Ecosystem/habitat types used in Environment Canterbury's biodiversity reporting
Identified in the Canterbury Water Management and the Canterbury Biodiversity strategies

Dryland ecosystems

Photo N. Head.
Eyrewell Dryland Reserve.

Photo: G. Ure.
Native grasses under a kanuka remnant.

Photo: G. Ure.
Admiring a native daphe, inland Kaitorete Spit

Dryland ecosystems experience no inundation by water and include species that are intolerant of permanently-saturated soils or soils that are saturated for prolonged periods of time.

Drylands habitats occur in areas of naturally low rainfall and/or free-draining soils. Natural vegetation cover typically includes native grassland, shrubland and dry forest.

Drylands contain about half of New Zealand's most threatened indigenous plant species. There is a very high diversity of native herbs, sub-shrubs (short woody plants) and grasses.

The animals in drylands are mostly lizards and invertebrates. Drylands are important habitats for birds, such as banded dotterels and pipit, and are used as feeding areas for breeding black fronted terns.

Drylands have important biodiversity, natural, physical, cultural and recreational values.

Drylands are New Zealand's least protected and most threatened native ecosystems.

Braided rivers

Photo: Environment Canterbury
Waimakariri River.

Photo: D. Gray

Photo: G. Ure
Black-billed gulls feeding, Rangitata River

Braided rivers feature multiple divergent and re-joining channels separated by gravel islands.

Our braided river ecosystems are of international significance and iconic features of Canterbury.

They are geologically unusual and the plant and animal communities they support are found nowhere else in the world.

Braided rivers provide ecological links between the mountains and the sea and support distinctive flora and fauna.

Braided rivers provide habitats for a diverse range of birds including several threatened species such as the wrybill, black fronted tern, black-billed gull, and black stilt, which all breed exclusively or almost exclusively on the river gravel beds. There are a number of other birds that use braided rivers to breed but are not so dependent upon them.

The upper reaches of alpine braided rivers are largely unmodified with indigenous riverbed ecosystems, high water quality, natural character and scenic values.

Upper reaches provide important spawning areas for trout and salmon and native non-migratory fish, such as galaxiids, which live in their tributaries. Galaxiids were given this name because of the patterns on their skin which, to the people who first identified them, looked like a galaxy of stars.

The lower reaches of braided rivers are characterised by wide gravel beds, many channels and highly variable flows.

River mouths provide spawning areas for native fish, habitat for a wide variety of coastal birds and waterfowl and support high recreational use.

Mahinga kai, wahi tapu and wahi taonga sites abound, especially near river mouths.

Braided rivers contribute to 88 per cent of the region's run-off – and even more during periods of low river flows.

They are a significant source of high quality water for the region's aquifers, and provide water for community irrigation and stock water schemes.

Banks Peninsula and Kaikōura streams


Photos: Environment Canterbury.
French Farm (Left), Pawson's Stream (right), Banks Peninsula.


Photos: Environment Canterbury
Lyell Creek, (left), Middle Creek (right), State Highway 1, Kaikōura

Banks Peninsula and Kaikōura streams are typically short and most flow directly into harbour and estuarine environments with significant values for marine mammals, marine ecosystems, shellfish gathering, and recreation.

These streams are of critical importance to rare native fish species due to the absence of salmonids, remnants of indigenous riparian vegetation in their lower reaches, and relatively stable flows.

Fish spawning sites occur in the lower reaches.

Banks Peninsula and Kaikōura streams provide important mahinga kai, wahi tapu and wahi taonga sites.

They are also an important source of community drinking water.

Wetlands

Photo M. Parker.
Sanctuary Swamp

Photo: G. Ure.
Red/ copper tussock in a foothills wetland.

Photo: G. Ure.
A tarn wetland, Hakatere.

Naturally occurring wetlands include permanently or intermittently-wet areas, shallow water and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.

Less than 10 per cent of the region's previously-extensive freshwater wetlands remain.

