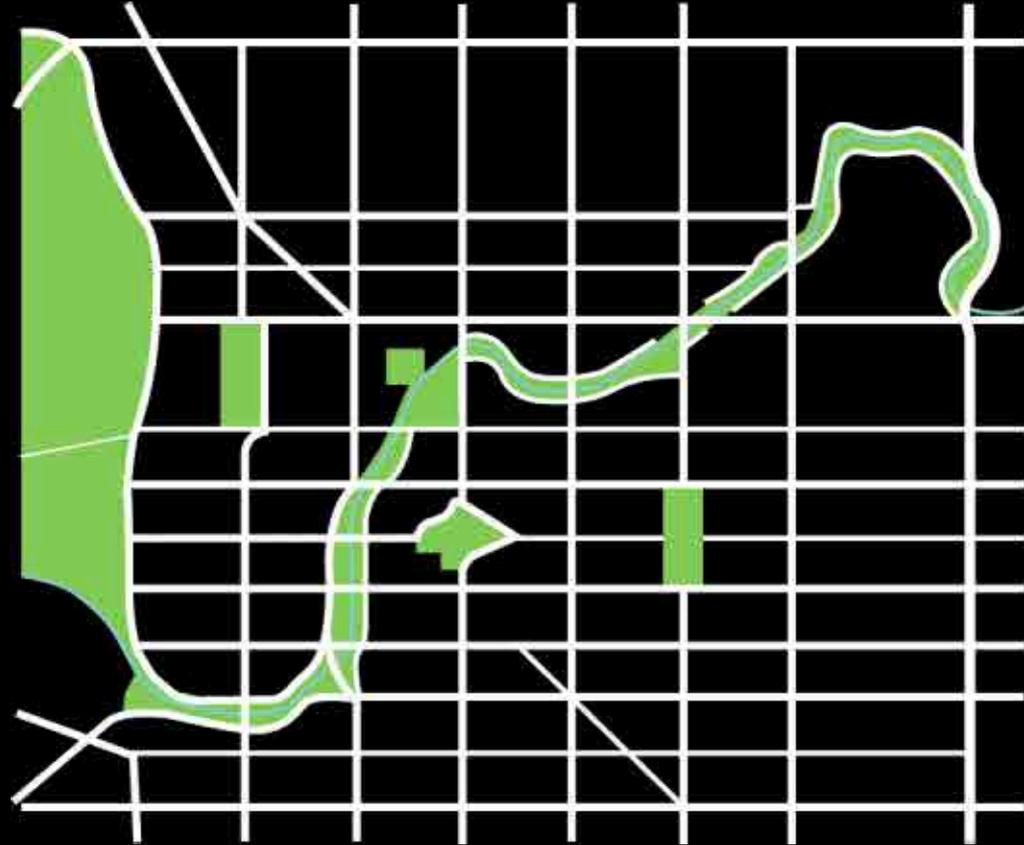


Toward
**Respectful &
Resilient** City
Renewal

Di Lucas, landscape architect

Lucas Associates

Thursday, September 8, 2011



Heritage landscapes should be assessed with regard to:

A. Heritage Fabric

The presence of heritage fabric and not simply an assembly of historically unrelated historic places or sites is determinative. Relationships, webs, spaces, nodes, networks, features and/or activities must be present and detectable.

B. Natural Science Values

The way natural values in the underlying landscape (geological, topographical, ecological and dynamic components of the landscape) have translated into the cultural landscape and influenced human actions, beliefs and traditions.

C. Time Depth

Presence of era layers – links, overlays, eradication

D. Tangata Whenua Value

Cultural and spiritual heritage values for tangata whenua identified in accordance with tikanga Maori.

E. Cultural Diversity

How the landscape expresses the presence of cultural/ racial variety in a variety of layers (tangata whenua, pakeha/European, Chinese, Pacific Islands, other) and whether and how these layers are linked or otherwise related to each other.

F. Legibility and Evidential Values

How the landscape clearly expresses past cultural processes, strong historic connotations and evokes a distinctive sense of place ...

and/ or how factual and recorded knowledge (archival, statutory, archaeological and ethnographic), oral and anecdotal history, folklore and other methods of historic tradition provide evidence for the physical presence of intact layers, remnant layers or traces.

G. Shared and Recognised

Including social, symbolic and political values, and the relationship of the current generation with the heritage environment, its traditions and stories.

H. Aesthetic Values

Cultural patterns, processes and elements and their coherence, memorability, and community perceptions.

I. Significance

Representativeness, rarity, and distinctiveness of character - how strongly the heritage expresses culture(s) values, presence and development.

*A city's identity is made up of its
collected memories which create a
sense of place.*

-Draft CCC Central City Plan



Formation of the basis to the greater Christchurch landscape



250 MILLION YEARS AGO sand & mud is deposited on the sea floor. Over time it becomes rock forming the Torlesse rocks which make up a large part of NZ's landmass today.



DURING THE FOLLOWING 100 MILLION YEARS the Torlesse rocks are forced up by pressures deep within the earth above sea level to form an ancient landmass.



This was subsequently eroded down to a low lying plain.



65 MILLION YEARS AGO the sea eventually invaded. This was overlain with a mix of quartz sand which turned to Chertens Bay sandstone.



25 MILLION YEARS AGO the Torlesse rocks were popped up for the second time resulting in the Southern Alps that we see today.



At the same time a large pressure bulge was forming out to the east below the sea as molten volcanic rock began to rise to the earth's surface. This formed an island.



12 MILLION YEARS AGO these hot rocks broke the surface in a series of eruptions and in places covered the Torlesse rocks and sandstones.



11 MILLION YEARS AGO another large mass of molten rock pushed toward the surface and began the formation of the Lyttelton volcano. Over the next million years many eruptions and misty layers of material built up a large basalt cone.



10 MILLION YEARS AGO the volcanic activity stopped, the cone began to erode and the sea eventually breached the crater wall forming what is Lyttelton Harbour today.



Subsequent volcanic activity followed on the southern flank of the crater and Mount Herbert was born, material thrown out of the vent flowing down into the flooded Lyttelton crater.



9 MILLION YEARS AGO near 24 kilometres away the Akaroa biggest cone of them all covering much of the existing landfall.



BETWEEN 8 & 6 MILLION YEARS AGO there were some of the Lyttelton Volcano. During this time the massive Akaroa crater wall breached by the sea.

