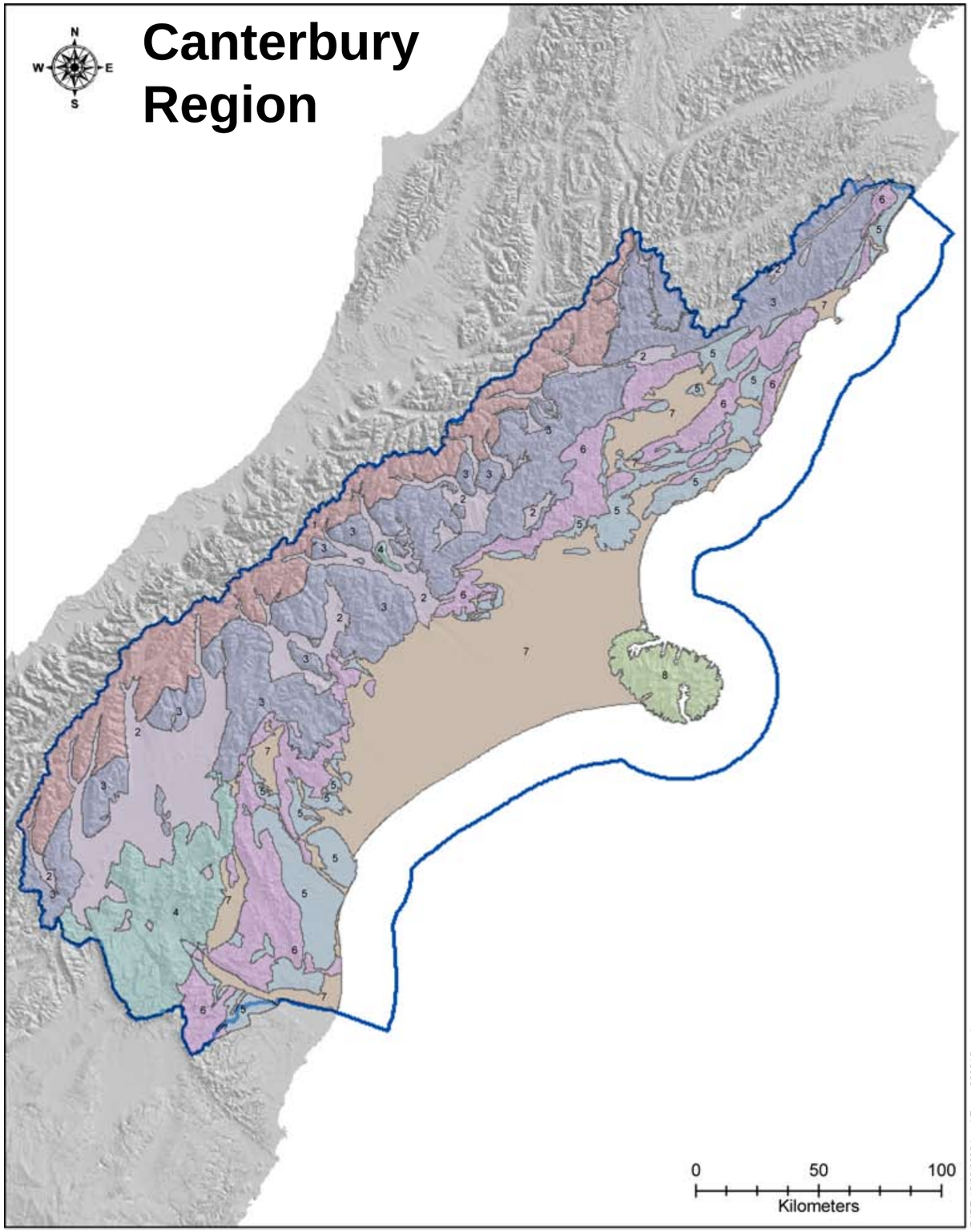
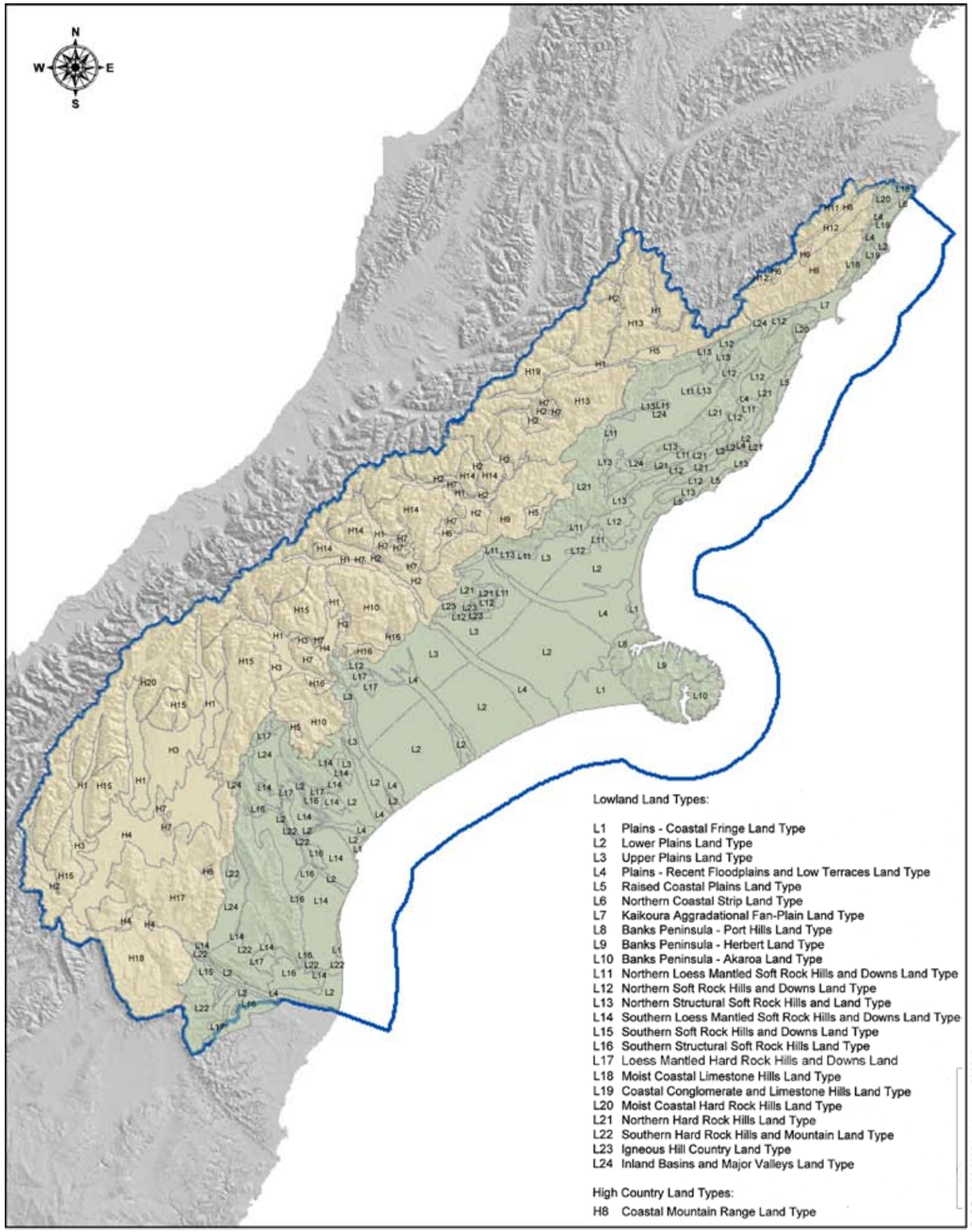
Canterbury Region



Landscape Types

- 1 - Alpine
- 2 - Intermontane Basins
- 3 - Sub Humid to Humid Mountain Ranges
- 4 - Semi Arid to Sub Humid Mountain Ranges
- 5 - Soft Rock Hills and Downs
- 6 - Hard Rock Hills and Downs
- 7 - Plains
- 8 - Banks Peninsula
- Canterbury region



Lowland Land Types:

- L1 Plains - Coastal Fringe Land Type
- L2 Lower Plains Land Type
- L3 Upper Plains Land Type
- L4 Plains - Recent Floodplains and Low Terraces Land Type
- L5 Raised Coastal Plains Land Type
- L6 Northern Coastal Strip Land Type
- L7 Kaikoura Aggradational Fan-Plain Land Type
- L8 Banks Peninsula - Port Hills Land Type
- L9 Banks Peninsula - Herbert Land Type
- L10 Banks Peninsula - Akaroa Land Type
- L11 Northern Loess Mantled Soft Rock Hills and Downs Land Type
- L12 Northern Soft Rock Hills and Downs Land Type
- L13 Northern Structural Soft Rock Hills and Land Type
- L14 Southern Loess Mantled Soft Rock Hills and Downs Land Type
- L15 Southern Soft Rock Hills and Downs Land Type
- L16 Southern Structural Soft Rock Hills Land Type
- L17 Loess Mantled Hard Rock Hills and Downs Land
- L18 Moist Coastal Limestone Hills Land Type
- L19 Coastal Conglomerate and Limestone Hills Land Type
- L20 Moist Coastal Hard Rock Hills Land Type
- L21 Northern Hard Rock Hills Land Type
- L22 Southern Hard Rock Hills and Mountain Land Type
- L23 Igneous Hill Country Land Type
- L24 Inland Basins and Major Valleys Land Type

High Country Land Types:

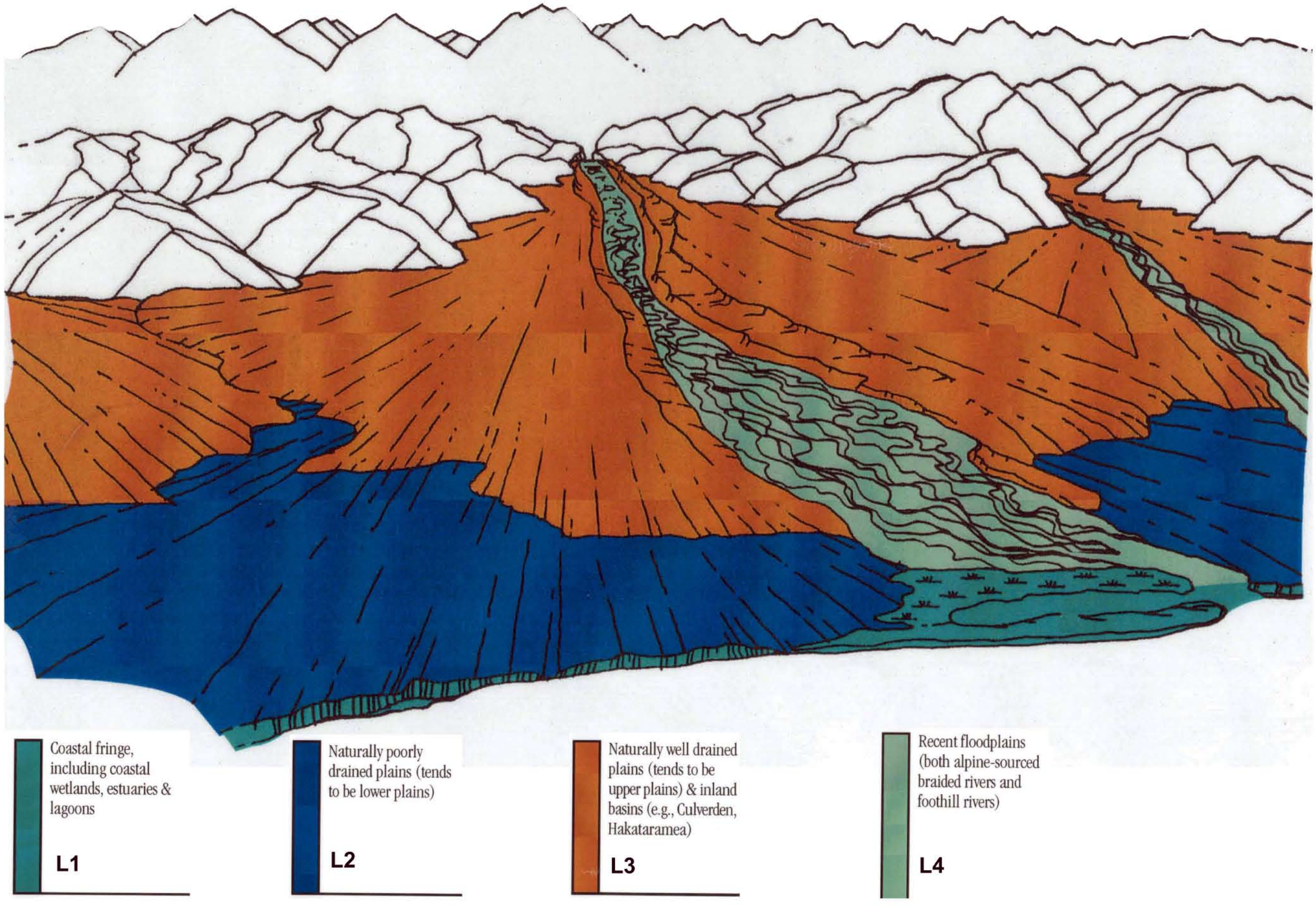
- H8 Coastal Mountain Range Land Type

Land Types

Landscapes

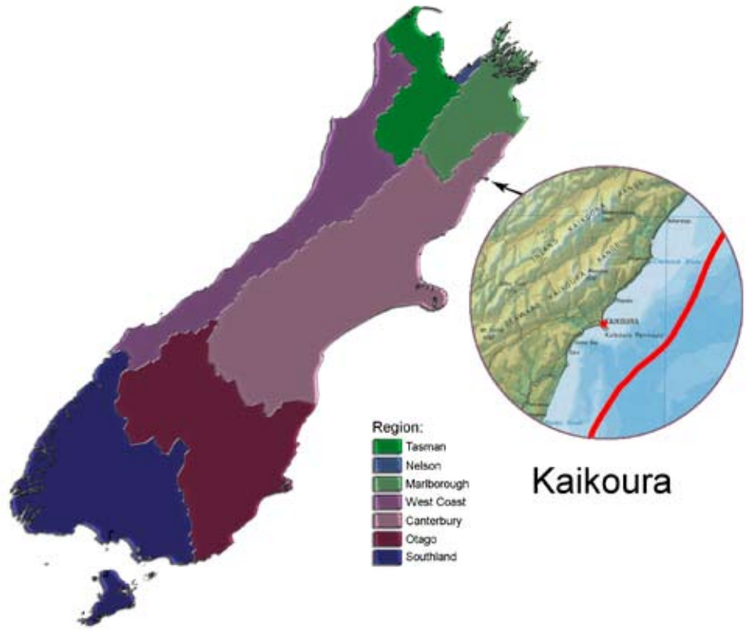
- High Country Areas
- Lowland Areas
- Canterbury region