Some of our region's wetlands are internationally significant (i.e. Te Waihora/Lake Ellesmere) and many are culturally significant as mahinga kai or wahi tapu sites.

High country lakes

Photo: D. Gray

Photo: Environment Canterbury.
Lake Benmore

High country lakes are located within the foothills of the Southern Alps, below the treeline.

The Canterbury high country has more than 40 lakes – large and small, deep and shallow, which are fed by rainfall, snowmelt and glacial meltwater.

Large high country lakes include Lake Coleridge and Lake Pukaki.

Medium to small lakes include Lake Sumner, Lake Pearson and Lake Middleton.

High country lakes offer habitat for large numbers of native birds, native fish, invertebrates, aquatic and lake-margin plants.

Rare/threatened species include the crested grebe and marsh crake.

Intermontane streams

Photo: M. Parker.
Cora Lynn stream

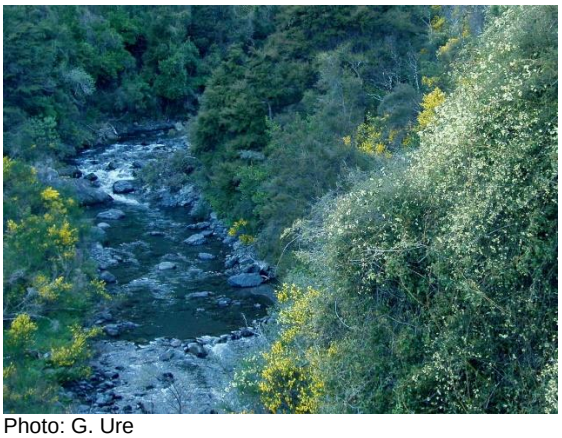


Photo: G. Ure
Gorge Stream, Hurunui

Intermontane streams are located inland between mountains or mountain ranges.

Intermontane streams are generally faster flowing, cooler and contain lower sediment levels than lowland streams.

Many have high natural character and provide valuable habitat for native fish such as long-jaw galaxiids.

Fish and invertebrates present in intermontane streams are adapted to high oxygen and low temperatures - high water quality and sediment-free substrates.

Hill country catchments

Photo: G. Ure
Beech forest and grey scrub, Hurunui.

Photo: G. Ure
Cabbage trees and mikimiki, Selwyn-Waihora.

Hill country catchments incorporate all land above 600 metres or with slopes greater than 200 degrees.

Canterbury's hill country catchments include some substantial areas of beech forest, significant areas of relatively unmodified tussock grassland, and remnant habitats of woody ecosystems.

These woody ecosystems or grey shrublands (also called grey scrub) are dominated by native divaricating shrubs. These include matagouri, diverse Coprosma spp., Corokia, several Melicytus spp., with lianes and creepers, some of which are restricted to grey scrub such as Clematis marata and C. quadribracteolata. Pre land-clearance grey scrub communities will also have the tiny hemi parasitic native mistletoe Korthalsella.

Native kānuka forest mixed with native shrubs or exotic grasslands; manuka shrubland with its associated fernland or shrub heaths of mires and frost flats; matagouri shrubland; and, successional exotic gorse-broom shrubland with native cabbage trees dotted throughout can be found in grey scrub remnants.

Kānuka and manuka are alternate scrub/ forest types that may either occur in mixture with grey scrub, in mixture with each other or as near monocultures. In Canterbury, manuka is more likely on sites with impeded drainage or very low fertility. In the foothills grey scrub and kānuka will naturally progress toward a low broadleaf forest type and depending on seed sources, fertility and moisture availability, some areas will progress towards podocarp forest (matai, totara, Hall's totara).

Pre-human permanent grey scrub communities would have been found only in harsh sites that had one or more characteristics that prevented tree species occurring (frost hollows, saline, extreme exposure, dryness or low rainfall, seasonal flooding, basic soils (e.g. limestone escarpments).

Hill country catchments also include naturally-rare limestone outcrop ecosystems that provide habitat islands which frequently support concentrations of threatened, endangered and endemic species vastly disproportionate to their size. Unique species can sometimes be confined to just a few outcrops in one location, e.g. a native gentian and a buttercup near Cave.