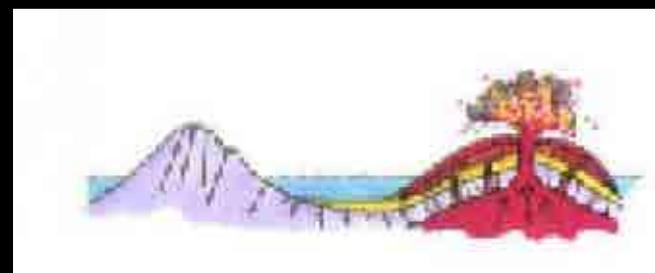
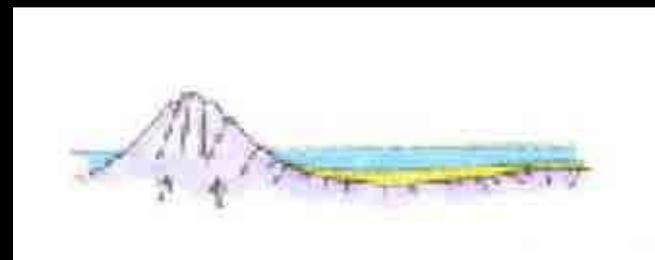


Volcanic activity ceased after this period and constant erosion created the form of Banks Peninsula that we see today. But all was not quiet, FROM 2 MILLION YEARS AGO TO THE PRESENT DAY to the west, giant glaciers were grinding the Southern Alps down and spewing massive amounts of shingle out of the mountains and building a new plain. Over time this grew to depths of up to 1 kilometre forming the Canterbury plains.

Canterbury Plains Port Hills Lyttelton Harbour Akaroa Harbour

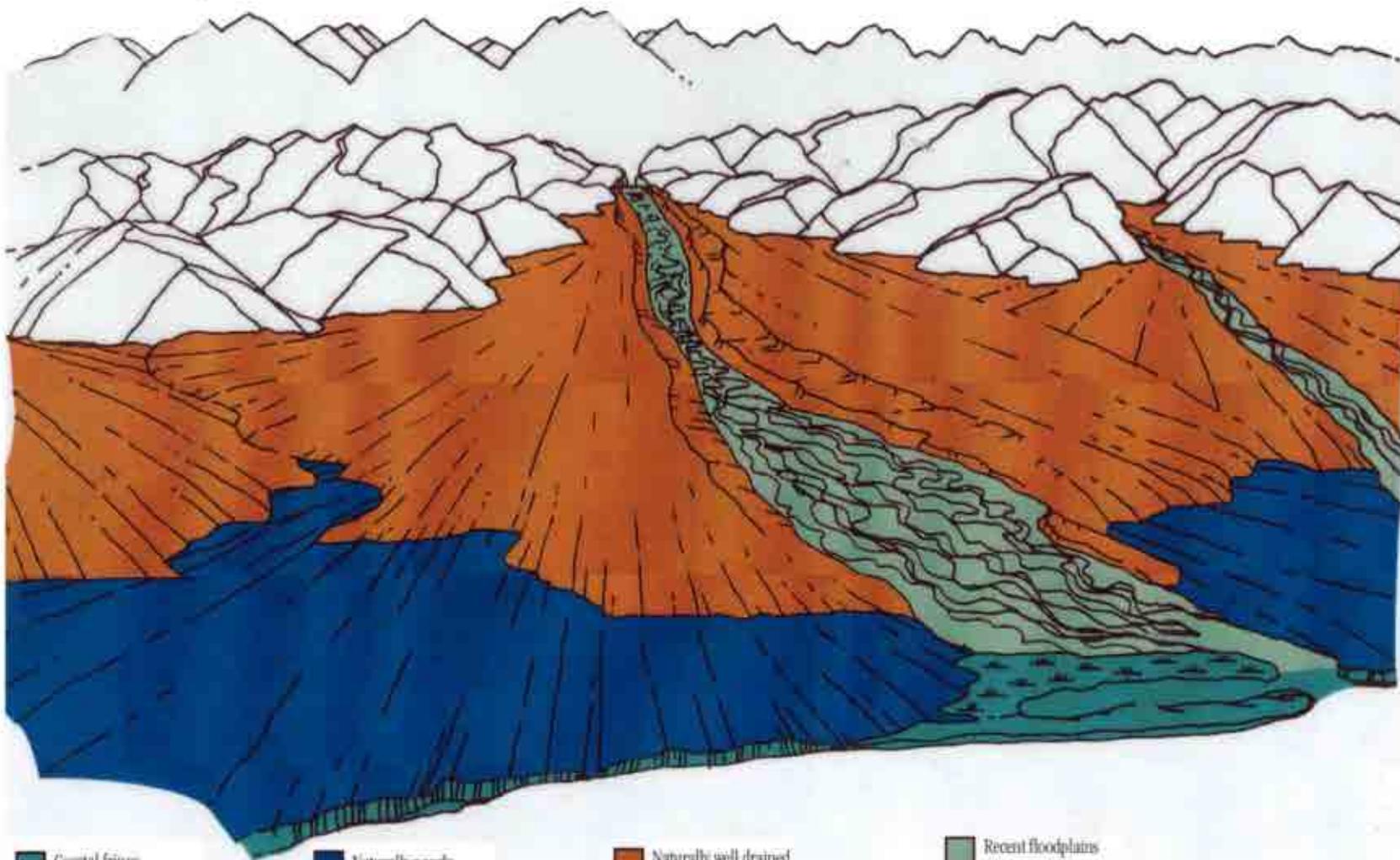


20,000 YEARS AGO the plains, continually moving out to sea eventually touched the volcanic mass linking it with the mainland. For glacial deposits were whipped up by the ice westerly and plastered on the old volcano as a blanket of yellow silt called loess. In places this is up to 20 metres thick.



