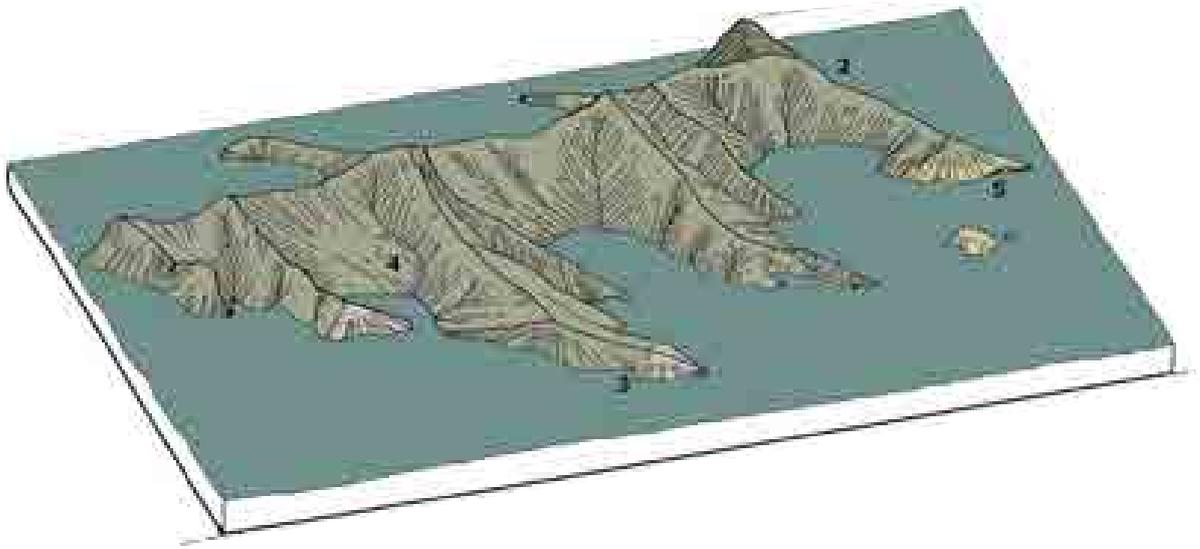
Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 5: Eastern Arapawa & The Brothers Islands

Outstanding Coastal Natural Character Area 11: Islands of Queen Charlotte Sound



* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper hill and mountain slopes, minor component	Siliceous, foliated t.z. 111A and t.z. 11B schist of the Caples Group	600–700	Red beech-silver beech-kamahi-mountain totara-southern rata-tree fuchsia forest.	Forest Red beech-silver beech-kamahi-mountain totara-southern rata-tree fuchsia forest.
2	Moderately steep to steep lower hill slopes	Siliceous, foliated t.z. 111A and t.z. 11B schist of the Caples Group	0–600	Rimu-kahikatea/tawa-kohekohe-pukatea-nikau-hinau forest. Tawa-mixed broadleaf forest. Hard beech-kamahi-pongamimingi forest on ridges and spurs. Secondary mixed broadleaf mamaku forest (mahoe, kaikomako, rangiora, heketara, mapou, fivefinger, wineberry, putaputaweta, karamu). Tawa-pukatea forest (kohekohe, nikau, kiekie in places). Manuka scrub stands with emergent rewarewa. Kanuka forest	Forest Rimu-kahikatea/tawa-kohekohe-pukatea-nikau-hinau forest. Tawa-pukatea forest (with kohekohe, nikau-kiekie in places). Rimu/hard beech-kamahi forest. Rimu-matai-kahikatea-tawa-pukatea forest
3	Moderately steep low broad headlands	Siliceous, foliated t.z. 111A and t.z. 11B schist of the Caples Group	0–50	Black beech forest.	Rimu/black beech forest.

Coastal Terrestrial Area 5 : Portage

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
4	Minor prograding inlet heads, fans, and wetlands	Recent alluvium from predominantly schistose rocks, minor swamp and estuarine deposits	0–20	Mixed broadleaf forest with supplejack and kiekie. Kahikatea-pukatea forest with tawa and nikau. Sea rush-jointed rush rushland with marsh ribbonwood.	Forest Kahikatea-pukatea forest with tawa and nikau. Shrubland and Shrub-Rushlandmarsh ribbonwood -manuka- <i>Coprosma propinqua</i> scrub with toitoi. Sea rush-jointed rush rushland with marsh ribbonwood.
5	Steep coastal cliffs, minor component	Siliceous, foliated t.z. 111A and t.z. 11B schist of the Caples Group	0–100	Coastal fringe of rangiora-akiraho-wharariki-akeake shrubland.	Shrubland Coastal fringe of rangiora-akiraho-wharariki-akeake shrubland.

Abiotic

The Portage Coastal Terrestrial Area includes the low dissected ridge with a highly indented shoreline, between Queen Charlotte and Kenepuru Sounds, and the headlands between Endeavour Inlet and Ships Cove east of the Kenepuru Fault.

The dominant landforms include very steep to moderately steep, dissected, inner sounds hill slopes generally below 450 m, with minor mountain slopes to 700 m [Mt. Oliver]; low headlands, and confined coastal inlets with undulating to rolling prograding estuarine inlet heads and wetlands. Steep rocky shorelines are common but precipitous cliffs are not a prominent feature. Beaches are limited and there are a few small islands (Motuara, Allports, and Motutapu) and occasional stacks. The weakly dissected north-westerly oriented faces above a weakly serrated coastline in Kenepuru and Mahau Sounds form a striking contrast to the deeply incised coastline of headlands and recessed bays of Queen Charlotte Sound. The dip of bedrock rock foliation influences slope profiles and often determines the orientation of the failure surface of shallow landslide erosion. Areas of gently sloping fans and alluvial flats are restricted but are present Anakiwa and between Mahau and Kenepuru Sounds.

This Coastal Terrestrial Area is developed on siliceous, predominantly strongly foliated t.z. 111A and minor t.z. 11B schists of the Caples Group.

Streams are small steep and short with limited low-gradient stretches near the coast. Some streams are ephemeral during dry conditions. Water quality issues associated with septic tanks are evident around settlements.

The area has a relatively dry to moist, temperate maritime climate with rainfalls between 1,400 and 1,600 mm per year. Summer droughts are infrequent but most common on the drier northwest-facing slopes above Kenepuru Sound. The maritime influence is less than that of the outer sounds being surrounded by significantly calmer sheltered seas, and sheltered from strong oceanic winds and storms.

Elevation ranges from sea level to 700 m with a mean elevation of 200 metres.

Biotic

Summary analysis: Total land area in Portage Coastal Terrestrial Area is 12,846 ha, of which 16% in native forest, 66% native shrubland, 14% exotic treeland, 1% in exotic scrub and 3% in pasture. This biotic environment forms part of the Department of Conservation's Sounds Ecological District.

Originally this Coastal Terrestrial Area was predominantly forested in indigenous vegetation, except for rock areas and beach shoreline fringes, bluffs, and estuarine embayment heads. There were also small areas of swamp forest on alluvium.

Now, this indigenous vegetation has been predominantly cleared, although a secondary forest cover has colonised much of this ecosystem, being more advanced in the many south-facing bays and headlands in Queen Charlotte Sound as well as on islands. There is good primary forest at the eastern end of the Coastal Terrestrial Area. Generally though, the forest is less compromised at higher elevations and steeper slopes. Fan and alluvial forests have almost entirely gone as has the coastal forest in Kenepuru. Remaining areas of coastal forest are well-represented on headlands in Queen Charlotte Sound however they are lost from many bays.

Freshwater wetlands are naturally rare in this ecosystem although a few still remain. Swamp forest is all but gone.

Regenerating shrublands of various stages are now a significant component of the landscape, especially above Kenepuru Sound.

There are a number of distinctive biota, communities and habitats. Rare island communities and biotic assemblages exist in this area and are completely predator-free. Motuara Island is nationally important as a threatened species marooning island for nationally threatened species such as South Island saddleback, Maud Island frog and Marlborough green gecko.

Primary podocarp-broadleaf forest between Ship Cove and Resolution Bay is distinctive and regionally outstanding, displaying intact natural sequences from ridge top to sea floor. Tracts of primary coastal forest (e.g. Kumatoto Bay) is also found in this area and is regionally important.

Remaining estuarine, freshwater wetland and alluvial communities are generally uncommon, although where they do exist, they are considered distinctive, vulnerable and regionally significant. ►



Above: Regenerating shrublands of various stages are now a significant component of the landscape, especially above Kenepuru Sound (pictured)

Coastal Terrestrial Area 5 : Portage

The biotic patterns are highly modified but generally are able to be interpreted. Complex human-induced patterns are evident. There are many long-standing communities connected by regenerating forest and shrublands present. South-facing communities are generally more intact (greater cover, less vulnerable to past and ongoing disturbance) than north-facing communities.

Dynamics and process are generally functioning healthily although there are ongoing weed and wild animal threats.

Moderate natural biodiversity is aided by the contribution of island biota.

Moderately low productivity is partly due to the moderately low fertility of highly schistose rock; seasonally limited by drought in places.

Lower gradient streams with intact habitats have potential to support diverse native freshwater fish populations including whitebait species, eels and bully associations (banded kokopu, koaro -r, redfin bully -r, shortfin eel, longfin eel -r, inanga -r, bluegill bully -r, common bully).

Notable plant species occurring in Portage Coastal Terrestrial Area include: large-leaved milktree -r; *Korthalsella salicornioides* -r; rewarewa; hangehange; *Corybas cheesemani*; white maire.

Animals include: western weka; little blue penguin -r; pied shag -t; reef heron -t; South Island saddleback -t (introduced); South Island robin; Maud Island frog -t,e (recently introduced); Marlborough green gecko -r,e (recently introduced).

Experiential

This elongated Coastal Terrestrial Area extends from coastal flat area of Linkwater in the south to Endeavour Inlet and parts of Resolution Bay in the north.

Dividing Kenepuru Sounds to the west from Queen Charlotte Sound in the east, the area is reasonably steep, with its highest elevations clothed in mature and regenerating native forest. Extending along the areas entire spine is the Queen Charlotte Track, an internationally recognised track offering unsurpassed views of the Marlborough Sounds. This walking track, which traverses through DOC and private land, takes approximately 3-5 days for walkers and 2-3 days for mountain bikers and is one of the best known and most popular walks in the country.

Vehicular access to the entire area is provided by the Kenepuru Road, located on the southern side of Kenepuru Sound. The majority of the lower flanks of both sides of this area are the most modified parts, noticeably on the Queen Charlotte side, where many houses, jetties and wharves occupy the coastal fringes and numerous bays. Despite the modification, the area as a whole retains reasonably high experiential values. At a more specific level, the northern-most areas retain the highest experiential values due to their high levels of naturalness.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

Level 3: Overall Area Rating for Portage Coastal Terrestrial Area

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			Very High

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 5: Portage Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Mt. Cawte and Southern Queen Charlotte Sound	Very High and High	<p>Tracts of primary coastal forest (e.g. Kumutoto Bay) found in this area are regionally important. Most of the remainder of the land is clad in regenerating native forests.</p> <p>South-facing biotic communities are generally more intact (greater cover, less vulnerable to past and ongoing disturbance) than north-facing communities.</p> <p>Areas of high experiential values along both Queen Charlotte Sound and Kenerpuru Sound.</p>	Areas of residential land adjacent to shoreline excluded from rating.
Northern Queen Charlotte Sound & Motuara Island	Very High	<p>There is good primary forest at the eastern end of the Coastal Terrestrial Area. Remaining areas of coastal forest are well-represented on headlands in Queen Charlotte Sound.</p> <p>Motuara Island is nationally important as an island refuge for “marooning” nationally threatened species.</p> <p>Primary podocarp-broadleaf forest between Ship Cove and Resolution Bay is distinctive and regionally outstanding, displaying intact natural sequences from ridge top to sea floor.</p> <p>Very high experiential values around Resolution Bay</p>	Refer to Coastal Terrestrial Area 8: Stokes for more on northern Queen Charlotte Sound

Refer also to Section F of this report for:

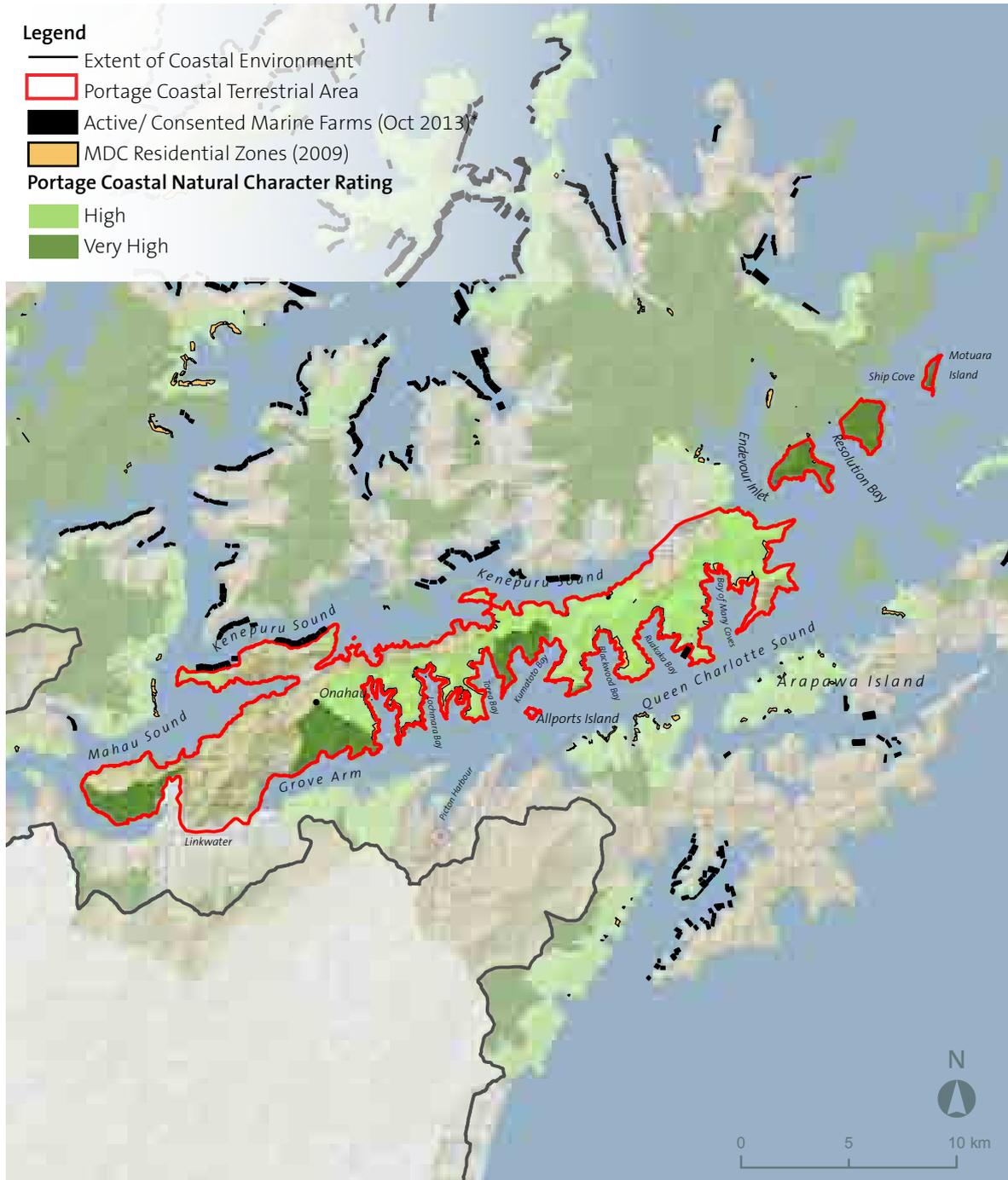
Outstanding Coastal Natural Character Area 10: Ship Cove & Resolution Bay

Outstanding Coastal Natural Character Area 11: Islands of Queen Charlotte Sound



Above: Tracts of primary coastal forest can be found at Kumutoto Bay (centre). The Queen Charlotte Track follows this series of ridge lines, separating Kenepuru Sound (top left) and the waters of Queen Charlotte Sound (top right)