Canterbury Landscape Type 7



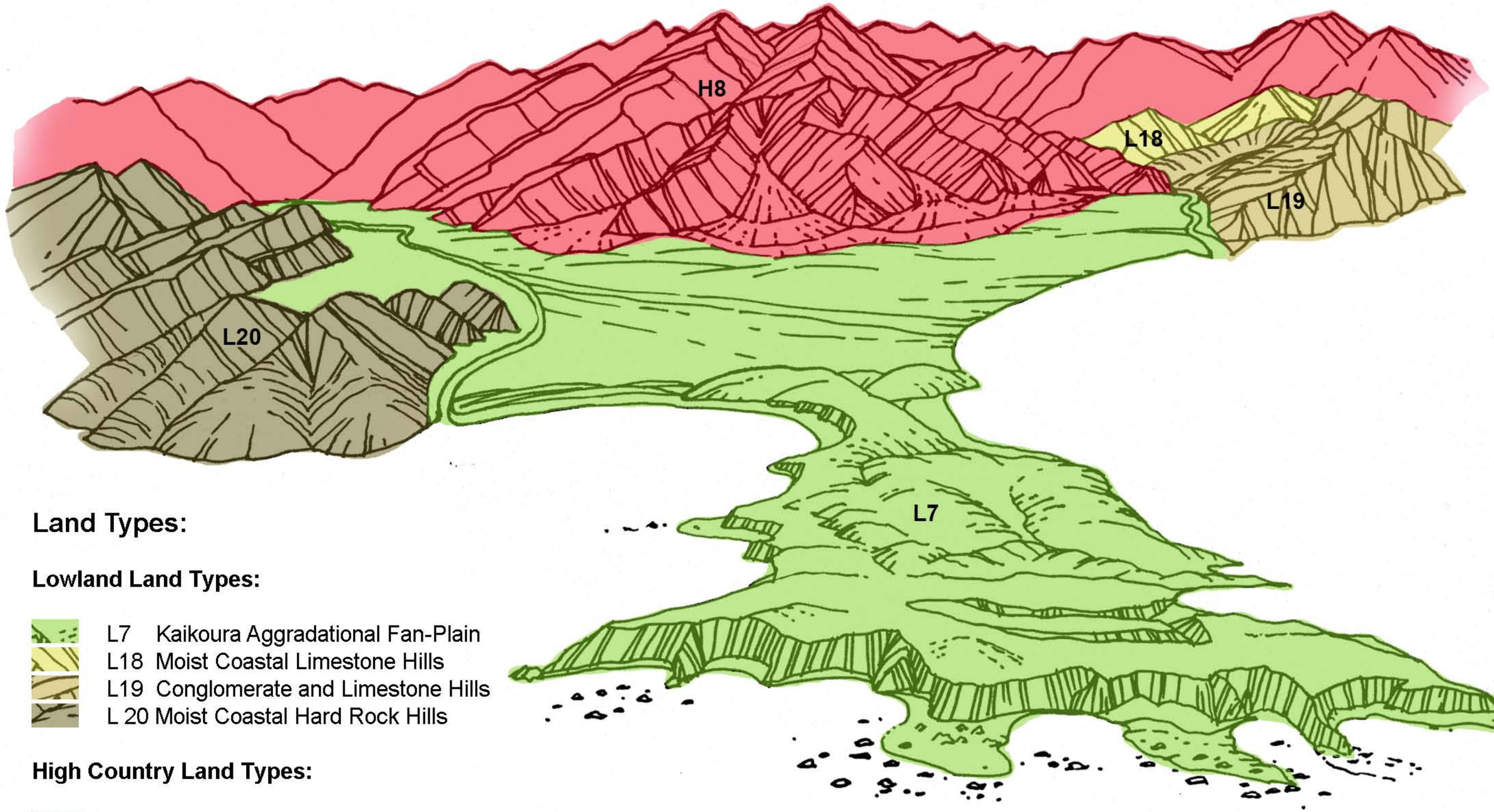
Canterbury Plains landform model

Canterbury Region
Kaikoura District



Kaikoura landform

Kaikoura limestone landform



Land Types:

Lowland Land Types:

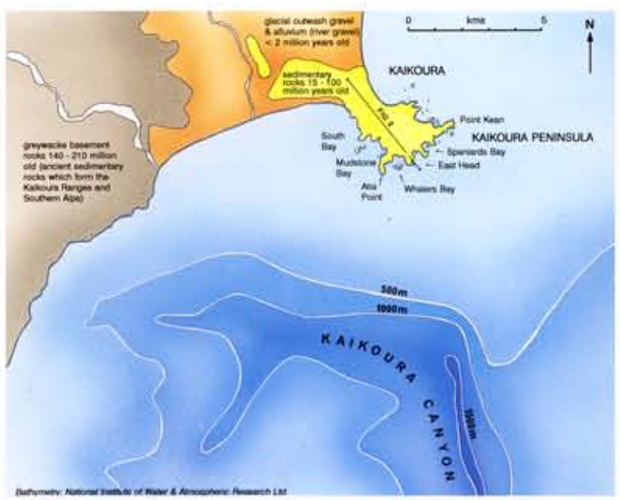
- L7 Kaikoura Aggradational Fan-Plain
- L18 Moist Coastal Limestone Hills
- L19 Conglomerate and Limestone Hills
- L 20 Moist Coastal Hard Rock Hills

High Country Land Types:

- H8 Coastal Mountain Range

Kaikoura landform model

FIGURE 1 Bathymetry and simplified geology of the Kaikoura area. Illustrated by G. Coates & G. Cox.



Canterbury Region Kaikoura District

Landform Components:

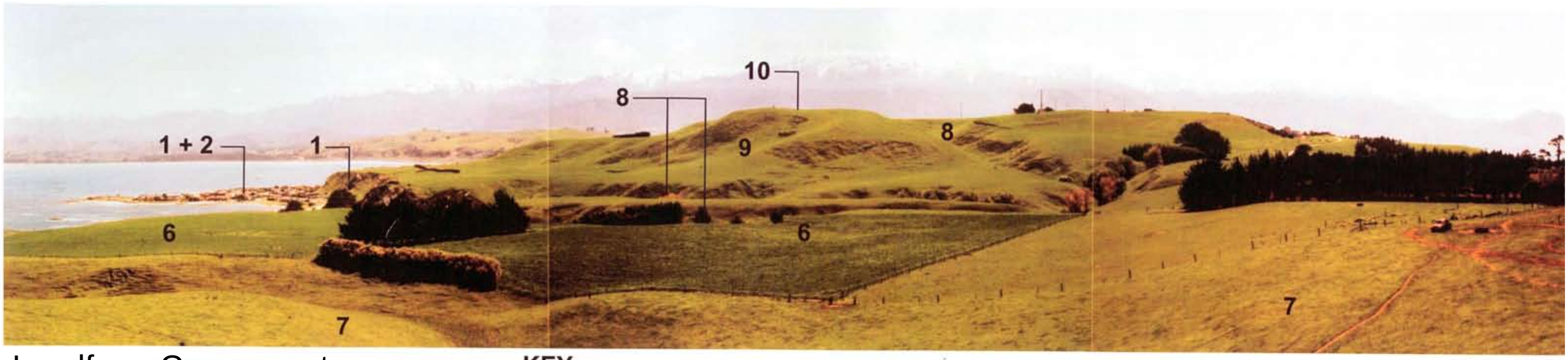
KEY

1	sea cliff	7	rolling hills
2	basal cliff colluvial fan - storm beach	8	dissected gullies
3	wave-cut platforms and reefs	9	former sea cliffs
4	stack	10	remnant dissected shore platforms and hills
5	beach	11	Kaikoura Fan
6	raised dissected marine terraces / shore platforms (at least 3 levels)		

Landform components 1 to 10 belong to a ‘Soft rock hills and downs’ land type
Landform component 11 to a ‘fan-plain’ land type

Landform Components, Kaikoura Peninsula

Kaikoura Peninsula



Landform Components

KEY

1 sea cliff
2 basal cliff colluvial fan - storm beach
6 raised dissected marine terraces / shore platforms (at least 3 levels)
7 rolling hills
8 dissected gullies
9 former sea cliffs
10 remnant dissected shore platforms and hills

Soft Rock Hills and Downs Land Type

Canterbury Region Kaikoura District

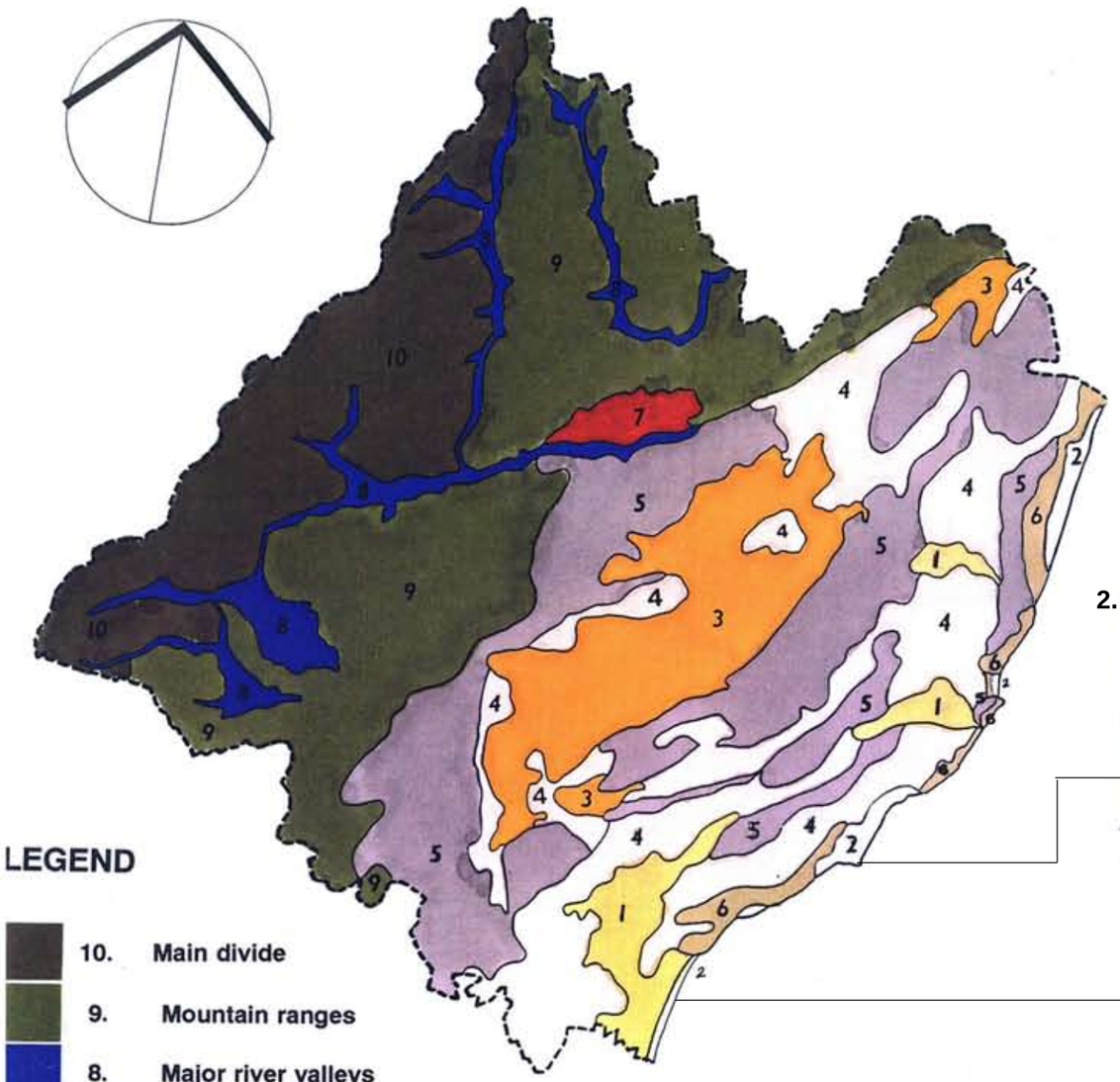
Above: Travelling south from the Waima River to Oaro beyond Kaikoura, the railway line tracks the coast ducking in and out of tunnels along the way.

Above: Smooth grey beach stones glisten as waves whipped to froth by wind are sucked back from the shore. Mangamaunu is one of the South Island's best known surfing beaches.

Left: Travellers along the Kaikoura coastal highway enjoy a scenic treat, with crashing surf to one side of the road and soaring snow-topped mountains to the other.

Above: The Kaikoura Peninsula sprawls into the ocean, to the south of the township. A walkway traverses the peninsula's rocky shore then cuts back to Kaikoura across the top of the headland, providing breathtaking views and close encounters with seals.

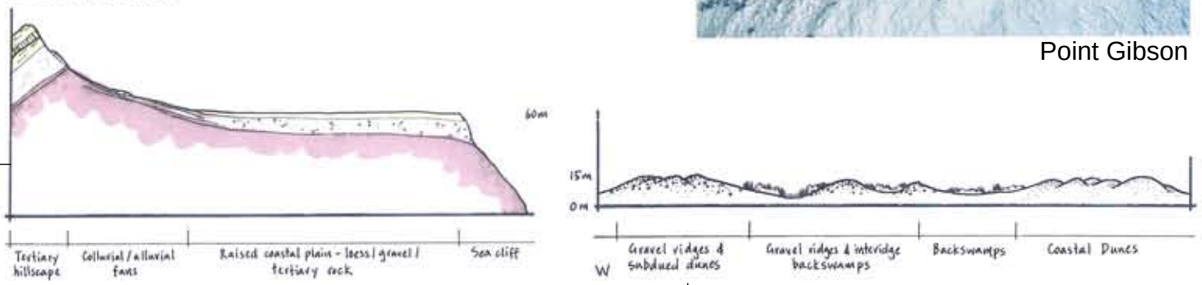
Canterbury Region Hurunui District



6. Coastal hills

Point Gibson

2. Coastal Plains



Hurunui landforms

Canterbury Region Hurunui District

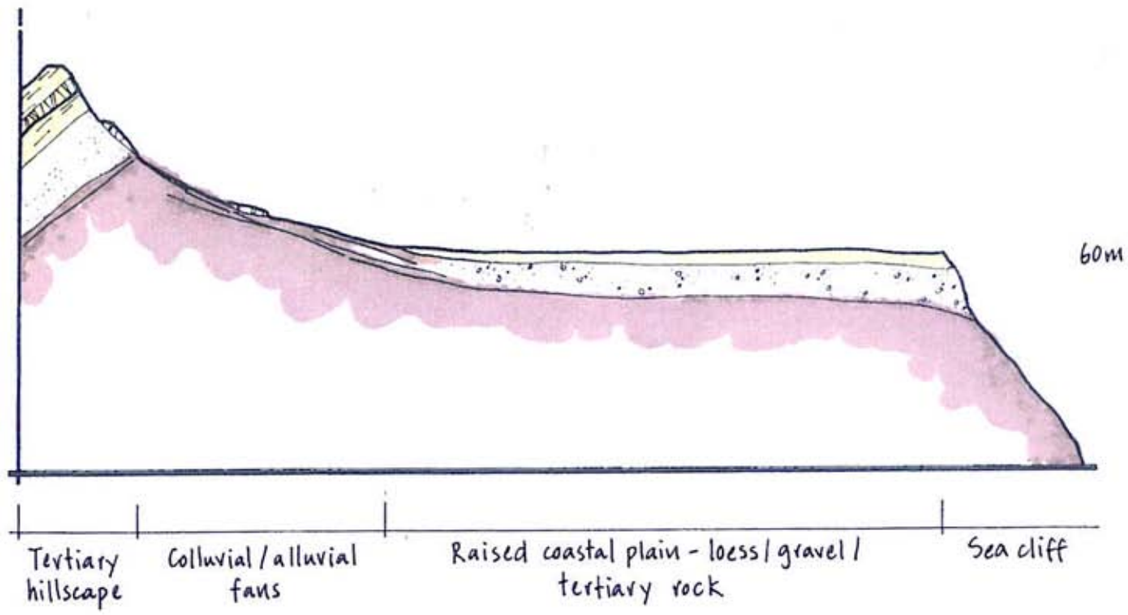
Claverley

L 5 RAISED COASTAL PLAINS LAND TYPE

Restricted, undulating, weakly dissected, raised coastal plains, including high steep seaward cliffs, steep incised gorges and small meander floodplains. Elevation ranges from 0 to 60 m and rainfall from 800 to 1000 mm/A. The land type includes the Motunau, Medina, and Claverley coastal plains.

landform component	geological formation	elevation m	remnant native vegetation	present land use
raised coastal plains	late Pleistocene marine gravel and sand, with loess mantle	10 - 60	silver tussock, danthonia grassland, scrub, kowhai	intensive grazing, feed and cash cropping
colluvial - alluvial footslope fans	late Pleistocene local fan deposits, with loess	10 - 60	matagouri scrub silver tussock, danthonia grassland	intensive grazing, feed and cash cropping
sea cliffs	Tertiary mudstone and sandstones	0 - 60	scrub, coastal forest, cliff perchers	extensive grazing, nil
incised gorges	Tertiary mudstone and sandstones	0 - 60	broadleaved scrub	nil, opportunistic grazing
narrow meander floodplains	Holocene and Recent alluvium	0 - 60	ephemeral gravel communities, marginal wetlands	semi intensive grazing,

agronomic potential	potential land use	potential impacts
high	cash and feed cropping, horticulture, intensive grazing	intensified land use, shelter belts, cultivation, subdivision
high	cash and feed cropping, horticulture, intensive grazing	intensified land use, shelter belts, cultivation, subdivision
low	extensive grazing, recreation	increase in exotic vegetation, recreation impacts
low	recreation	recreation impacts
high	cash and feed cropping, horticulture, intensive grazing	intensified land use, subdivision