Canterbury Plains Port Hills Lyttelton Harbour Akaroa Harbour





Coastal fringe,
including coastal
wetlands, estuaries &
lagoons

L1

Naturally poorly
drained plains (tends
to be lower plains)

L2

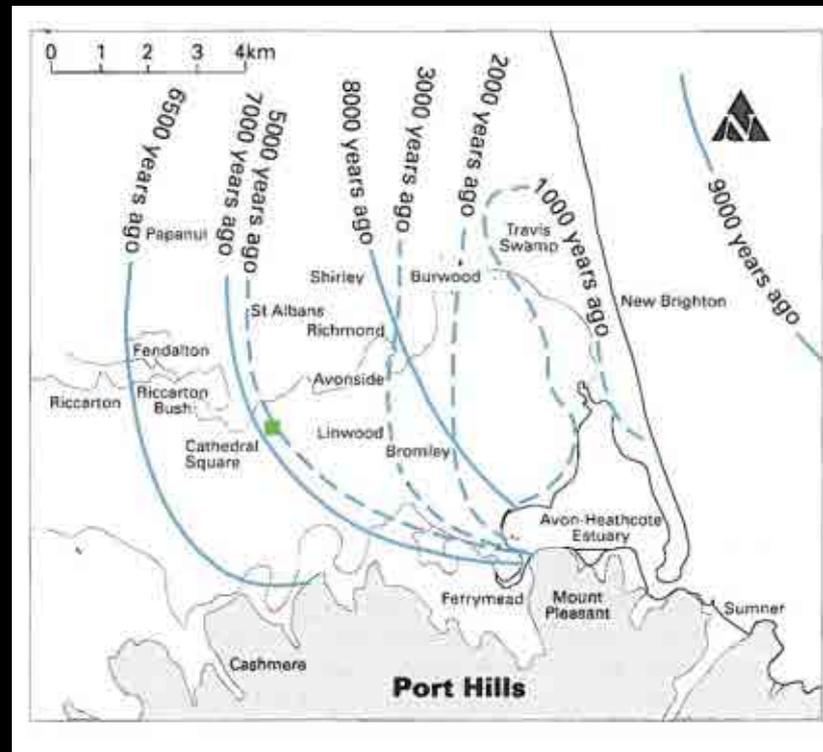
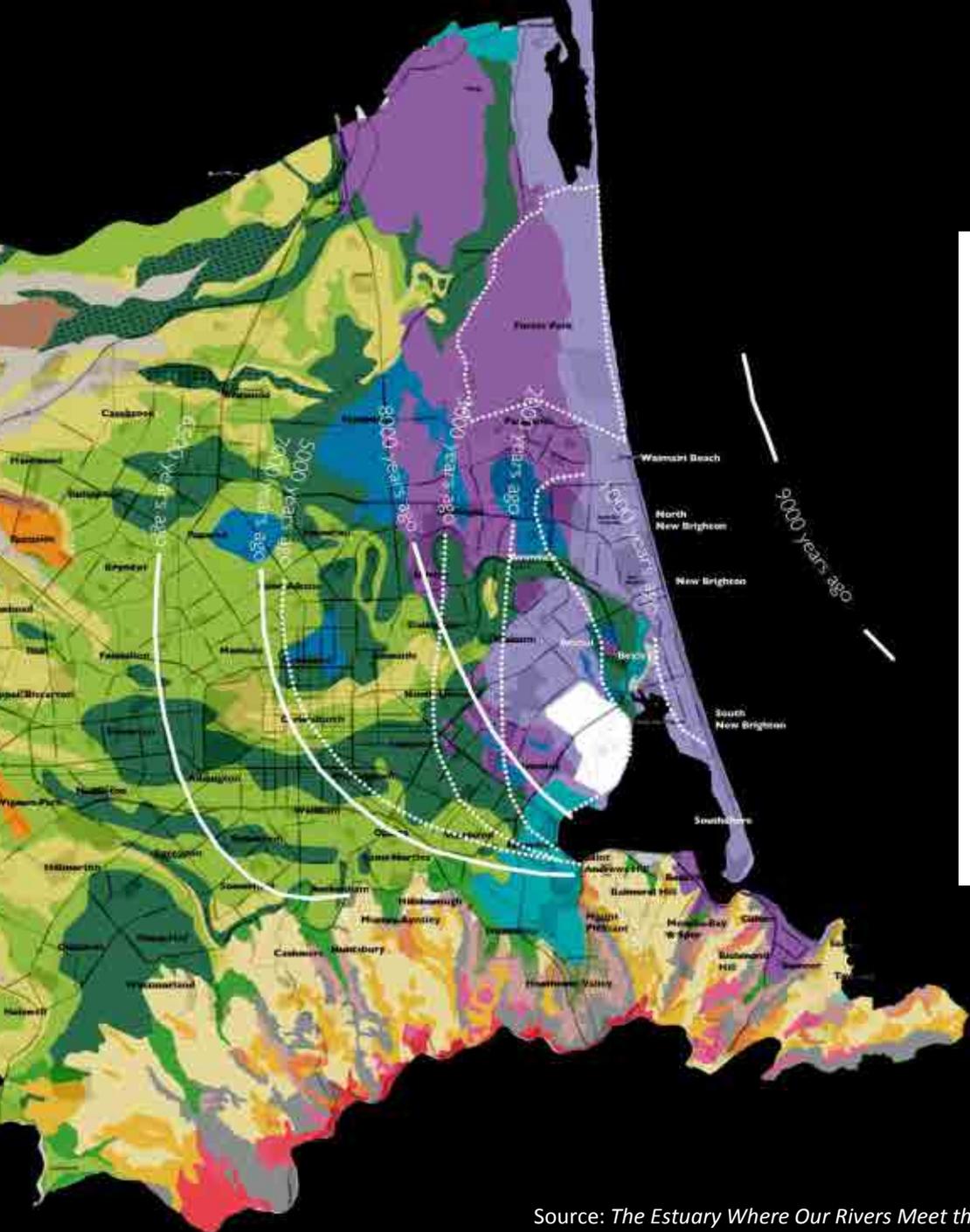
Naturally well drained
plains (tends to be
upper plains) & inland
basins (e.g., Culverden,
Hakataramea)

L3

Recent floodplains
(both alpine-sourced
braided rivers and
foothill rivers)

L4

Canterbury Plains landform model



Source: *The Estuary Where Our Rivers Meet the Sea Christchurch's Avon-Heathcote Estuary & Brooklands Lagoon*, p. 4

Courthouse Riverbank Dune 1852



Christchurch New Zealand

from the Bank of the Head of the River
June 1852

By A.C.H.