Coastal Terrestrial Area 5 : Portage

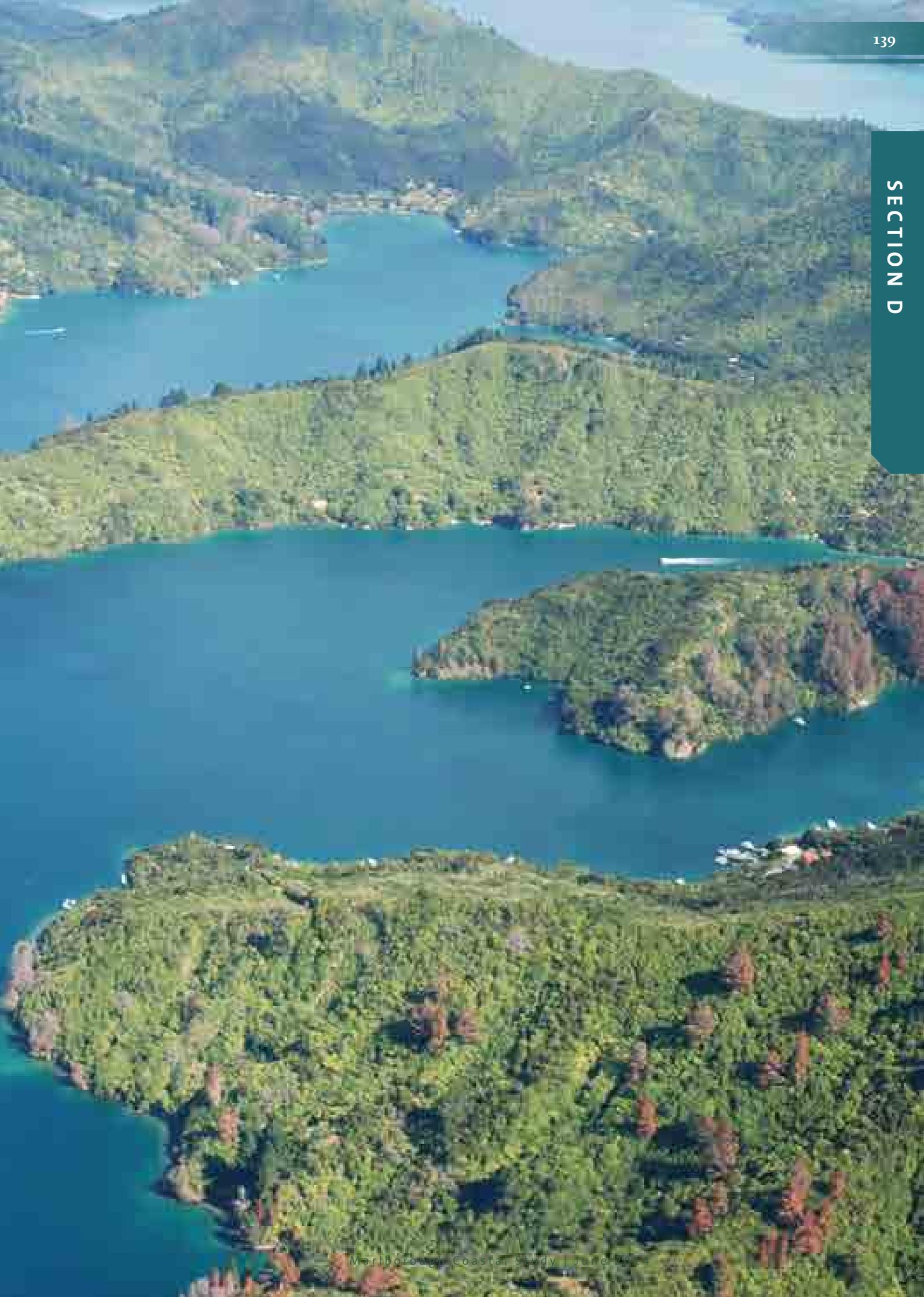


* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



Above: Motuara Island is situated at the northern extent of Portage Coastal Terrestrial Area and is nationally important as an island refuge for 'marooning' nationally threatened species

Opposite: Regenerating scrubland at Double Cove (foreground) and Lochmara Bay (background). Kenepuru Sound can be seen at the top right



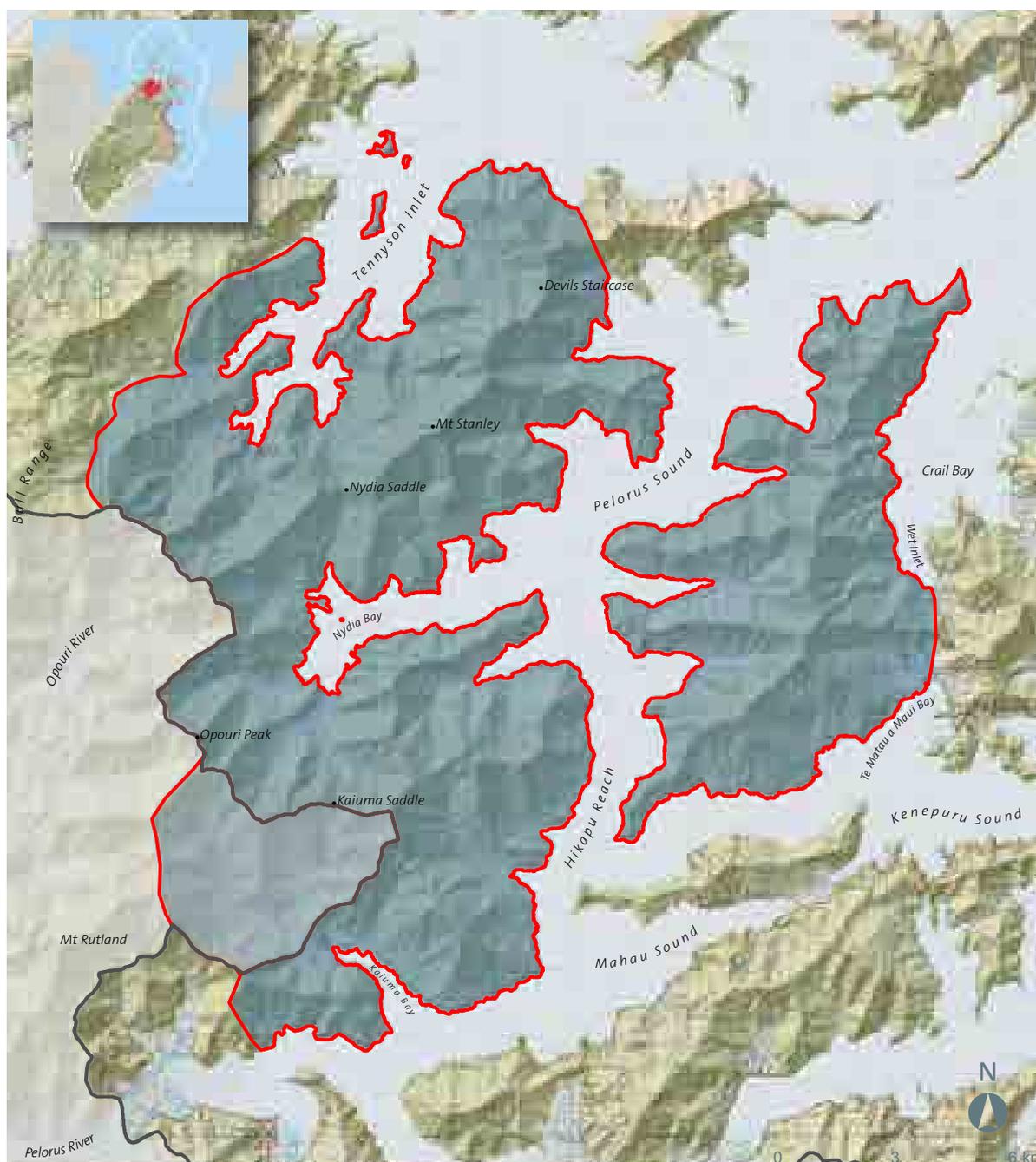
Coastal Terrestrial Area 6 : Nydia

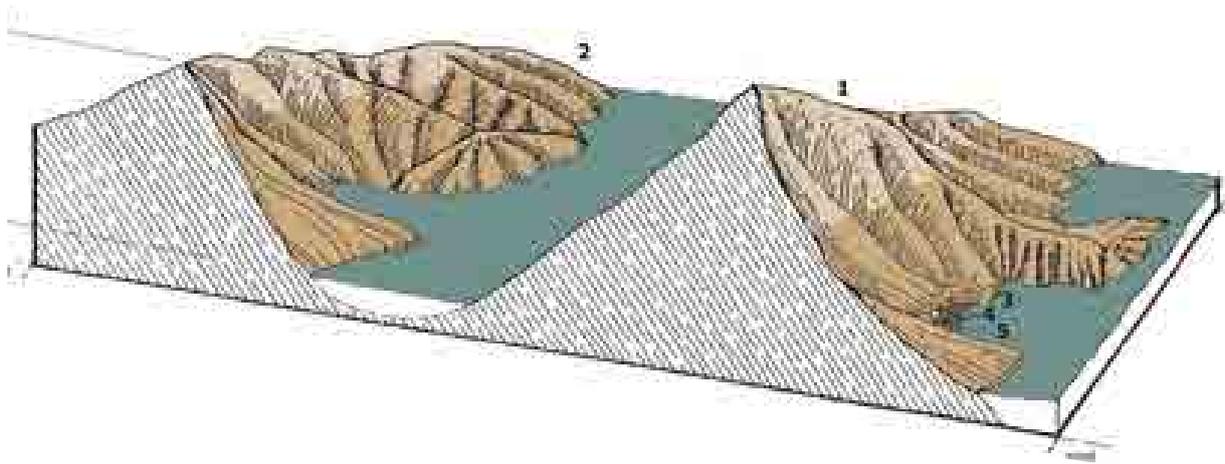
Collective Characteristics and Coastal Context

Red Beech, Supplejack, Filmy Ferns, Kakariki, Inner Sounds, Wet, Non to Weakly Schistose Area

Steep to moderately steep terrain is typical of this Coastal Terrestrial Area with slopes plunging at similar angles into the sea. Small inlets and bays nestle within a range of fine fingers and broad headlands. Within the sheltered valleys lie fans and wetlands accumulating on the alluvium washed down from the non-schistose sedimentary strata and weakly developed schists. Elevation here is moderately high with high rainfall at the tops. Being Inner Sounds, it is relatively sheltered and enjoys a moderate maritime influence. Some frosts occur on flats behind sheltered bays. Original forest covers much of the northern part of the Coastal Terrestrial Area.

The coastal context includes Mt. Rutland and the Bull Range. Tributaries of the Pelorus River, namely the Opouri River, the Tunakino River and the Ronga River drain into the Rai River at Rai Valley. The valley floors of these river corridors are modified with agricultural grazing and forestry. The mid and upper slopes are typically clothed with indigenous forests.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper hill and mountain slopes ³	Siliceous sedimentary sandstones and siltstones t.z. 11A schist of the Caples Group	600–971	Red beech - silver beech forest with kamahi, soft tree fern (<i>Cyathea smithii</i>). Silver beech - southern rata cloud forest on crest.	Forest Red beech - silver beech forest with kamahi, soft tree fern (<i>Cyathea smithii</i>). Silver beech - southern rata cloud forest on crest.
2	Moderately steep to steep lower hill slopes	Siliceous sedimentary sandstones and siltstones t.z. 11A schist of the Caples Group	0–600	Rimu/hard beech forest with kamahi, toro, ponga, and abundant scarlet rata vine. Black beech-ponga-mingimingi forest on headlands. Tawa-pukatea-mixed broadleaf forest with nikau, kiekie, supplejack, puka, kawakawa. Manuka scrub (with emergent pines in places). Kanuka scrub & forest with ponga & mixed secondary broadleaf species. Bracken fernland (where most recently burnt). Rimu-miro-tawa-hinau-mixed broadleaf forest (mahoe, pigeonwood, putaputaweta, mamaku, supplejack, kiekie).	Forest Rimu/hard beech forest with kamahi, toro, ponga, and abundant scarlet rata vine. Black beech-ponga-mingimingi forest on headlands. Rimu-miro-tawa-hinau-mixed broadleaf forest (mahoe, pigeonwood, putaputaweta, mamaku, supplejack, kiekie).

Coastal Terrestrial Area 6 : Nydia

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
3	Undulating terraces, floodplains and fans	Recent alluvium from predominantly sedimentary and schistose rocks	0–20		Kahikatea-pukatea-tawa-nikau forest.
4	Minor prograding inlet heads, fans and wetlands, e.g. Nydia and Tuna Bays	Recent alluvium from predominantly sedimentary and schistose rocks, minor swamp deposits	0–20	Manuka scrub (with emergent pines in places). Kanuka scrub & forest with ponga & mixed secondary broadleaf species. Toetoe-Coprosma propinqua-manuka-harakeke wetlands at bay heads. Tawa-pukatea-mixed broadleaf forest with nikau, kiekie, supplejack, puka, kawakawa. Kahikatea-pukatea-tawa-nikau forest. Rimu-miro-tawa-hinau-mixed broadleaf forest (mahoe, pigeonwood, putaputaweta, mamaku, supplejack, kiekie).	Flax-shrubland Toetoe-Coprosma propinqua-manuka-harakeke wetlands at bay heads. Forest Rimu-miro-tawa-hinau-mixed broadleaf forest (mahoe, pigeonwood, putaputaweta, mamaku, supplejack, kiekie). Kahikatea-pukatea-tawa-nikau forest. Matai-rimu-hinau-tawa forest.
5	Estuaries and tidal flats	Recent fluvial and estuarine deposits	0–3	Oioi rushland. Sea primrose herbfield. Coastal shrub daisy-tauhinu-manuka estuarine shrubland.	Oioi rushland. Sea primrose herbfield. Coastal shrub daisy-tauhinu-manuka estuarine shrubland.

Abiotic

The Nydia Coastal Terrestrial Area includes the terrain west of a line between Te Matau a Maui Bay and Wet Inlet, north of Kenepuru Sound, including the Hikapu Reach, Pelorus Sound, and Tennyson Inlet and those contributing catchments.

The dominant landforms include very steep to moderately steep, dissected, inner coastal hill and mountain slopes to 1,040 m (near Editor Hill); confined coastal inlets with undulating to rolling prograding inlet heads; sinuous undulating terraces and floodplains; and fans e.g., Kaiuma and Nydia Bays; and minor beaches, estuaries and tidal flats e.g., Kaiuma Bay. Steep rocky shorelines are common however there are few islands or stacks. The coastline is moderately dissected with numerous large, deeply indented inlets e.g., Tennyson Inlet and Nydia Bay and large and prominent headlands.

The terrain is developed on siliceous, non-foliated, well bedded sandstones and siltstones and weakly foliated t.z. 11A schist of the Caples Group.

Streams are generally of moderate size with high gradients, short low gradient stretches are restricted to reaches on the fans and alluvial flats. The area has high freshwater quality within the many forested catchments and headwaters. Some degradation occurs in the lower gradient reaches associated with agriculture. Water quality issues associated with septic tanks are evident around settlements.

The climate is relatively wet, with rainfall varying between 1,600 and 2,000+ mm per year, increasing rapidly with elevation. Summer drought is uncommon or negligible. The temperature range is ameliorated by the marine influence being surrounded by relatively calm, inner Sounds waters. Temperature inversion

and cold air drainage into valleys is pronounced with occasional frosts on gentle landforms. The lower elevations of these inner Sounds landscape are generally well sheltered from strong winds and storms. The high ridges and summits are very exposed to the prevailing westerly winds and storms. Winter snow on the summits is rare.

Elevation ranges from sea level to a 1,040m peak by Editor Hill on the inland boundary. There is also a peak east of Kaiuma Saddle which is 976m.

Biotic

Summary analysis: Total area of the Nydia Coastal Terrestrial Area is 24,819 ha, of which 59% in native forest, 25% in native shrubland, 12% in exotic treeland, 1% in exotic scrub and 3% in pasture. This biotic environment forms part of the Department of Conservation's Sounds Ecological District.

Originally this area was predominantly forested, except for rock and beach shoreline fringes, estuarine embayments, active floodplains, coastal wetlands, shrublands and herbfields, and rock stacks. Tall alluvial indigenous forest was a significant feature of the Coastal Terrestrial Area.

Today, upland forest communities and estuaries are still largely intact. Original forests on lower altitude hillslopes and toeslopes, and coastal forests are largely intact in Tennyson Inlet, and Nydia Bay to Fairy Bay, but most are gone from elsewhere in the Coastal Terrestrial Area. Lowland and coastal forests has been replaced by limited secondary forest and regenerating shrublands.

Alluvial communities, including wetlands and estuarine margins have all but disappeared from the larger alluvial areas. Small areas of alluvial forests and beach communities are still intact in Tennyson Inlet and Nydia Bay. The few islands in this area, notably in Tennyson Inlet, are possum-free and support forest with shore shrubland and herbfields.

There are a number of distinctive biota, communities and habitats. Remaining alluvial, estuarine, and freshwater communities are uncommon, however are distinctive, vulnerable and regionally significant. Although relatively small in extent, they contribute significantly to the biodiversity of the Coastal Terrestrial Area.