Land Types

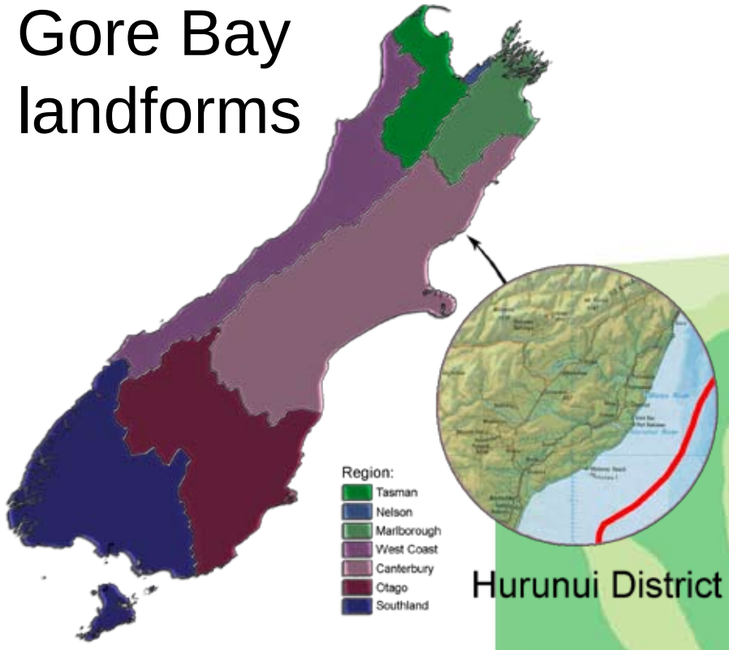
Canterbury Regional Landscape Study

(Boffa Miskell & Lucas Associates 1993)

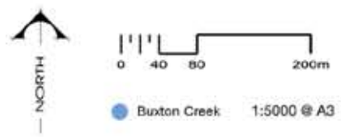
Hurunui District

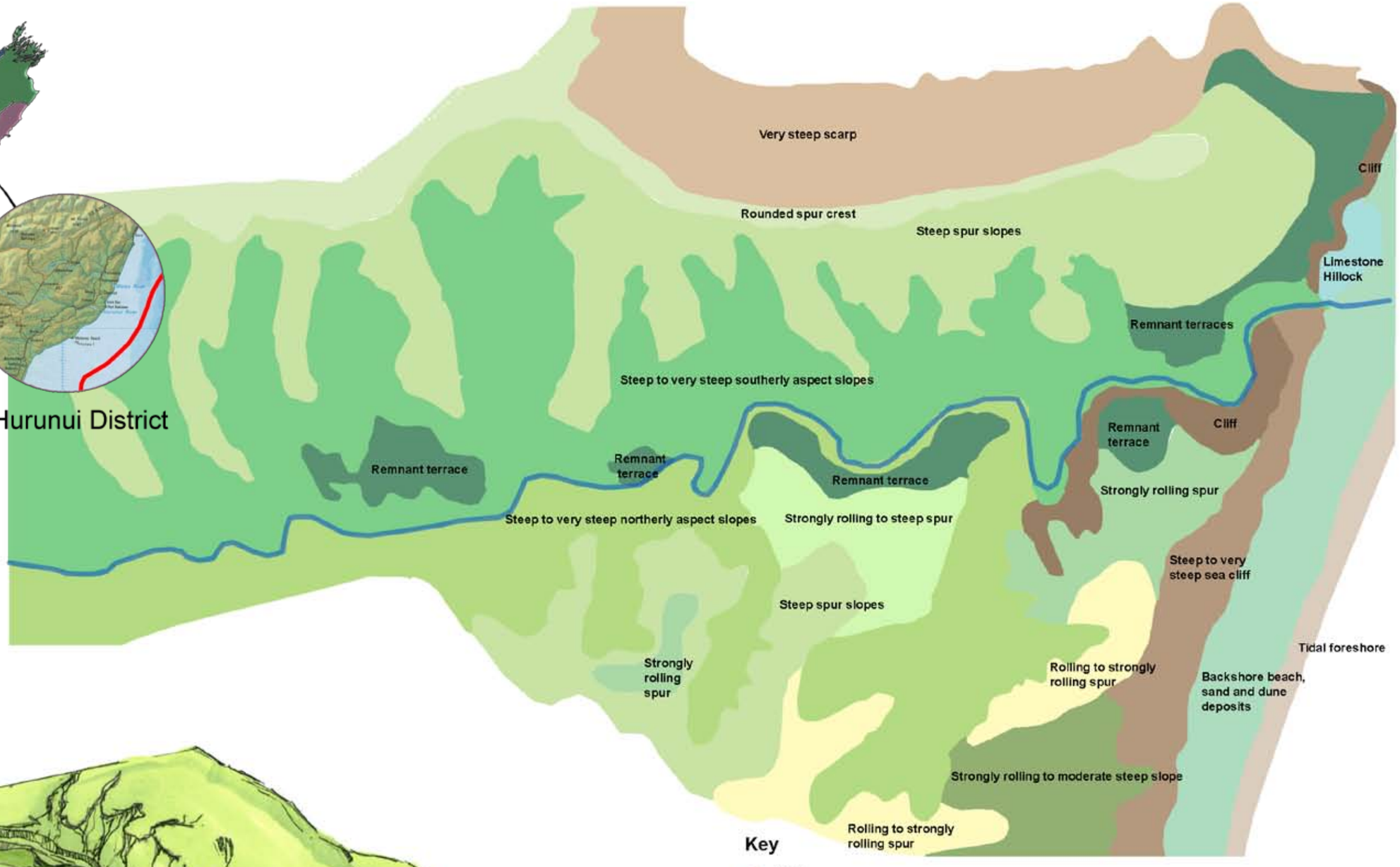
Gore Bay Coast

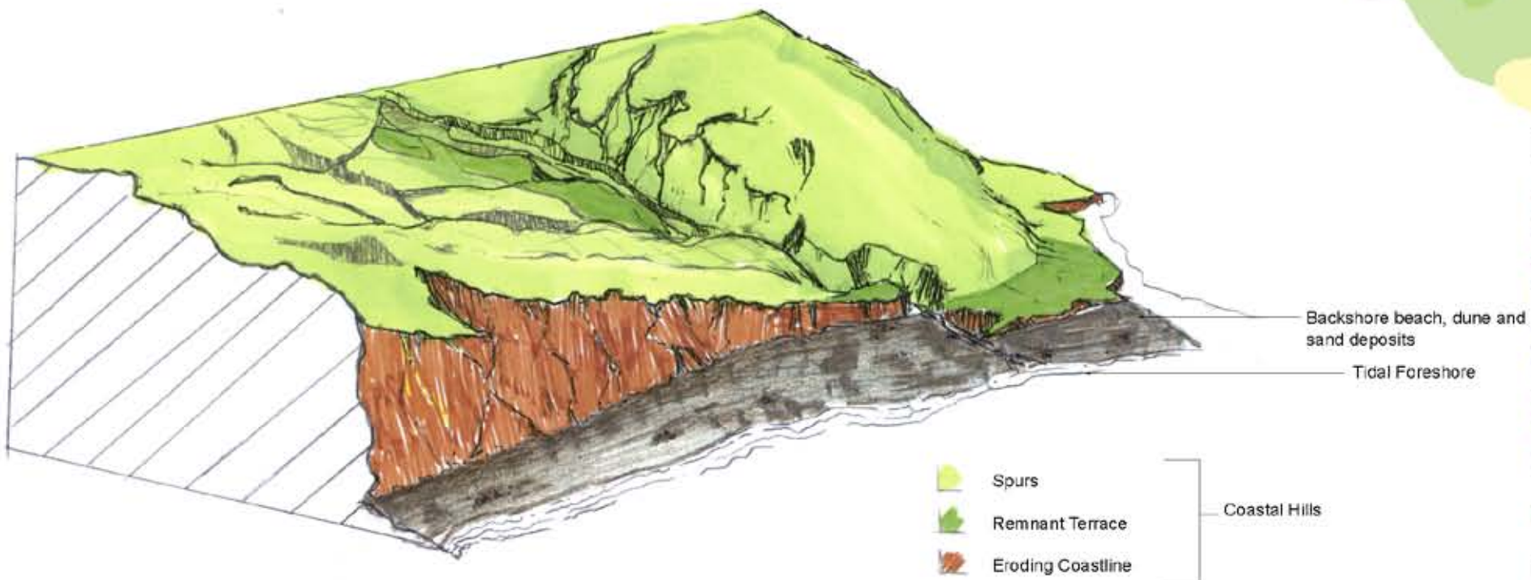
Gore Bay landforms



Hurunui District







Land Type Model - Buxton Gore Bay

Key

- Cliff
- Very steep scarp
- Steep to very steep southerly aspect slopes
- Steep to very steep northerly aspect slopes

Loess mantled 'soft' rock erosional hill slopes

- Rounded spur crest
- Rolling to strongly rolling spur slopes
- Strongly rolling spur
- Strongly rolling to steep spur
- Steep spur slopes

Spur crests and summits

- Remnant terrace

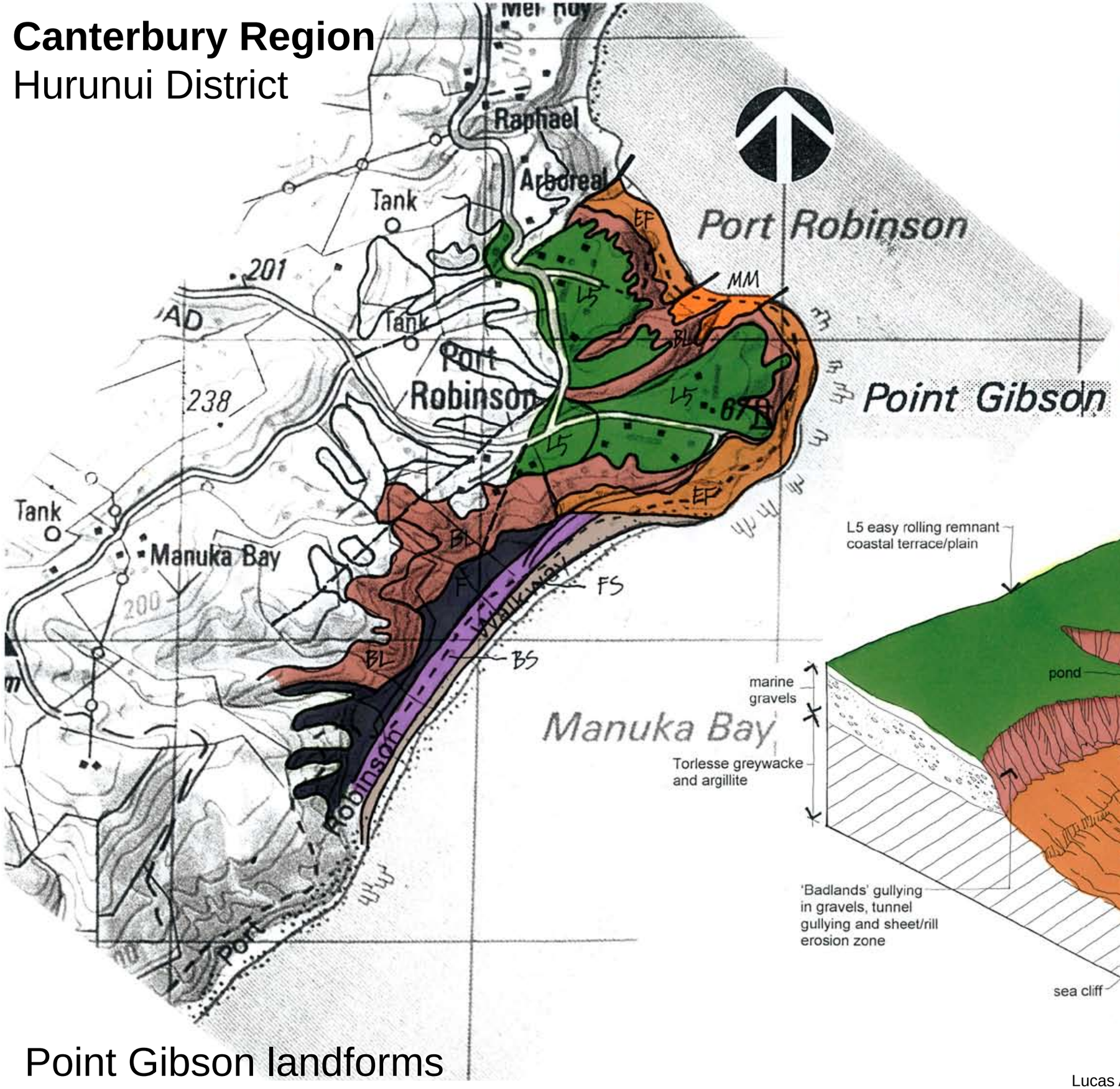
Terraces

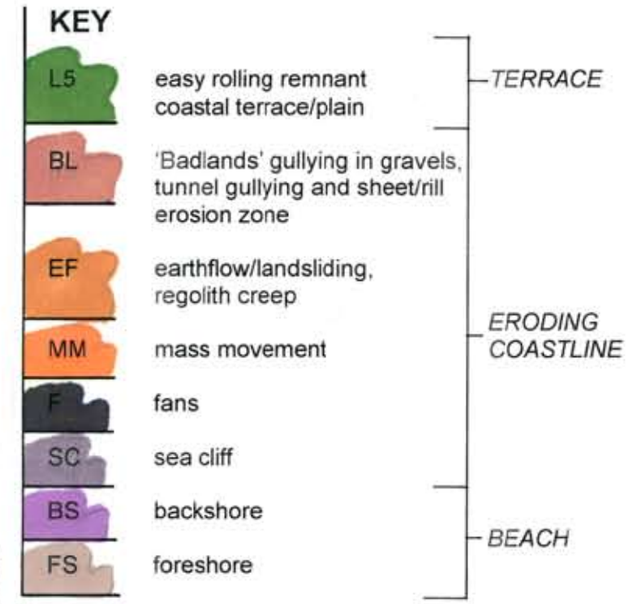
- Steep to very steep sea cliff
- Backshore beach, dune and sand deposits
- Tidal foreshore
- Limestone hillock

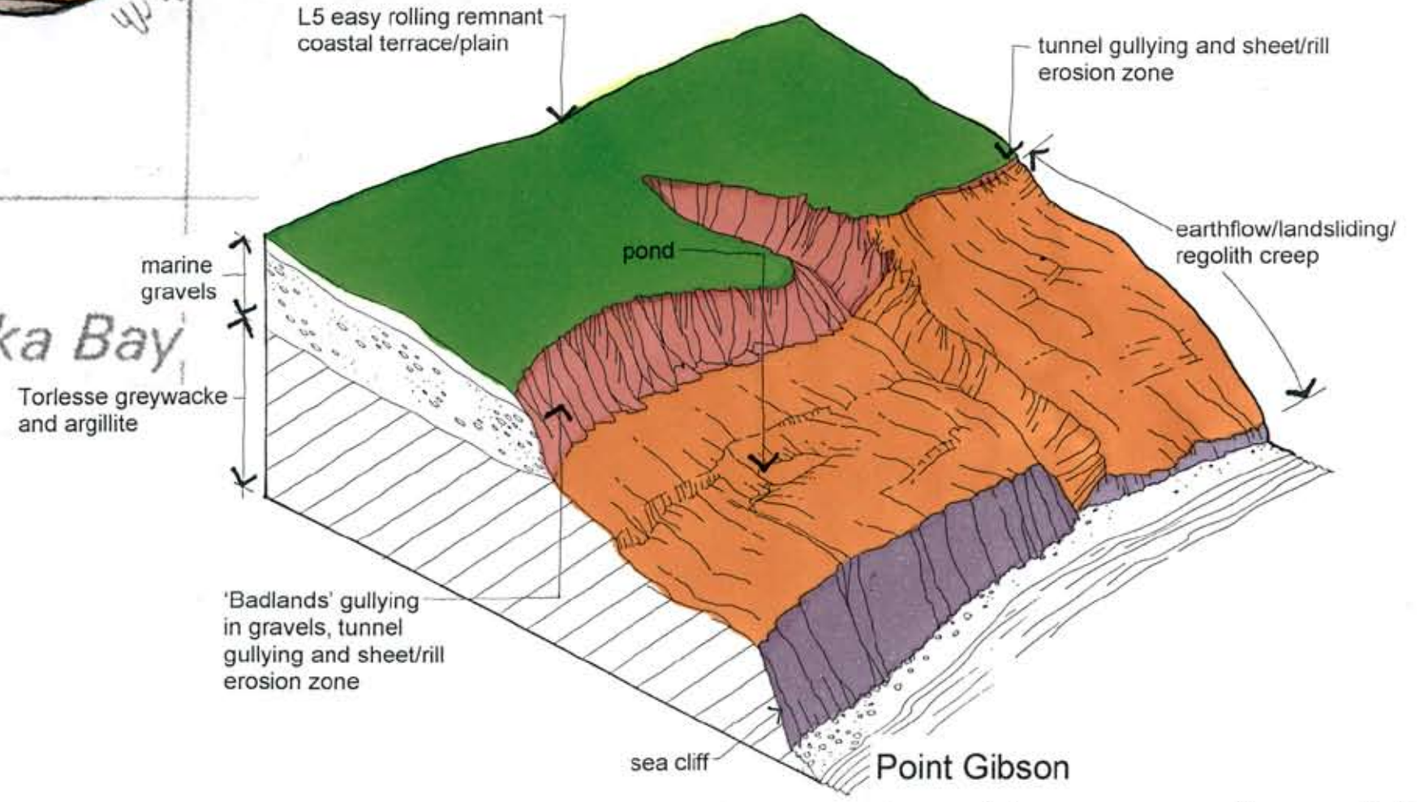
L11 Northern loess mantled soft rock hills and rock hills and downs land types