The hill country of South Canterbury is also home to the only known long-tailed bat/pekapeka population in the eastern South Island.

Hāpua, lagoons and estuaries


Photo: Environment Canterbury.
Te Waihora/ Lake Ellesmere


Photo: L. Bolton-Ritchie.
Ashley Estuary


Photo: L. Bolton-Ritchie.
Hurunui River hapua

Hāpua, lagoons and estuaries are examples of coastal hydrosystems or coastal aquatic environments. Each comprise a physical feature near the coast made up of hydrological, geomorphic and ecological components. Coastal hydrosystems can include significant surface water or groundwater inputs and the water within the different systems can span a gradient through freshwater to brackish to saline.

Examples in Canterbury include hāpua-type river mouth lagoons such as the Rakaia and Ashburton rivermouths, Waituna-type lagoons or coastal lakes such as Te Waihora/Lake Ellesmere and Wainono Lagoon, tidal-lagoon estuaries such as the Avon-Heathcote Estuary/Ihutai or freshwater river mouths such as the Clarence River. These water bodies are a link between freshwater and marine environments.

These coastal hydrosystems provide an important habitat for a diversity and abundance of native plants and animals including mahinga kai species such as cockles, pipis, flax and tuna (eel). They provide important nursery and spawning grounds for marine and freshwater fish species, such as whitebait, tuna, flounder, kahawai and yellow-eyed mullet, and margin habitats for the Canterbury mudfish.

Hāpua, lagoons and estuaries also form an important network for migrating and wintering wading birds. Even the smallest lagoons provide important bird feeding and resting habitats, and a link between larger lagoons for migrating bird species.

Estuarine and coastal areas hold significant cultural value for Ngāi Tahu and provide important mahinga kai and wahi tapu sites, particularly Te Waihora/Lake Ellesmere, Te Roto O Wairewa/Lake Forsyth and Wainono Lagoon.

Hāpua, lagoons and estuaries are also valued for boating, fishing and game-bird shooting.

Artificial and modified water bodies

Photo: Environment Canterbury
Water canal.

Photo: Environment Canterbury
Water canal.

Artificial and modified water bodies are created by human action and include irrigation canals, water races, canals for the supply of water for electricity power generation and farm drainage canals.

This category also covers lakes created by human action including any lake created as a result of damming a river, constructing an impoundment on land or excavating land.

In Canterbury, naturally-flowing streams, channelled and re-routed, and artificially-created lakes and waterways exist as a complex and interconnected network of waterways. Some of these waterways are very important for biodiversity, providing habitat for communities of native species. For example, just in the Te Waihora/Lake Ellesmere catchment alone there are several thousand kilometres of classified drains, small channels which flow into the larger drains (although dry for much of the year) and tile drains (subsurface drains).

Across the Canterbury plains, drains are often the last refuges of native wetland plants and habitats. Drains are living systems and provide valuable habitat for the plants and animals that live in and near water, including a number of fish species.

Lowland streams

Photo: Environment Canterbury.
Styx River

Photo: G. Ure
Native plant *Bulbinella beside* Gentleman Smith Stream, Hakatere.

Lowland streams are sourced from groundwater-fed springs and seeps. They are generally slower-flowing, warmer and carry more sediment than intermontane streams.

Most have a gravel bed and many have been modified and re-routed over the years.

Lowland streams provide habitat for species such as brown trout, whitebait, eels, koura and kakahi.

They hold significant cultural value for Ngāi Tahu, with springs used for healing, vegetation used for cultural purposes, and sites used for food gathering.

Fish and invertebrates present in lowland streams can tolerate a broader range of temperature and oxygen than found in intermontane streams at higher elevations.

Canterbury plains

Photo: G. Ure.
Looking out across the plains from Mount Hutt.

Photo: G. Ure.
Looking out across the plains from Lees Valley Road.

