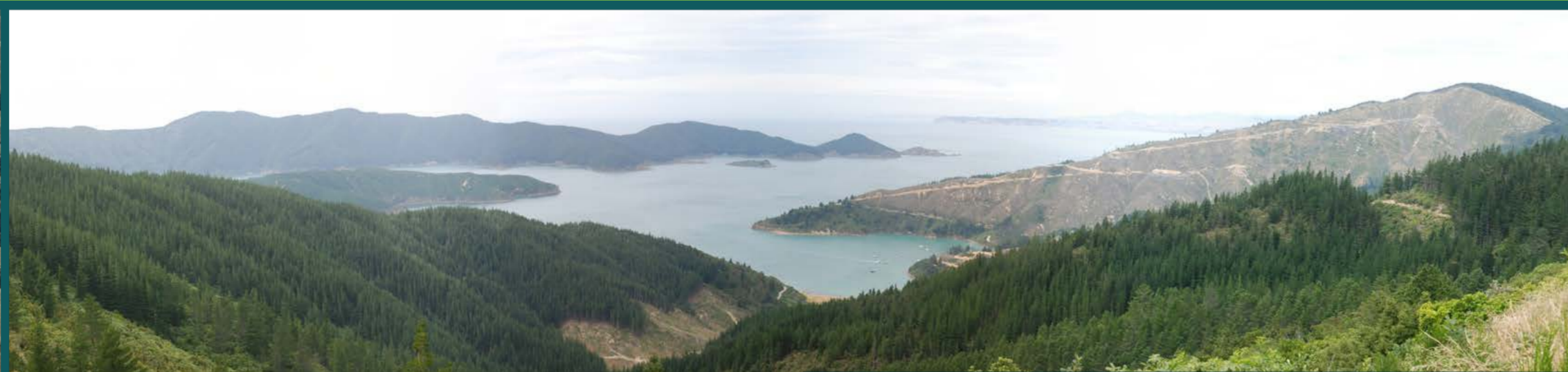




Section B

Introduction to the Marlborough Landscape



THE MARLBOROUGH DISTRICT

The landscape of Marlborough is one of the most diverse of any district within New Zealand. It ranges from the wide valley plains and lagoons of the Wairau River to the jagged and rough terrain of the Inland Kaikouras. These different landscapes offer spectacular scenery and exceptional economic and recreational opportunities (with approximately 40,000 New Zealanders calling it home). Located within the north-eastern corner of the South Island, Marlborough is the first part of the South Island experienced by many visitors from the north. The landscape has dictated settlement, recreation and economic fortunes. Marlborough is one of New Zealand's sunniest districts. MDC's 'About Marlborough' webpage, <http://marlboroughnz.com> states:

'Marlborough has 20% of New Zealand's coastline, woven through the beautiful Marlborough Sounds, and nearly 80% percent of its wine industry, stretched across our valleys.'

'Climb awe-inspiring mountains for breathtaking views, plunge into aquifer-fed rivers with pure sparkling waters, and devour some of the best gourmet produce in the country.'

The website continues to describe the following areas of Marlborough, all of which relate strongly to the landscape.

Awatere & Pacific Coastline

'The Awatere Valley is steeped in Māori and colonial history, from moa hunters to early settlers. These days farmland and vineyards merge, with the sub region's wines gaining a prominence around the world.'

'The snowcapped Mt Tapuae-o-Uenuku, central to Māori legend, stands tall above the golden hills, while to the east, the Pacific Ocean sparkles in brilliant blue. Drive south on State Highway 1 and you'll have that dazzling view on one side and the snowy Kaikoura Ranges on the other.'

Havelock, Pelorus & Kenepuru

'Tucked in beside beautiful wetlands, gorgeous native bush, and the magical Kenepuru, Mahau and Pelorus Sounds, lies the Greenshell™ Mussel capital of the world. In the waters beyond, you'll find rich history, wonderful landscapes and perhaps a fat snapper or two.'

'Access these magical waterways by boat, or walk to beautiful corners like Nydia Bay. You can also explore the area on the Kenepuru Road, or by driving via the stunning Pelorus River to French Pass, gateway to D'Urville Island.'

Blenheim & Wairau Valley

'A relaxed town in the heart of Marlborough's wine country, Blenheim has great cafes, galleries and shops, wrapped up within the picturesque Taylor and Opawa rivers. There's an abundance of vineyards and cellar doors surrounding Blenheim, so explore the beautiful Wairau Valley and discover why the world is in love with Marlborough wine.'

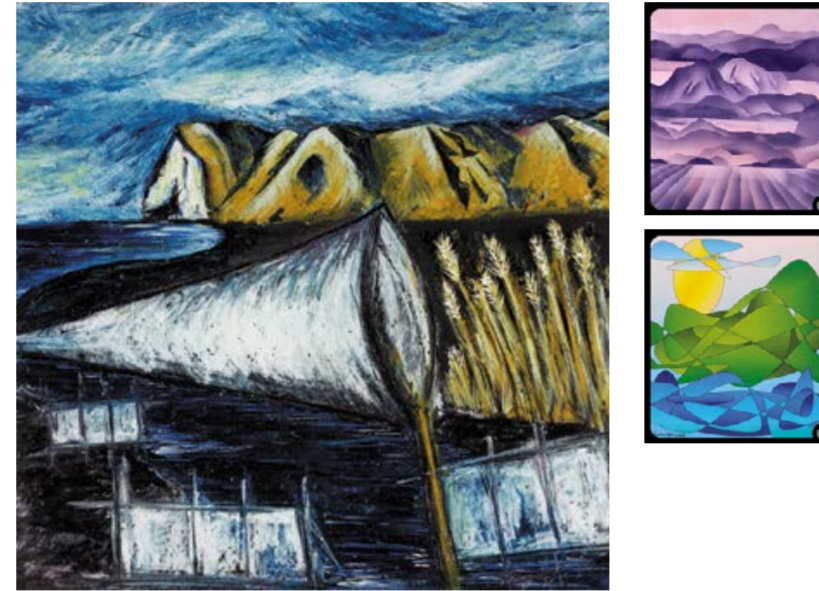
Picton & Queen Charlotte Sound

'Picton is a beautiful port town, poised at the edge of the Queen Charlotte Sound, and is home to fantastic cafes, restaurants, galleries and specialty shops.'

'Go by boat, bike or car to explore the intricate waterways beyond, with island bird sanctuaries, secluded bays, protected wildlife, luxurious resorts and the brilliant Queen Charlotte Track.'

Much has been written about Marlborough, with its landscapes providing an important context. Cultural encounters, such those experienced at the Wairau Bar between Māori and the first Europeans, place special associations in the landscape. The exploits of European pioneers such as Londoner, John Guard, who set up the first whaling station in the Marlborough Sounds and Thomas Brunner and William Travers who were guided by Māori into the Molesworth area, lend historical credence to settlement patterns. Flaxbourne Station is recognised as the birthplace of New Zealand's sheep farming industry.

The landscapes of Marlborough are a major selling point of the region. It is a principal reason why people come to live and visit. It also provides the conditions essential to a successful wine and aquaculture industries.



Community perceptions of the Marlborough landscape as seen through various editions of the Telecom White Pages.



Various local and tourist related marketing focusing on the Marlborough landscape.



Wairau Diversion.



GEOLOGICAL HISTORY AND ITS INFLUENCE ON THE MARLBOROUGH LANDSCAPE

The geology of Marlborough reflects the dynamic processes over some 200 to 300 million years of constant geomorphological folding, drowning, tilting and erosion.

Marlborough straddles the boundary between the Pacific and Australian plates, where the Pacific Plate is slowly moving under the Australian Plate creating continental collision. This transition zone created the uplift associated with the Southern Alps and other ranges within the South Island. On the ground, the Alpine Fault line demarcates this transition zone throughout the spine of the South Island, through the Cook Strait and onto Wellington and the North Island. The northern section of the fault line in the South Island is referred to as the Wairau Fault, which is demarcated by the Wairau River, and effectively splits the district in two. Either side of the Wairau Fault line are a series of smaller fault lines that follow many Marlborough valley systems in a north-easterly / south-westerly direction. Collectively, these faults are known as the Marlborough Fault System and effectively split the district in two.

The Marlborough geology comprises predominantly of sandstone and mudstone (collectively known as greywacke) of the Jurassic period. This has been compressed, deformed and metamorphosed into a series of terrane rocks that occupy the majority of the mountainous interior south of the Wairau River. North of the Wairau River, the geological landscape is older than its southern counterpart, where sedimentary rocks of sandstone, siltstone and mudstone of the late Permian and Early Triassic age (some 200 to 300 million years ago) occupy the majority of the Sounds and Richmond Ranges. These older rocks of the Nelson and Marlborough Sounds area are part of the Australian Plate and were once connected to western Otago and parts of Fiordland, some 10 million years ago. Progressive movement northwards of both the Australian and Pacific plates along the Alpine Fault has resulted in the relatively complex geology and landscapes of today. Over time, alluvial deposits by glacial activity and river erosion has added sandy gravels to many of the bays, coves and river mouths of Marlborough. The adjacent geological map illustrates the base rock scenario of Marlborough.