Some tracts of upland forest are vital habitats for nationally threatened species such as giant land snails (*Powelliphanta*). These include the distinctive stunted wind shorn forests on exposed ridges and summits.

Tennyson Inlet and Nydia Bay supports some of the largest tracts of lowland and coastal forests in Marlborough. These are largely intact altitudinal sequences of primary forest, extending from ridgetops to seafloor and are therefore nationally important.

Biotic patterns are largely intact at higher altitudes and partially so in lower altitude and coastal areas. Alluvial patterns are very incomplete and difficult to interpret.

Plant communities on Tennyson Inlet islands are possum-free. Some plant communities are very distinctive, especially the coastal herbfields, which support nationally threatened species and are nationally important.

Natural process functioning and dynamics are generally healthy except for alluvial areas and estuarine margins, as there are ongoing wild animal and weed threats.

Natural biodiversity is moderate; enhanced by coastal, non-forest and alluvial communities.

Overall, the natural productivity is moderate, with low productivity at high altitudes and high estuarine and alluvial productivity.

Low gradient stream stretches which are close to the sea provide good habitat for threatened fish. Native fish diversity is moderate to high.

Notable plant species occurring in Nydia Coastal Terrestrial Area include: Cooks scurvy grass -t; large-leaved milktree -r; estuary sedge -r; hangehange; ramarama; scarlet rata vine; supplejack; pukatea; kiekie; *Collospermum hastatum*; rengarenga; gully treefern.

Notable animals in this area include: *Powelliphanta 'obscura'* -r,e; western weka; pied shag -t; reef heron -t; little blue penguin -r. Threatened fish (all At Risk, -r) include koaro, longfin eel, redfin bully, shortjaw and giant kokopu, inanga and dwarf galaxias. Also commonly found but not considered threatened are banded kokopu, shortfin eel, common and giant bully, smelt, and spotted shag.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

Coastal Terrestrial Area 6 : Nydia



Above: Tennyson Inlet retains extremely high experiential values, due mainly to its unmodified indigenous vegetation

Experiential

This Coastal Terrestrial Area occupies the mid-south-western inner part of the Sounds, and is centred on mid Pelorus Sound. The largest area of settlement is at Duncan Bay, located within Tennyson Inlet and accessed via the Tennyson Inlet Road, although there are other smaller areas of settlement, including those within Nydia Bay. Due to the topography and location, there are limited roads within this area, where the main mode of transport is via boat. The Nydia Track, which is typically a 2-day tramp of 27km (or a one day cycle), extends from Duncan Bay to Nydia Bay and through a range of land uses, including indigenous

and regenerating forests and farmland. The climb to Kaiuma Saddle (387 m) at the mid-point of the track has superb views of the inner Sounds, as well as of Marlborough's highest mountain, Tapuae-o-Uenuku (2885 m), to the south in the distant Inland Kaikoura mountains. There are also numerous campsites and visitor accommodation areas.

Tennyson Inlet and parts of Nydia Bay retain extremely high experiential values, due mainly to its unmodified indigenous vegetation cover that extends from the shore line to the ridges and peaks that contain the inlet.

Level 3: Overall Area Rating for Nydia Coastal Terrestrial Area

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			Very High

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 6: Nydia Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Tennyson Inlet & Nydia Bay area	Very High	<p>Original forests on lower altitude hillslopes and toeslopes, and coastal forests are largely intact in Tennyson Inlet, and Nydia Bay to Fairy Bay.</p> <p>Small areas of alluvial forests and beach communities are still intact in Tennyson Inlet and Nydia Bay and contribute significantly to the biodiversity of the area.</p> <p>Tennyson Inlet and Nydia Bay supports some of the largest tracts of lowland and coastal forests in Marlborough. These are largely intact altitudinal sequences of primary forest, extending from ridgetops to seafloor and are therefore nationally important.</p> <p>There are nationally threatened plants on the Tennyson Inlet islands.</p> <p>Tennyson Inlet and parts of Nydia Bay retain extremely high experiential values, due mainly to its unmodified indigenous vegetation cover that extends from the shore line to the ridges and peaks that contain the inlet.</p>	Some modification around Tuna Bay, Penzance Bay and North West Bay restricts those areas to High Natural Character.
Southern and eastern parts	Very High and High	<p>Extensive upland forest, although some regenerating to slopes around Hikapu Reach.</p> <p>High experiential values.</p>	

Refer also to Section F of this report for:

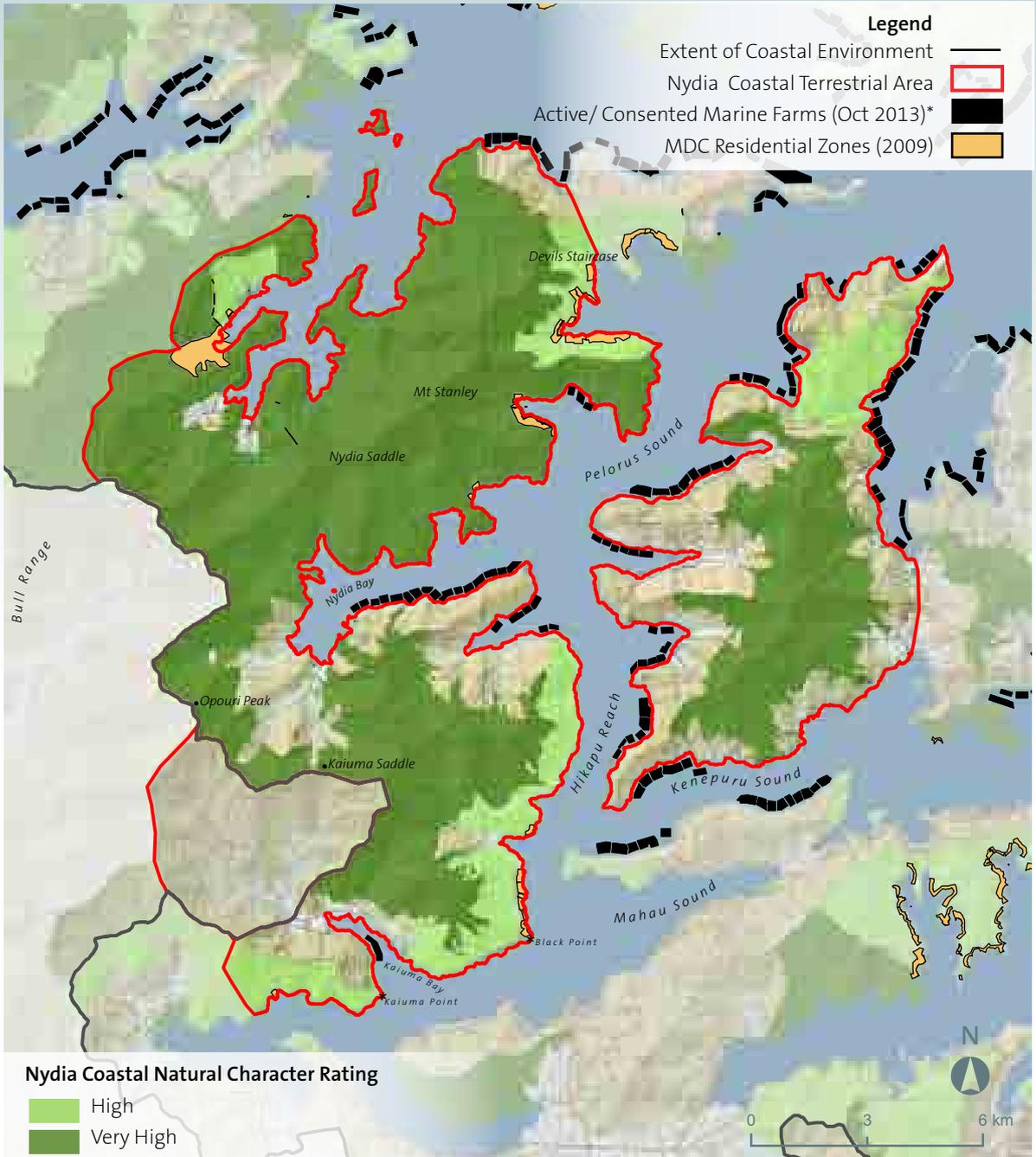
Outstanding Coastal Natural Character Area 8: Tennyson Inlet and Inner Pelorus Sound



Above: Wet inlet, Crail Bay



Levels 4 & 5: Specific Parts within Nydia Coastal Terrestrial Area Holding High or Very High Natural Character



* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational



Above: Kaiuma Bay road winds its way around Kaiuma Point

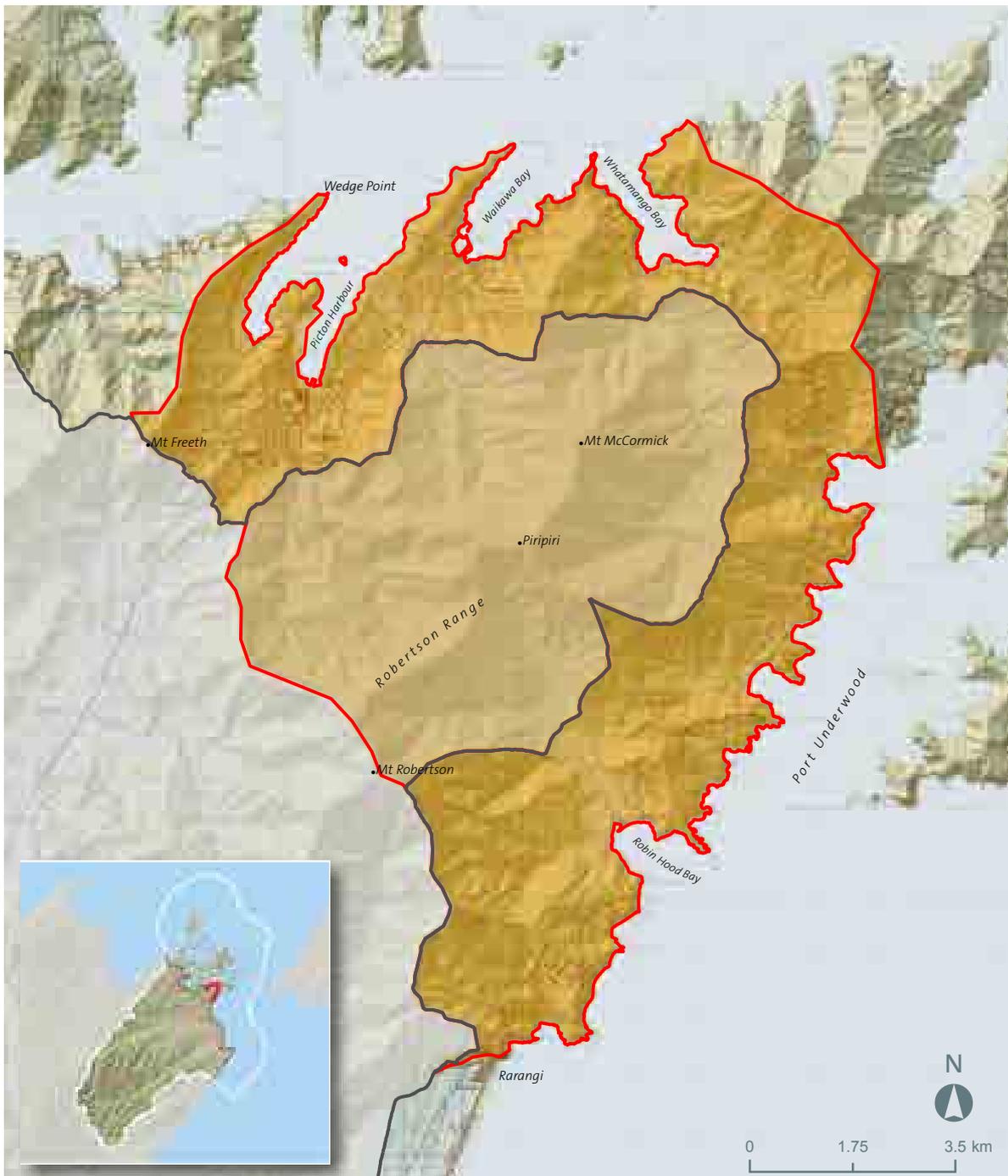
Opposite: Regenerating scrubland and pine forest on Black Point, at the convergence of Mahau Sound and Pelorus Sound/ Hikapu Reach. The waters of Hikapu Reach stretch to the far right

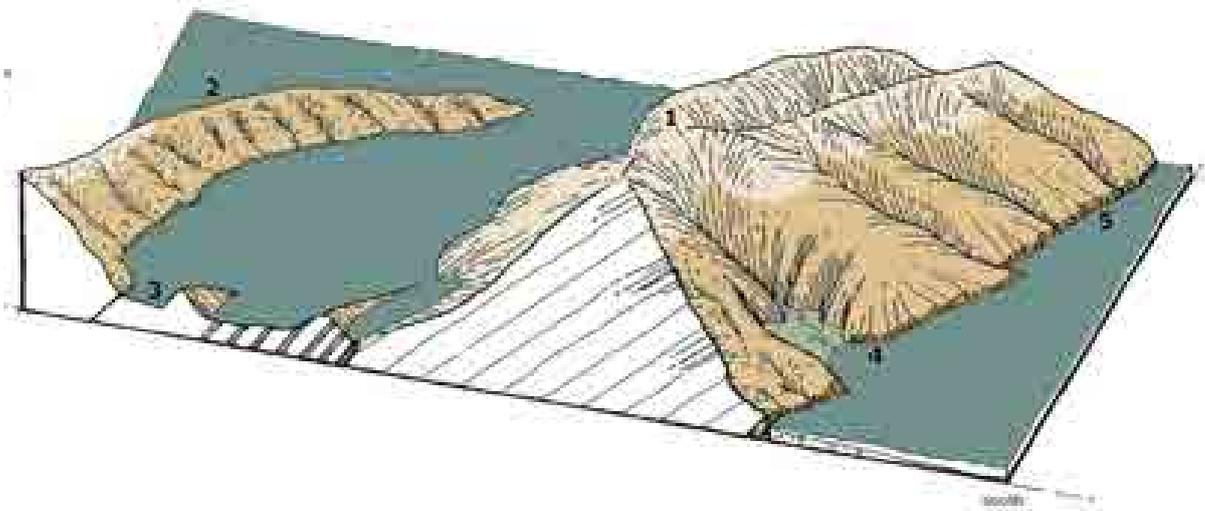
Coastal Terrestrial Area 7 : Robertson

Collective Characteristics and Coastal Context

Mamaku, Horopito, Ruru, Moist, Non to Weakly Schistose Ecosystem

This Coastal Terrestrial Area is part of the larger Roberston Land Type which includes very steep to moderately steep schist and sedimentary rocks, which underlie the hills and mountains and extend into the coastal context. Colluvium and alluvium coalesce on the lower slopes and valley floors between the broad shoulders of indented inlets. Elevation is high and rainfall moderate with a variable maritime influence. Exposure is high, and the tops are subject to infrequent snow fall events. Mountain flanks support large tracts of forest.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper mountain slopes	Siliceous, sedimentary and weakly foliated t.z. 11A and IIB schist of the Torlesse Supergroup	600–920	Red beech-silver beech-kamahi with horopito, mountain fivefinger, soft tree fern, broadleaf, and hupiro (stinkwood). Silver beech forest with southern rata and hall's totara.	Red beech-silver beech-kamahi forest with horopito, mountain fivefinger, soft tree fern, broadleaf, and hupiro (stinkwood). Silver beech forest with southern rata and hall's totara.
2	Moderately steep to steep lower hill and mountain slopes	Siliceous, sedimentary and weakly foliated t.z. 11A and IIB schist of the Torlesse Supergroup	0–600	Hard beech-black beech forest with emergent rimu, and kowhai, ponga, scarlet rata vine, heketara, crown fern. Mixed broadleaf forest of mahoe, wineberry-mamaku, fivefinger, putaputaweta, tutu. Tawa forest in gullies & flats with emergent podocarps in places (rimu, kahikatea) & pukatea, nikau, mahoe, pigeonwood, pate. Black beech forest. Pukatea-tawa-mahoe-mixed broadleaf forest.	Hard beech-black beech forest with emergent rimu, and kowhai, ponga, scarlet rata vine, heketara, crown fern. Pukatea-tawa-mahoe-mixed broadleaf forest. Rimu/black beech forest.
3	Undulating terraces fans and floodplains	Recent alluvium from predominantly schistose rocks, swamp deposits	0–30	Matai-totara-kahikatea-tawa-titoki-white maire treeland.	Forest Matai-totara-kahikatea-tawa-titoki-white maire forest. Kahikatea-narrow-leaved ribbonwood-lacebark forest.