1000 years here

WAIMAKARIRI

mokihi

matakouri

Nga Putaringamotu o
Nga Pakihi Whakatekata o
Waitaha

moa

otakaro

opawaho

WAITAHA

WAITAHA IMPORTANT AREAS

Forested dry & wet plains

Coastal
lands

PORT HILLS SUMMIT

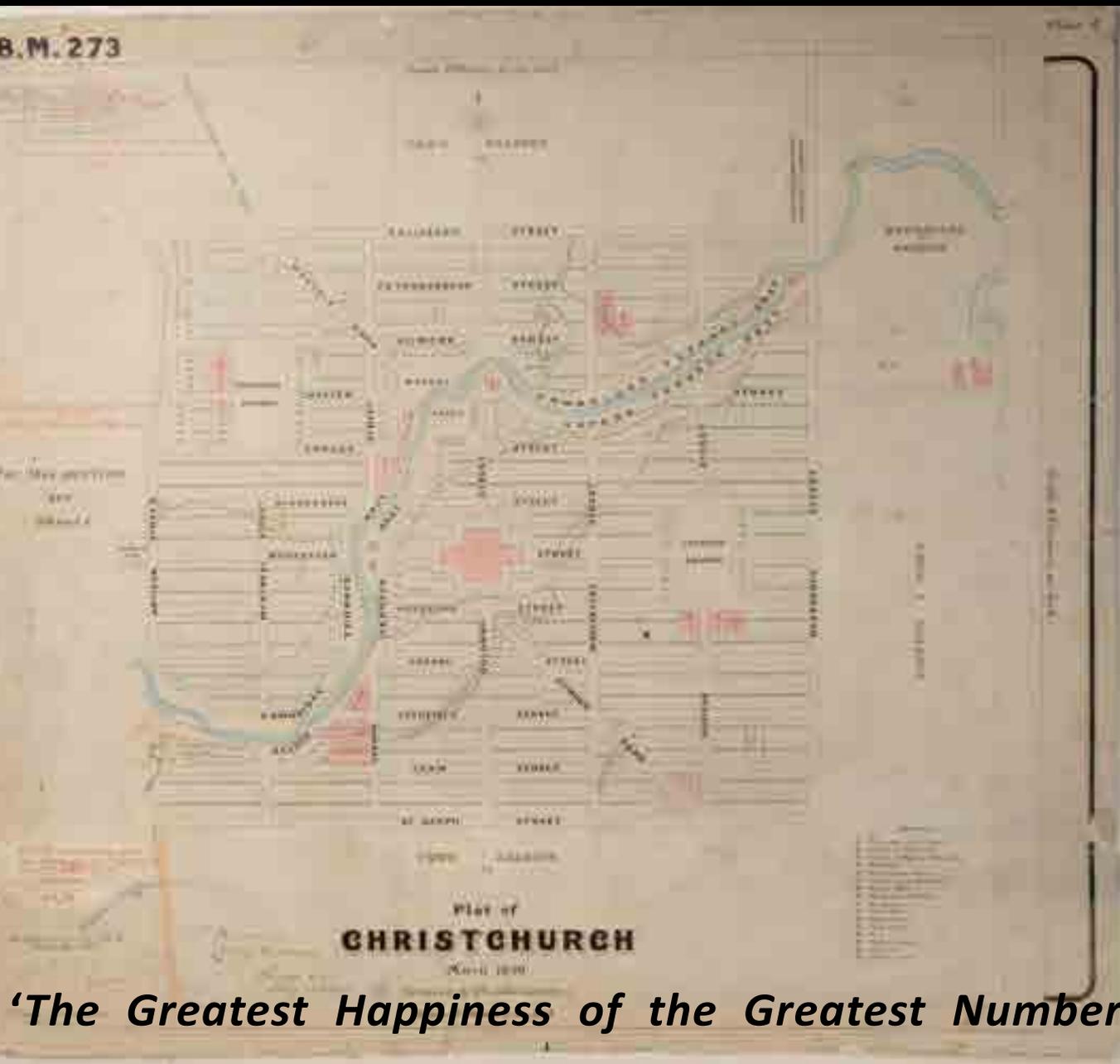
■ Waitaha important local areas



March 1850 Map of
C h r i s t c h u r c h



March 1850 Map of Christchurch



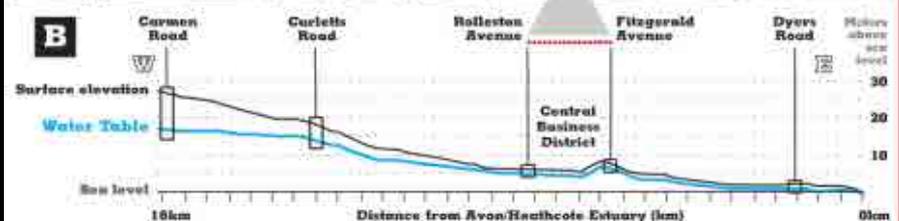
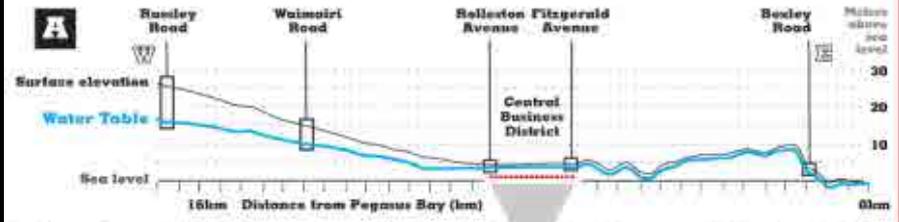
A park greenbelt was to:

- Improve the environment for the working class
- Separate urban and rural
- Control city expansion
- Guard against & protect the natives
- Transplant the British landscape

'The Greatest Happiness of the Greatest Number'

STREAMS UNDER THE CENTRAL CITY

- The CBD's soil is "highly variable" and parts are susceptible to liquefaction.
- Buildings generally performed to expectation but design standards for foundations should be reviewed.
- Underground creeks played a large part in liquefaction during the February quake.
- Geotechnical assessments need to be done before constructing new buildings in the CBD.



Liquefaction also seemed to follow the path of old streams buried beneath the city streets.

“The zones of more pronounced liquefaction do appear somewhat to line up with the old stream channels, which sheds some light on the reasons for variability in liquefaction manifestation.”