ULTRAMAFIC MINERAL BELT

Forming the north-western boundary of the district is a distinct band of rock known as the Ultramafic Mineral Belt (which is part of the Dun Mountain Ophiolite Belt), which extends from D'Urville Island south-westward through Croisilles Harbour, to the Bryant Range and the Red Hills close to Tophouse. These rocks are igneous and lack silica and contain high levels of magnesium and iron. They weather to a reddish-brown colour (similar to iron oxide 'rust') and, due to their high mineral content, few plants choose to grow on them. These rocks form important geological features within the district.



The east coast of D'Urville Island (foreground) looking towards French Pass (background).

Geomorphology of Marlborough

The Marlborough landscape can be divided into a number of units, based on its physical and geological form, namely the Marlborough Sounds; outer islands, mountains and plateaus; river valleys and lakes and coastal landforms.

THE MARLBOROUGH SOUNDS

The Marlborough Sounds represent a drowned valley (or ria) landform resulting from a combination of tectonic movements and sea-level rises during the past 15-20 million years. The fractured landscape of islands, elongated spurs and complex sinuous Sounds are as iconic to this district as Mount Cook is to the Southern Alps.

Parts of the Marlborough Sounds are relatively shallow, reflecting its former valley landscapes. Strong tidal currents are evident around French Pass, due to its narrow constriction between the shallow embayment of Tasman Bay to the west and the outer Sounds to the east. The highest point is Mount Stokes, which rises to 1,203 metres a.s.l.

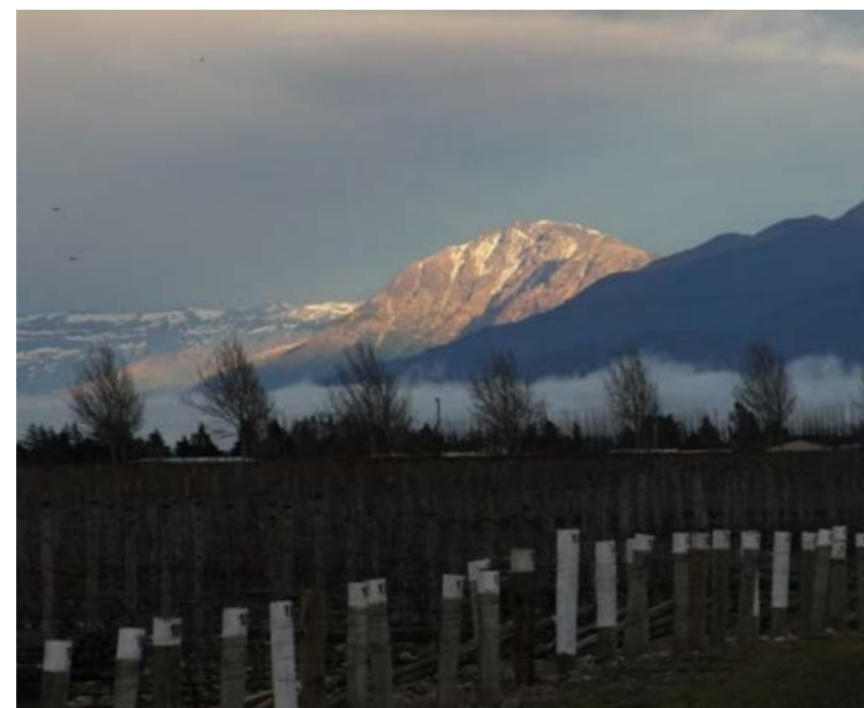
Pelorus Sound to the west and Queen Charlotte Sound to the east are the two main inlets leading to the settlements of Havelock and Picton. Geological evidence above and below the water suggests that the striking faults evident along the Queen Charlotte Fault zone show the former river systems that moulded the Marlborough Sounds landscape before they were flooded. These river systems flowed southwards and connected with the Pelorus River at Havelock and through the broad Kaituna valley towards the Wairau Valley.

OUTER ISLANDS

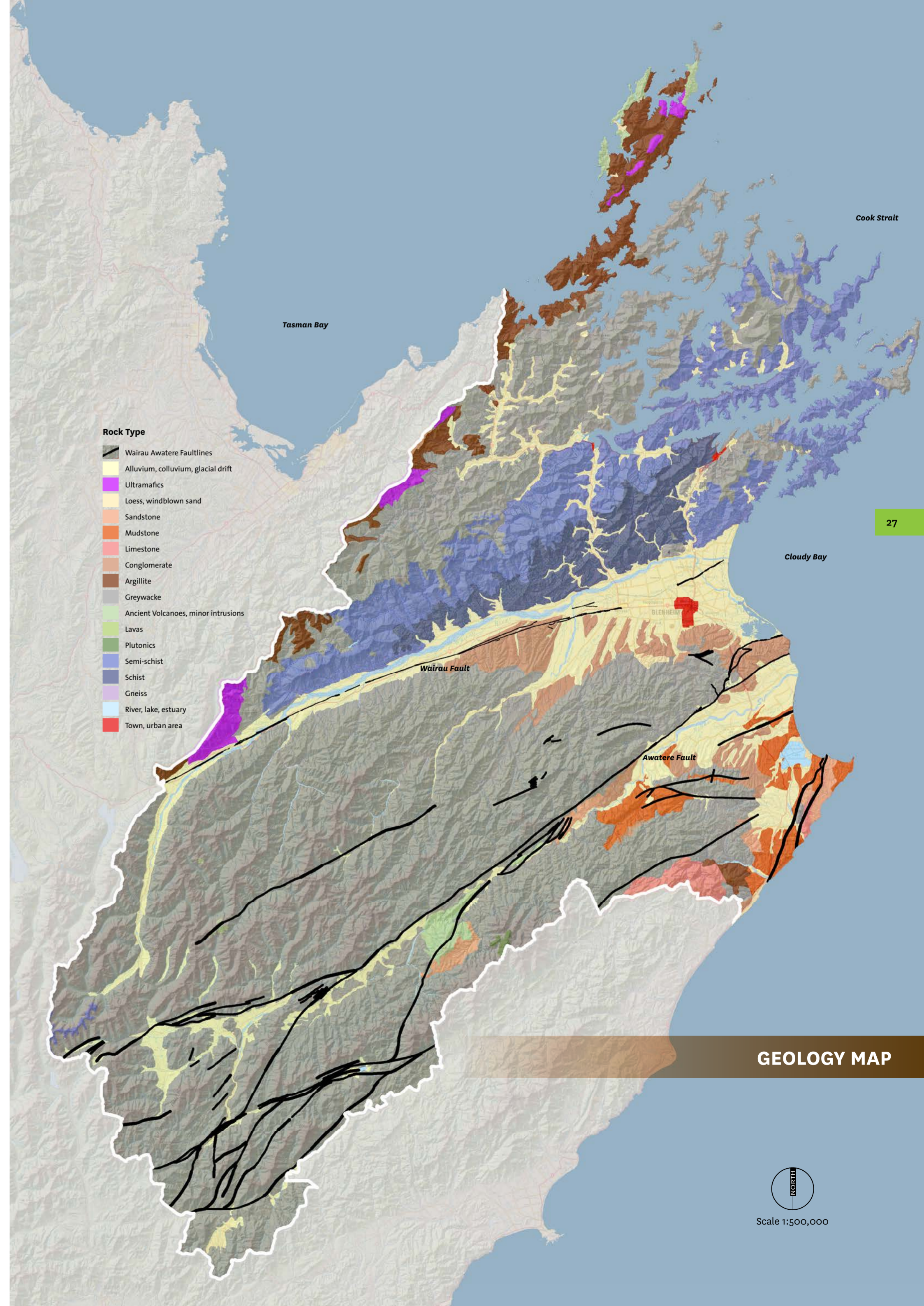
The outer islands lie between Croisilles Harbour and Port Underwood, with D'Urville Island being the largest, providing a separation between the waters of Tasman Bay and Cook Strait. These are essentially above-water remnants of ancient ridges and spurs and directly associated with the drowned valley system which formed the Marlborough Sounds. D'Urville Island displays steep hills and mountains which are typical of its underlying ultramafic geology. D'Urville Island is of moderate elevation, the remainder of the outer islands, which are made from a range of predominantly schists and sedimentary strata are of low elevation.

The brutal exposure to the elements has continued to shape these islands, which display steep and exposed rocky sea cliffs, wind-swept coastlines and endemic shrublands, herbfields and tussockland communities.

These highly exposed islands harbour species native and/or endemic to New Zealand and Cook Strait, with many (including Stephens, Chetwodes, Titi and the Brothers Islands) being island sanctuaries. Rare species include the Stephens Island tuatara and king shag.



Mt Patriarch, on the north bank of the Wairau River.



MOUNTAINS AND PLATEAUS

The mountainous heart of the Marlborough landscape extends from the Marlborough Sounds in the north to the district's southern boundary along the Clarence River. The area is divided along the Alpine Fault and Wairau valley into two sections; the Richmond Ranges to the north of the Wairau and the higher Molesworth/Kaikoura ranges to the south.