Coastal Terrestrial Area 7 : Robertson

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
4	Prograding inlet heads	Recent alluvial and estuarine deposits	0–10	Swamp maire-mixed broadleaf forest	Kahikatea-swamp maire forest. Matai-totara-kahikatea-tawa-titoki forest.
5	Steep rocky shorelines	Siliceous, sedimentary and weakly foliated t.z. 11A and IIB schist of the Torlesse Supergroup	0–100	Rangiora-fivefinger-akiraho-akeake-wharariki forest. Mamaku-tauhinu-ngaio-taupata.	Rangiora-fivefinger-akiraho-akeake-wharariki forest. Mamaku-tauhinu-ngaio-taupata .
6	Dunes	Recent marine sand and gravel		Pingao duneland (dominated by marram-Whites Bay)	Spinifex- pingao duneland.

Abiotic

The Robertson Coastal Terrestrial Area includes the terrain east of Mt. Freeth and Wedge Point between Queen Charlotte Sound and Port Underwood, including the lower faces of Mt. McCormick and the lower north-eastern faces of Mt. Robertson. The upper flanks of Robertson Range are excluded as this falls within the Coastal Context.

The dominant landforms include steep to very steep, moderately dissected, hill and mountain slopes to 920 m; confined coastal inlets e.g., Robin Hood and Waikawa Bays, and Picton Harbour, with undulating terraces, floodplains and fans; and rolling, prograding inlet heads. Compared with the rest of the Sounds these fluvial depositional landforms are substantial but of limited extent. Intertidal flats e.g., Whatamango Bay, stacks (Mabel), beaches and dunes are also present. The coastline in Port Underwood is intensively dissected with numerous small bays and headlands whereas the inlets in Queen Charlotte Sound tend to be broader. Steep rocky shorelines are common but sea cliffs are not a prominent feature.

The Robertson Coastal Terrestrial Area is developed on siliceous, weakly foliated t.z. 11A, and t.z. 11B schist and well to poorly bedded sandstone and siltstone sedimentary rocks of the Torlesse Supergroup. Major faults run through Picton and Waikawa Bay.

Moderate to large high gradient streams originate off Mt. Robertson, meandering low gradient reaches are restricted to the fans and alluvial flats. Freshwater is generally of high quality in forested catchments and headwaters. Some degradation occurs in the lower gradient reaches, and fish passage constraints with channelisation and alteration of in-stream habitats impacts on water quality in the urban the parts of the Waitohi and Waikawa Streams.

The climate is temperate to cool and moist, rainfall varies between 1,200 and 1,600 mm p.a., increasing markedly with elevation. Summer drought is uncommon or negligible above 250 m. The temperature range is ameliorated by the maritime influence and is greater at higher altitudes. The maritime influence is variable ranging from significant on those aspects exposed to the south e.g., in Port Underwood, but more moderate on the sheltered slopes overlooking the inner Sounds e.g., around Picton and Waikawa. The high ridges and summits are exposed to strong winds from most directions, and winter snow is infrequent. Light winter frosts are common on gentle landforms and temperature inversion and cold air drainage into valleys is pronounced, although there are some frost-free areas.

Elevation ranges from sea level to 920 m with a mean elevation of 350 metres.

Biotic

Summary analysis: Total land area of Robertson Coastal Terrestrial Area is 11,100 ha, of which 48% in native forest, 35% in native shrublands, 10% in exotic treeland, 2% in exotic scrub and 3% in pasture.

Originally, this area was predominantly forested, except for rock and beach shoreline fringes, coastal shrublands, coastal and inland bluffs, estuarine embayments, active floodplains and dune systems.

Tall alluvial forest was once a significant feature of the ecosystem. Upland forests, bluff systems and estuaries are still largely intact.

Lowland hill slope forest is still intact in upper reaches of some main valleys (e.g. Waitohi, Graham and Stace Rivers), but is severely compromised on most slopes facing the coast, especially north faces.

Shrublands (with extensive wilding pines) and second-growth forest cover much of lowland hillslopes. Some coastal shrublands are still extant.

There is almost no coastal forest remaining within the coastal environment and few alluvial communities and estuarine margins remaining.

There are a number of distinctive biota, communities and habitats. Upland forest tracts are intact (some exceptionally so) and are vital habitats for nationally threatened species. Distinctive stunted, windshorn forests are a feature of exposed ridges and summits. Good understorey structure persists in places.

Tracts of primary lowland hillslope forests are still quite extensive and regionally important. Forest tracts providing vital habitat for nationally threatened species, such as giant land snails and Eastern Sounds carabid beetle, are nationally important.

Remaining alluvial, estuarine, and freshwater communities are uncommon, distinctive, vulnerable and regionally significant. Although relatively small in extent, they contribute significantly to the biodiversity of the ecosystem.

Immediately beyond the coastal environment around Stace Creek are alluvial forest and shrubland communities which are some of the most extensive in the Sounds and almost extinct in Marlborough and support regionally threatened species - regionally outstanding.

Distinctive Sounds coastal shrublands reach their southern limit at Rarangi.

Biotic patterns are largely intact at higher altitudes and partially so at lower altitudes. Coastal natural patterns are largely lost and difficult to interpret. As a consequence, intact altitudinal sequences are gone.

Natural process functioning and dynamics are generally healthy for upland and some lowland areas but largely broken down for coastal and alluvial areas. Also, ongoing wild animal and weed threats are major in places.

Natural biodiversity is moderate; enhanced by coastal, non-forest and alluvial communities.

Overall natural productivity is moderate with low productivity at high altitudes and high estuarine and alluvial productivity.

Extremely high freshwater values in southern catchments (e.g. Stace River). Excellent access and extensive low gradient stretches provide vital habitat for a very diverse native fishery, including threatened species. ►



Above: The coastline in Port Underwood is intensively dissected with numerous small bays and headlands

Coastal Terrestrial Area 7 : Robertson

Plant species that are notable in Robertson Coastal Terrestrial Area include: *Melicytus* aff. *obovatus* -r; pingao -r; swamp maire; laurel daphne; *Euphrasia cuneata*; green mistletoe; *Cyrtostylis reniformis*.

Animal species of this area include: *Powelliphanta 'bicolor'* -r; western weka; little blue penguin -r; pied shag -t; Eastern Sounds carabid beetle (*Megadromus* sp.) -r,e; *Wainuia nasuta* -t; native slug (*Pseudaneitea gravisulca*) -r,e; lamprey -r, dwarf galaxias -r, shortjaw kokopu -r, shortfin eel and longfin eel -r, banded kokopu, inanga -r, koaro -r, torrentfish -r, blue-gill -r and redfin bullies -r, inanga -r.

Experiential

This Coastal Territorial Area includes the western shores of Port Underwood and the north-facing flanks of the peaks of Mt. McCormick and Piripiri on Queen Charlotte Sound. Access is provided along this entire area, via the Port Underwood Road linking Rarangi in the south to Waikawa/ Picton to the

north. The area's lower elevated parts are reasonably modified with roads, tracks, housing, powerlines and forestry, with only the higher elevations of the Robertson Range holding the highest naturalness values. Indigenous vegetation and numerous freshwater streams occupy these more lofty elevations, which are generally difficult to access, other than for the determined tramp.

There are numerous small bays forming Port Underwood's western side, where numerous campsites and places for visitor accommodation are located. These areas provide for high experiential values, and are also heavily associated with post colonisation and Maori heritage. The Queen Charlotte Sound area is heavily modified with the settlements of Waikawa and Picton.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds



Above: Robin Hood Bay

Level 3: Overall Area Rating for Robertson Coastal Terrestrial Area

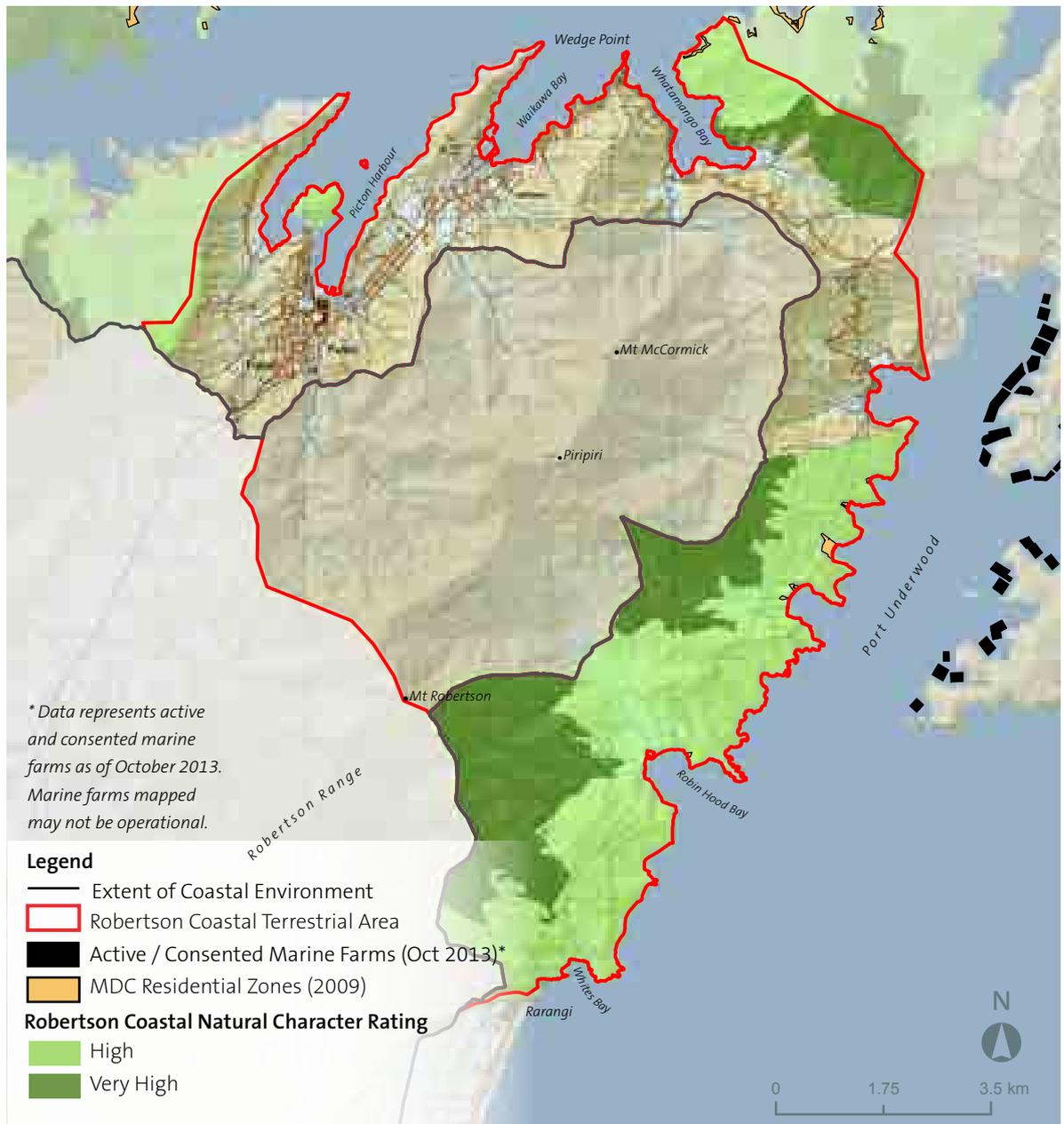
Degree of Natural Character	Natural Character Attributes		
	Abiotic	Biotic	Experiential
Very High			
High	✓	✓	✓
Moderate to High			
Moderate			
Moderate to Low			
Low			
Very Low			
Overall Natural Character Rating			High

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 7: Robertson Holding High or Very High Natural Character

General values applicable to the whole Coastal Terrestrial Area

Upland forest tracts are intact (some exceptionally so) and are vital habitats for nationally threatened species. Tracts of primary lowland hillslope forests are still quite extensive and regionally important.

Sub Area	Rating	Key Values	Additional Comments
Port Underwood area	High	Numerous indented bays in Port Underwood from Whites Bay to Willawa Point/ Oyster Bay hold high experiential values	Most modification occurs closest to the shoreline
Queen Charlotte Sound areas	High	Forested headland of Kaipupu Point, now managed as a "mainland island".	
Upper parts of Mt Robertson and Kahikatea	Very High	Upland indigenous forest tracts provide vital habitat for nationally threatened species. Very high perceived naturalness.	Some exotic forestry occupies the lowlands.

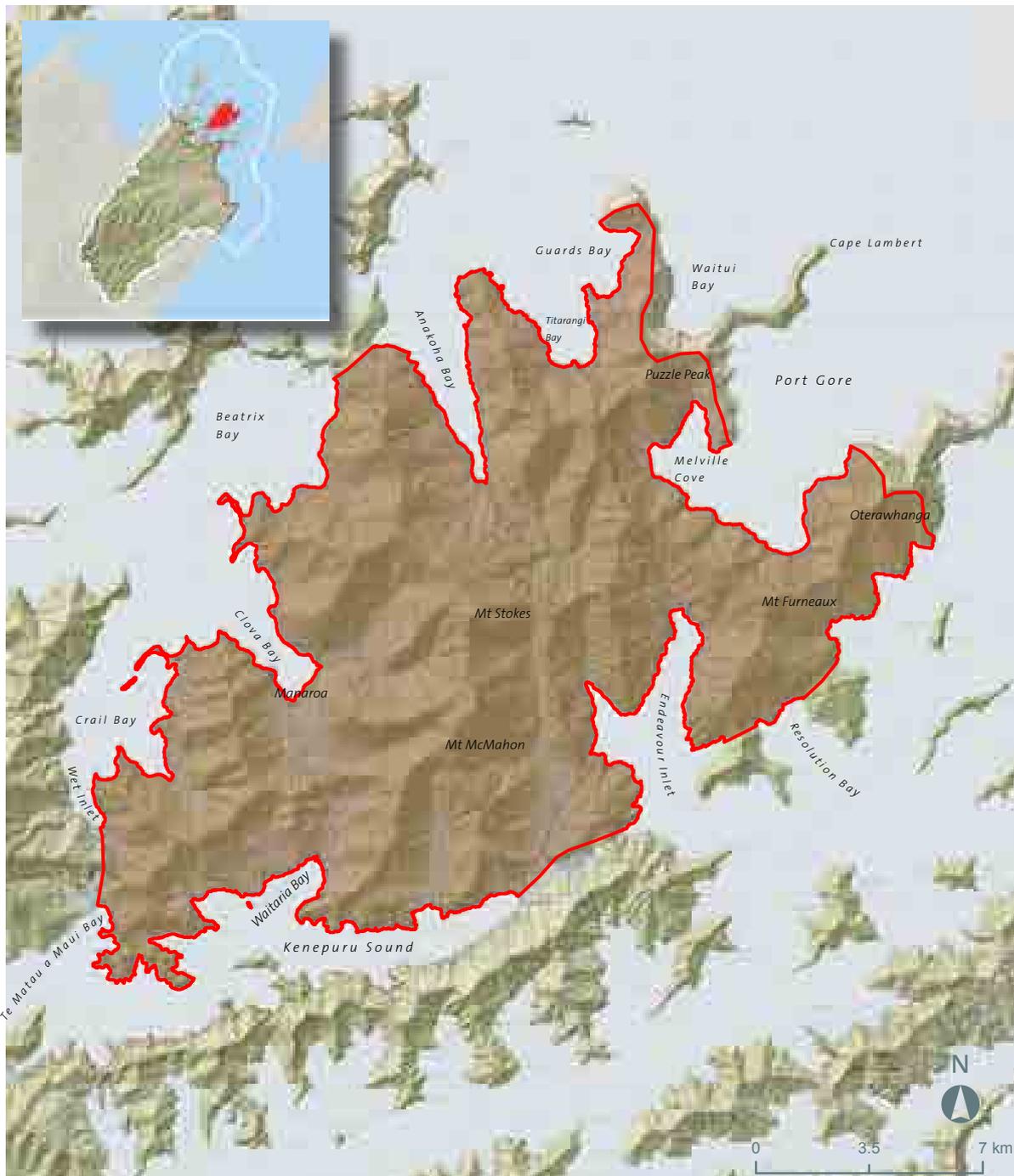


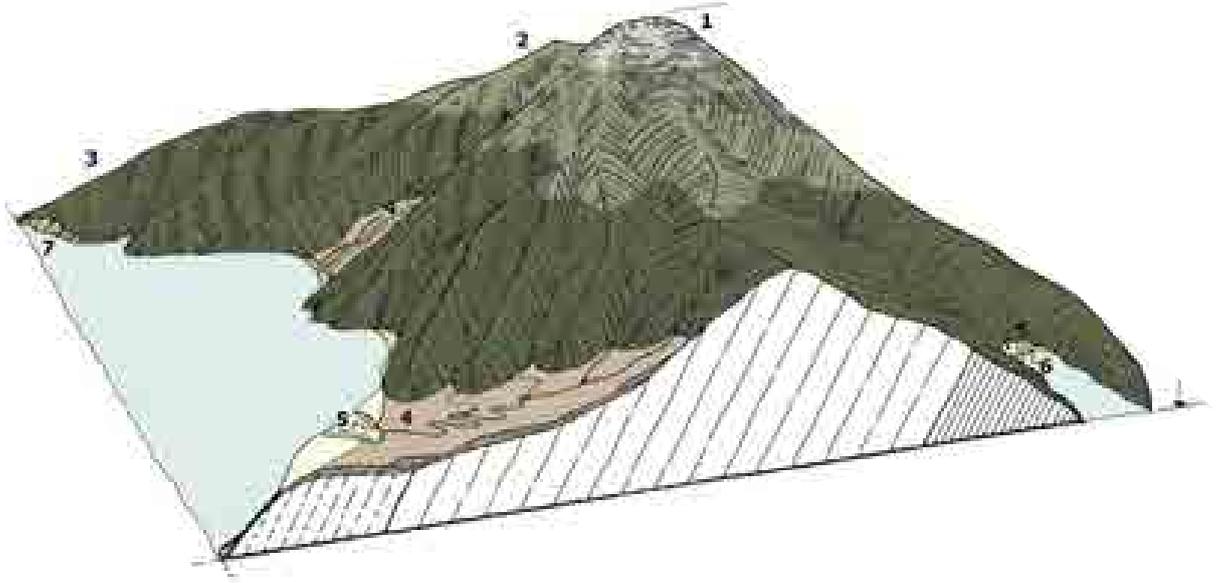
Coastal Terrestrial Area 8 : Stokes

Collective Characteristics and Coastal Context

Silver Beech, Stoppy-Stop, Celmisia macmahonii, Mohua, Sounds, Wet, Weakly To Strongly Schistose Ecosystem