-The Press, Tuesday, September 6, 2011

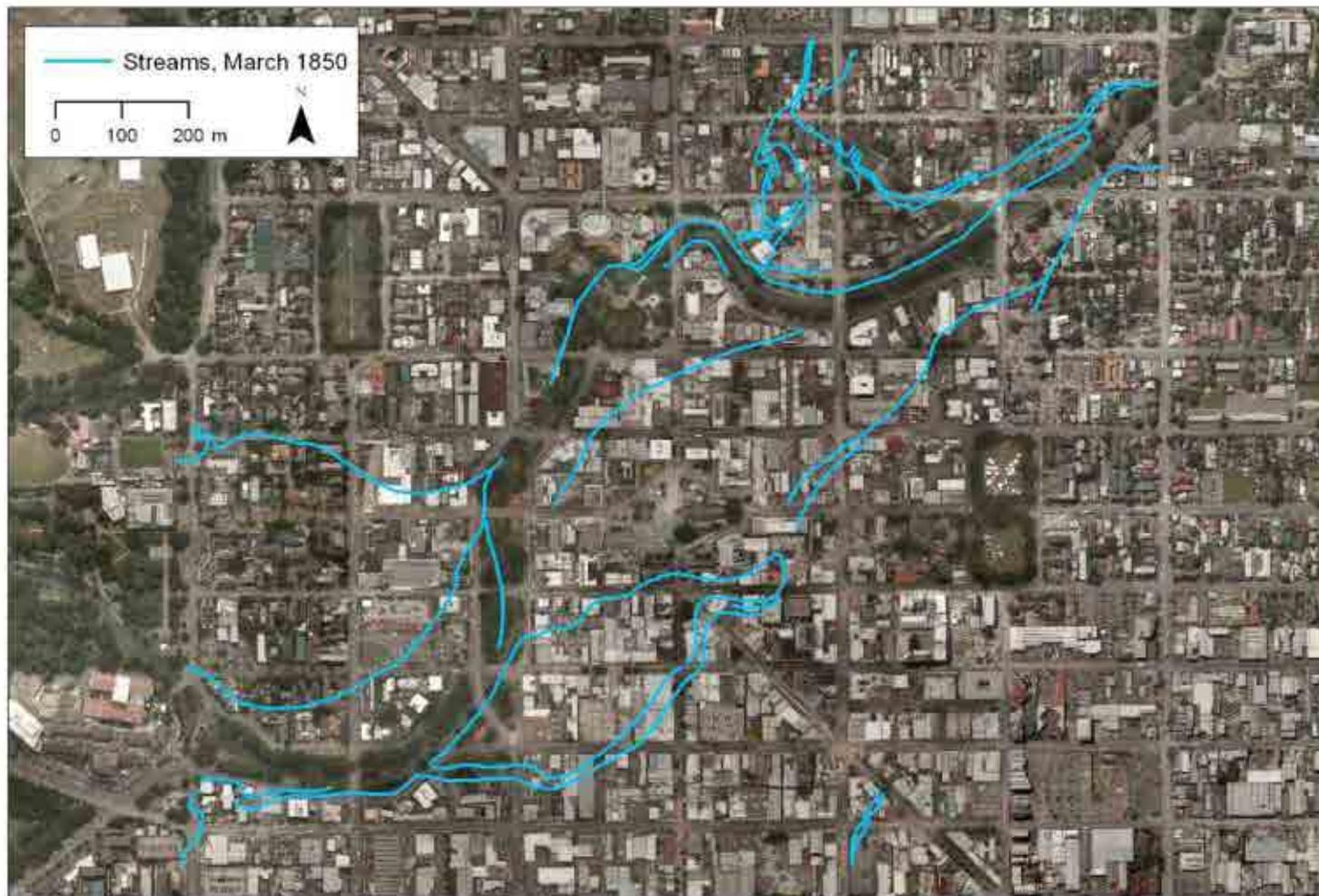


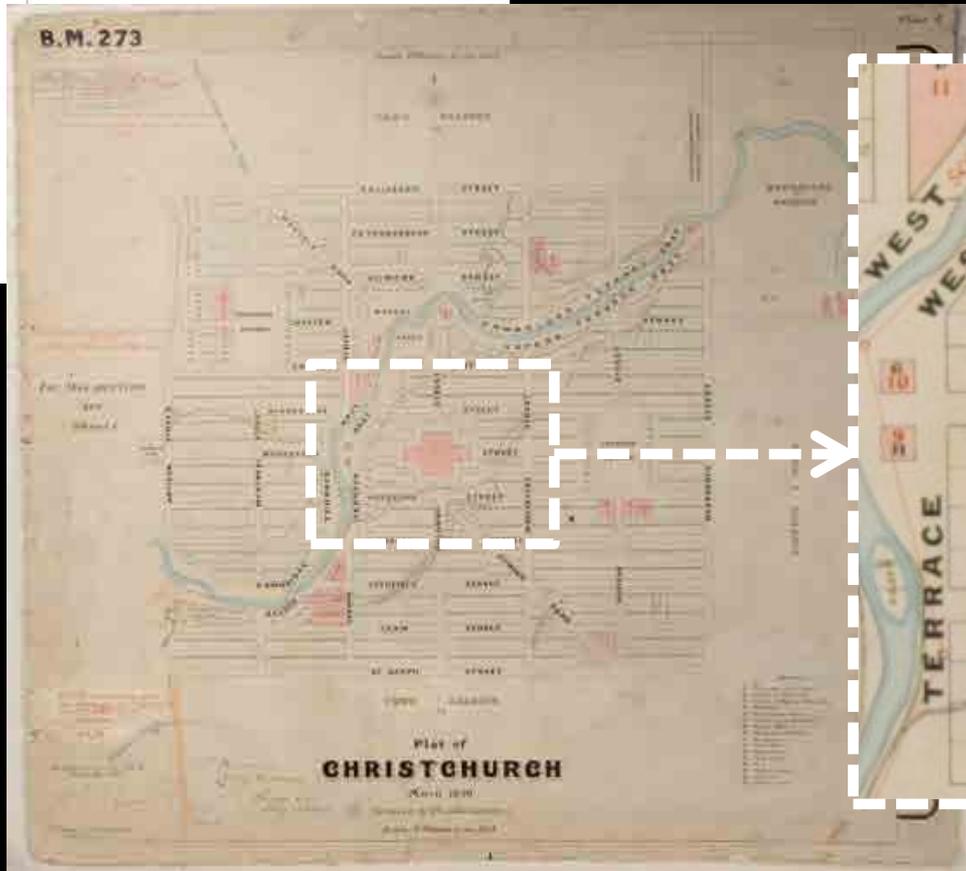
Figure 4. Streams in central Christchurch as mapped in March 1850, superposed on aerial photography captured on 24 February 2011. Streams digitised from the Black Map of Christchurch (March 1850), downloaded from Archives New Zealand (ANZ, 2011) (<http://archives.govt.nz/gallery/v/Online+Regional+Exhibitions/Chregionalofficegallery/ss/Black+Map+of+Christchurch/>)

In 1937 I was the office boy at the Christchurch Tramway Board in the south east corner of the Square - just across the road from the Govt Buildings. Each morning I filled the General Manager's water bottle from a gushing spring which was a few yards from our front door in Dalgety building next door.

John Hulme
1025626
2002_06/21/08/11/11

In 1937, I was the office boy at the Christchurch Tramway Board in the south east corner of the Square – just across the road from the Government Buildings. Each morning, I filled the General Manager’s water bottle from a **gushing spring** which was a few yards from our front door in Dalgety building next door.