The northern Richmond Ranges comprise the Richmond Range themselves, the Bryant Range, the Red Hills Ridge, and the Onamalutu, Kaituna, Tuamarina, Pelorus and Rai Valleys. The valley systems immediately south of the Marlborough Sounds are generally wetter and lower in elevation than the Richmond Range to the south of them, and include sinuous, undulating terraces and steep to very steep dissected hills. The Red Hills, within the western part of this group are quite distinctive and separate from the surrounding mountains being part of the ultramafic landmass that extends along the district's north-western boundary to D'Urville Island. The rock within these limits has been smoothed by glacial activity so that vegetation cover is lacking due to the limited growing medium. The Richmond Range is the highest mountain area north of the Wairau Valley, comprising steep and very steep mountain slopes climbing to Red Hills at 1,790 metres a.s.l. in the south and to Mount Richmond at 1,756 metres a.s.l., Mount Rintoul at 1,730 metres a.s.l. and Mount Fishtail at 1,641 metres a.s.l. further north.

The southern Molesworth high country and Kaikoura mountains gain the highest elevation within the district, with Tapuae-o-Uenuku at 2,885 metres a.s.l. on the Inland Kaikoura Range being the highest mountain in the district. This mountainous range comprises a series of glaciated valleys, rugged mountain ranges, intermontane plateaus and major high country river valleys.

RIVER VALLEYS AND LAKES

The course of the Wairau and Awatere Rivers have been strongly influenced by the underlying tectonic movement of the Marlborough Fault System. The broad Wairau Valley plain, which extends 15 km across its coastal edge, is the result of tectonic uplift and of erosion by the Wairau River, which follows the course of the Alpine Fault. The Awatere River valley system was also influenced by the same tectonic movements, however, this valley contains a series of terraces further inland. Here the river has 'cut' through into the tertiary sediments revealing deep, incised 'gorge-like' features.

COASTAL LANDFORMS

As well as the Marlborough Sounds, Marlborough contains a variety of coastal landforms and features, due to the variety of underlying geomorphic patterns and processes that have been exposed to constant coastal processes. Those of note include the broad, low-lying sweep of Cloudy Bay and its associated coastal marshes, lagoons and sand bars south of the Wairau and the sequence of coastal ridges and swales at Rarangi. Further south, are the eroded cliffs of White Bluffs/Te Parinui o Whiti that divide Cloudy Bay to the north from Clifford Bay to the south; the coastal cliffs around Cape Campbell, and the stranded former bay of shallow Lake Grassmere. South of Cape Campbell are the coastal limestone features around the Flaxbourne River mouth stretching northwards to Chancet Rocks and south to Weld Cone and Needles Point.



Ben More, inland of Willawa Point, south Marlborough.

Geopreservation Society Inventory

The New Zealand Geopreservation Inventory (see Appendix 3) highlights the 'best examples of the wide diversity of natural physical features and processes that together characterise each part of New Zealand and document its long complex geological history, the formation of its landforms and evolution of its unique biota' (p4).

New Zealand has a unique and extremely diverse natural landform, geology and soil heritage, due to its location and formative processes. The New Zealand Geopreservation Inventory 'aims to identify and list information about all the internationally, nationally and many of the regionally important earth science sites throughout New Zealand, irrespective of their current protected status' (p5).

Within Marlborough there are 71 recognised sites of geological importance, ranging from historic areas of mining to submerged ridgelines, dammed lakes and sea cliffs. The majority of these sites/landscapes have been mapped by hand by the Geopreservation Society in their reference books, and are indicated by locator spots in this Landscape Study on the accompanying map. However, their mapped extents have been referenced and in some locations form the boundary of the ONFLs.

Each site is listed for its Importance and Vulnerability.

For Importance, the Inventory categorises the sites into three levels (A-C):

- A: International: Site of International Scientific Importance;
- B: National: Site of National Scientific, Educational or Aesthetic Importance;
- C: Regional: Site of Regional Scientific, Educational or Aesthetic Importance.

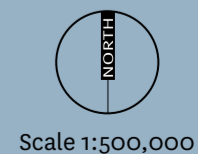
For Vulnerability, each site has been classified (1-5) depending on its perceived vulnerability to human activities:

1. Highly vulnerable to complete destruction or major modification by humans;
2. Moderately vulnerable to modifications by humans;
3. Unlikely to be damaged by humans;
4. Could be improved by human activity;
5. Site already destroyed (not necessarily by human activity).

The full list is contained within Appendix 3.



GEOPRESERVATION INVENTORY MAP



Scale 1:500,000

SOILS OF MARLBOROUGH

As illustrated on the accompanying map, Marlborough is made up of a number of different soil types that reflect its current and former geomorphological processes. Continued crustal uplift and erosion of the underlying varied geology has resulted in a complex network of soil-types that support a range of differing vegetation species and land uses.

The soil-forming factors vary from location to location and include, but are not restricted to: parent material, climate, organisms, topography and time. Weathering, leaching, erosion and matter accumulation also influence the type and location of soils. Comparison of the geology map (p27) and the soils map (p31) shows that the distribution of soil types in Marlborough closely resembles that of the parent rock. For example, the predominantly greywacke mountainous interior that accounts for nearly 45% of Marlborough's landscape is associated with dry, light to medium brown soils and the ultramafic band of rocks that continue through the main divide towards D'Urville Island display areas of podzolised soils.

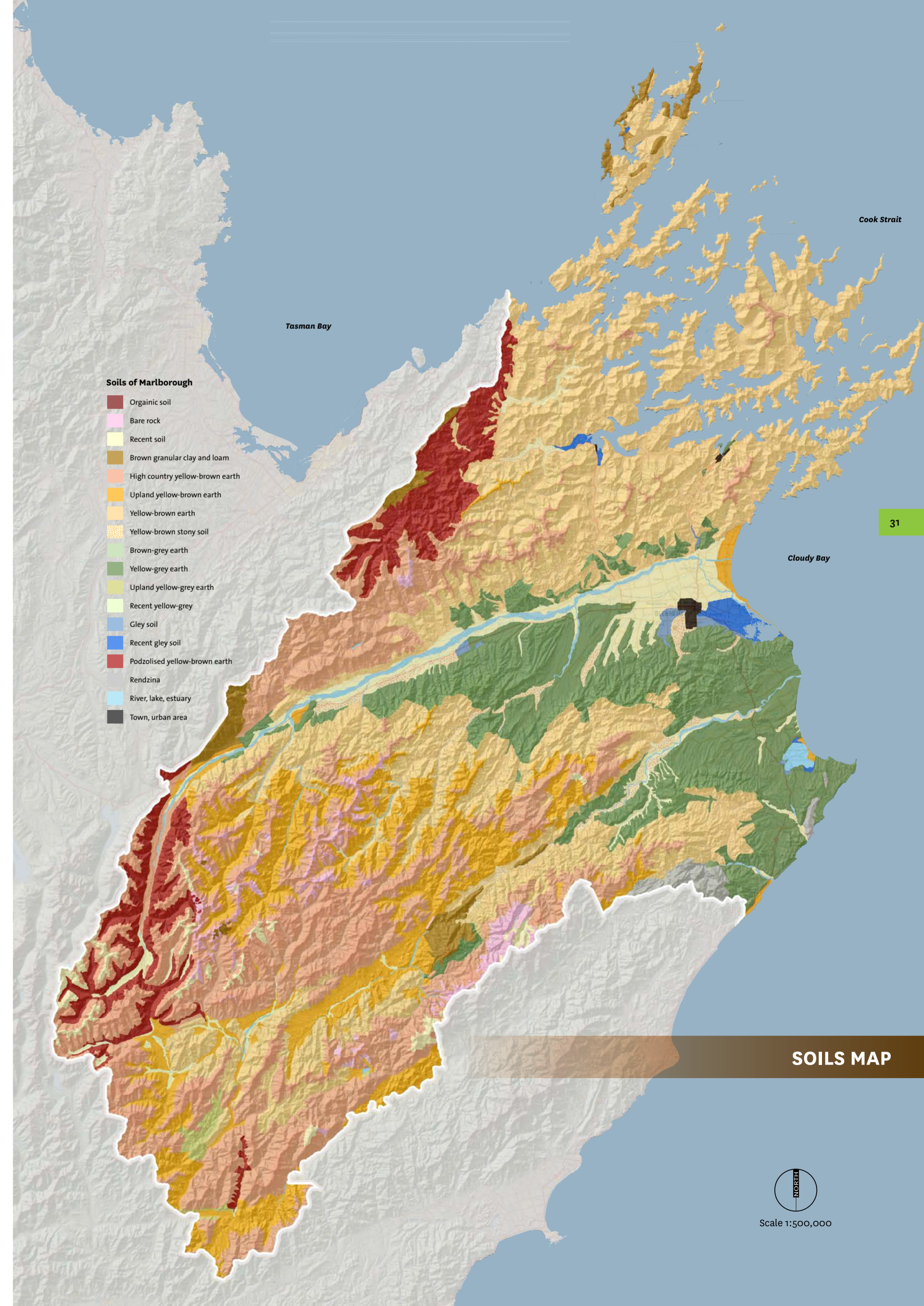
The most fertile soils are found within the river valleys where extensive alluvial outwash from the surrounding mountains has deposited a rich quantity of minerals. However, this distribution is not even, as soils can accumulate in places that hinder productive land uses.



Lake Elterwater, north of Ward. Weld Cone Wind Farm can be seen in the background.