L6 Northern Coastal Strip

Canterbury Region
Hurunui District



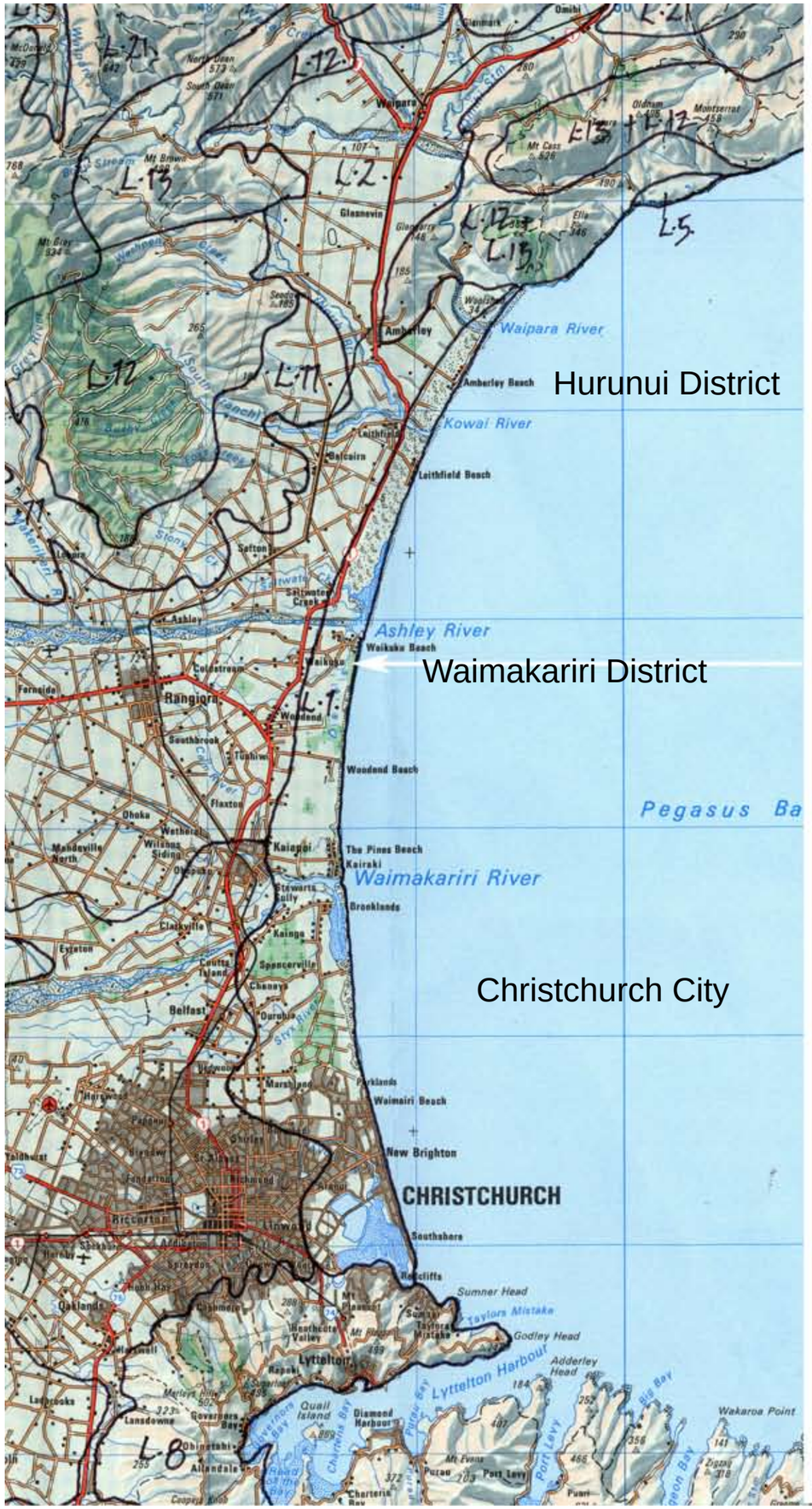




Land type map & model

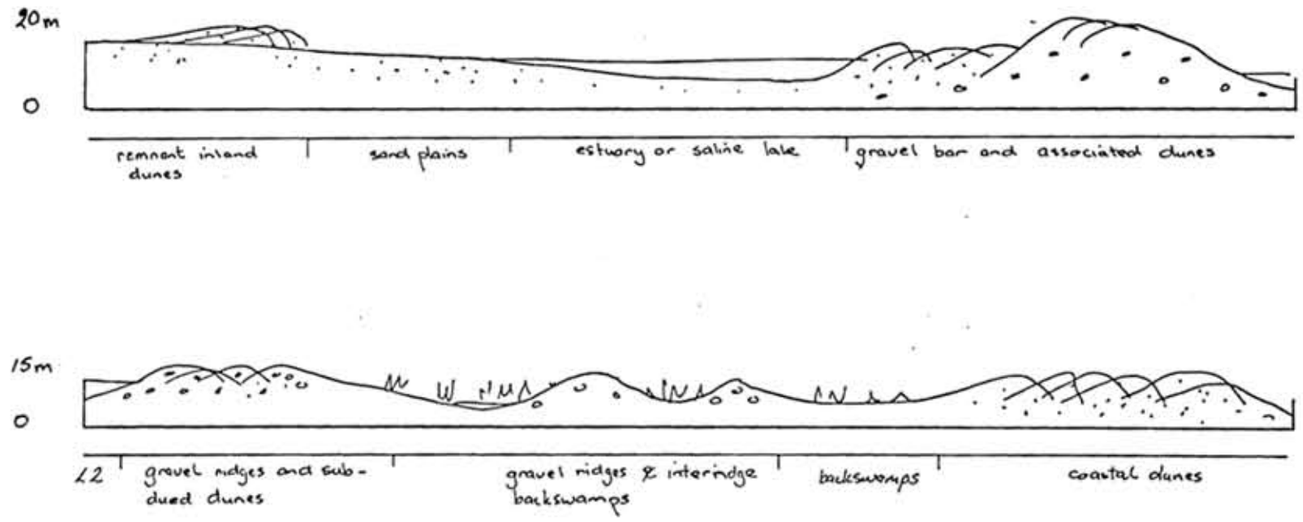
Point Gibson landforms


Region:
Tasman
Nelson
Marlborough
West Coast
Canterbury
Otago
Southland
Point Gibson
BL
L5
BL
EF
F
L5
BS
BL
MM
FS
L5
EF
BL
SC
EF
KEY
L5 easy rolling remnant coastal terrace/plain
BL 'Badlands' gullying in gravels, tunnel gullying and sheet/rill erosion zone
EF earthflow/landsliding, regolith creep
MM mass movement
F fans
SC sea cliff
BS backshore
FS foreshore
Point Gibson
Land types
overlaying high level aerial oblique (April 1991)



Canterbury Region

Hurunui, Waimakariri & Christchuch City Districts



L 1 PLAINS - COASTAL FRINGE LAND TYPE

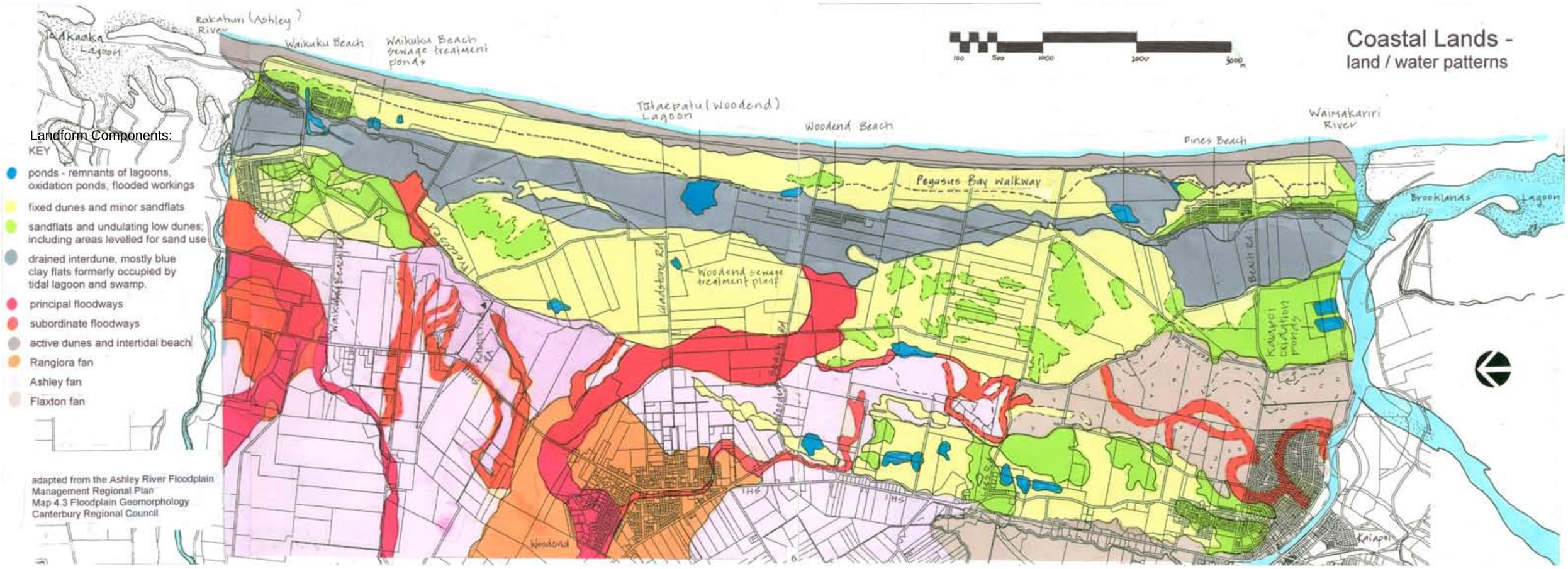
Canterbury plains coastal fringe incorporating undulating to rolling coastal beach sand dunes and associated interdune backswamps, sand plains, gravel beach ridges and bars, and saline lake and lagoonal fringe wetlands. Elevation ranges from 0 - 20 m and rainfalls from 600 - 800 mm/A. The land type includes the coastal fringe from the Waipara River mouth to Banks Peninsula, the margins of Lake Ellesmere and the coastal fringe north and south of Timaru.

landform component	geological formation	elevation m	remnant native vegetation	present land use
Beach sand dune complexes	Holocene and Recent dune sand	0 - 20	pingao, dune slack, danthonia grassland	extensive grazing, exotic forestry, conservation, recreation, stabilized waste land
backswamps	Holocene and Recent alluvium and organic deposits	0 - 20	swamp, carr, lacustrine, slacks, saltmarsh	intensive grazing, feed cropping
sand plains	Holocene and Recent sands and lagoonal deposits	0 - 50	*Scirpoides* sedgeland, dune slack, silver tussock, danthonia grassland	extensive grazing, waste land
gravel bars and beach ridges	Holocene and Recent beach gravel and dune sands	0 - 20	pingao, scrub, bracken	extensive grazing, waste land
saline lake and estuary fringes	Holocene and Recent fluviatile and lagoonal deposits	0 - 3	salt marsh (esturine, lacustrine)	extensive grazing, feed and cash cropping

agronomic potential	potential land use	potential impacts
low	exotic forestry, extensive grazing, stabilization, recreation	exotic trees, recreational impacts, loss of native vegetation
medium	cash and feed cropping, horticulture, intensive grazing	intensified land use, drainage, windbreaks, subdivision
low	semi intensive grazing, recreation	loss of native vegetation, increase in exotics, recreational impacts
low	semi intensive grazing, recreation, stabilization	loss of native vegetation, increase in exotics, recreational impacts
medium	intensive grazing, cash and feed cropping	intensified land use, drainage, windbreaks, subdivision

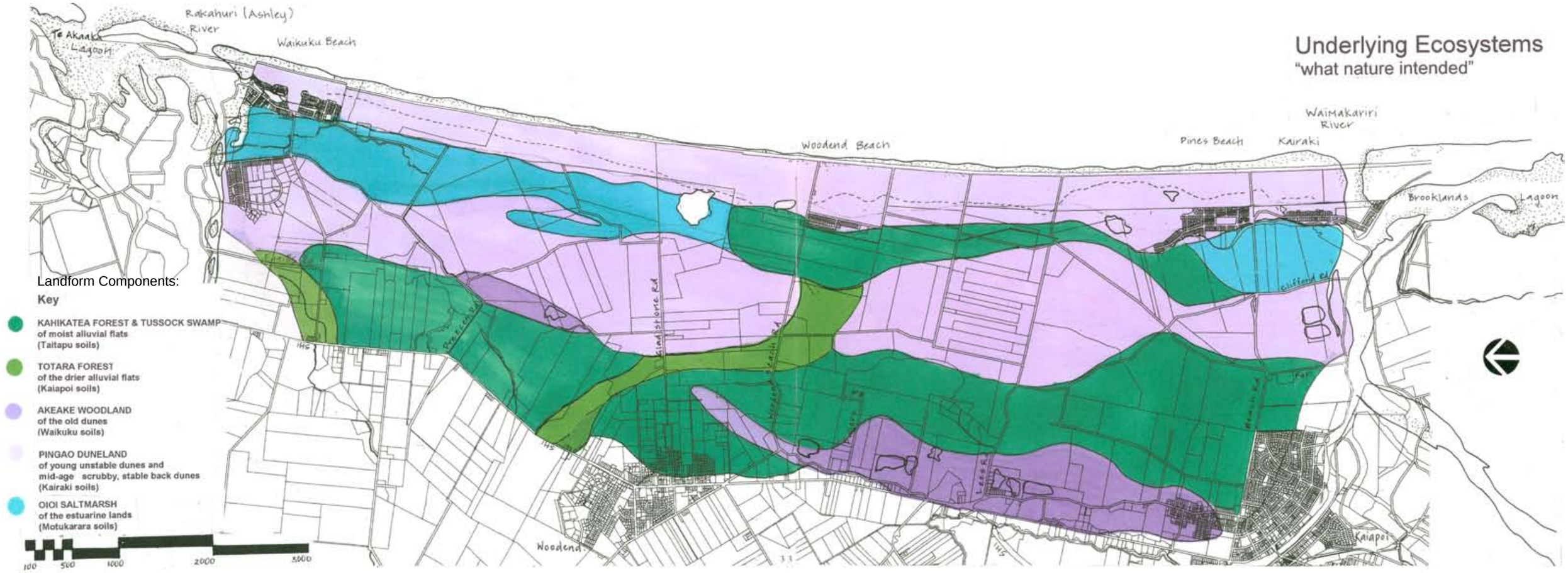
Canterbury Land Types

Canterbury Region Waimakariri District



Coastal Lands - Waimakariri to Rakahuri (Ashley)