-John Hulme (1/9/11)

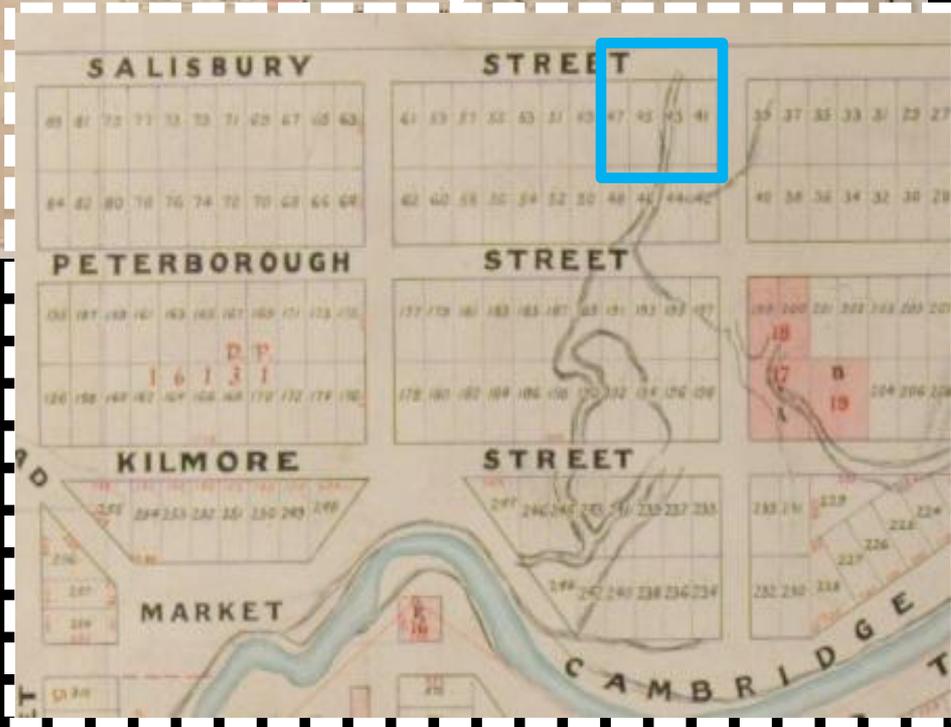


B.M. 273

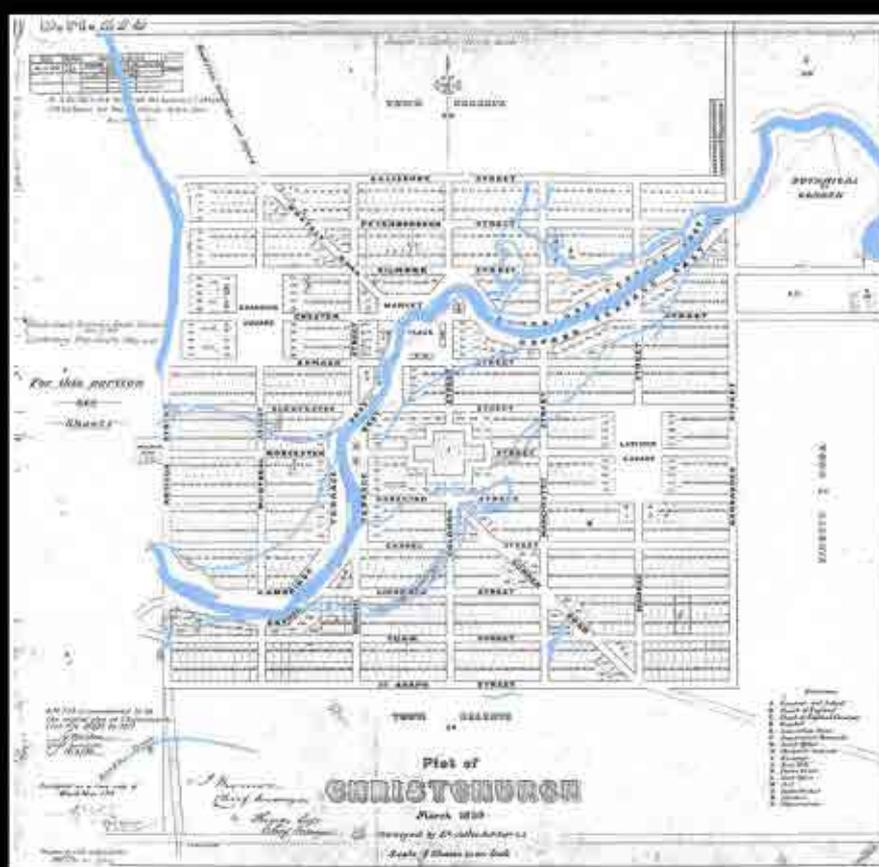


'So that is how you treat waterways in the city. Interesting!'

-Dick Lucas (1993)