Weld Cone from Ward Beach.



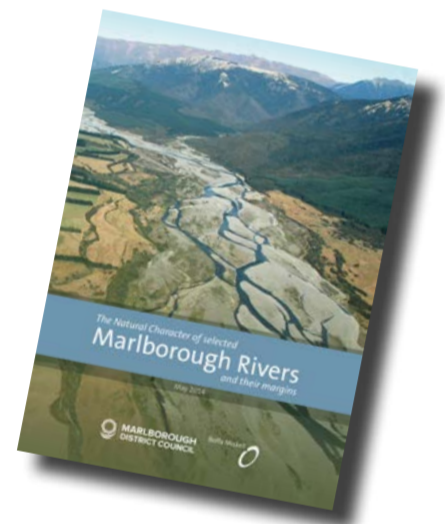
RIVER ENVIRONMENTS IN MARLBOROUGH

Marlborough's many rivers and streams have assisted to mould and shape the landscape. The two principal rivers are the Wairau and Awatere Rivers. Other rivers in the district include the Pelorus, Rai, Wakamarina and Kaituna Rivers to the north of the Wairau. The Waihopai, Omaka and Leatham Rivers flow into the Wairau from the south. Within the southern high-country, the Acheron and part of the Clarence Rivers wend their way through steep terrain, with their confluence north of Hanmer Springs. The Clarence occasionally follows the district's south-eastern boundary, before it crosses through the Kaikoura District to the sea. The vast majority of the rivers and streams in Marlborough have their headwaters within mountains, namely the Richmond Range and the series of glaciated ranges south of the Wairau. These rivers often have extensive river catchments with their flow regime affected by periods of heavy rain or drought.

The Wairau, Awatere and parts of the Clarence are braided rivers. They have shingle beds and flow bank to bank in high flood. These rivers have carried sediment, largely produced by glacial action, from the mountains towards the sea. When land has been uplifted through tectonic activity, the rivers have continued to cut through the deposited gravels, creating flat-topped river terraces flanking the river valleys. Braiding is a typical riverine feature for the eastern South Island and refers to the 'braided' pattern of small channels that flow around more or less permanent gravel islands (which are usually covered and often modified in size and shape during severe floods).

There are a number of spring-fed streams and creeks located within Marlborough, such as Spring Creek north of Blenheim on the Wairau Plain.

The natural character of rivers, lakes and their margins is relevant to Section 6(a) of the RMA. An assessment of the natural character of Marlborough's Rivers is contained within a separate report entitled *The Natural Character of selected Marlborough Rivers and their Margins*, May 2014.



The Wairau River

The Wairau, being the longest river within the district, and the longest braided river in the north of the South Island, occupies for most of its length a broad valley centred along the Alpine Faultline. Several significant tributaries flow into it along its length, including the Branch and Waihopai Rivers. The Wairau traverses mainly terrace gravels to within 2 km of its mouth at Cloudy Bay. Near the coast, where it becomes estuarine, swamps, marshes and beach deposits are evident.

Wetlands

During 2001 a desk-top overview of Marlborough's wetlands, their type, location and extent was collated, using topographical maps and aerial photographs. The 2001 study revealed that there were two types of wetlands; palustrine wetlands and lacustrine wetlands. Palustrine wetlands are essentially inland areas of marshes, bogs and swamps which lack flowing water and which have vegetation permanently or seasonally above the water. Lacustrine wetlands have permanent or intermittent standing open water without large areas of emergent vegetation. Chapter 11 (Land) of the 2008 *State of the Environment Marlborough* comments that: 'A total of 1,149 recorded sites were recorded in the survey, representing 1,242 individual wetlands. Of these, 597 were natural wetlands and 645 were manmade, with a high density of these (417) being recorded on the Wairau Plain. 441 of the wetlands were of the palustrine type and these have decreased in area by 89% across Marlborough between 1840 and 2000. Of those that remain only 24 sites have some degree of protection. Only 3.3% of the original palustrine wetland area remains in the lowland ecological districts with less than 1% of the original area being under some form of protection' p272.

A review of the 2001 wetland inventory commenced in 2008, using the latest aerial photography, satellite imagery, mapping techniques and fieldwork surveys. Based on this updated material, the 2008 wetland study assesses the significance of Marlborough's wetlands based on their current condition and the likely pressures and threats facing them.

Wetlands have been an important aspect of the research undertaken for this Landscape Study, particularly where wetlands are associated with important landscape features, such as the Rarangi Beach Ridges and wetland complex at Rarangi. Although the Rarangi area has been heavily modified by human activity, the sequence of dry gravel and sand ridges and associated wetland hollows are unique in New Zealand and rare internationally, despite their diminished legibility and coherence. Para wetland (swamp), near Koromiko is by far the biggest lowland alluvial freshwater wetland system in Marlborough and is of ecological significance.

The Wairau River source is immediately north of Lake Tennyson within the Spencer Mountains and the Molesworth high country, and wends its way northwards through steep and glaciated mountainous terrain, to connect with the Alpine Faultline, south of Tophouse. The vegetation cover in this area has been highly modified, although there are remnant stands of beech evident. From Tophouse, the river widens and turns in an easterly direction, becoming increasingly braided as it continues towards Cloudy Bay and the sea. From the Waihopai River confluence, the river valley broadens significantly into the Wairau Plain, where the landscape and river margins have been highly modified. Close to its mouth, the Wairau becomes estuarine, where lagoons and a few isolated wetlands and unmodified watercourses are all that is left of the original mosaic of forest, wetland, shrub and tussockland. The Wairau enters the sea at the Wairau Bar.

Rai/ Pelorus Rivers

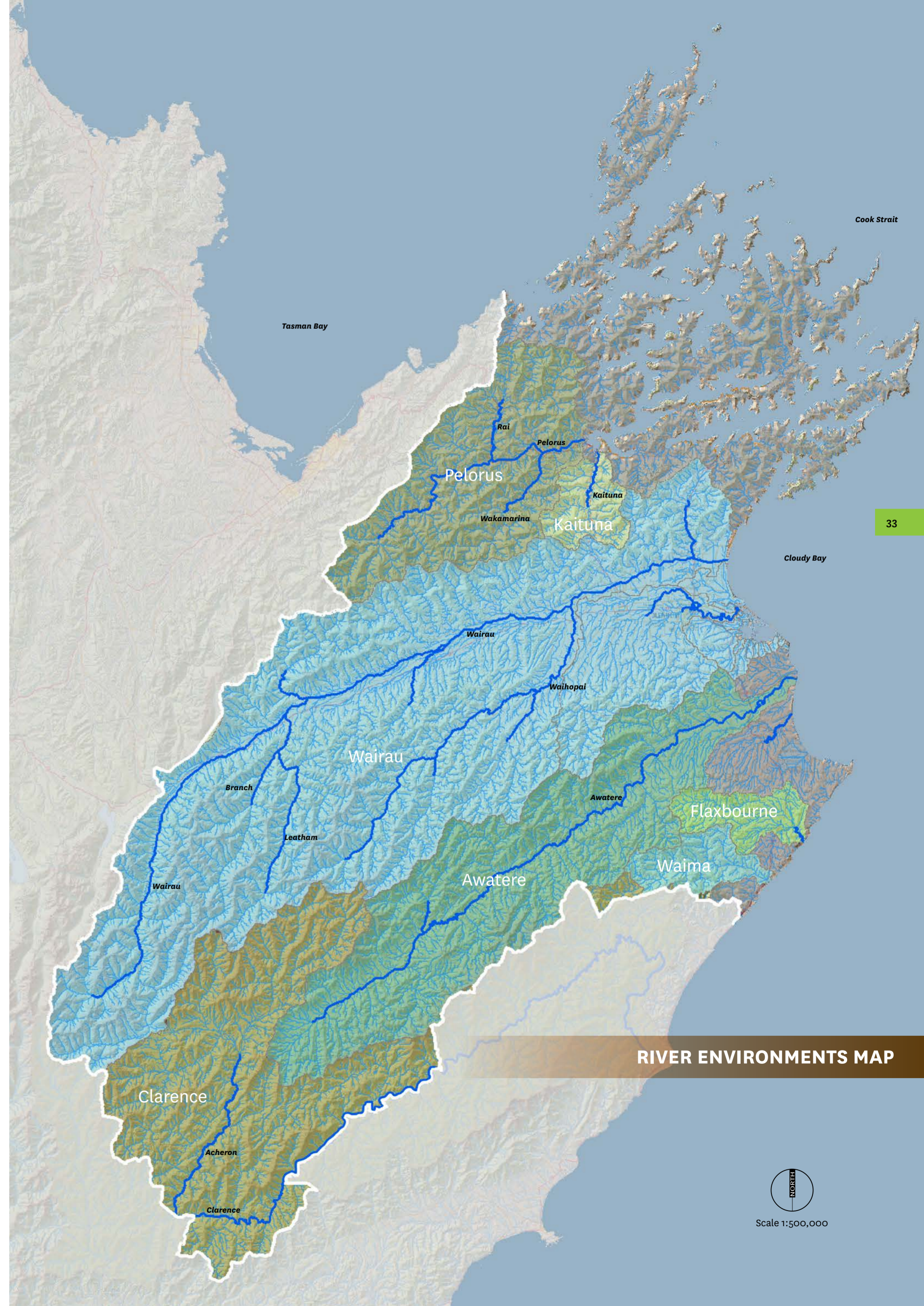
The Pelorus and Rai Rivers both flow towards Havelock and the Marlborough Sounds. Extensive mudflats are evident around the mouth of the Pelorus River, resulting in an area significant for intertidal and subtidal habitats. The Pelorus River's source is high within the Richmond Range where the river flows in a northerly direction towards Pelorus Sound through predominantly indigenous bush. The Rai River flows southwards from the river catchments south of the Bryant Range and converges with the Pelorus River at Pelorus Bridge. From this convergence point, the river flows through predominantly agricultural land eastwards towards Havelock.