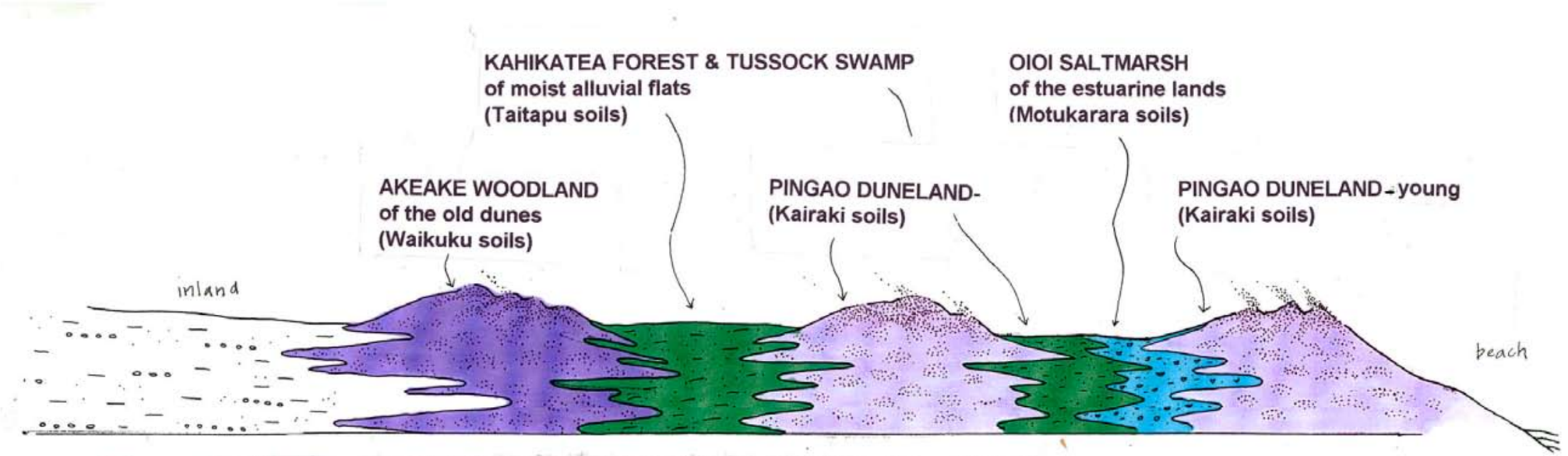
Canterbury Region Waimakariri District



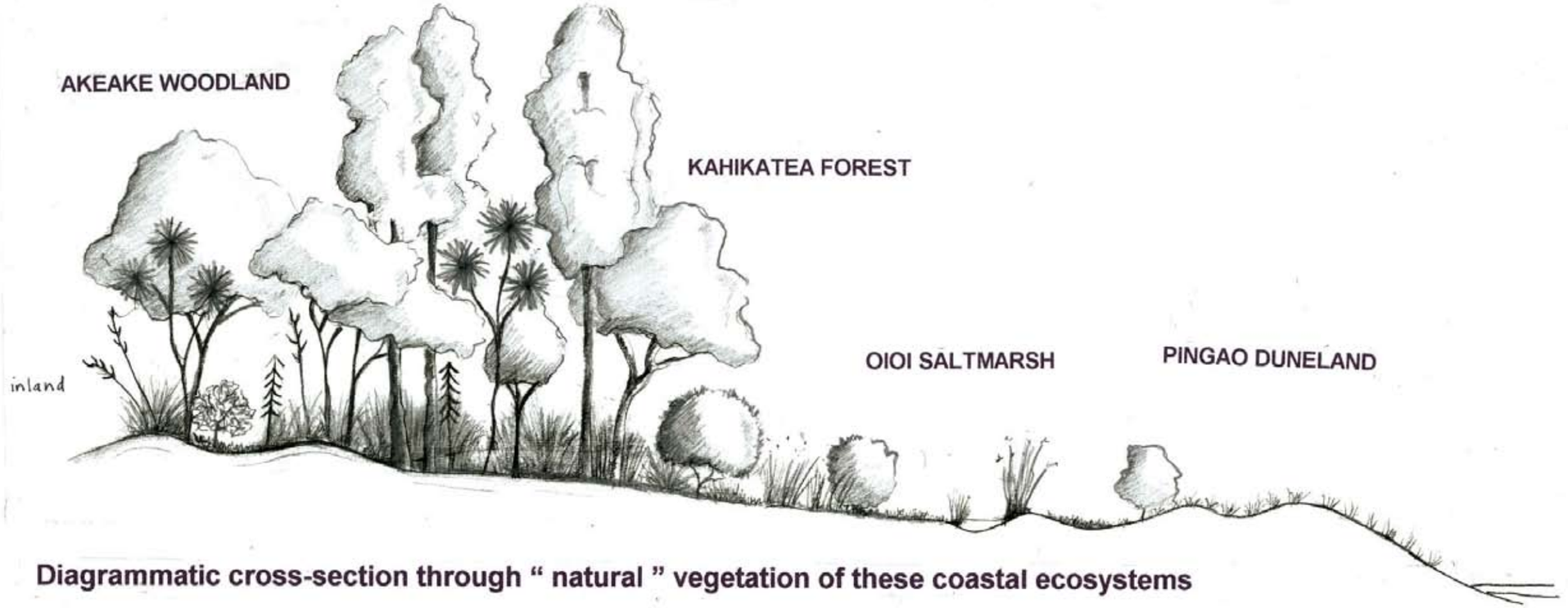
Coastal Lands - Waimakariri to Rakahuri (Ashley)

The Coastal Lands of Waimakariri - Rakahuri (Ashley). Lucas Associates with Ian Lynn, Landcare Research 1998 **13.9.1**

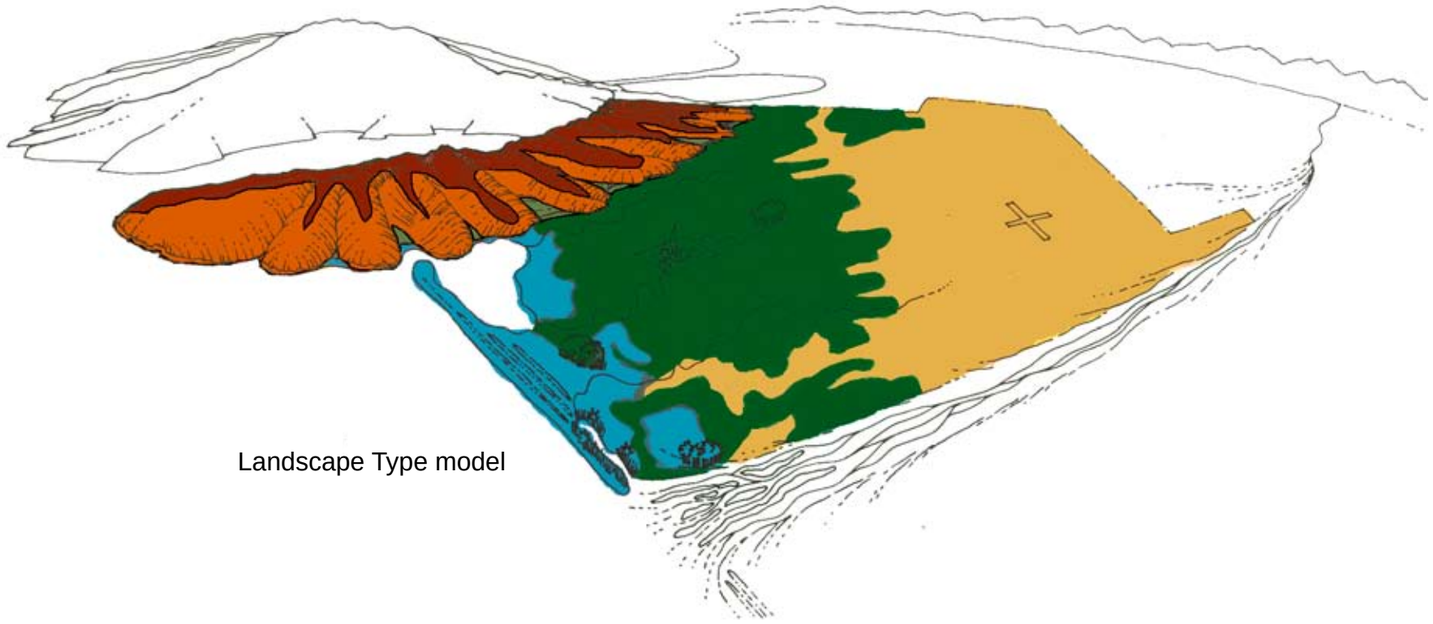
Coastal Lands - Waimakariri to Rakahuri (Ashley)



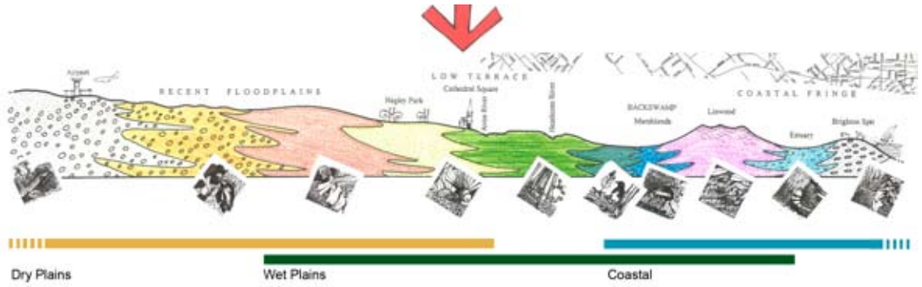
Diagrammatic cross-section through land system underlying ecosystems



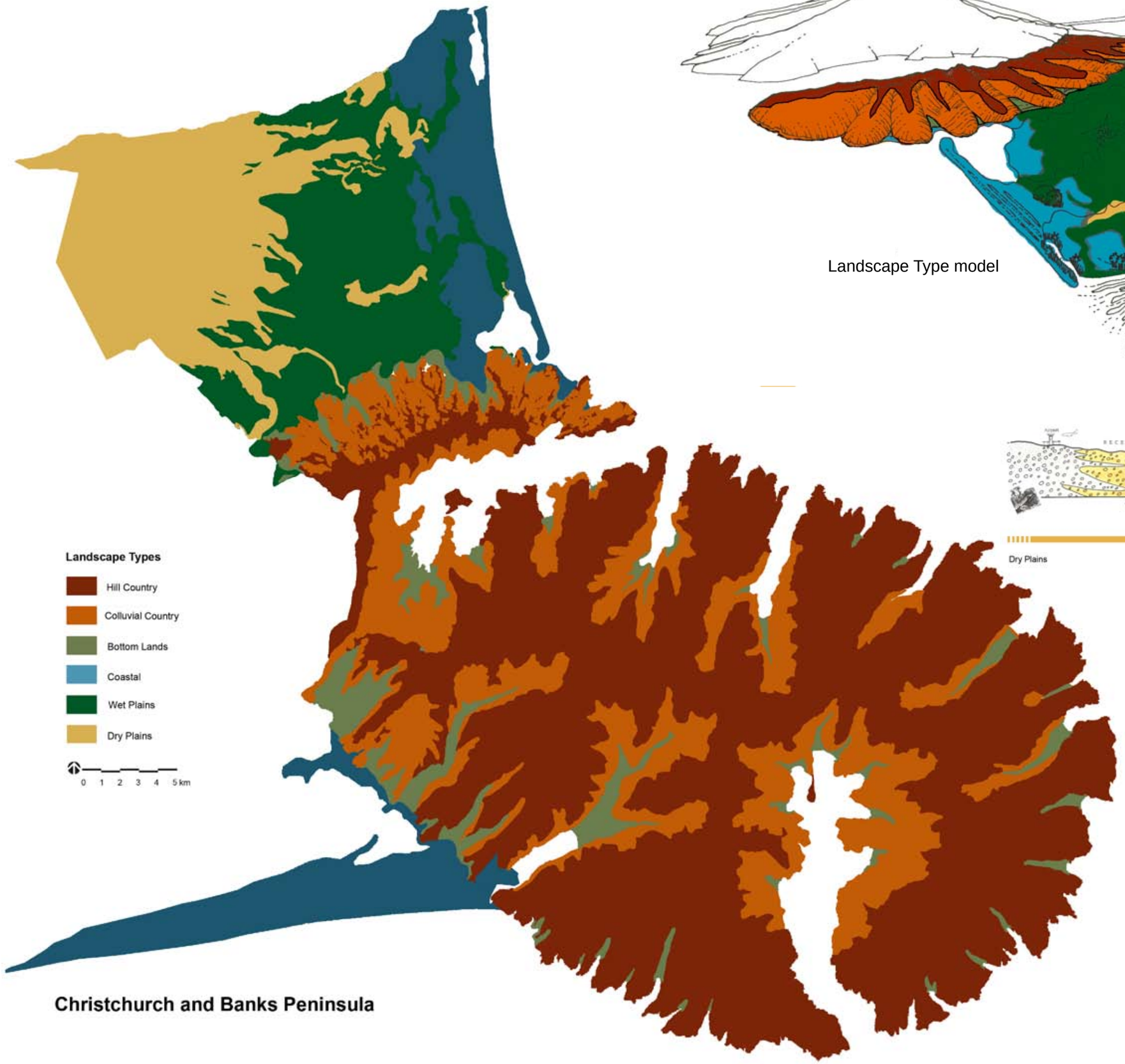
Diagrammatic cross-section through " natural " vegetation of these coastal ecosystems



Landscape Type model



Christchurch City Landscape Type and landform cross section



Canterbury Region

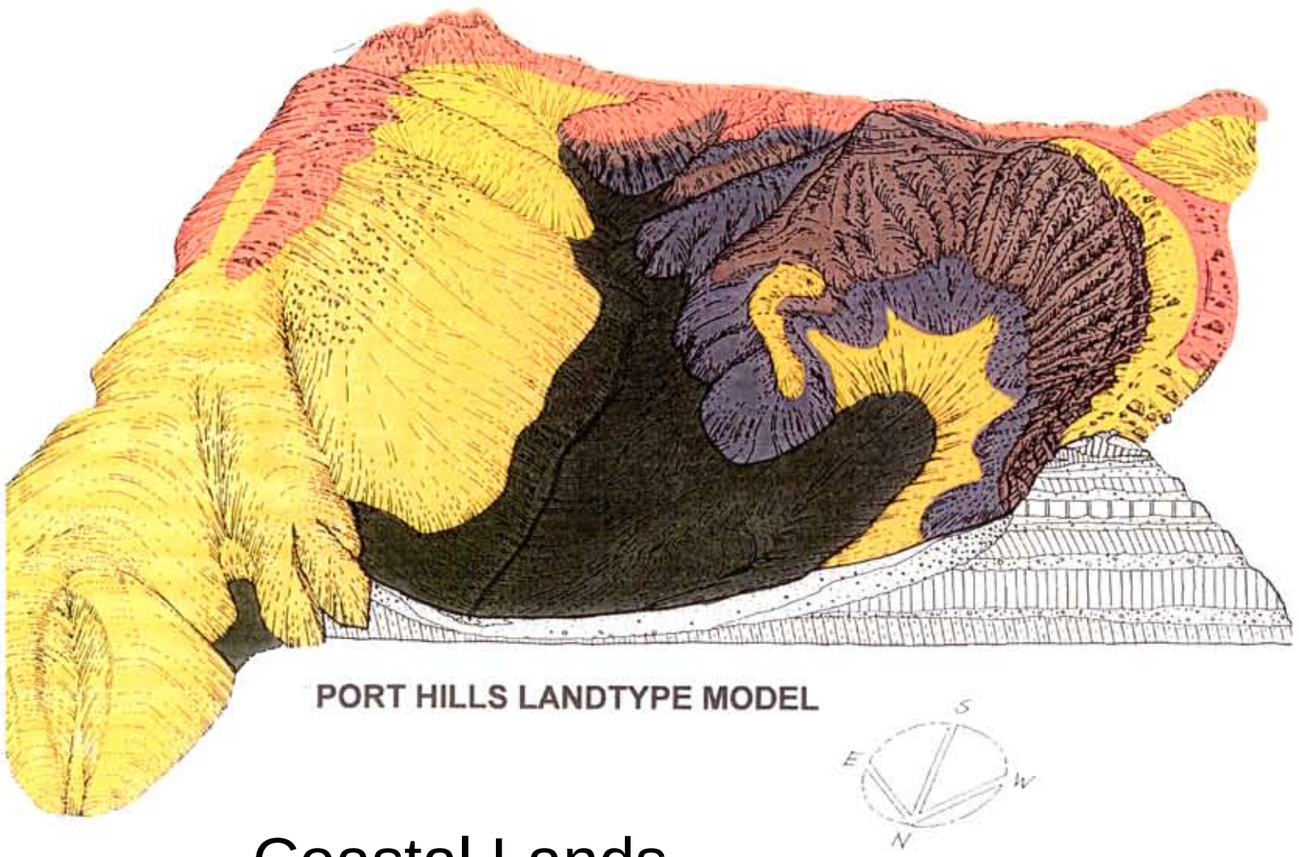
Christchurch City & Banks Peninsula

Landscape Types

THE COAST

1	tunnelling mud crab	Helice crassa
2	South Island pied oystercatcher	Haematopus finschi
3	common bully	
4	pingao	Desmoschoenus spiralis
5	sand coprosma	Coprosma acerosa
6	marsh ribbonwood	Plagianthus divaricatus
7	taupata leaves	Coprosma repens
8	taupata hedge	
9	tauhinu	Ozothamnus leptophylla
10	poroporo	Solanum laciniatum
11	akiraho or golden akeake leaves	Olearia paniculata
12	pied shag/cormorant	Phalacrocorax varius
13	ngaio	Myoporum laetum
14	toetoe flowers	Cortaderia richardii
15	manuka	Leptospermum scoparium
16	harakeke or flax flowers	Phormium tenax
17	scrambling pohuehue leaves	Muehlenbeckia complexa
18	oioi or jointed wire rush	Leptocarpus similis
19	white faced heron	Ardea novaehollandiae
20	hono or NZ shoveller	Anas rhynchotis
21	tuangi/tuaki or cockle	Austrovenus stutchburyi
22	pipi	Paphies australis
23	kakaha or bush flax	Astelia fragrans
24	karamu leaves and fruit	Coprosma robusta
25	ti kouka or cabbage tree	Cordyline australis
26	manatu or lowland ribbonwood	Plagianthus regius
27	karaka leaves and fruit	Corynocarpus laevigatus
28	NZ broom	Carmichaelia australis
29	wiwi or giant rush	Juncus pallidus
30	patiki or sand flounder	Rhombosolea plebia
31	tuna heke or short finned eel	Anguilla australis
32	rahurahu or bracken fern	Pteridium esculentum
33	thick-leaved mikimiki	Coprosma crassifolia
34	red fruited karamu	Coproma rhamnoides
35	kapuka or broadleaf leaves	Griselinia littoralis
36	akeake	Dodonea viscosa