Very steep to moderately steep, evenly contoured coastal hills and mountain slopes with steep and rolling upper ridge crests and summits dominate this ecosystem forming the substantial Stokes massif. The coastline is characterised by several large, deeply incised inlets and prominent headlands. In the confined coastal inlets, undulating to rolling prograding inlet heads are evident and comprise alluvial flats, fans and dunes. There is a considerable range in height and rainfall gradient from sea level to the mountain tops, which are exposed and sometimes covered in snow. The influence of the sea is significant as it surrounds the landmass. Original forest covers most of the upper slopes of Stokes massif and its summit supports the only occurrence of subalpine vegetation in the Sounds.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Strongly rolling to moderately steep broad mountain summits and upland ridge crests	Siliceous, foliated t.z. 11A to t.z. 111A schist of the Caples Group	1000–1203	Shrub-tussockland (broad and mid-ribbed snow tussocks with mixed shrubs). -Shrub-sedge-cushionfield (<i>Montitega dealbata</i> , <i>Donatia n-z</i> , <i>Oreobolus pectinatus</i> , <i>Carpha alpina</i>). Mt Stokes daisy- <i>Celmisia rutlandii</i> rockland.	Grassland Shrub-tussockland (broad and mid-ribbed snow tussocks with mixed shrubs). Shrub-sedge-cushionfield (<i>Montitega dealbata</i> , <i>Donatia n-z</i> , <i>Oreobolus pectinatus</i> , <i>Carpha alpina</i>). Mt Stokes daisy- <i>Celmisia rutlandii</i> rockland.
2	Steep to very steep upper hill and mountain slopes	Siliceous, foliated t.z. 11A to t.z. 111A schist of the Caples Group	600–1100	Silver beech forest with leatherwood in places. Mountain beech forest. Silver beech-red beech forest with halls totara, southern rata, papauma, toro, kamahi and toi.	Forest Silver beech forest with leatherwood in places. Mountain beech forest. Silver beech-red beech forest with halls totara, southern rata, papauma, toro, kamahi and toi.
3	Moderately steep to steep lower hill slopes	Siliceous, foliated t.z. 11A to t.z. 111A schist of the Caples Group	0–600	Rimu/hard beech - toro-kamahi forest with halls totara, miro. Tawa - mixed broadleaf forest. Kohekohe - mixed broadleaf forest. Mixed broadleaf-mamaku forest. Tauhinu - bracken shrubland.	Forest Rimu/hard beech - toro-kamahi forest with halls totara, miro. Rimu-kahikatea/tawa - mixed broadleaf forest. Kahitatea-matai/kohekohe - mixed broadleaf forest.

Coastal Terrestrial Area 8 : Stokes

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
4	Undulating terraces, floodplains, fans and associated wetlands and deltas, e.g. P27/980050, 970098	Recent alluvium from predominantly schistose rocks	0–20	(Kahikatea)/tawa - pukatea forest on alluvium. Kanuka forest on alluvium.	Forest Kahikatea-pukatea-nikau swamp forest
5	Minor prograding inlet heads and fans, e.g. P26/980110, 030165	Recent alluvium from predominantly schistose rocks, minor swamp deposits	0–20	Matai-titoki-tawa forest. Kohekohe-mixed broadleaf forest. Kaikomako-kahikatea-mahoe-tawa forest. . Kanuka forest on alluvium. Marsh ribbonwood shrubland. Manuka-Carex sedge-shrubland.	Forest and Shrubland Kahikatea-matai-totara-kohekohe-tawa-titoki forest. Marsh ribbonwood shrubland. Manuka-Carex sedge-shrubland.
6	Beach ridges and dunes, e.g. P26/056202	Recent marine sand and gravel	0–20	Spinifex, dune slack, rushes, sedges, low scrub	Spinifex-pingao duneland.
7	Minor steep to precipitous eroding sea cliffs	Siliceous, foliated t.z. 11A to t.z. 111A schist of the Caples Group	0–100	Horokaka rockland. Silver tussock tussock-loamfield. Tauhinu-taupata-wharariki-flax-shrubland	Horokaka rockland. Silver tussock tussock-loamfield. Taupata-wharariki-tauhinu flax-shrubland.

Abiotic

The Stokes Coastal Terrestrial Area includes terrain east of a line between Te Matau a Maui Bay and Wet Inlet, centred on Mount Stokes, and includes the head of Kenepuru Sound through to Endeavour Inlet.

The dominant landforms include very steep to moderately steep, dissected, inner coastal hill and mountain slopes; strongly rolling to moderately steep, upland ridge crests and summits to 1,203 m [Mt. Stokes]; confined coastal inlets with undulating to rolling prograding inlet heads; sinuous undulating terraces and floodplains; fans, wetlands and associated deltas [e.g. the head of Kenepuru Sound, and Manaroa]; and minor rolling beach ridges and dunes. Steep rocky shorelines are common but precipitous sea cliffs are not a prominent feature. Ocean sea cliffs to the east and north are included in the Cook Strait coastal area. In contrast to the surrounding coastal

environments the coastline is characterised several large, deeply indented bays and inlets e.g., Port Gore, Anakoha Bay, Endeavour Inlet, separated by prominent peninsulas and headlands. Fans, alluvial terraces and floodplains are common and occupy significant areas compared to the rest of the Sounds e.g., Clova and Waitaria Bays. Minor landforms include intertidal flats at the heads of major inlets e.g., Anakoha Bay, Kenepuru Head, islets e.g., Clark and Ouokaha, beaches; and regionally significant dunes at Titirangi.

The terrain is developed on siliceous, weakly to strongly foliated t.z. 11A, 11B, and t.z. 111A schist of the Caples Group.

A number of streams originating off Mt. Stokes are large, long and have high gradients. Reaches of low gradient meandering stream reaches are restricted to



This coastal terrestrial unit is characterised by several large, deeply indented bays and inlets such as Port Gore

Coastal Terrestrial Area 8 : Stokes

the fans and alluvial flats and are some of the most well-developed in the Sounds, e.g., Kenepuru Head. Freshwater quality is high in forested catchments and headwaters. Some degradation in water quality is evident in lower gradient reaches as a result of farming activity.

The climate is temperate to cool and relatively wet, rainfall varies between 1,200 and 2,000+ mm p.a., increasing rapidly with elevation. Summer drought is uncommon or negligible above 150 m. The maritime influence is variable but significant in the north where the terrain is exposed to oceanic winds and storms but significantly less in more sheltered inlets, Kenepuru Sound and Endeavour Inlet. The high ridges and summits of Mt. Stokes are exposed to the prevailing westerlies and receive infrequent winter snow. Frosts occur on gentle sheltered landforms.

Elevation ranges from sea level to 1,203 m with a mean elevation of 400 metres.



Above: Mt Stokes cushionfield

Biotic

Summary analysis: Total land area in Stokes Coastal Terrestrial Area is 27,319 ha, of which 42% in native forest, 34% in native shrubland, 6% in exotic treeland, 2% in exotic scrub and 17% in pasture. This biotic environment forms part of the Department of Conservation's Sounds Ecological District.

Originally, this area was predominantly forested, except for rock and beach shoreline fringes, coastal and inland bluffs, estuarine embayments, sub-alpine communities, active floodplains and dune systems. Subalpine communities on Mt. Stokes comprise predominantly rockland, boulderfield, tussockland, shrublands, and cushion bogs.

Tall alluvial forest is a significant feature of this Coastal Terrestrial Area. Upland forests and alpine communities, bluff systems and estuaries are still largely intact. Forests of lower altitude hill slopes and toe-slopes, and coastal forests are severely compromised. Very little of the original forests remain, although a significant proportion of this is now secondary forest and regenerating shrublands.

Alluvial communities and estuarine margins are all but gone. Indigenous vegetation of dunes are gone.

Within the sub-alpine plant communities the followings species are present: outcropping rockland bluffs with scattered Mt. Stokes cushion daisy (*Celmisia macmahonii* var. *macmahonii*), *Celmisia rutlandii* and Mt Stokes carrot (*Anisotome haastii* var.); shrub-tussock boulderfield; shrub-tussockland; shrub-sedge-cushionfield (*Montitega dealbata*, *Carpha alpina*, *Donatia novae-zelandiae* and *Oreobolus pectinatus*).

Within the forests, silver beech dominates with leatherwood (*Olearia colensoi*) in places. Kanuka forest is prevalent on alluvium; (kahikatea)/tawa-pukatea forest is also found on alluvium; kaikomako-kahikatea-mahoe-tawa forest is found on alluvium and matai-titoki-tawa forest is found on alluvium. Other species include rimu/hard beech-toro-kamahi forest with hall's totara, miro; silver beech-red beech forest with halls totara, southern rata, toro and toi; kohekohe-mixed broadleaf forest; tawa-mixed broadleaf forest; mixed broadleaf forest.

Scrublands include manuka shrubland; tauhinu-bracken shrubland; horokaka rockland; silver tussock tussock-loamfield; taupata-wharariki-tauhinu flax-shrubland; marsh ribbonwood shrubland; manuka-Carex shrub-sedgeland.

Subalpine communities are unique and very distinctive in this area, supporting local endemics. Some of the species occurring here are found nowhere else in the Sounds including species which are otherwise confined to the North Island (e.g. *Chionochloa flavescens* subsp. *flavescens*), *Leptinella squalida* subsp. *squalida*). This is the only subalpine area in the Sounds coastal environment and is nationally important.

Remaining alluvial, estuarine, freshwater and dune communities are uncommon, however are distinctive, vulnerable and regionally significant. Although relatively small in extent, they contribute significantly to the biodiversity of the Coastal Terrestrial Area.

Some tracts of upland forest are distinctive, diverse and act as vital habitats for nationally threatened species. Distinctively stunted, windshorn forests are present on exposed ridges and summits.

A few large, nationally important primary coastal and lowland forest tracts remain; they contribute to intact altitudinal sequences from ridgetop to seafloor, (e.g. Black Head, Big Bay, Ship Cove).

Unusual coastal shrublands occur in places, (e.g. above Jacksons Head.)

Biotic patterns are disrupted in most lower altitude and coastal areas, however are largely intact at higher altitudes. Alluvial patterns are largely lost and therefore uninterpretable.



Above: *Hebe speciosa*

Dynamic process functioning is generally healthy except for alluvial sites. Ongoing management of wild animal and weed threats is required.

Natural biodiversity is high due to range of altitude, landform and habitat types; especially enhanced by subalpine communities.

Overall productivity is moderately low partly due to moderately infertile schists. There is low productivity at high altitudes.

Low gradient stream reaches which are close to the sea provide good habitat for a diverse range of threatened fish including New Zealand longfin eel, inanga, koaro, torrentfish, blue-gill and redfin bullies, shortjaw and giant kokopu, lamprey and dwarf galaxias (all At Risk -r). Also commonly found but not considered threatened are banded kokopu, common bully and shortfin eel.

Notable plants in Stokes Coastal Terrestrial Area include: *Celmisia macmahonii* var. *macmahonii* -r,ee; *Anisotome haastii* var -e, *Celmisia rutlandii* -r,e; *Hebe rigidula* var. *rididula* -r; titirangi -r; *Astelia 'Stokes'* -r,e; raukawa; toi; broad-leaved snow tussock; leatherwood; *Aciphylla aurea*; *A. squarrosa*; *Donatia novae-zelandiae*; *Carmichaelia odorata*; *Alseuosmia pusilla*; pygmy pine; woollyhead. ▶

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

ee = endemic to Stokes Coastal Terrestrial Area



Above: The forested slopes of Mt Furneaux

Coastal Terrestrial Area 8 : Stokes



A few large, nationally important primary coastal and lowland forest tracts remain; they contribute to intact altitudinal sequences from ridgetop to seafloor, (eg. Black Head, Big Bay, Ship Cove)

Animals in this area include: *Powelliphanta 'bicolor'* western weka; little blue penguin -r; pied shag -t; reef heron -t; koaro -r, banded kokopu, lamprey -r. Mohua (yellowhead) -t has recently become extinct through rat and stoat irruptions, Mt Stokes having been the only known occurrence of this bird in the northern South Island in the last 40 years.

Experiential

The Stokes Coastal Terrestrial Area incorporates one of the largest and highest landforms in the Sounds and due to its central location, straddles both the eastern and western parts of the Sounds. The area also straddles the inner and outer Sounds, where extreme weather can also play an important aspect into the areas experiential values. Contained by Queen Charlotte Sound/ Endeavour Inlet to the east, Kenepuru Sound to the south, Crail and Beatrix Bays to the west, Anakoha and Guards Bay to the north-west and Port Gore to the north, the area retains

maintains many different characteristics. Although access to the area can be gained via water from these many areas, there is essentially only one vehicular route, which wends its way along the arm dividing Kenepuru Sound from Queen Charlotte Sound and splinters off to many of the respective areas. Modification is most apparent in along the lower coastal shores and within the lower lying valleys of this area, with the highest elevations protected for their conservation values. Much of the modification reflects the varied land use, which includes pastoral grazing and forestry. Residential housing, airstrips and transmission lines are also evident in these areas. Despite this, the natural darkness of the night sky is virtually free from artificial light.

The area is particularly memorable where the level of modification is least, notably the most elevated parts of Mt. Stokes and along the Queen Charlotte Shores of Endeavour Inlet and Ship Cove.

Level 3: Overall Area Rating for Stokes Coastal Terrestrial Area

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			Very High



Endeavour Inlet

Coastal Terrestrial Area 8 : Stokes

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 8: Stokes Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Mt. Stokes massif inner Port Gore and Camp Bay	Very High (& High around inner Port Gore and Camp Bay)	<p>Original forest covers most of the upper slopes of the Stokes massif and its summit supports the only occurrence of subalpine vegetation in the Sounds. It is the largest and highest forest tract in the Marlborough Sounds, and includes largely-intact shore-to-tops sequences. The area also straddles the inner and outer Sounds, where extreme weather can also play an important aspect into the areas experiential values.</p> <p>Unique sub-alpine rockland vegetation [i.e. <i>Celmisia macmahonii</i> var. <i>macmahonii</i> only occurs here, on bluffs]</p> <p>More settled areas of inner Port Gore retain High levels of natural character due to regenerating bush and limited modification.</p> <p>Limited modification and indigenous forest cover along the Queen Charlotte Shores of Endeavour Inlet and Ship Cove.</p>	Parts of Titirangi Road and Anakoha Road connecting Port Gore and Guards Bay/ Anakoha Bay are included within the rating due to their limited visual and physical presence.
Southern extents	Very High	Original forest covers most of the upper slopes around Bob's Knob and the lowlands around Golf Reef Bay in Kenepuru Sound	

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 10: Ship Cove and Resolution Bay

Outstanding Coastal Natural Character Area 12: Mt. Stokes



Inner Port Gore and the steep slopes of Mt Furneaux

Levels 4 & 5: Specific Parts within Stokes Coastal Terrestrial Area Holding High or Very High Natural Character



* Data represents active and consented marine farms as of October 2013. Marine farms mapped may not be operational.