The Awatere River

Like its sister, the Wairau, the Awatere River rises within the high country. The river flows in a north-easterly direction for most of its length, parallel to the Inland Kaikoura Range along a fault line, a splinter of the Alpine Fault. From Jordan in the upper Awatere Valley, the valley gradually broadens into a series of wide flat alluvial terraces bounded by hills. From the confluence of the Medway River/Black Birch Streams with the Awatere, the valley again broadens and the river channel gradually becomes braided. The landscape becomes dominated by farmland and the river increasingly appears more modified than further upstream due to adjacent land use practices. Within the Seddon area, the Awatere Valley is broad, with the river continuing in its braided form towards Clifford Bay. The lower river terrace is colonised by exotic vegetation and is highly modified by adjacent vineyard and agricultural land use activities. The river mouth is affected by coastal processes and alluvial deposits, with the river following a route northwards, behind the beach, before flowing into the sea.

The Clarence River

The Clarence River occupies a relatively large catchment, although only a small portion of its 125 km length is contained within the district. Located within the mountainous south of the district, it rises on the eastern slopes of the Spencer Mountains in the neighbouring Canterbury region and as it flows seawards it acts, for a short distance, as the district's south-eastern boundary, most notably within Molesworth Station. Although the Clarence River only occupies approximately 29 linear kilometres within Marlborough, its catchment extends a significant distance northwards into the district, where it joins with the Wairau and Awatere River catchments.



TOPOGRAPHY AND ELEVATION OF THE MARLBOROUGH LANDSCAPE

The topography of the Marlborough District is variable, including the flat plains of the Wairau Valley that are virtually at sea level, the drowned valleys and undulating vegetation-clad peaks of the peninsulas and islands of the Marlborough Sounds, and the inland rugged mountainous landscape where peaks exceed 2,800 metres a.s.l.

Due to the districts long geological creation and relatively active geology, a number of distinctive topographic features have become icons of the area and, coupled with a relatively temperate climate, have dictated settlement and land use patterns.

The Wairau Valley, being relatively sheltered by the mountains to the north and south has been the focus of settlement and the greatest intensity of land management, due to its relatively level nature, fertile soils and amenable climate. The Wairau Valley accentuates the Alpine Fault throughout its length by its flat, broad valley bottom and mountainous setting. The Awatere Valley is similar, although the pattern of settlement is not as clearly pronounced along its length, due to the differing nature of its underlying form. Both the Wairau and Awatere Rivers contain broad flat plains close to the sea, where the majority of the land has been intensively developed into vineyards.

The crumpled nature of the interior landforms are due to their seismic setting and geological form. Constant weathering has resulted in a number of mountainous topographic features, namely the Red Hills south-west of the Richmond Range, the Molesworth plateau, Tapuae-o-Uenuku and the mountains associated with the Main Divide.

Coastal processes working against the landform have also moulded an interesting transition zone. This zone includes the coastal cliffs of Cape Campbell and White Bluffs/Te Parinui o Whiti; the salt marshes, lakes and sandbars; and the drowned valleys of the Marlborough Sounds. Convoluted inlets and channels, secluded bays and coves, and broad estuarine valleys, such as that at Havelock, are typical of the Sounds.

The steepest parts of the district are the upper sections of the mountains, which are over 34° slope and are often characterised as bare rock. Conversely, the valley floors, specifically the Wairau and Awatere Valleys, are the flattest in the district, i.e. below 3° slope and reflect have the amount of land use/development activity. This is illustrated on the Slope Map, overleaf.

In terms of aspect, there is a noticeable trend of development on the northern slopes of the Marlborough Sounds to capture the majority of the sun. Similar trends are evident within the Wairau Valley, where vineyards and new housing schemes are encroaching into the Wairau Dry Hills south of Blenheim to capitalise on the hills' northern aspect. This is illustrated on the Aspect Map overleaf.



The rugged profile of the Inland Kaikoura Ranges.



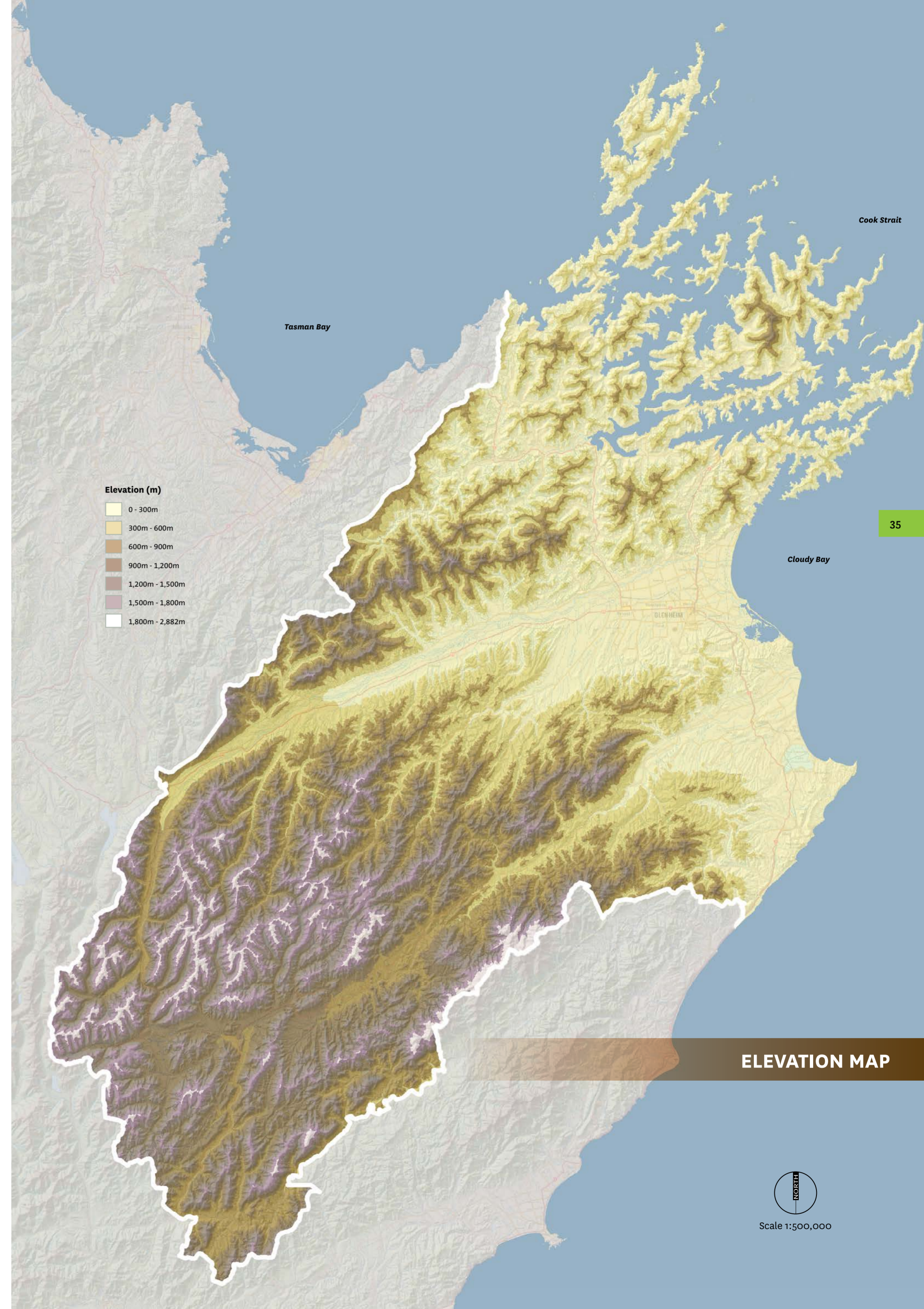
The flat river plains and the coastal environment of the Wairau River.

