The New Brighton coastline as we know it today is a fairly recent occurrence. Six to seven thousand years ago the coastline was at Kaiapoi, Fendalton and Riccarton. Sea levels were more than 150m higher than they are now, because 14,000 years ago a warmer climate melted the icecaps and glaciers, raising the sea level.

Two thousand years ago the coastline was approximately 3–4km inland of the present shoreline. Sediment, eroded from mountains, has been washed down the rivers, building up the shoreline and slowly shifting it eastwards.

Flora
The salt-laden coastal winds greatly restrict which plants can survive and consequently there are few trees and shrubs. Nevertheless, the cliff faces from Sumner to Godley Head support a hardy collection of native and exotic grasses, herbs and small shrubs.

In the 19th Century, European settlers destroyed many of the coastal plants on the dunes, through burning and over-grazing. To try and stabilise the sand dunes large areas were planted with pine trees and marram grass. Today, restoration programmes on the coastal sand dunes are under way to replant areas of previously open sand with native sand-binding plants, such as pingao (golden sand sedge), spinifex (kowhangatara), cottonwood, milkweed (Euphorbia glauca), blue milkweed (E. pepuls), and sand coprosma (waiu-o-kahukura). In some large scale dune recontouring sites (African) ice plant is used to initially stabilise the dunes before they are replanted with native sand-binding plants, shrubs and trees.

Fauna
The rocky coastline of Godley Head is the home of Canterbury’s white-flippered penguin (kororā). The 40cm tall, white-flippered penguin breeds only on the coast of Banks Peninsula and Motunau Island. In summer, the penguins swim to Southland, returning to Banks Peninsula for the winter. Introduced predators, such as ferrets, have caused the white-flippered penguin population on Godley Head to decline sharply.

Off Sumner Head, near Taylors Mistake, the small Hectors dolphin (upokohue) can sometimes be seen playing. The dolphins are only 1.45m long, with black, grey and white markings and can easily be recognised by their rounded dorsal fin. The Hectors dolphin, named after Sir James Hector, a former curator of the New Zealand National Museum, is an endangered species. The marine mammal sanctuary, from Sumner Head to the Rakaia River, was created to reduce accidental fishing of the dolphins in recreational and commercial nets. The restrictions apply from November to the end of February.

The rocky headlands and boulder beaches conceal a range of sea life just under the pounding waves and surging surf. Barnacles, seaweeds, lichens, chitons and crabs thrive in the upper tidal zones. In the mid to low tide zone, sea anemones, snails, whelks, mussels, starfish and sea urchins can be found. Just below low tide are the swaying kelps and red seaweeds.

On the surf beach, which stretches from Southshore Spit, northwards, black-backed gulls (karoro) regularly patrol at low tide in search of shellfish. Small sandhoppers feed on freshly deposited seaweed and at low tide, surf clams, pipi, and swimming crabs hide within the sand.

The coastal sand dunes are home to the katipo spider, feared by some for its venomous bite. It is, however, very shy and vulnerable to habitat modification. The spider has an important role in the ecological systems of the sand dunes, eating insects that can damage the sand dunes, such as the hard-backed beetles that feed on the roots of some sand dune grasses.
Human History

The coastline has been a major source of food and resources since the first Maori settled in the 1500s. The Ngati Mamoe migrated south from the North Island and assimilated Waitaha, first by intermarriage, then by warfare and finally by negotiated peace. In the mid 1700s Ngai Tahu migrated south from the North Island and, in a process similar to that experienced by the Waitaha, assimilated the Ngati Mamoe.

As fires destroyed the forests inland approximately 500 years ago, Maori became reliant on the coast. Several thousand campsites have been found along the coastline, between the estuary and the Waikari River mouth. The coastline was a source of fish, shellfish and seabirds for Maori, particularly the Avon-Heathcote Estuary and the wetlands of Brooklands Lagoon.

Many of the early settlers’ first encounters with the coastline near Christchurch ended in despair, as their household belongings were destroyed when their boats tried to cross the sandbar at the mouth of the Avon-Heathcote Estuary. The mouth of the estuary was notorious for wrecking boats. Some ships would wait three to six weeks off the coast for a chance to cross the sandbar and even then many were wrecked.

Recreation

There are extensive sections of rocky coastline, sandy beaches and two estuaries, where the intricate ecosystems of plant life and animals exist. Care must be taken not to damage or remove plants and animals from their natural habitat.

The wide, open, flat expanse of the sandy beach along Pegasus Bay provides plenty of space for walking, horse riding, mountain bike riding, land yachting, fishing, picnicking, swimming, surfing, body boarding or just enjoying the sea air. People are encouraged to swim in designated areas between the flags in front of the surf life saving clubs. Dogs are to be kept on leads when passing through these areas and away from swimmers. Dogs must also be restrained to avoid disturbing roosting coastal and migratory birds, particularly at high tide.

A coastal walk runs almost continuously from the mouth of the Waimakariri River to Southshore Spit.

Management issues

The sandy coastline is a great place for all types of recreation, however, the impact of activities on the sand dunes can cause major erosion and destabilisation.

People visiting the beach are encouraged to keep to boardwalks and designated tracks, helping to preserve the plants that are stabilising the sand dunes. Sand dunes are important for protection against wave action and storms that can flood the land behind the dunes.

Nylon fences have been used to trap and stabilise sand on the seaward side of the dunes to prevent the inland spread of windblown sand which would otherwise smother the dune vegetation behind. These new fore-dunes then act as a buffer for storm events. The planting of the sand dunes with plants is also an important process in the stabilisation of the narrow dunes along the Christchurch foreshore. The planting of marram grass, an early introduced sand-binding plant, has led to the rapid vertical growth of the dunes. Today, native sand binders such as pingao and spinifex are favoured as they create lower, broader dunes that are more stable and sustainable.

With new subdivisions being developed close to the coastline, conflict can arise from people in new residential buildings who would like to have a view over the sand dunes. The height and management of sand dunes protects the land behind the dunes from waves and seawater during storms. The sand dunes carry out a valuable role in the naturally dynamic coastal ecosystem.

• Pingao, a plant species native to New Zealand and sometimes called golden sand sedge, is popular as a weaving material and very effective for sand dune erosion control. Pingao grows towards the sea with long “ropey” runners that trap new sand and assist in the formation of stable dunes and in the recovery of the dunes after storms have taken sand away.

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