Above: The peak and ridgeline associated with Grants Lookout (centre) from Furneaux Lodge, Queen Charlotte Sound.
Opposite: Launching outside Furneaux Lodge, Endeavour Inlet

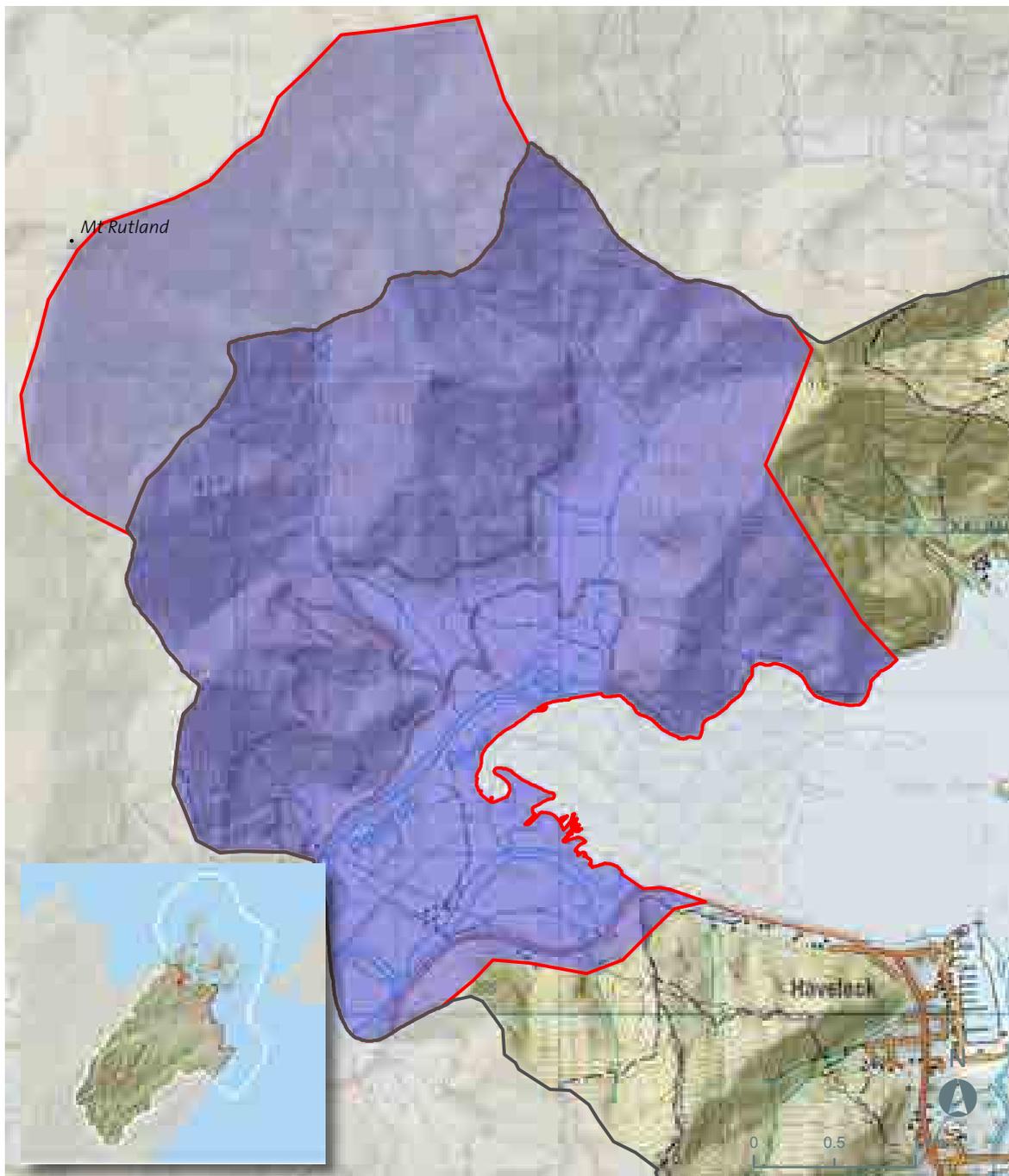
Coastal Terrestrial Area 9 : Pelorus

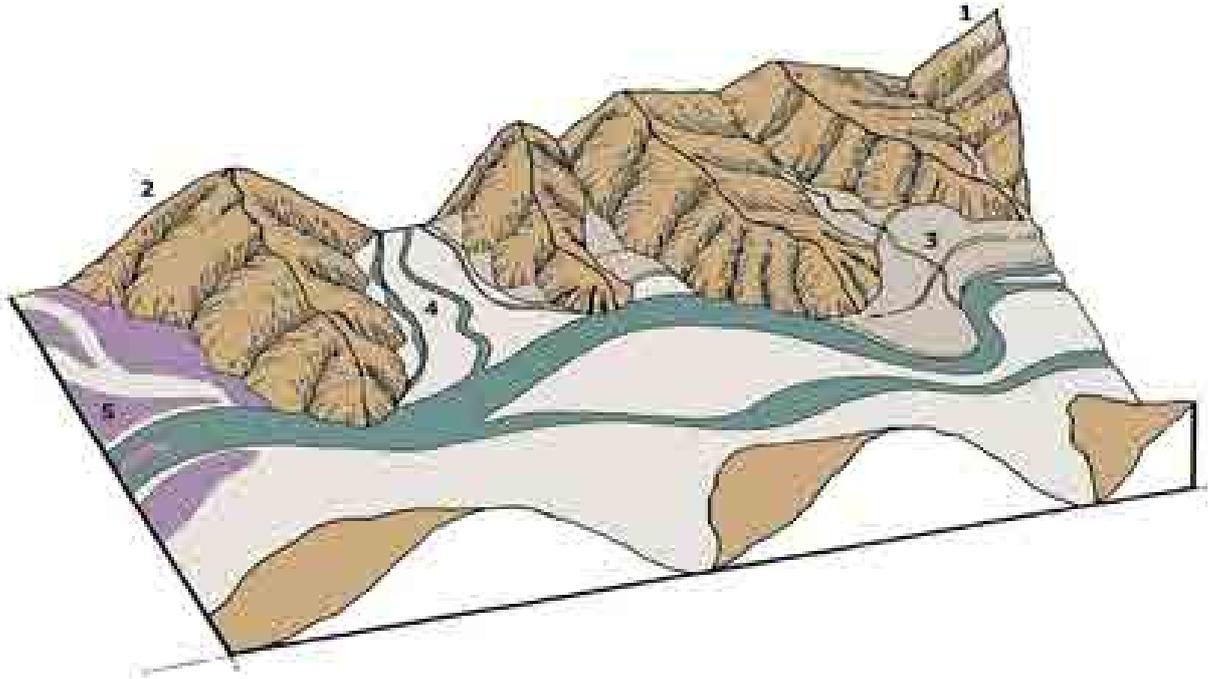
Collective Characteristics and Coastal Context

Kahikatea, Rimu, Beeches, Non to Weakly Schistose Area

The Pelorus Coastal Terrestrial Area is a small part of the inland mountainous Pelorus Land Type. It encompasses a small section of the lower valley floor, flood plain and distributary delta of the Pelorus River, and the adjoining south-easterly aspect steep hill country to the north. The recent alluvial and estuarine deposits and landforms infilling the mouth of the valley are extensive by Sounds standards and are prone to flooding and fresh silt deposition. The low energy saline depositional environment of shallow distributary delta channels and tidal flats provides a specialist freshwater and estuarine habitat. Elevation and rainfall range are moderate. The Pelorus delta complex and upper hill slopes are still dominated by native vegetation.

The coastal context includes the mid and upper Pelorus valley. The mid parts of the valley are typically modified, with numerous pine plantations, roads, small settlements and farmsteads occupying the lower slopes and valley floor. The higher slopes and upper Pelorus catchment retains less modification, where indigenous forest dominate.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper slopes and summits (minor component)	Non-foliated, well to poorly bedded sandstones and siltstones, and weakly foliated t.z. 11A schist of the Caples Group	700–1008	Mid-ribbed snow tussockland. Carpet grass turfland. Coprosma - Hebe subalpine shrubland. Cushion-herb-rockland. Mountain beech forest (treeline). Red-silver-mountain beech forest. Red beech-silver beech-kamahi forest	Grassland-Shrubland Mid-ribbed snow tussockland. Carpet grass turfland. Coprosma - Hebe subalpine shrubland. Cushion-herb-rockland. Forest Mountain beech forest (treeline). Red-silver-mountain beech forest. Red beech-silver beech-kamahi forest.
2	Moderately steep to steep lower hill and mountain slopes	Non-foliated, well to poorly bedded sandstones and siltstones, and weakly foliated t.z. 11A schist of the Caples Group	0–700	Hard beech forest with rimu emergent, kamahi, ponga. Mixed broadleaf forest. Tawa forest with mixed broadleaf spp. Hard beech-silver beech forest.	Forest Hard beech-silver beech forest. Hard beech forest with rimu emergent, kamahi, ponga. Rimu/tawa-mixed broadleaf forest.
3	Undulating terraces, fans and terrace remnants	Pleistocene alluvium from predominantly sedimentary and schistose rocks	5–150	Podocarp–broadleaved forest, rimu, matai, kahikatea	Forest Rimu-totara-matai-black beech-tawa forest. Black beech-matai forest. Rimu/black beech forest. Silver beech-black beech-rimu forest.

Coastal Terrestrial Area 9 : Pelorus

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
4	Narrow sinuous floodplains	Recent alluvium from predominantly sedimentary and schistose rocks	5–20	Lowland ribbonwood-kowhai treeland. Kahikatea-matai forest. Totara-matai forest. Riparian flood zone shrublands and herbfields.	Forest Kahikatea-matai-totara forest. Lowland ribbonwood-narrow-leaved lacebark-kowhai forest. Cabbage tree-harakeke tree-flaxland. Riparian flood zone shrublands and herbfields.
5	Prograding delta / tidal flat	Recent alluvial and estuarine deposits	0–3	Lowland ribbonwood-kowhai treeland. Manuka-kahikatea-swamp coprosma shrubland. Three-square sedgeland. Bolboschoenus sedgeland. Oioi rushland. Marsh ribbonwood coastal shrub daisy shrubland. Seablite-glasswort herbfield.	Lowland ribbonwood-kowhai treeland. Manuka-kahikatea-swamp coprosma shrubland. Three-square sedgeland. Bolboschoenus sedgeland. Oioi rushland. Marsh ribbonwood-coastal shrub daisy shrubland. Seablite-glasswort herbfield.

Abiotic

The dominant landforms include the floodplain and regionally significant prograding delta-estuarine tidal flat complex of the Pelorus River, sinuous undulating terrace remnants, minor footslope fans, and the adjacent marginal steep to very steep, dissected, hill slopes and ridges to 700 m.

The landscape is underlain by siliceous, non-foliated, well to poorly bedded sandstones and siltstones, and weakly foliated t.z. 11A schist of the Caples Group. The recent alluvial and estuarine deposits and landforms are extensive by Sounds standards. The lower reaches of the Pelorus River flood frequently ponding surface water and depositing fresh silt.

The large river low gradient shallow distributary channels dominate the freshwater habitat, with short steep high gradient streams draining the steepland component. A major area of low energy saline-estuarine habitat exists at the interface between the freshwater environment and that of Pelorus Sound. Water quality in this reach of the Pelorus is variable, eutrophication and contamination from intensive land use is an issue.

The climate is temperate and relatively wet, with rainfall varying between 1,600 and 1800 mm per year, increasing with elevation. Summer drought is uncommon or negligible although occasional

very intense rainfall events occur. Warm summer temperatures are apparent in valleys sheltered from strong winds and storms. Winter frosts are typical on valley floors but are ameliorated to some extent by coastal proximity. Cold air drainage onto the valley floor can be pronounced, and there is a high incidence of valley fog, especially in winter.

Elevation ranges from sea level to 700 m on the flanks of Mt Rutland.

Biotic

Summary analysis: Total land area of Pelorus Coastal Terrestrial Area is 1,951 ha, of which 58% is native forest, 3% native shrubland, 19% exotic treeland, 1% exotic scrub and 14% pasture.

Originally all the hill country and alluvial landforms of this coastal terrestrial area was forested. Discrete non-forest areas were restricted to tidal flats and estuaries, riparian communities, active flood plains and deltas, within the flood zone of the lower Pelorus River, a few coastal non-forest wetlands, and rare bluff communities and slip sites.

Now, upper hill country forest on the Mt Rutland flanks and the Pelorus intertidal, estuarine delta system are still largely intact. Low altitude and coastal hill country forests are greatly compromised and alluvial forest is

almost entirely gone, being reduced to rare treeland stands. All non-forest communities are variously altered and diminished, especially on the active flood plains, large delta system and upper estuarine shrublands.

The area retains numerous distinctive biota, communities and habitats. Lowland and coastal podocarp-beech and mixed broadleaf forests on hill country.

Distinctive remnant alluvial communities, although now reduced to scattered treelands, are regionally important and include fertile podocarp and mixed broadleaf treeland, and semi-deciduous kowhai-ribbonwood-lacebark treelands.

Estuarine and adjoining freshwater wetland communities are extensive, very distinctive, regionally outstanding, and provide important habitats.

Despite the small coastal extent, natural biodiversity is moderate due to a wide range of landforms - especially riverine and estuarine - and water regimes involving both freshwater and seawater. Alluvial biodiversity has been severely compromised by clearance and the fragments that remain are vulnerable to loss.

Biotic patterns and sequences, dynamics and process functioning are largely intact at higher altitudes on the hillslopes, but disrupted throughout most of the lower hillslopes, and almost lost in alluvial areas. Alluvial patterns are highly fragmented and very difficult to interpret. Intertidal patterns are very well-preserved but sequences through to alluvial communities are largely gone.

Natural productivity is high in alluvial and intertidal communities and decreasing to moderate productivity on adjacent hillslope communities.

Extensive inanga -r spawning and adult rearing habitat in tidal zones.

Notable plant species of Pelorus Coastal Terrestrial Area include: coral mistletoes (*Korthalsella salicornioides* -r; *Korthalsella clavata* -r, estuary sedge -r; lowland ribbonwood; kōwhai; tōtara; oioi; saltmarsh ribbonwood; coastal shrub daisy; swamp coprosma; green mistletoe; horse's mane; clubrush; marsh clubrush.

Animals include: banded rail -r, fernbird -r, spotless crane -r, pukeko, western weka and little blue penguin -r. Diverse and larger freshwater habitat types supporting: shortfin and longfin -r eel, giant -r and banded kokopu, blue gill -r, common and upland bullies .

A significant brown and rainbow trout population supports an important recreational fishery.

A variety of estuarine and marine fish penetrate the lower Pelorus such as Kahawai, grey and yellow-eye mullet and snapper.