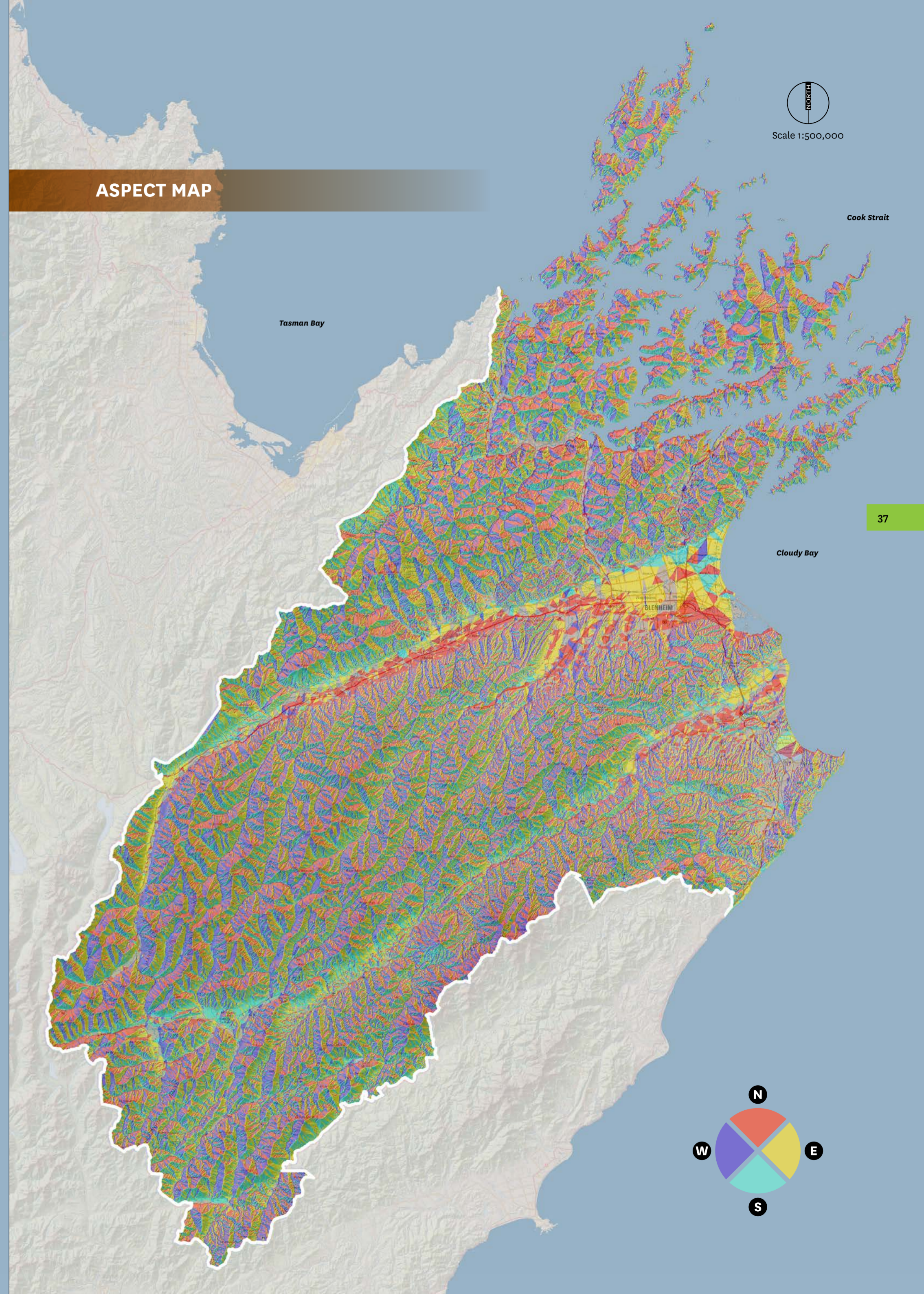
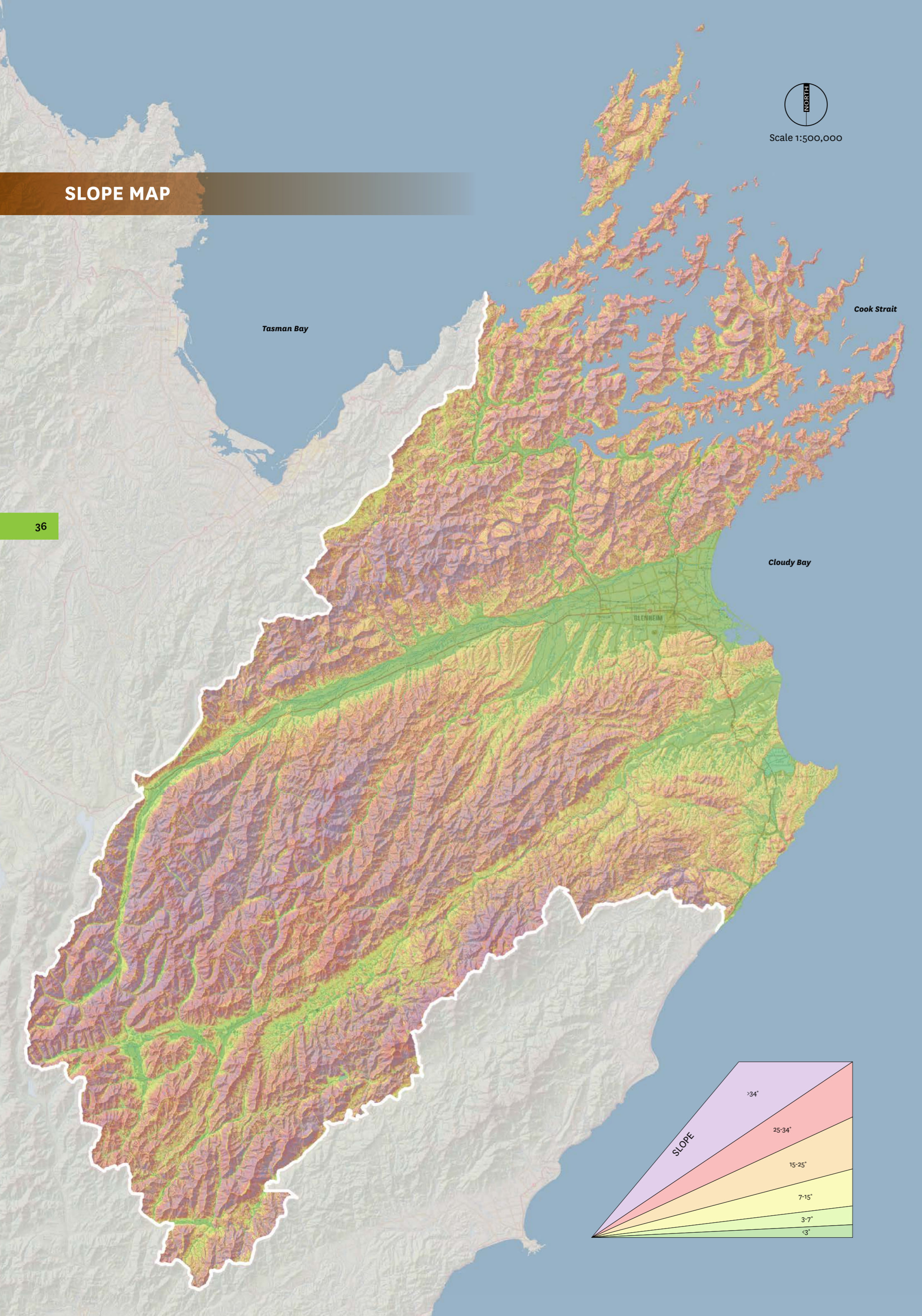


The undulating grass hills south of the Wairau Valley.



South bank of the Wairau Valley.





LAND COVER AND LAND USE PATTERNS IN MARLBOROUGH

A number of factors influence land use patterns including soils, geology, climate, elevation, topography, aspect, existing vegetation cover and accessibility. Many interconnecting factors dictate how people use and manage the land.

The whole of the district's landscapes are managed in some way or another. There are significant areas that are managed as conservation land (the majority by the Department of Conservation), where management is focused towards preservation, restoration and predator/ weed control measures for recreational and ecological benefits.

Other main land uses in Marlborough include exotic forestry, (predominantly pine plantations), pastoral farmland for grazing (including dairy, sheep, cattle and deer), crop growing, soft fruit growing, viticulture and nut growing. These land uses, associated with rural and rural residential lifestyle plots, are widely distributed around the district, with viticulture being the most intensively managed.

A number of specialised land uses in operation also operate throughout Marlborough, such as boutique farming and horticultural practices (alpaca farming, bee keeping, cheese making and truffle and lavender harvesting) as well as infrastructure (oxidation treatment ponds, salt works, hydro infrastructure, small quarries, and transmission lines). Land use is also influenced by towns (such as Blenheim), villages (such as Ward), marinas, ports, roads, railway lines and high country tracks.

Land use patterns also change, occurring for a variety of reasons, although in the district is often attributed to land ownership, market dynamics and current economic conditions. Land use change occurs at different scales and frequencies, from seasonal crop rotations, to fundamental shifts from agriculture to forestry. Historically, Marlborough's land use patterns would have been quite different. At one time sheep, gold mining and whaling were principal activities.

Marine farms, including mussel farming, salmon farming and scallop harvesting are a type of activity that is influencing shores within the bays, coves and sheltered inlets of the inland Marlborough Sounds area and the more exposed outer Sounds. See further discussion under 'Aquaculture' overleaf.

Each one of these land uses influences both the visual and biophysical character of the landscape.

Wine Growing in the Wairau and Awatere Valleys

One of the principal land use activities with which Marlborough is currently associated is the industry of grape-growing and wine-making. Wine Marlborough New Zealand the industry's development as follows:

'As the 21st century moves ahead, it is hard to imagine the Marlborough landscape without hundreds of thousands of vines. But it hasn't always been this way. In reality the march of vines across the plains and gently sloping hills of the region only began back in 1973. Prior to that Marlborough was better known for its abundance of sunshine and its production of barley and lucerne. No one could have imagined that a little known wine company based in Auckland would change the face of Marlborough forever.'