Canterbury Region Port Hills, Christchurch City



Coastal Lands

L 8 BANKS PENINSULA - PORT HILLS LAND TYPE

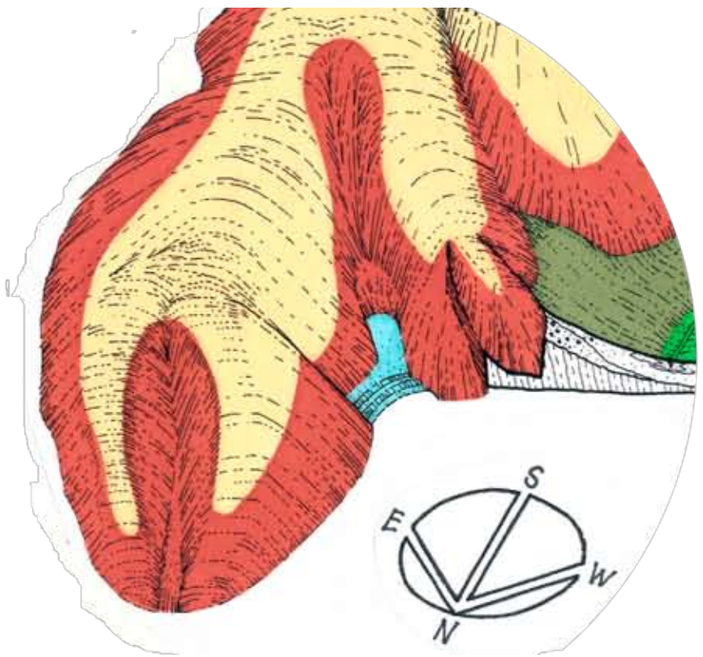
Westerly segment of the steep to very steep, dissected (distinct ridge and valleys), Lyttelton volcano bounded by the western shore of Lyttelton harbour and Gebbies Pass; with loess mantled, smooth and tunnelled lower slopes, especially those with a westerly aspect; broken, rocky, moderately steep to very steep westerly aspect mid and upper backslope dip slopes; rocky spur crests and major ridge summits; very steep to steep rocky and bluffy scarp slopes (easterly aspect); very steep coastal cliffs, and small, poorly drained valley floors with beach dunes. Elevation 0 - 580 m, rainfall 600 - 850 mm/A .

landform component	geological formation	elevation m	remnant native vegetation	present land use
smooth, loess mantled lower slopes and spurs	loess over Tertiary aged Lyttelton Volcanic Group rocks	0 - 150	silver tussock, scrub	intensive and semi-intensive grazing, feed cropping, urbanization, orchards
upper, broken, rocky dip slopes	Tertiary aged Lyttelton Volcanic Group rocks with minor loess	0 - 580	silver tussock, dry scrubland, kanuka woodland, podocarp hardwood forest	semi-intensive grazing, exotic forestry, recreation, scenic reserves, urbanization
rocky and bluffy (easterly aspect) scarp slopes	Tertiary aged Lyttelton Volcanic Group rocks	0 - 580	broadleaved scrub, hardwood forest, dry scrub	extensive grazing, exotic forestry, recreation, scenic reserves
rocky summits and crests	Tertiary aged Lyttelton Volcanic Group rocks	200 - 580	broadleaved scrub silver tussock grassland, herbfield	extensive grazing, recreation, scenic reserves
poorly drained valley floors; with lagoonal deposits and beach dunes	Holocene loess and loess-volcanic derived alluvium, dune sands, and lagoonal deposits	0 - 30	remnant native dune spp, slacks, scrub	urbanization, intensive grazing, feed cropping, horticulture

SILVER TUSSOCK, tree weta, gentle rolling ecosystem of Takahe soils
(eg. residential Clifton, Richmond Hill tops, Balmoral Hill, rear of Redcliffs flat, Mt Pleasant, St Andrews, & Huntsbury Hills, Broad Oaks, Cashmere Hill, Westmorland, Hoon Hay Valley (west of stream), Kennedys Spur top)

AKEAKE, jewelled gecko, foot-slope ecosystem of steep Scarborough Hill soils
(eg. residential of Moncks Bay)

KAPUKA, korora, coastal inlet ecosystem of Taylors Mistake soils
(eg. residential of Taylors Mistake)



THE KAHIKATEA KERERU PLAINS CITY
OTAUTAHI CHRISTCHURCH

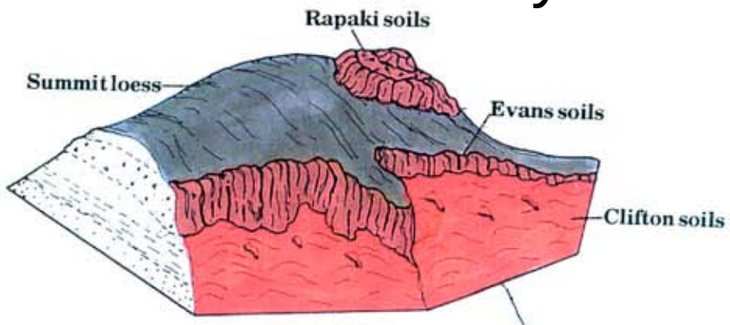
Indigenous Ecosystems of the Port Hills **set 4**

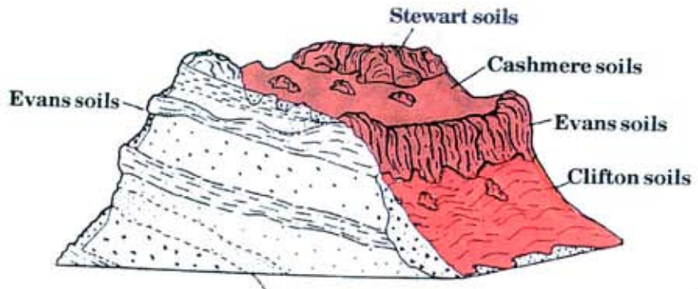
The particular ecosystem underlying each hill and valley residential area is noted beneath each signature name (also see index overleaf)

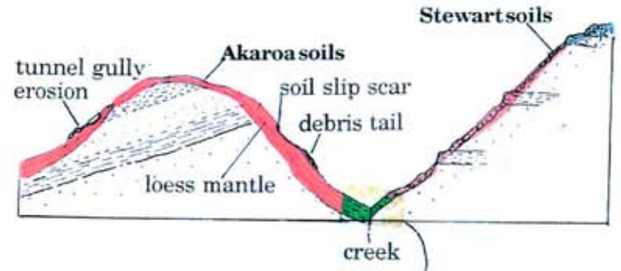
Copies available from:
Beckenham Service Centre
Linwood Service Centre
Sockburn Service Centre

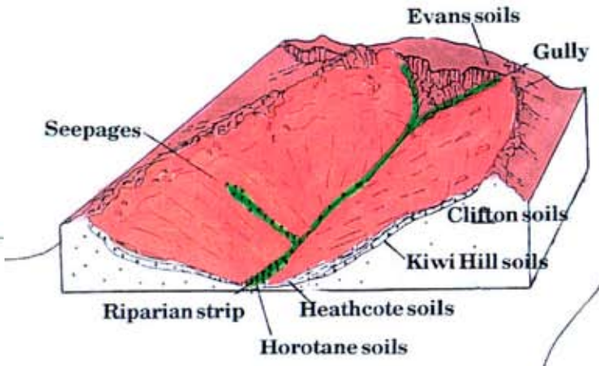
Canterbury Region Christchuch City

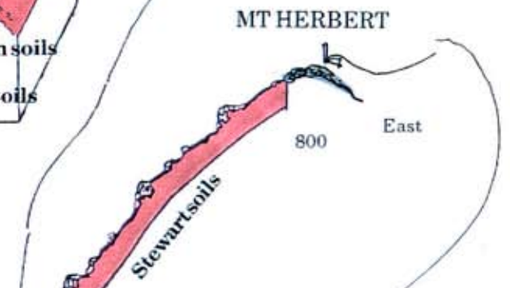
"What type of soil and ecosystem is your patch?"

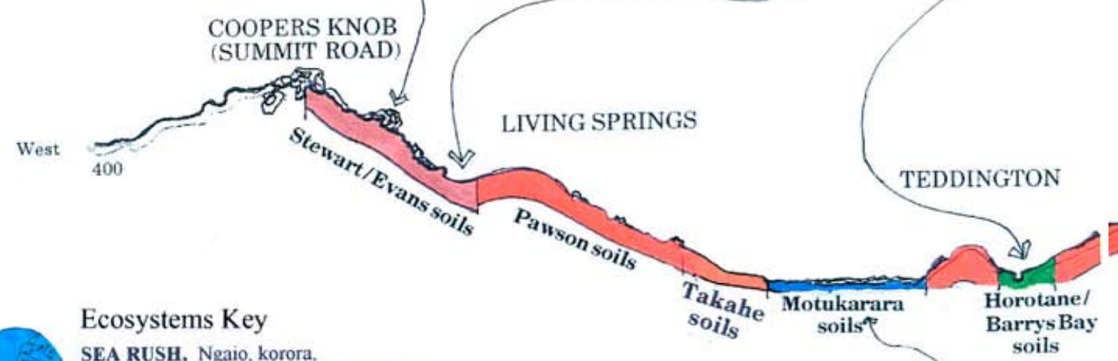


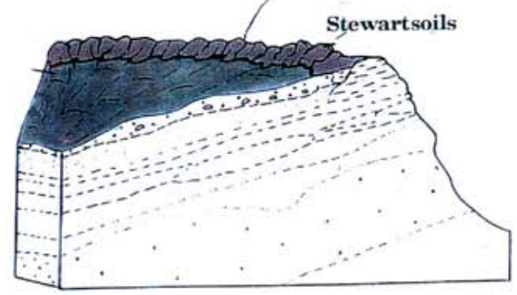


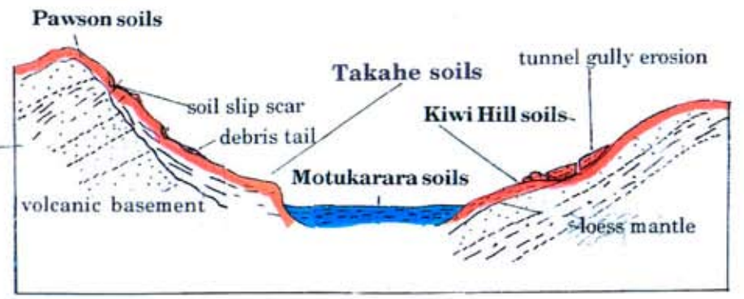












Ecosystems Key

SEA RUSH, Ngaio, korora, coastal ecosystem (marsh, rock & beach) (*Motukarara, Taylors Mistake,* & part *Evans* soils)

KAHIKATEA, Kaikomako, kotare, gully & swamp forest ecosystems (*Horotane* & part *Heathcote* soils)

& **HARAKEKE,** Pukio, banded kokopu, swamp & stream ecosystem (*Horotane* & part *Heathcote* soils)

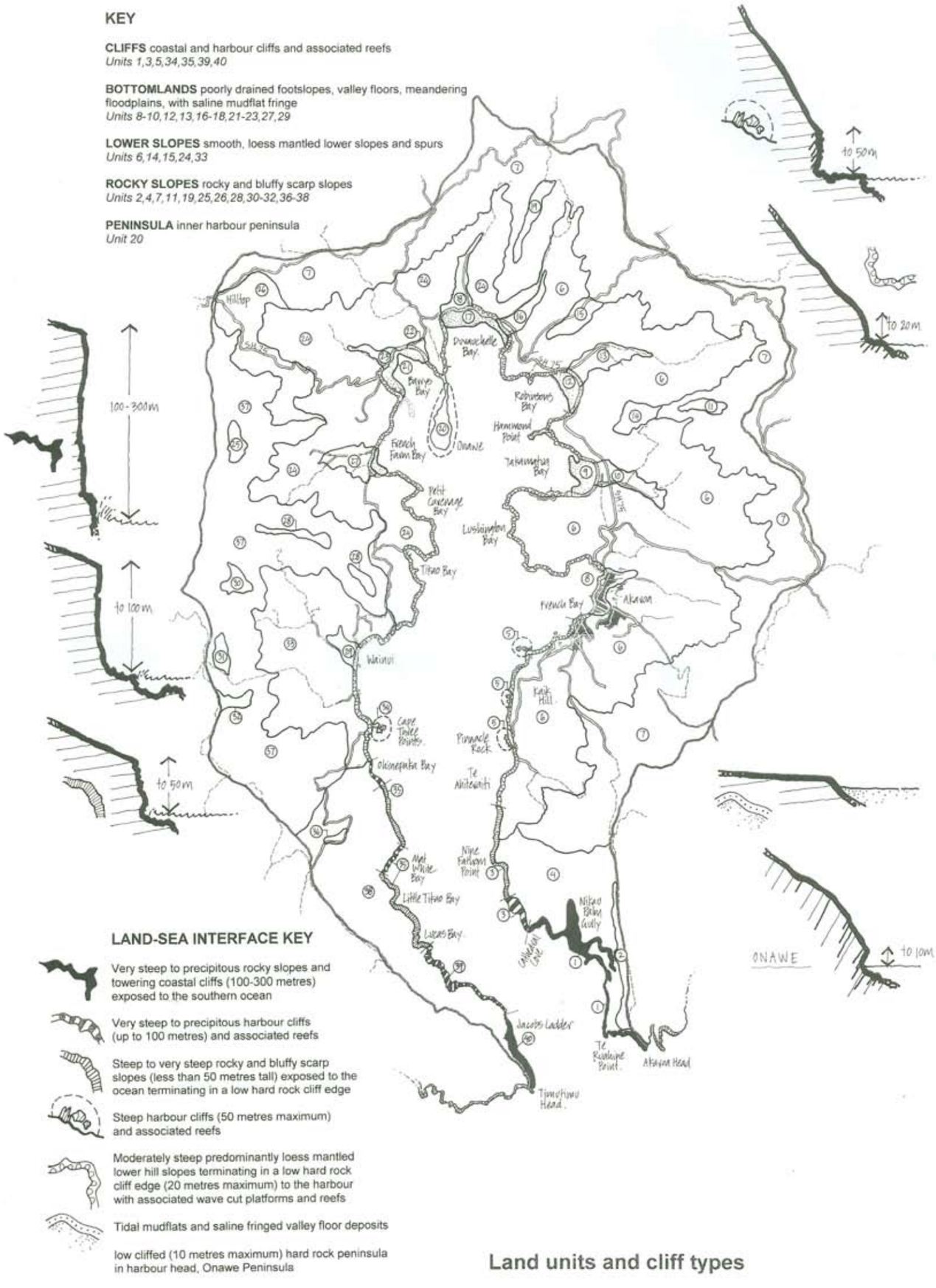
MATAI, Totara, kereru, moist forest ecosystem (*Heathcote, Takahe, Pawson, Akaroa, Rapaki, Kiwi Hill* & *Clifton* soils)

KOWHAI, Korokio, jewelled gecko, dry, rocky ecosystem (*Cashmere, Stewart* & *Evans* soils)

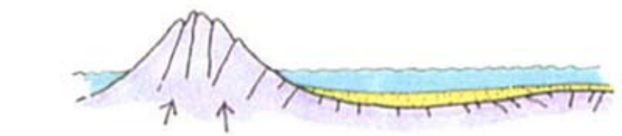
KAIKAWAKA, Inaka, karearea, humid sub-alpine ecosystem (*Bossu, Summit, Rapaki* & part *Stewart* soils)