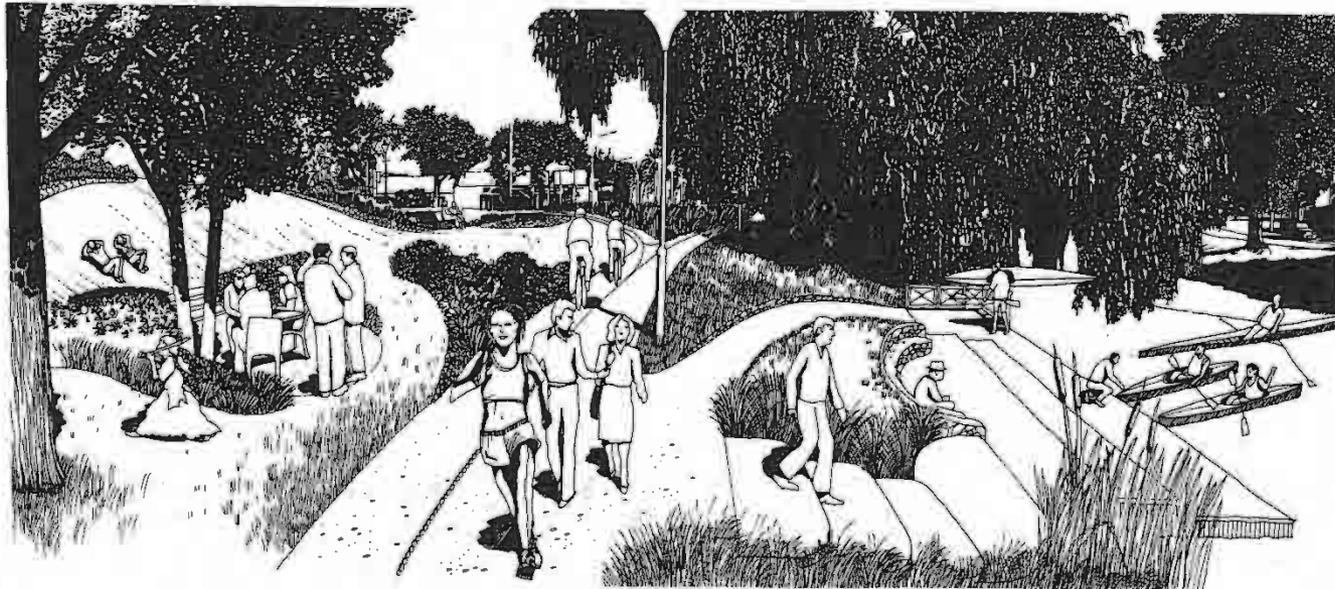


Central City Waterways as at 1850 & in 2000



AVONSIDE ~~DRIVE~~ PARK

from Fitzgerald Avenue to Linwood Avenue



Lucas Associates



EXISTING SITUATION:
 two-lane, two-way traffic, no pedestrian
 and cycle opportunities or riverbank
 access

All drawings are from the same viewpoint, viewed looking west
 from approximately 50 metres from the intersection of
 Fitzgerald Avenue and Ansonia Drive

Lucas Associates
 221 Manchester Street, tel: 3822 750 April 6, 2001

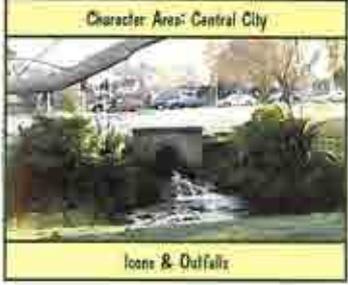
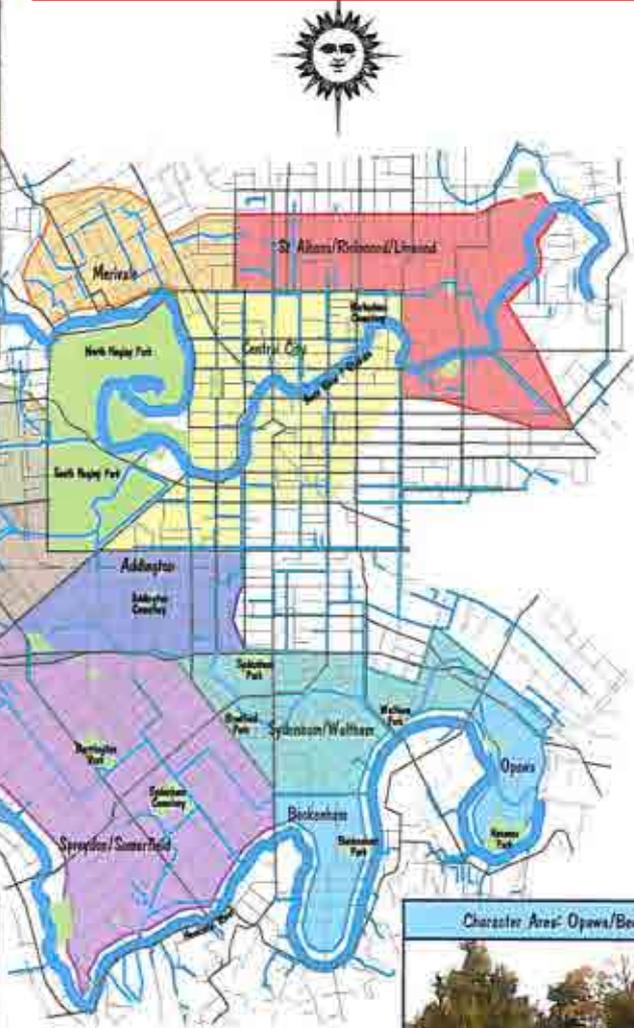
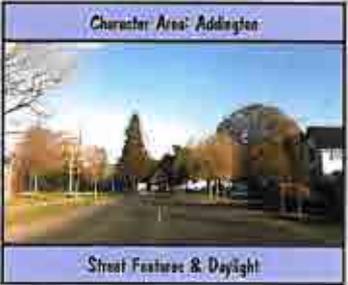
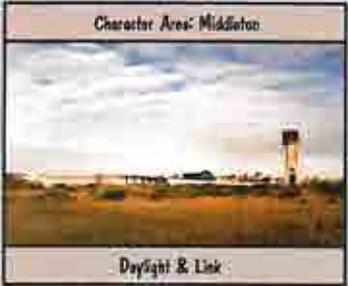
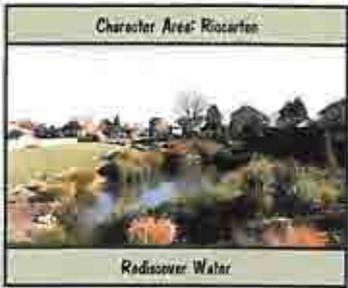


RIVERSIDE PARK

With road removed, pedestrian and
 cycle routes, slopes regraded and
 naturalised plus riverbank access with
 possible landing stages etc.

With one lane, one way slow street,
 pedestrian and cycle routes, slopes
 re-graded and naturalised.

Commendable works

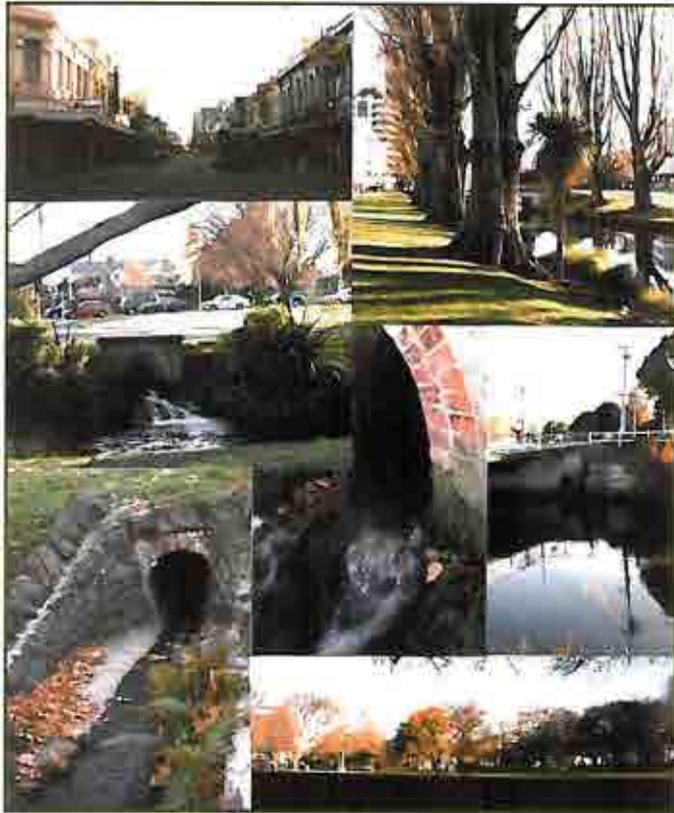


LEGEND

- Major Roads
- Railway
- Open Waterways
- Piped Waterways
- Reverses/Conservation Areas/Significant Green w/ Open Space