The growth of viticulture has transformed the land use of the Wairau and Awatere Valleys from one of pasture, cropping and stone fruit growing to a semi-industrialised landscape of regimented rows of vines and large wine-related processing buildings. The expansion of vineyard development within these two valleys is illustrated on the map below and demonstrates the trend of vineyards extending further up the valleys, most noticeably the Wairau Valley. It is important to realise that these viticultural plantings and the associated industry has grown from nothing in 1973 to represent the single most important lowland crop in the district today.

Over the last 13 years groundtruthing (ground observation) of land use has provided information about viticulture coverage in Marlborough. This information was last updated for 2013.

As at September 2013 Marlborough's total vineyard area is approximately 23,769 hectares.

- Wairau Plain and Valley > 16,947 ha

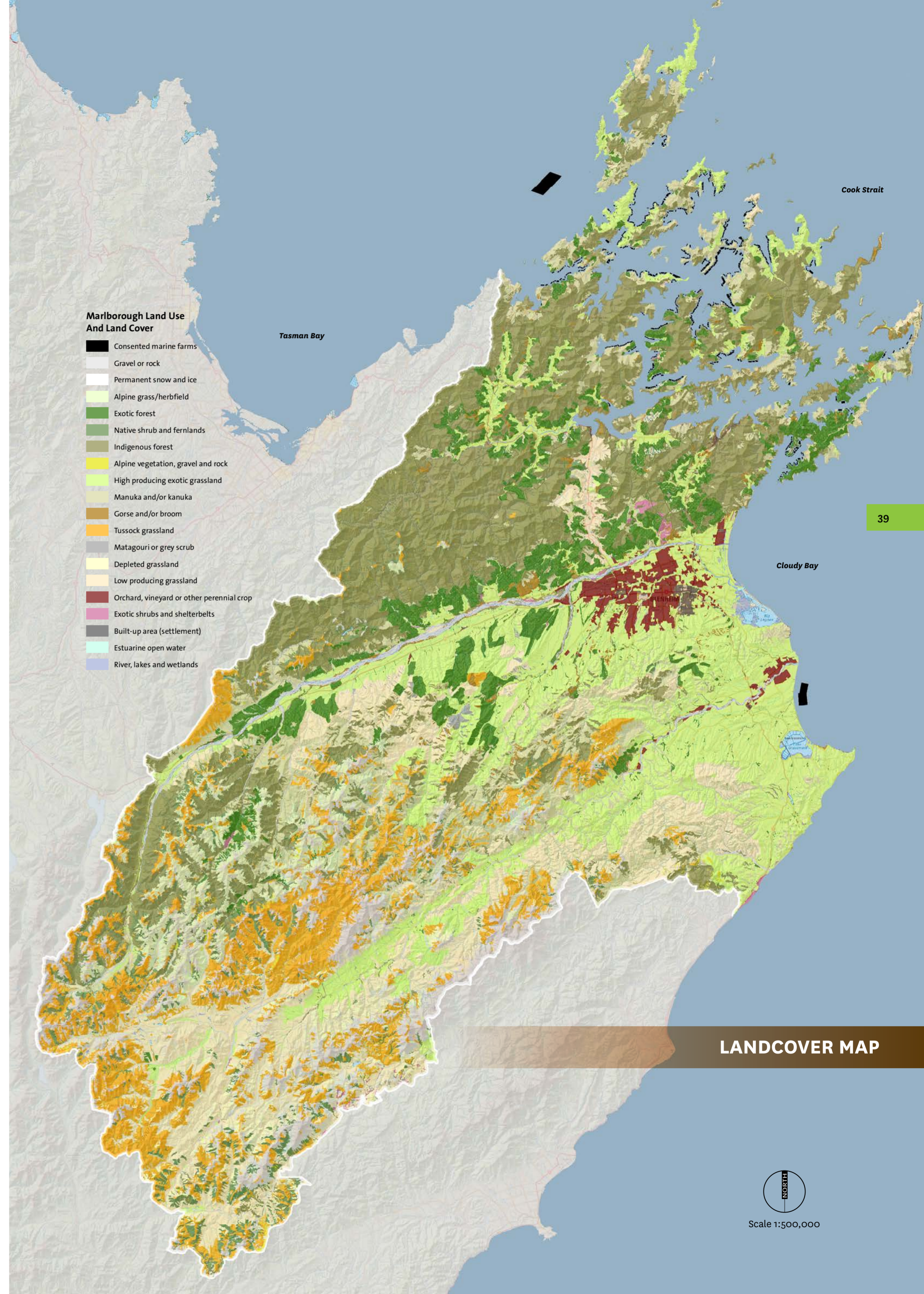
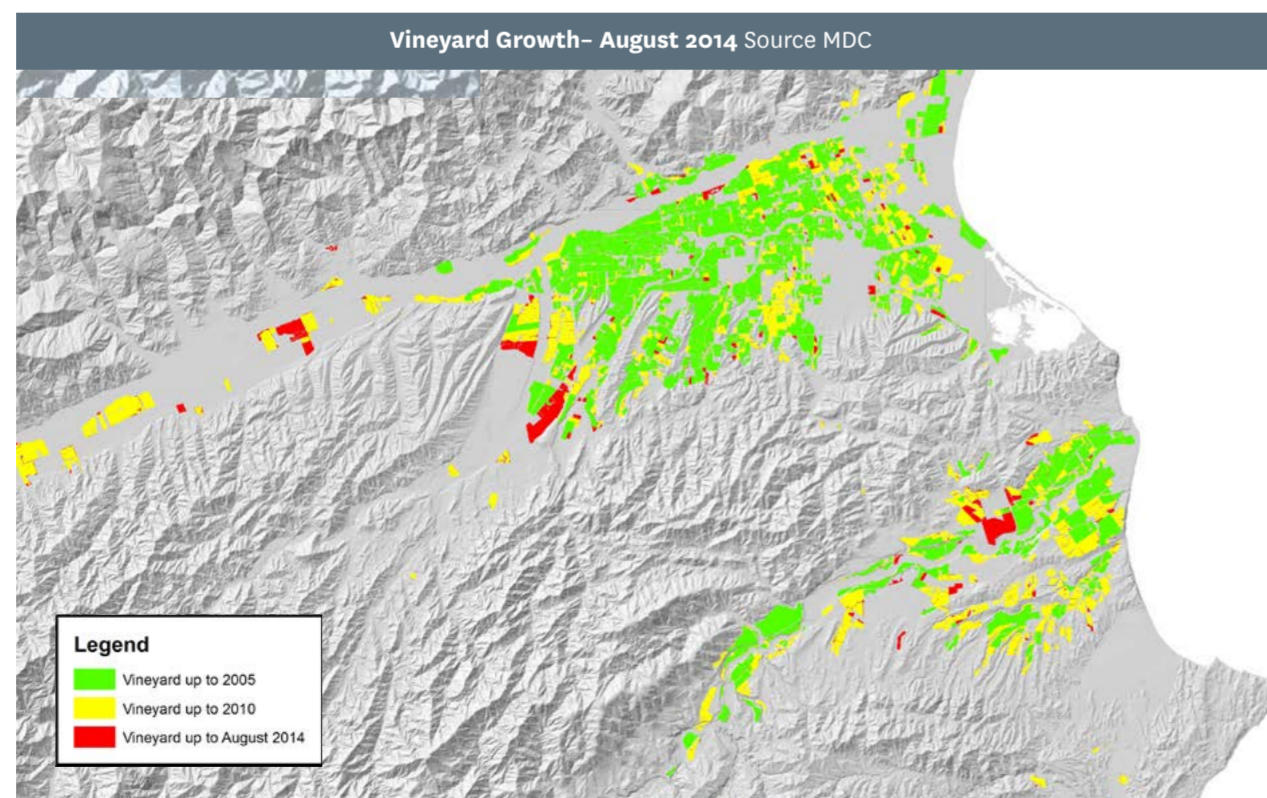
- Awatere Valley, Blind River and South > 6,822 ha

Due to limited land availability, vineyards have been developed over the lower rolling hills of the smaller southern valleys leading onto the Wairau Plain, along the Awatere Valley up to Aotea and through the Blind River complex. There is also a substantial spread west along the Wairau Valley up to the Wye River.

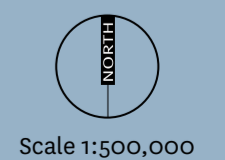
Many of the vineyards are now being irrigated from purpose-built dams due to the marginal water resources available in some areas.



Waihopai Valley aerial looking south, 13 March 2013.



LANDCOVER MAP



Public Conservation & QEII Areas

Conservation is the land use of greatest extent in Marlborough. Land with conservation status is a mosaic of reserves, parks, national parks and QEII National trust open space covenants. Most of this land is protected under the Reserves Act 1977, the Conservation Act 1987 and the Queen Elizabeth the Second National Trust Act 1977. A large proportion of it is administered by the Department of Conservation. MDC also has responsibilities for reserve management. The map on the facing page illustrates the recorded natural areas in Marlborough. The map does not illustrate the areas currently regenerating with native vegetation that are not in DoC ownership.