Lyttelton Harbour Basin landforms

Akaroa Harbour Basin landforms

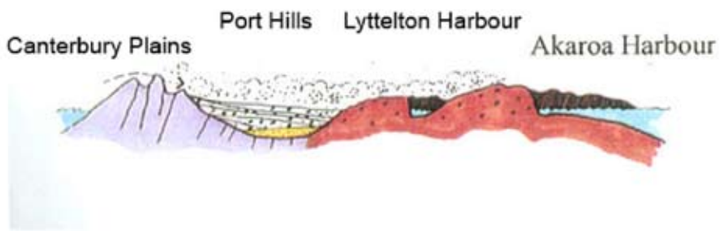


Land units and cliff types



25 million years ago

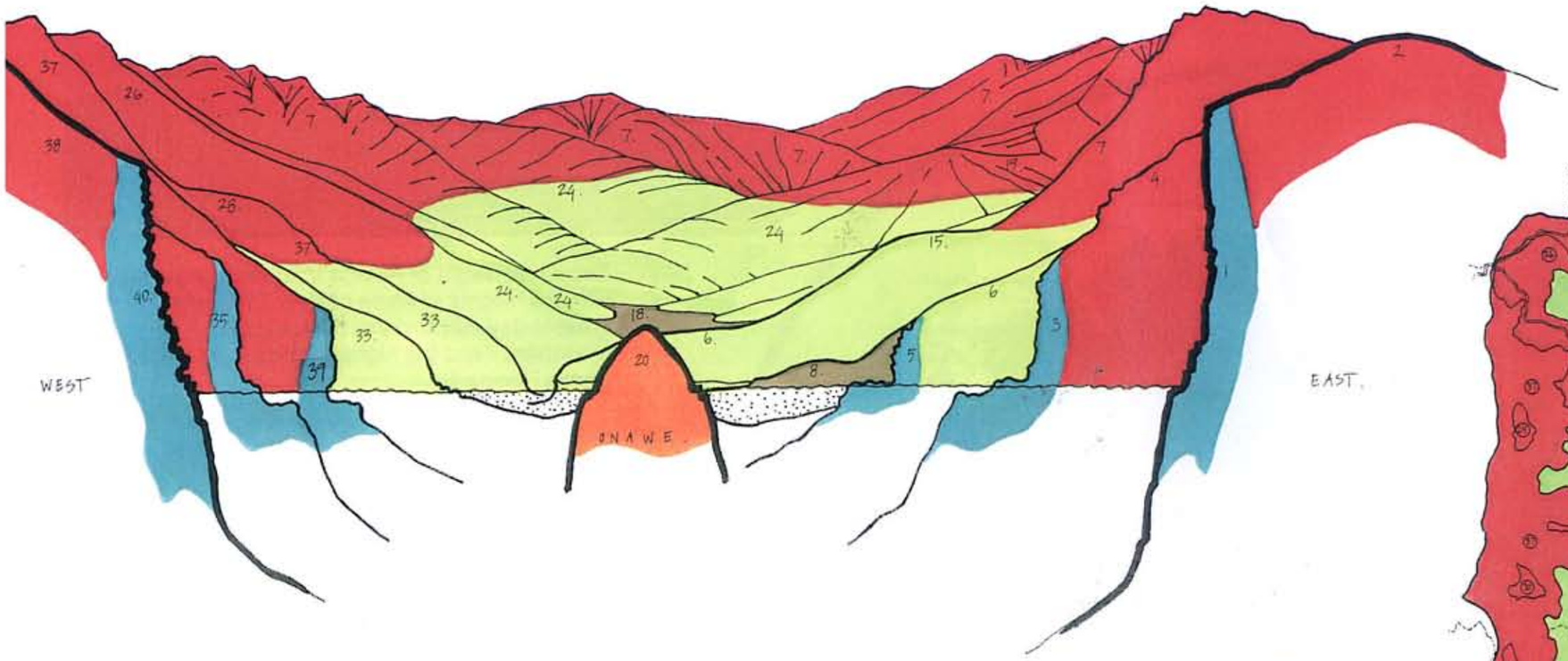
9 million years ago

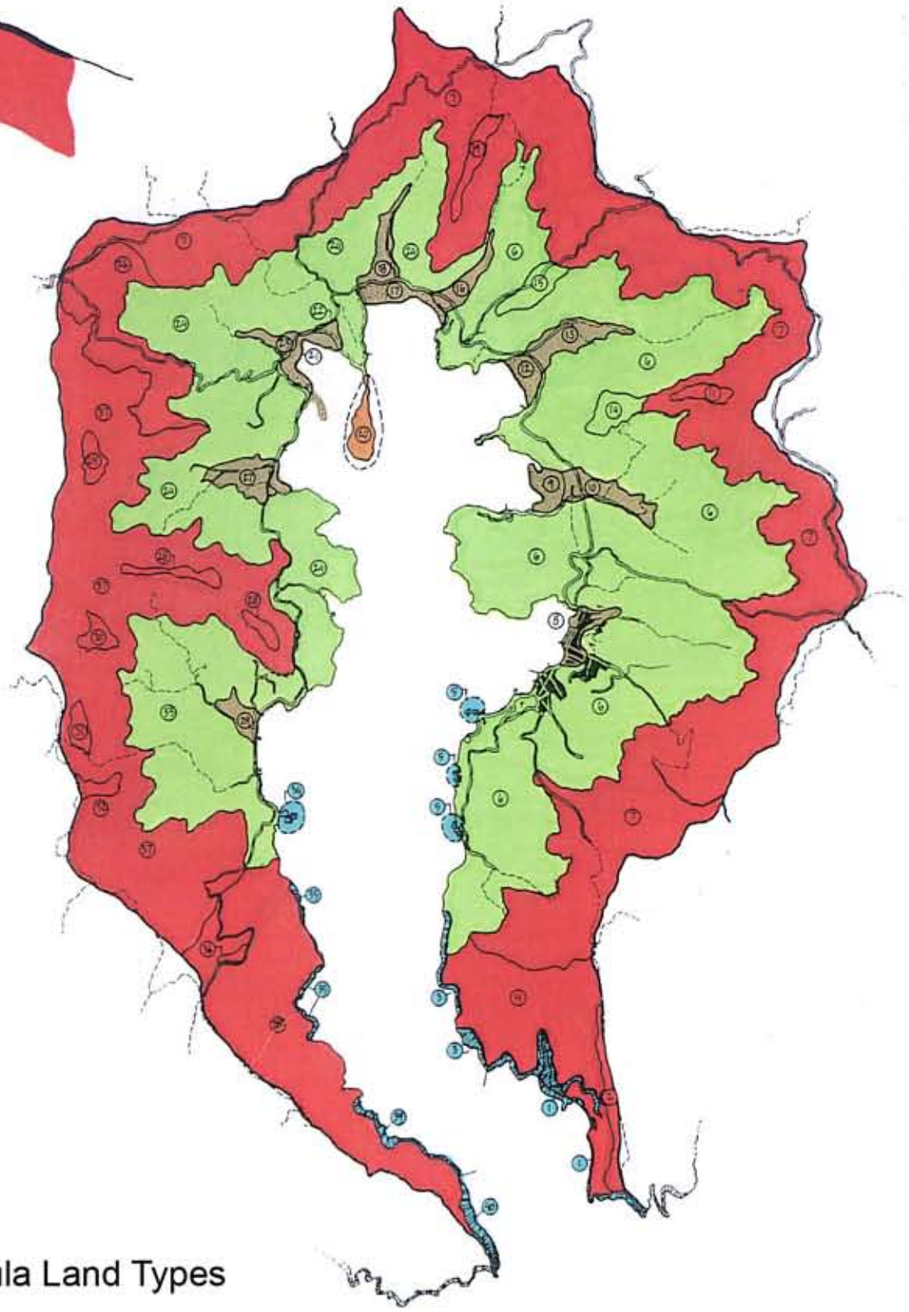


20,000 years ago

Formation of the basis to the greater Christchurch landscape

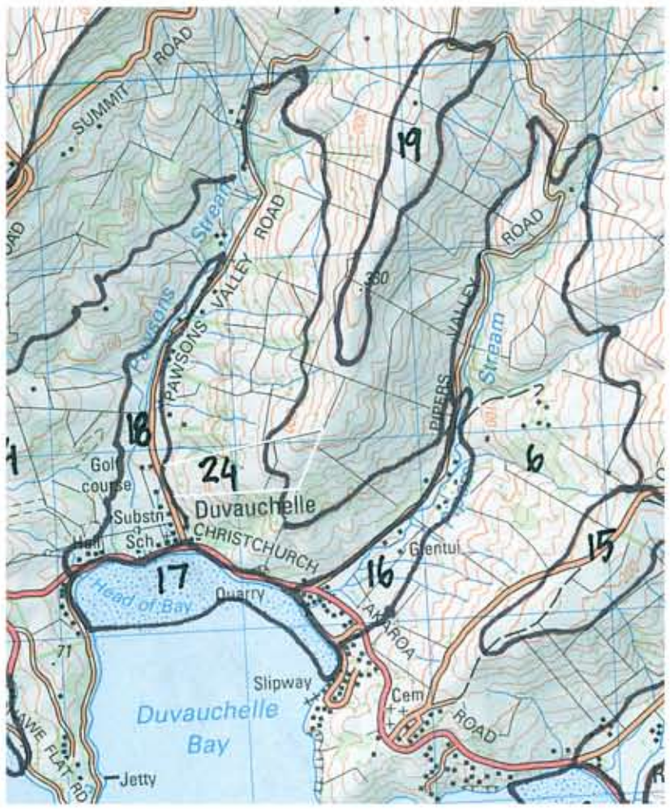
Doris Lusk - Akaroa Harbour Banks Peninsula 1949. Natural character interpretation through art.





KEY

- coastal and harbour cliffs and associated reefs
- poorly drained footslopes, valley floors, meandering floodplains, with saline mudflat fringe
- smooth, loess mantled lower slopes and spurs
- rocky and bluffy scarp slopes
- inner harbour peninsula



Banks Peninsula Land Types

6	Rocky scarp slopes
7	Smooth colluvial slopes
15	Bottom lands
16	Smooth colluvial slopes
17	Rocky scarp slopes
18	Smooth colluvial slopes
19	Smooth colluvial slopes
24	Rocky scarp slopes

Taylors Mistake, Christchurch City, Banks Peninsula

Landform Components:

- raised beach gently undulating (1-3°)
- easy rolling (3-7°)
- rolling (7-13°)
- strongly rolling (13-20°)
- moderately steep (20-28°)
- steep (28-38°)
- cliffs
- beach & dune system
- contour lines (20m interval)

Whitewash Head
Smugglers Cove
Giants Nose
Moki Point
Hobsons Bay
The Point
North End
Taylors Mistake main beach
The Crocodile
Black Rock
Harris Bay
Boulder Bay
Godley Head
Summit Road
Godley Head Farm Park
Summit Road
Lyttelton Harbour

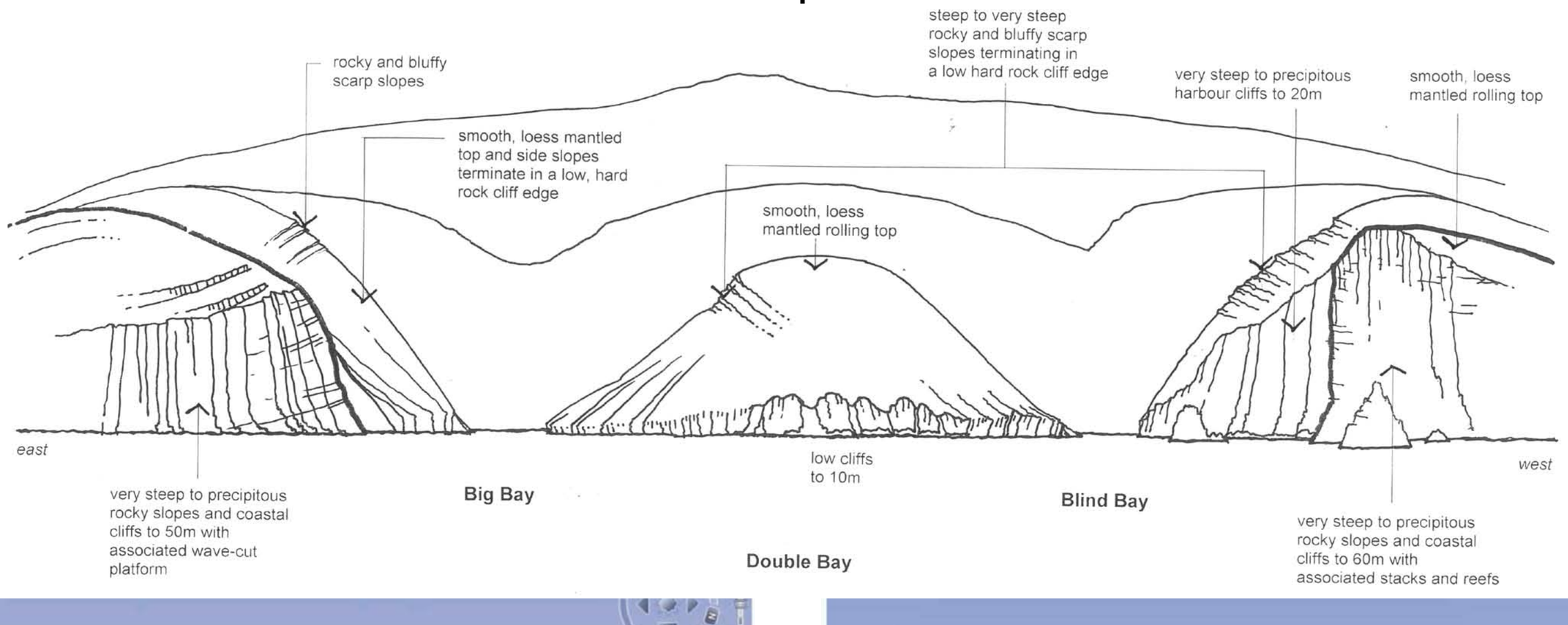
The Lands of Taylors Mistake

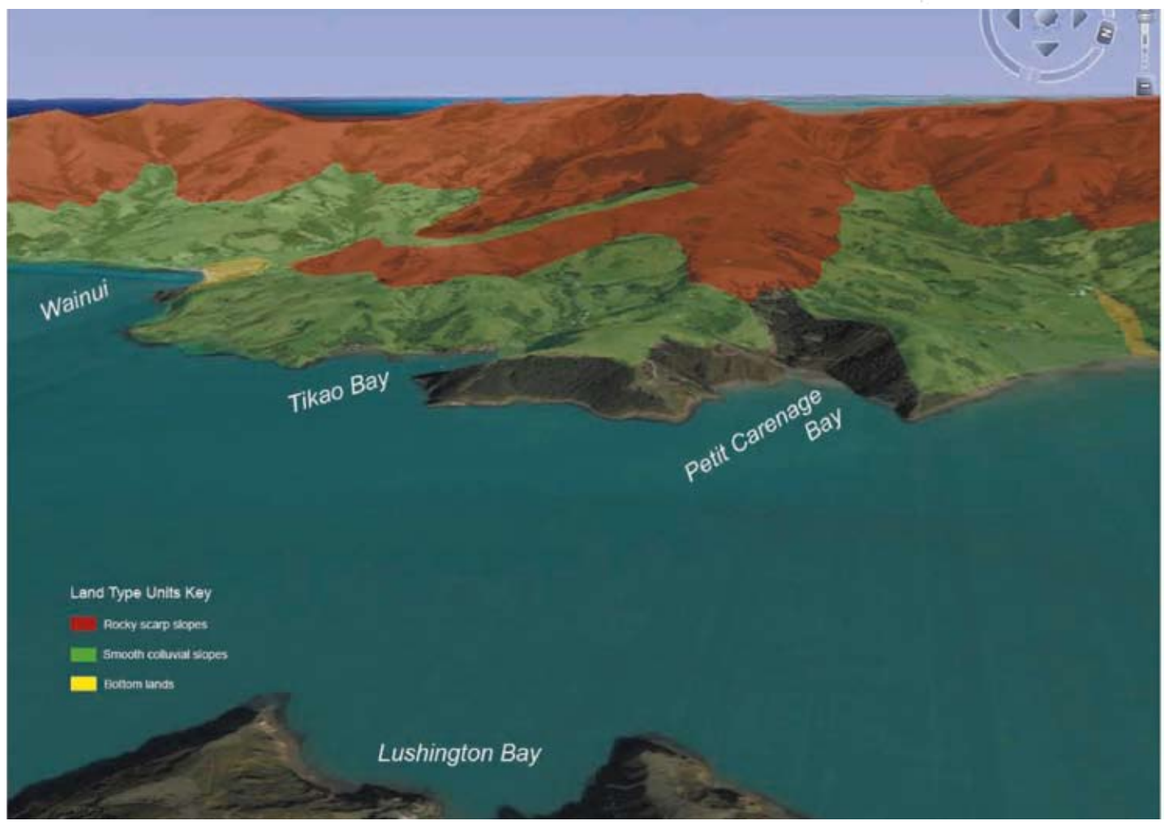
adapted from Part of Soil Survey Report 70
'Soil Map of the Sumner Region of the Port Hills, Canterbury, NZ'
by B.B.Trangmar, 1975