Experiential

The Pelorus Coastal Terrestrial Area is the smallest in the Sounds, encapsulating the delta and mouth of the Pelorus River and the southern flanks of Mt. Rutland. The intertidal river delta, with its network of small waterways is extremely memorable, especially in terms of its character to Havelock. The forested upper slopes of Mt. Rutland assist in framing this intimate part of the Sounds. Access is provided via SH6 and via Kaiuma Bay Road on the northern bank of the river.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds

Level 3: Overall Area Rating for Pelorus Coastal Terrestrial Area

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



Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 9: Pelorus Holding High or Very High Natural Character

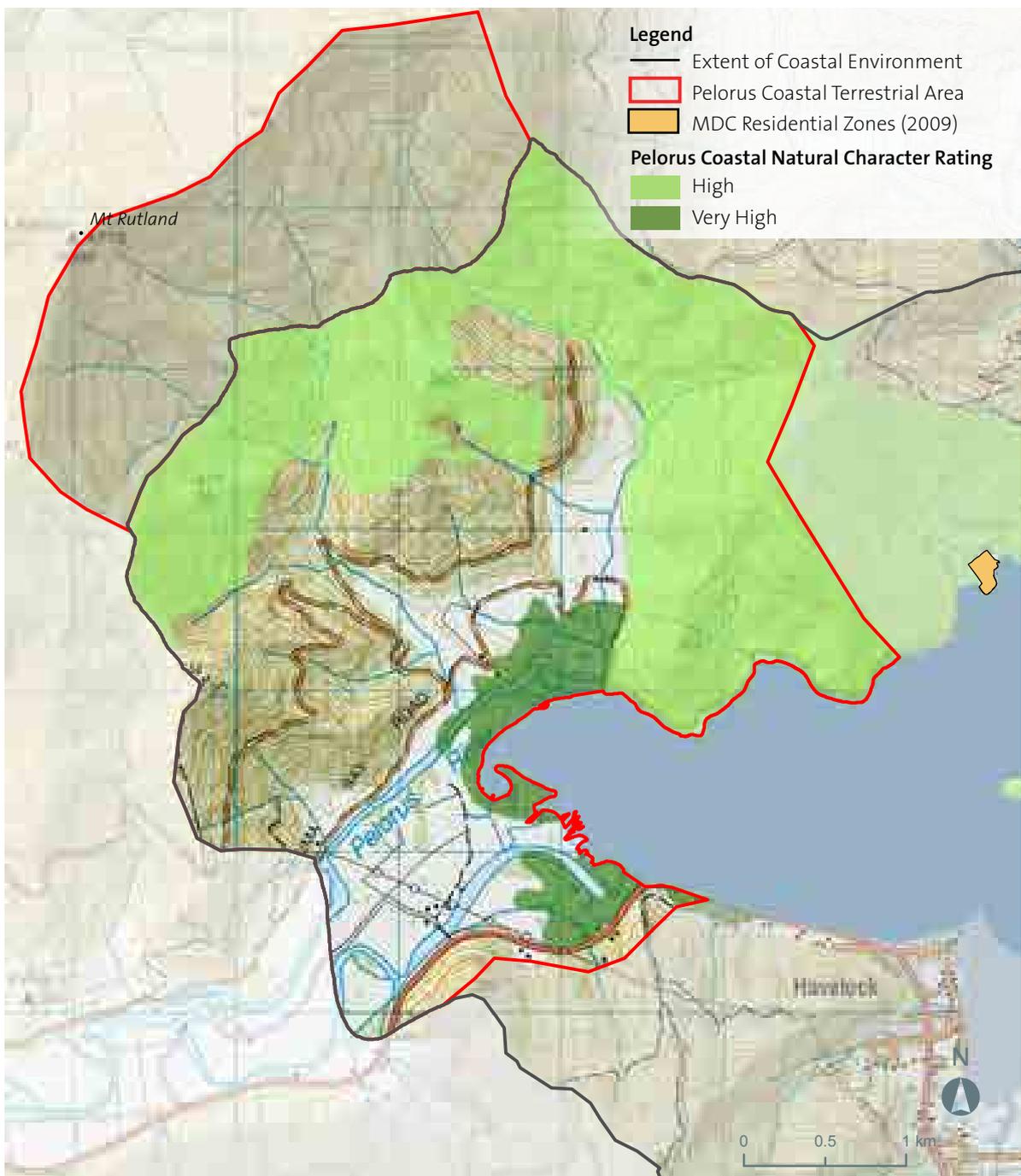
Sub Area	Rating	Key Values	Additional Comments
Pelorus/ Kaituna Estuary	Very High	<p>Distinctive remnant alluvial communities, although now reduced to scattered treelands, are regionally important and include fertile podocarp and mixed broadleaf treeland, and semi-deciduous kowhai-ribbonwood-lacebark treelands.</p> <p>Estuarine and adjoining freshwater wetland communities are extensive, very distinctive, regionally outstanding, and provide important habitats.</p> <p>The estuarine system also has biotic patterns and sequences, dynamics and processes that are largely intact.</p> <p>The intertidal river delta, with its network of small waterways holds very high perceived naturalness values.</p>	Refer also to Coastal Marine Area C

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 9: Pelorus Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Upper vegetated slopes	High	The forested upper slopes of Mt. Rutland assist in framing this intimate part of the Sounds. Biotic patterns and sequences, dynamics and process functioning are largely intact at higher altitudes on the hillslopes	Lower slopes retain commercial forestry. Area delineated by vegetation cover.

Refer also to Section F of this report for:

Outstanding Coastal Natural Character Area 13: Pelorus Estuary



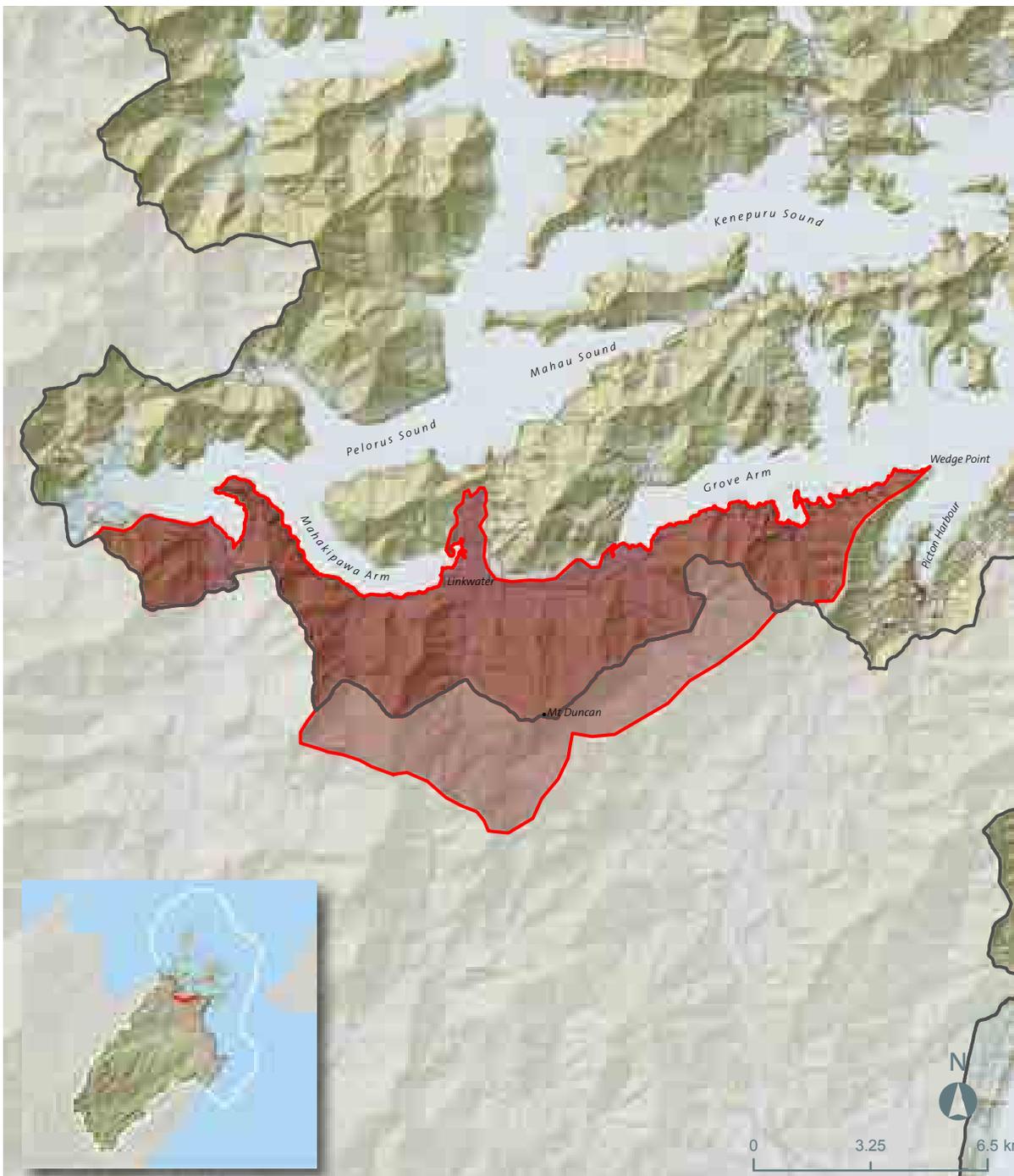
Opposite: Pelorus Estuary

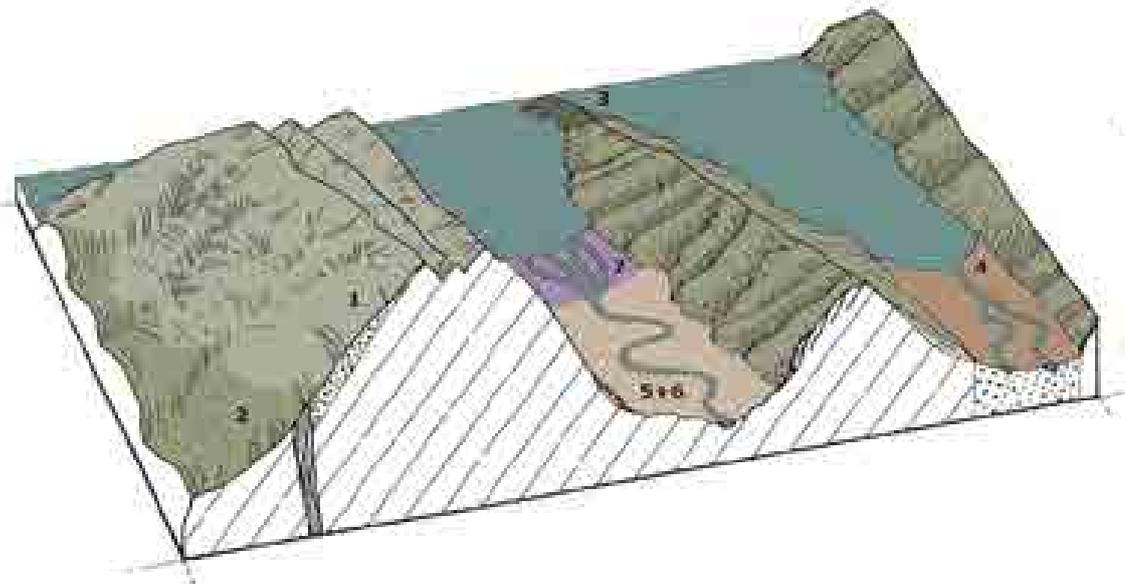
Coastal Terrestrial Area 10 : Kaituna

Collective Characteristics and Coastal Context

Papauma, Kamahi, Karearea, Inland Eastern Moist to Wet, Strongly Schistose Area.

The Kaituna Coastal Terrestrial Area is a small part of the mostly inland mountainous Kaituna Land Type. It extends across the northern part of the largely inland Kaituna Land Type. It encompasses the steep slopes adjacent to Havelock, the Mahakipawa and Grove Arms of the Pelorus and Queen Charlotte Sounds, and the Linkwater lowlands. The steep slopes are underlain by weakly to strongly foliated schist rocks. Extensive fan, floodplain and terrace alluvium and colluvium sourced from the surrounding hill slopes in-fills the Linkwater valley which separates Pelorus and Queen Charlotte Sounds. The shoreline consists of small delta - tidal flat complexes or steep rocky shores. Rainfall is adequate and increases with elevation. Forests clothe the steep slopes and coastal context with pasture on the gently sloping topography.





	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
1	Steep to very steep upper mountain slopes [includes some large-scale slab failures]	Siliceous, foliated t.z. 11A to t.z. IIIB schist of the Caples Group	700–900	Silver beech forest with <i>Olearia lacunosa</i> , <i>Chionochloa cheesemanii</i> (forest snow tussock). Red beech forest with putaputaweta, silver beech, southern rata, halls totara. Silver beech-red beech forest with halls totara. <i>Celmisia hieracifolia</i> rockland (upland forest outcrops).	Forest Silver beech forest with <i>Olearia lacunosa</i> , <i>Chionochloa cheesemanii</i> (forest snow tussock). Red beech forest with putaputaweta, silver beech, southern rata, halls totara. Silver beech-red beech forest with halls totara. <i>Celmisia hieracifolia</i> rockland (upland forest outcrops).

Coastal Terrestrial Area 10 : **Kaituna**

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
2	Moderately steep to steep lower hill and mountain slopes [includes some large-scale slab failures]	Siliceous, foliated t.z. 11A to t.z. IIIB schist of the Caples Group	0–700	Hard beech-kamahiponga forest with some rimu. Black beech forest with mingimingi, shining karamu. Mixed broadleaf forest mahoe, fivefinger, tree fuchsia, wineberry, putaputaweta. Tawa-titoki-white maire forest. Rimu-black beech forest. Manuka-kanuka scrub. Tawa forest with mixed broadleaf species mainly mahoe. Tauhinu scrub. Silver tussockland.	Forest Rimu/Hard beech-kamahiponga forest. Rimu/-black beech forest. Kahikatea/tawa mixed broadleaved species forest. Shrubland and Rockland Tutu shrubland and rockland.
3	Moderately steep low broad headlands	Siliceous, foliated t.z. 11A to t.z. IIIB schist of the Caples Group	0–50	Black beech-kowhai-akiraho forest (Mahakipawa coastal fringe). Black beech forest with mingimingi, shining karamu.	Black beech-kowhai-akiraho forest (Mahakipawa coastal fringe). Rimu-black beech forest.
4	Broad undulating terraces, floodplains and fans	Recent and Pleistocene alluvium from predominantly schistose rocks	0–20	Matai-totara-silver beech-black beech-mixed broadleaf treeland.	Forest Kahikatea-pukatea swamp maire forest. Kahikatea forest. Matai-totara-silver beech-black beech-mixed broadleaf forest. Harakeke-cabbage tree flax-treeland.
5	Narrow undulating terraces and footslope fans	Pleistocene alluvium from predominantly schistose rocks	5–120	Rimu-black beech forest.	Rimu-black beech forest. Totara-matai-white maire forest. Kahikatea-matai-tawa forest.
6	Narrow sinuous floodplains	Recent alluvium from predominantly schistose rocks	5–20		Forest Kahikatea-swamp maire forest. Lowland ribbonwood-matai-totara-kowhai forest. Kahikatea-matai-tawa forest.

	Landform component	Geological formation	Elevation (m)	Remnant native vegetation	Past & potential native vegetation
7	Prograding delta / tidal flat	Recent alluvial and estuarine deposits	0–3	Oioi rushland.	Oioi rushland. Marsh ribbonwood-coastal shrub daisy-Coprosma propinqua-tauhinu estuarine scrub. Kowhai-narrow-leaved lacebark, lowland ribbonwood forest.

Abiotic

The Coastal Terrestrial Area of the Kaituna land type encompasses the northerly slopes of the Richmond Range overlooking Pelorus Sound, the Linkwater lowlands, and the Grove Arm of Queen Charlotte Sound to Wedge Point.

Landform components include steep to very steep, structurally controlled, hill and mountain slopes to 892 m [Mt Duncan], reflecting the dip of the schistosity; sinuous, undulating terraces, footslope fans and floodplains; and the Kaituna River delta - tidal flat complex.

The terrain is developed on siliceous, weakly to strongly foliated t.z. 11B, and t.z. 111A and 111B schist of the Caples Group and associated colluvium and valley fill alluvium. The orientation of the schist foliation imparts a characteristic rippled evenly contoured weakly dissected topography on the north-westerly aspect slopes and a contrasting steeper bluffy and more blocky topography on the southerly slopes. Fan, floodplain and terrace alluvium and colluvium sourced from the surrounding hill slopes has in-filled the valley and separated Pelorus and Queen Charlotte Sounds at Linkwater. The Linkwater flats are the largest contiguous area of flat and gently sloping land in the Sounds. Significant delta-tidal landforms are also present at the mouth of the Kaituna River and at the heads of the Grove and Mahakipawa Arms. The steepland rocky coastline comprises shallow indented bays with few prominent headlands.

Short steep high gradient streams draining the steepland component usually have high water quality. Some degradation of water quality is evident in lower gradient reaches of the Kaituna River and on the Linkwater lowlands as a result of intensive agriculture.

The climate is temperate and relatively wet, rainfall varies between 1300 and 1600 mm per year, increasing from east to west. Summer drought is uncommon or negligible above 150 m, although occasional very intense rainfall events occur. Warm summer temperatures are apparent in valleys sheltered from strong winds and storms. Winter frosts are typical, sometimes severe on valley floors. Cold air drainage into valleys can be pronounced and there is a high incidence of valley fog. Overall a strong maritime influence is limited to the estuary and delta areas and the slopes adjacent to the Mahakipawa and Grove Arms.

Elevation ranges from sea level to 892 m [Mt Duncan].

Coastal Terrestrial Area 10 : Kaituna

Biotic

Summary analysis: Total land area of Kaituna Coastal Terrestrial Area is 8,553 ha, of which 31% in native forest, 33% in native shrubland, 18% exotic treeland, 1% exotic scrub and 15% in pasture.

Originally the terrestrial coastal area of this Coastal Terrestrial Area was forested except for tidal flats, estuaries and deltas, some valley non-forest wetlands, some riparian and bluffs communities, and slip sites.