The ecology of Marlborough is diverse. This variety is influenced by Marlborough's topography, geology, soils and climate. For example, the convoluted labyrinth of waterways in the Sounds provides a more moderate, moist climate compared to the hot dry summers and sharp winters experienced in the mountains. This variation influences the diversity of ecological habitats, from forest covered lowlands (including beeches and podocarps such as rimu, matai, miro and totara) to the subalpine shrublands and tussocklands on the ultramafic landscapes of the Red Hills, Bryant Range and parts of D'Urville Island.

The majority of this bioclimatic variety is contained within conservation land. As most of it is accessible public open space, it is also important for many other reasons than its conservation values, including recreation activities, landscape and visual amenity. The substantial open space resource which exists in the Marlborough Sounds, for example, contributes significantly to the wellbeing of both Marlburians and visitors to the area. It also provides protection for important habitats and ecosystems. In addition, these open space areas often exhibit high levels of natural character, this being identified as a matter of national importance under section 6 of the RMA.

Conservation areas administered by DOC cover a very large land area and are intimately connected with some very important water resources in the area (e.g. Queen Charlotte Sound and the Pelorus River). Marlborough as a whole contains extremely important pieces of New Zealand's conservation heritage, including the greatest diversity of natural values among any of New Zealand's six DoC Conservation Partnership Regions (Marlborough is part of the 'North and Western South Island Partnership Region'). As an example, south Marlborough alone is one of the five centres of endemism for native plants in New Zealand. A number of the areas are of national importance, both in terms of their particular ecological value and for the tourism and recreation opportunities they provide. Some areas are of international importance. The nature and significance of the conservation values present within the

conservation estate is described in detail in the Conservation Management Strategy for the Nelson/Marlborough Conservancy (1996).

Overseas tourism accounts for a significant proportion of the New Zealand economy and the vast majority of visitors come to see the New Zealand landscape. Significant economic benefits from the tourism and recreation sectors enable better protection and management of public conservation lands and provide enhanced ecological benefits, water quality and flood and erosion control.

Aquaculture

Alongside viticulture, aquaculture is an important industry within Marlborough, producing approximately 80% of all commercially grown seafood in New Zealand. Largely based in the Marlborough Sounds, the majority of marine farming occurs in Pelorus Sound and within areas of the Outer Marlborough Sounds, although there are also marine farms in Croisilles Harbour, Port Underwood and outer Queen Charlotte Sound. From the earliest days of aquaculture in New Zealand, the sheltered waters of the Marlborough Sounds were identified as an ideal location for marine farm development. Initially marine farms were developed on a hobby/part-time basis by fishermen and farmers. Green-lipped mussels were the first shellfish species to be farmed but production has since expanded to include: salmon, pacific oysters, scallops, kingfish, paua (abalone) and seaweeds.



Above: Part of a mussel farm in Pelorus Sound.
Below: The Molesworth Station, managed by DOC.



PUBLIC CONSERVATION AND QEII AREAS MAP

EARLY HISTORY AND SETTLEMENT OF THE MARLBOROUGH DISTRICT

Early Settlement

Marlborough contains numerous cultural and historic places of significance to both Māori and Europeans. These include archaeological sites, historic buildings, historic places and traditional sites such as wahi tapu as well as numerous other artefacts and areas associated with and interwoven with the cultural history of the area. Much of this is documented within 'Te Tau Ihu Statutory Acknowledgements 2014'. People today value a range of landscape attributes associated with the area's cultural heritage.

Māori myths, spirits and legends are imbued with the environment and tell of the earliest inhabitants of the area through landscapes and features which often bare spiritual associations and eulogies. Specifically, the Marlborough landscape is richly endowed with Māori values, attributed mainly to the sheltered and convoluted waters of the Sounds and of the coastline.

In 'Natural and Historic Values and Areas of Marlborough Sounds Planning District: A discussion Paper on Issues and Options for their protection' (1992) Lianne Rich and Derek Shaw outline the history of Māori settlement as follows.

'The early inhabitants of New Zealand were a sea-faring people. When canoes provided the major means of transportation practically all habitation was centered around the coast. Throughout New Zealand the majority of archaeological sites are concentrated in coastal areas reflecting the fishing, hunting, gathering and horticultural opportunities that these areas offered.'

'Long before the signing of the Treaty of Waitangi, iwi such as Rangitane and Ngati Kuia, resided in the Sounds, harvesting crops from the land and the sea. Coastal Marlborough was renowned for the abundance of mahinga kai and people travelled from afar to access the rich food resource (Hippolite, personal communication).'

'The remnants of this habitation are widespread throughout the Sounds. Although many sites are hidden to all except the trained eye, it is not too difficult to pick out the remains of pa, midden and kumara gardens in several areas of the Sounds.'

'Due to the convoluted coastline of northern Marlborough, its waters were extensively visited and mapped by Europeans. These predominantly sheltered waters lead to the establishment of many of New Zealand's first industries, such as whaling.'

Rich and Shaw also describe initial exploration, colonisation and sea-faring disasters.

'Abel Tasman was the first European visitor to the Marlborough Sounds, albeit one who never set foot on New Zealand soil, (Potton, 1987). All the principal explorations of Captain Cook in the 1770's centered around Ship Cove in Queen Charlotte Sound. It was on Motuara Island that Cook raised the British flag to proclaim this part of New Zealand as British Territory.'

'Bellingshausen, a Russian explorer of the 1820's and the French voyager D'Urville, both followed in the wake of Cook, bartering with local Māori and charting the Sounds waters.'

'More extensive charting of the Sounds coastline took place at various times in the 1830's to 60's initially by Lieutenant Chetwode at the helm of the HMS Pelorus and later in separate expeditions by Captains Lambert and Stokes.'

'At the turn of the 19th century, with vessel passage through and around the Sounds increasing, the intricate and hazardous nature of the coastline to mariners was recognized with the establishment of lighthouses on Stephens and Brothers Islands. Severe gales or treacherous reefs were the ruin of several ships in the late 1800's. In 1889 and 1894 respectively the Southern D'Urville area claimed the coastal traders the Koranui and the Gazelle. The reefs off Cape Jackson saw the sinkings of the Rangitoto (1873) and the Lavington (1884). Wrecks that are greater than 100 years old come under the protection of the Historic Places Act. All of these are now popular dive spots.'

'In addition to the submerged wrecks, the Edwin Fox, built in 1853 currently rests in Picton Harbour. The Edwin Fox had a long and colourful history as a convict ship, immigrant ship, refrigerated meat store and coal carrier. Adjacent to the hulk are the Edwin Fox Museum and workshop dedicated to its restoration.'

Whaling in the Marlborough Sounds

Whaling was one of the first commercial activities to establish in Marlborough because the Marlborough Sounds provided sheltered waters for the early whalers relatively close to the northward whale migration route. Indeed, for the first 40 years of the 19th century, whaling was the most significant economic activity for Europeans in New Zealand (Stephens, 2009). In the 1820s a shore whaling station was established on Arapawa Island and, by 1911, the Perano family had founded a whaling industry on the island that lasted until the end of whaling in 1964 (McSaveney, 2008). Many whaling stations were established within the sheltered bays and coves of the Marlborough Sounds, with small communities developing. Today, much of the evidence has been removed, although small remnants exist, particularly on the Port Underwood coastal road.

Economic Development

Due to Marlborough's favorable climate and sheltered valleys, European settlement of the land flourished, and the rate of change evident in the landscape accelerated as the region's economic potential was realised. With the arrival of grazing stock, tussock and native swamp, scrubland and forest were converted to pasture and a network of small towns began to grow. Large braided rivers such as the Wairau, often a source of danger during floods, were spanned by bridges and flood control measures later became a focus (eventually leading to the creation of the river-straightening Wairau River diversion). In the 1860s and 1870s, Marlborough rivaled Canterbury in wool production, Auckland in timber production and also had a flourishing flax fibre industry. During this time, extensive areas of indigenous habitat were lost.

Gold Mining in Marlborough

Although not as rewarding as in other parts of the country, gold was mined in Marlborough, primarily in the Wakamarina area and on the north bank of the Wairau River for a number of years in the mid-19th century. Relics from the era are still evident today. The following passage about gold and gold mining in New Zealand (Te Ara Encyclopedia of New Zealand, www.teara.govt.nz) describes the mining in the Wakamarina valley:

'In 1864, gold was discovered in the Wakamarina River, a tributary of the Pelorus River. Up to 6,000 Otago miners rushed to the workings, as initially these were very rich. A tent town sprang up, with 3,000 men giving the name Canvastown to the area. But the river gravels were worked out quickly and the rush soon passed. Later, reef gold was also discovered, but it was low grade and the reefs were mainly worked for the tungsten mineral scheelite.'

Today's Landscape

Today, the landscape reflects both natural processes and several centuries' of human occupation. Continual land use change and evolving agricultural practices reflect changing economics and human requirements over time. Landscapes are dynamic and will continue to evolve, yet natural and cultural features that are evidence of the past will remain. The cultural history of events that occurred in Marlborough have added a cultural and heritage dimension to the understanding of the region's landscape and landscape values.