Taylors Mistake landform components: Hobsons Bay, Moki Point to Whitewash Head

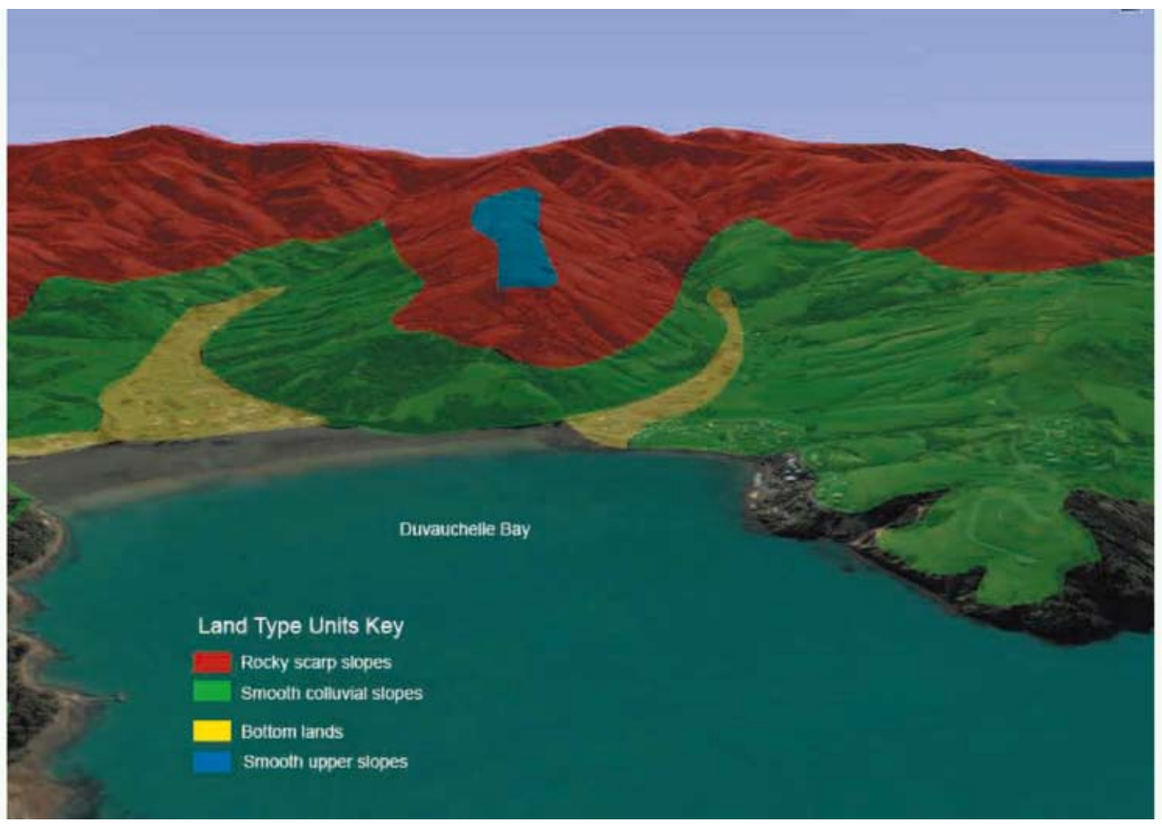
from above Harris Bay, looking westwards (taken 1993)

Banks Peninsula outer coast landform components



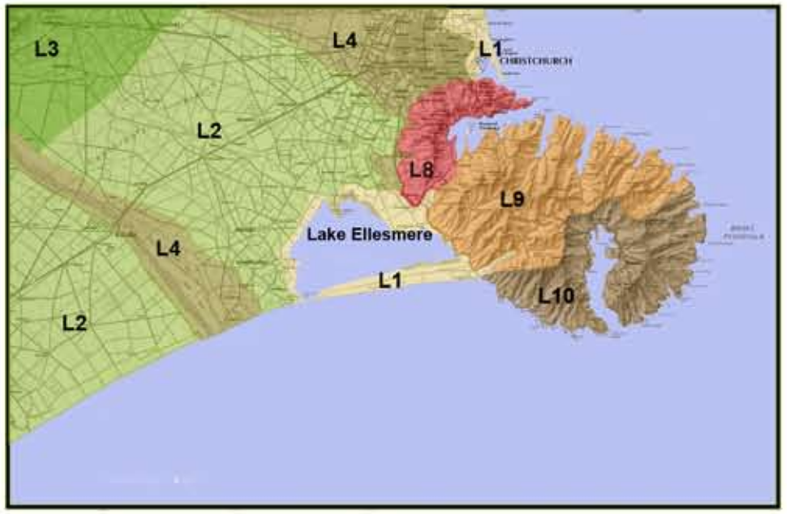


Akaroa Harbour



Duvauchelle Bay

Lake Ellesmere (Te Waihora) Land Types

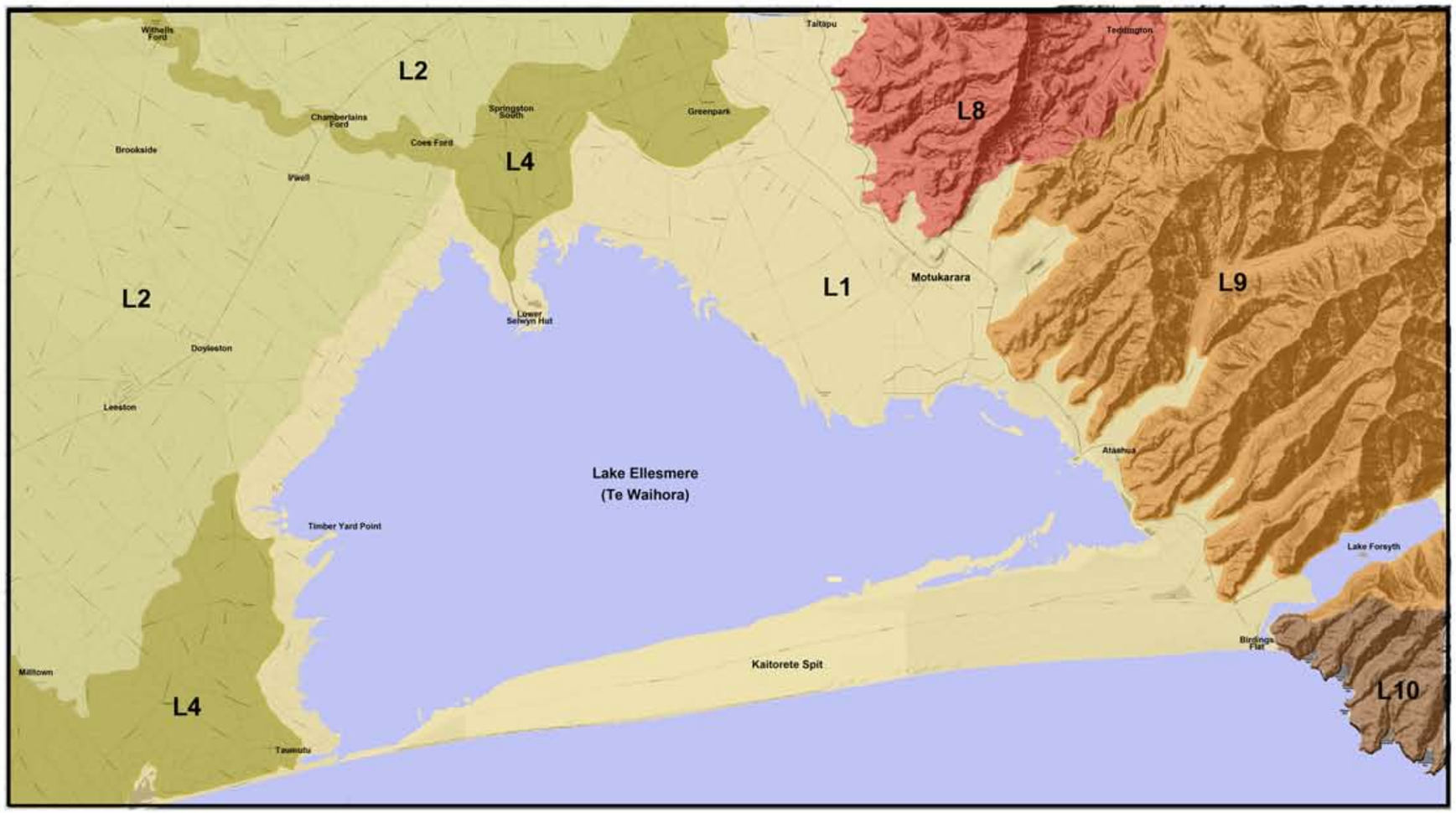


Regional Land Types of Lake Ellesmere - mapped at 1:250,000

To Kaitorete Spit & Te Waihora

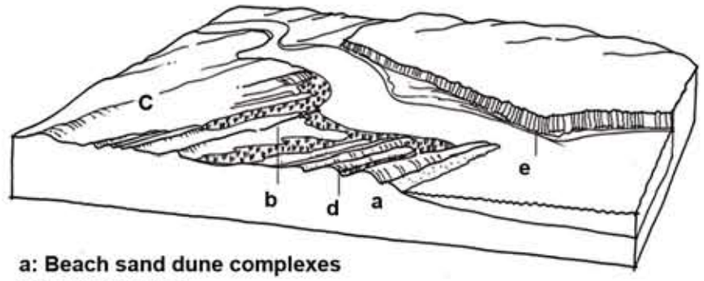
Lake Forsyth and Kaitorete Spit
Bill Sutton (1972)

Kaitorete Spit



Land Types of Lake Ellesmere - mapped at 1:50,000

Landform Component of L1: Plains - Coastal Fringe Land Types

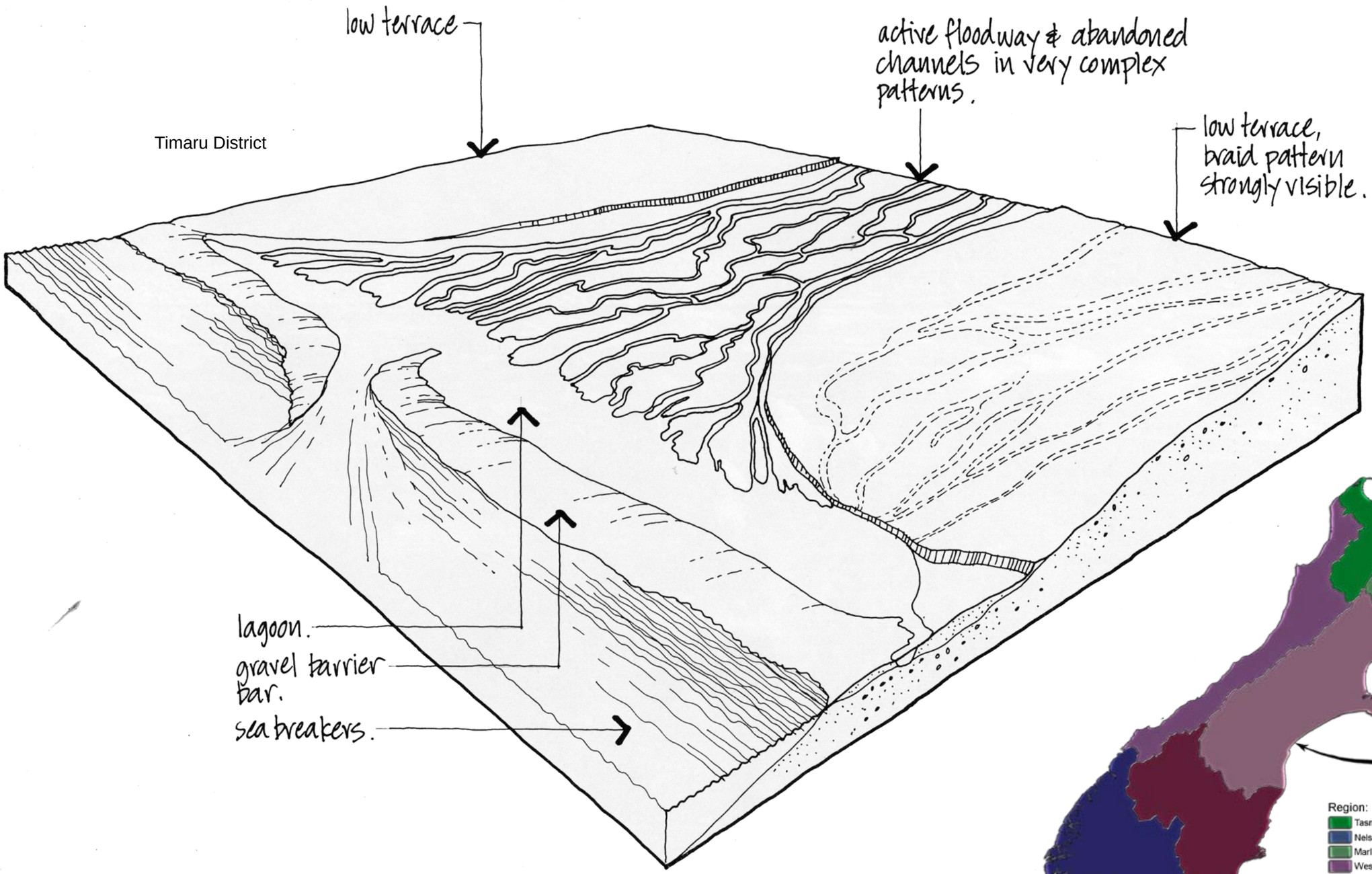


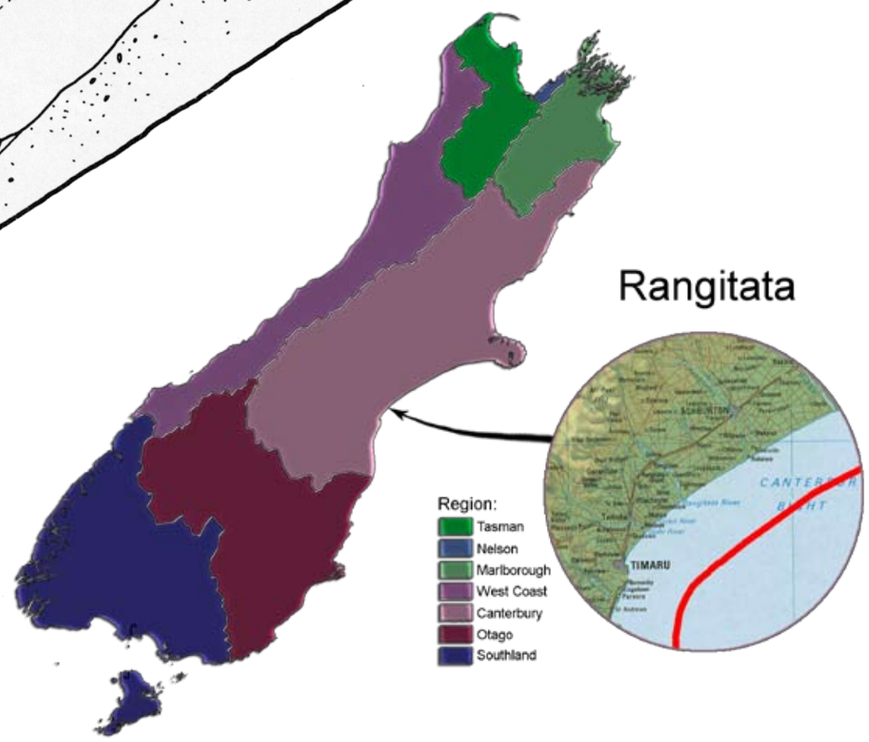
a: Beach sand dune complexes
b: backswamps
c: sand plains
d: gravel bars and beach ridges often below seacliffs
e: saline lake and estuary fringes

Land Types

- L1: Plains - Coastal fringe
- L2: Lower plains
- L3: Upper plains
- L4: plains - recent flood and low terrace
- L8: Port hills
- L9: Herbert
- L10: Akaroa

Canterbury Region Ashburton &Timaru Districts





Rangitata River mouth landform model

NATURE OF UNDERLYING LANDS

A complex of estuarine, alluvial and downland systems:

estuarine

- part of the coastal environment
- built from interacting coastal and freshwater processes
- inter-related shingle spit, lagoon, wetland and mud flats
- made up of fines, shells and shingle
- strong saline influence
- coastal shrubland, rushes and sedges
- naturally rich in birdlife, fish, shellfish, insects, etc.

alluvial

- gentle valley bottom - a "mini plain"
- system built from stream deposits
- silt loams developed over greywacke gravels
- deep, fertile soils
- naturally kahikatea forest land of kereru, tui and bellbird

downlands

- volcanic timaru basalt blanketed with deep loess layers
- gently rolling landscape, some steep scarps and slopes
- downlands above, enclosing the alluvial and estuarine
- naturally totara-matai forestlands on deep loess soils