Now, lowland hill country forests and coastal communities are greatly compromised - no original forest remains. Some of this is now secondary forest and native shrublands.

Alluvial forests are almost entirely gone - included swamp forests, fertile mixed podocarp and mixed broadleaf low terrace forests, and less fertile podocarp-beech high terrace forests. All low altitude non-forest communities are variously altered and diminished, especially estuarine fringes, deltas, riparian communities and wetlands.

There are a number of distinctive biota, communities and habitats.

Lowland and coastal hillslope forests uncommon and regionally significant for inland distributions of warm, northern species such as hangehange, and regionally rare species such as swamp maire.

Remnant alluvial and estuary fringe communities are regionally important (including treelands). Many species for which alluvial habitat is vital are now locally extinct.

Large estuarine communities, especially at Kaituna River mouth delta, Mahakipawa Arm head and Okiwa Bay head, are very distinctive, highly productive, and provide important habitats.

Overall, moderate natural biodiversity due to limited range of altitude and landforms. Alluvial biodiversity largely lost.

Biotic patterns and sequences, dynamics and process are severely compromised and fragmented throughout most of the lower hillslopes, and lost in alluvial areas, and are uninterpretable. Intertidal patterns are well-preserved but sequences through to alluvial communities are largely gone.

Natural productivity is variable, ranging from high in alluvial and intertidal communities and decreasing to moderate in hill slope forest and shrubland communities. Highly schistose rocks are relatively infertile.

There is generally, a lower abundance of native fish and a limited whitebait fishery. Species recorded include inanga-r, shortfin and longfin eels-r, giant and redfin bully-r, smelt, koaro-r and banded kokopu. Inanga spawning seems likely where habitat is suitable within the tidal reaches.

Freshwater quality, processes and riparian habitat is significantly compromised in some waterbodies, particularly Kaituna River.

Plant species that are notable in the Kaituna Coastal Terrestrial Area include: ladies' tresses -t, yellow mistletoe -r; *Celmisia hieracifolia*; hangehange; kōwhai; swamp maire; white maire.

Animals include: karearea (NZ falcon) -r; pied shag - t; black shag -r, fernbird -r; banded rail -r; royal spoonbill -r; white-faced heron; pied stilt -r, western weka and little blue penguin -r.

t = threatened nationally

r = at risk nationally

e = endemic to Marlborough Sounds



The Kaituna River Estuary and Havelock Marina

Coastal Terrestrial Area 10 : Kaituna



Queen Charlotte Drive at Okiwa Bay looking northwards towards Mt Cullen

Experiential

The Kaituna Coastal Terrestrial Area extends from Wedge Point in the east to Pelorus River mouth in the west and captures all of the intervening land. This relatively slender area of land is easily accessed via Queen Charlotte Drive and includes the large settlement of Havelock at the mouth of the Kaituna River. The winding Queen Charlotte Road is a more scenic alternative road option for road users travelling between Picton and Havelock, offering picturesque views of Grove Arm, Okiwa Bay and Mahakipawa Arm and the forested peaks beyond. Cullen Point

is a noted headland where views are obtained towards Havelock from the track. Numerous areas of residential development line the lower slopes of this transportation corridor, while the steeper terrain to the south is predominantly clothed with indigenous vegetation. For visitors and locals, high levels of perceived naturalness are gained from the walking track on Cullen Point and from the road and houses on Queen Charlotte Drive. Many people choose to live in this area, which is often more sheltered than other parts of the Sounds.

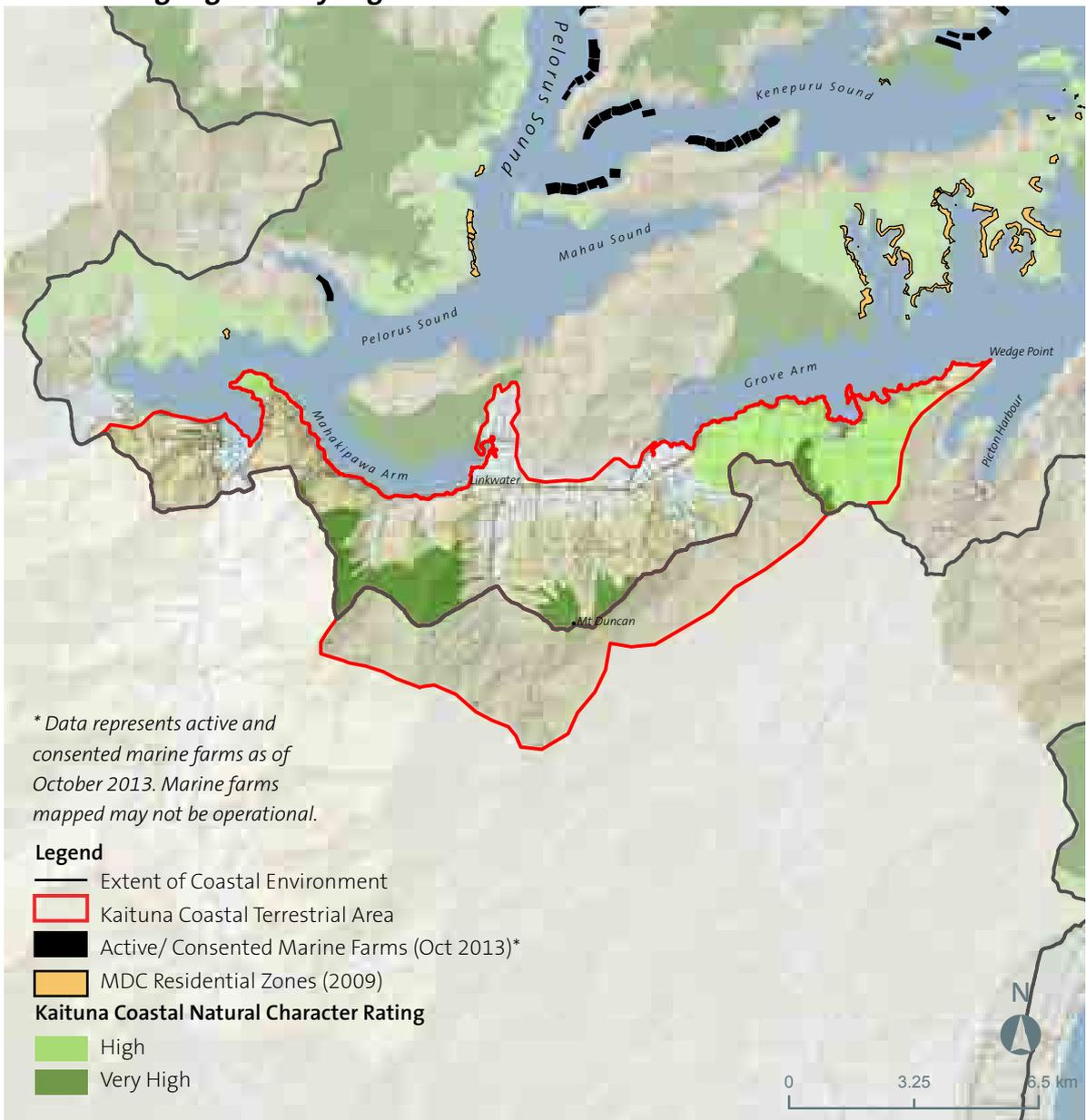
Level 3: Overall Area Rating for Kaituna Coastal Terrestrial Area

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

Levels 4 & 5: Specific Parts within Coastal Terrestrial Area 10: Kaituna Holding High or Very High Natural Character

Sub Area	Rating	Key Values	Additional Comments
Cullen Point	High	Cullen Point is a noted vegetated headland where views are obtained towards Havelock. High levels of perceived naturalness from track	
South of Grove Arm	High	Biotic patterns and sequences south of Grove Arm. High levels of perceived naturalness from Queen Charlotte Drive	Many houses reduce naturalness closest to the shore.
Elevated parts of Mt Duncan	Very High	Upland indigenous forest tracts provide vital habitat for nationally threatened species. Very high perceived naturalness.	Pasture, forestry and scrub dominate lower slopes.

Levels 4 & 5: Specific Parts within Kaituna Coastal Terrestrial Area Holding High or Very High Natural Character



Marlborough Sounds Study Findings: Coastal Natural Character Values at the 'Area' Scale (Level 3)

As explained at the beginning of this section (Section D), the ten Coastal Terrestrial Areas (which include freshwater) and seven Coastal Marine Areas of the Marlborough Sounds have been described and evaluated at the 'Area' wide scale (i.e. at Level 3 of diagram on page 27). Components specifically mentioned within each of the 'Areas' have been mapped and evaluated at the next scale (i.e. Levels 4 & 5). Refer overleaf for more about the finer scale mapping.

At the broader Level 3 'Area' scale, the areas (e.g. Portage) were found to be broadly homogenous, with moderate to high, high or very high abiotic, biotic and experiential values. The more remote the area, such as Cook Strait, the higher the degree of natural character (i.e. very high) 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 are typically more sheltered, hold higher degrees of modification (such as Portage), and this is reflected in their 'Area'

rating. Natural character ratings for each Coastal Marine Area and each Coastal Terrestrial Area for the Marlborough Sounds are shown in the tables below and mapped opposite.

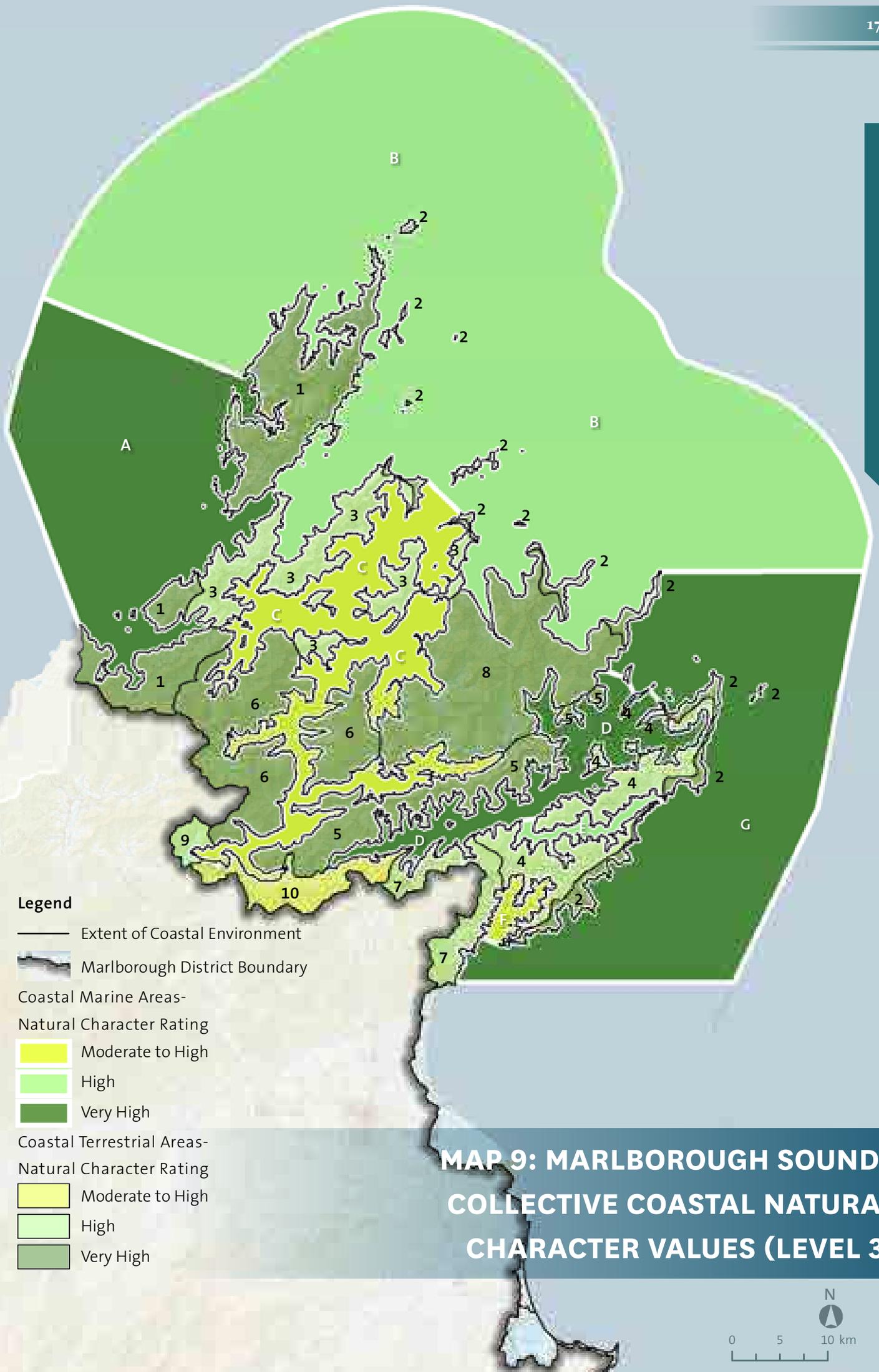
Within each Coastal Terrestrial and Coastal Marine Area, there are specific parts that hold high or very high abiotic, biotic or experiential values. These are considered at the next scale down (i.e. Levels 4 & 5 in the diagram on page 27). However, due to the knowledge and information available, it has only been possible to map Marine Areas holding high or very high levels of abiotic and biotic natural character. See next pages for this more detailed evaluation and mapping.

As part of a separate assessment, there are 13 areas within the Marlborough Sounds that hold Outstanding Natural Character. Again, these tend to be located within more exposed locations and include many outlying islands and extremities. Tennyson Inlet is one of the few more sheltered locations holding Outstanding Natural Character. See Section F for the evaluation and mapping of these outstanding areas.

Summary Boxes of Natural Character Evaluation at the 'Area' scale (i.e. Level 3):

Coastal Terrestrial Areas- Natural Character Rating		
1	D'Urville	Very high
2	Cook Strait	Very high
3	Bulwer	High
4	Arapawa	High
5	Portage	Very high
6	Nydia	Very high
7	Robertson	High
8	Stokes	Very high
9	Pelorus	High
10	Kaituna	Moderate- High

Coastal Marine Areas - Natural Character Rating		
A	Tasman Bay- South Western D'Urville Island	Very High
B	D'Urville Island- Northern Cook Strait	High
C	Pelorus Sound (including Forsyth Bay)	Moderate to High
D	Queen Charlotte Sound	Very High
E	Tory Channel	High
F	Port Underwood	Moderate to High
G	Eastern Cook Strait & Outer Queen Charlotte Sound	Very High



Marlborough Sounds Study Findings: Coastal Natural Character Values at the Specific Scale (Levels 4 & 5)

Following on from the broader evaluation mapping exercise on the preceding pages, this page and the map opposite outlines the natural character evaluation of the Marlborough Sounds at the finest or most detailed scale (i.e. Levels 4 and 5 of the diagram on page 27). Here, individual bays, shorelines, peaks and headlands 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 within the broader 'Area' descriptions and evaluations. For example, the D'Urville Island Coastal Terrestrial Area has been rated very high as a collective area (see previous page at Level 3). At a

more detailed level (i.e. Levels 4 and 5 of the diagram on page 27) specific mention is made of the intact upland vegetation, its lack of modification, the nationally important geological features including Matarau Point beach, Greville Harbour boulder spit and the Whangarae limestone outcrops. A collective evaluation of this material by the study team determined that those areas retain 'very high' levels of natural character, sitting within an area holding broad 'very high' levels of natural character. More modified parts of D'Urville were determined as either 'high' or held no rating, which meant that those areas were considered 'less than high'.

See Section F of this study for the separate mapping of the Outstanding Natural Character Areas.

Key to Levels 4 and 5 Natural Character mapping opposite

Coastal Terrestrial Areas Key	
1	D'Urville
2	Cook Strait
3	Bulwer
4	Arapawa
5	Portage
6	Nydia
7	Robertson
8	Stokes
9	Pelorus
10	Kaituna

Specific Parts Holding Very High or High Natural Character	
Very High	
High	

Coastal Marine Areas - Natural Character Rating	
A	Tasman Bay- South Western D'Urville Island
B	D'Urville Island- Northern Cook Strait
C	Pelorus Sound (including Forsyth Bay)
D	Queen Charlotte Sound
E	Tory Channel
F	Port Underwood
G	Eastern Cook Strait & Outer Queen Charlotte Sound

Refer to individual Coastal Terrestrial Areas within Section D for a more detailed map illustrating High and Very High Natural Character at the specific scale (i.e. levels 4 and 5)



MAP 10: SPECIFIC COASTAL NATURAL CHARACTER VALUES OF THE MARLBOROUGH SOUNDS (LEVELS 4 & 5)