The Canterbury plains are home to some of the most highly-modified landscapes and ecosystems in the country, and include our urban environments.

Thousands of hectares, historically, were modified by agriculture, horticulture and forestry – the plains being most suitable for human settlement, food and fibre production.

Native shrublands and grasslands on the plains today provide habitat for a variety of plants and animals, many of which are found in few other places. Scattered, these fragments include dryland and woody ecosystems, each one with its own assemblage of plants, insects, and birds.

Native shrubland and grassland remnants are today regarded as having high natural heritage and biodiversity values.

Nationally-important remnants remain such as McLeans Island grasslands. At least 150 indigenous insect species have been identified in McLeans Island. Four of these insect species, plus a number of moths, are scarce in the region.

McLeans Island also provides habitat for the nationally threatened plant species plains Olearia, Raoul's mat daisy and leafless pōhuehue.

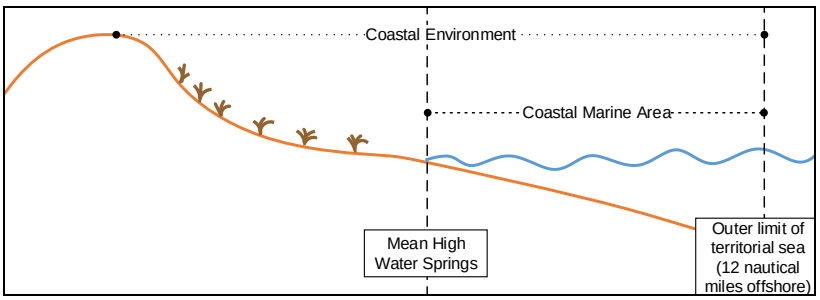
Coastal environment

Photo M. Giller.
Looking towards New Brighton

Photo G. Ure.
Pingao, Kaitorete Spit

Photo: L. Bolton-Ritchie
Sea grass – Akaroa harbour intertidal flat.

Canterbury's coastal environment includes three distinct but interrelated parts: the sea (Coastal Marine Area), the active coastal zone, and the land backdrop.



Canterbury's coastline extends nearly 800 kilometres from Kekerengu Point just north of the Clarence River mouth to the Waitaki River in the south. The sea, from mean high water springs out to 12 nautical miles offshore covers 11,620 square kilometres.

Within Canterbury's coastal environment, from the land backdrop to the outer limit of the territorial sea, there are a variety of coastal marine habitats and ecosystems.

Sand dunes, estuaries and lagoons, coastal wetlands, coastal cliffs, rocky headlands, limestone bluffs, deep sea canyons, the deeply indented volcanic remnants of Banks Peninsula, sandy mudflats, rocky intertidal and subtidal reefs, sandy and gravel beaches, muddy or sandy seabed, along with surf breaks of national importance, make Canterbury's coastal environment a hot spot for coastal and marine biodiversity.

Landward, remnant indigenous coastal forest, salt marsh, wetland, and sand dune vegetation (including grasses like pingao), provides habitat for a variety of native birds, lizards, invertebrates and fish.

Seaward, a high diversity of plant (algae) and animal (invertebrates such as paua, rock lobster, sponges, anemones, crabs and shrimps, shellfish and snails, worms, starfish and sea cucumbers), ascidians, fish, and marine mammals inhabit coastal waters along with a diversity seabirds.

The mouths of Canterbury's braided rivers and their coastal lagoons provide feeding, resting and breeding habitats for migratory and wading bird species, and breeding grounds for fish such as flounder and whitebait.

Seagrass on some intertidal mudflats supports a diversity and abundance of invertebrates and is habitat for juvenile fish.

The Kaikōura canyon plunges to depths of more than two kilometres a few hundred metres offshore and out to sea - one of the most biologically productive deep-sea habitats so close to shore anywhere on earth.

The nationally threatened species *Smeagol manneringi* – a genus of small air-breathing sea slug, is only found in the upper intertidal zone in Kaikōura. The name of the genus is in honour of Tolkien's fictional character Gollum, who was originally known as Sméagol.