CENTRAL CITY NEIGHBOURHOODS
PROJECT AREA 7

CENTRAL CITY



Source: Christchurch City Council 1999

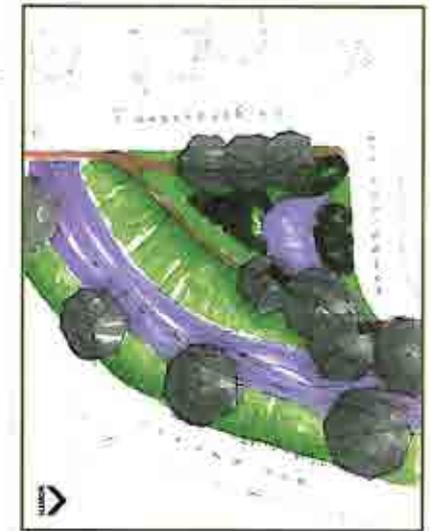
CHARACTER

NEIGHBOURHOOD



100 50 0 100 200 300 400 500 600 700 800 900 1000
SCALE m

- Existing and Potential Values:
- Ecological values confined to river corridor.
 - Highlight drainage system through vinyl cones, eg durable & artistic works beside sumps - fish symbol.
 - Highlight brick barrels & interpret as historic part of drainage system.
 - Enhance stormwater outfalls.
 - Investigate options for 'daylighting' piped systems with regard to life of structures.



VISION: ICONS & OUTFALLS



Day-lighted stream corner of Barbadoes & Salisbury Streets

Day-lighted waterway through central Seoul

BEFORE



AFTER



RIVER AND STREAM PROFILES

These profiles show the sequence of native plants best suited to each zone. Scale is exaggerated.

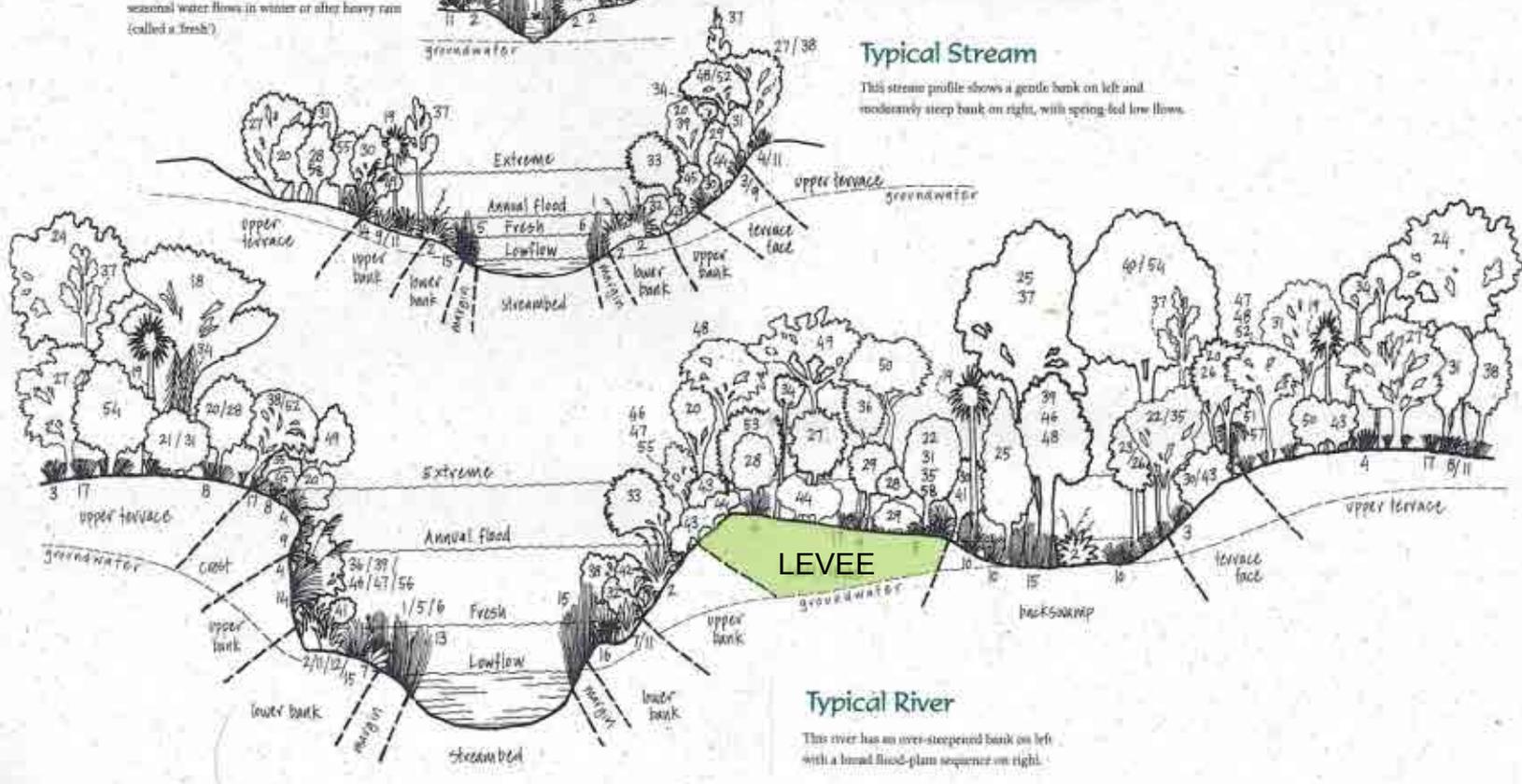
Typical Seasonal Stream

This profile shows upper stream reaches with seasonal water flows in winter or after heavy rain (called a 'fresh').



Typical Stream

This stream profile shows a gentle bank on left and moderately steep bank on right, with spring-fed low flows.



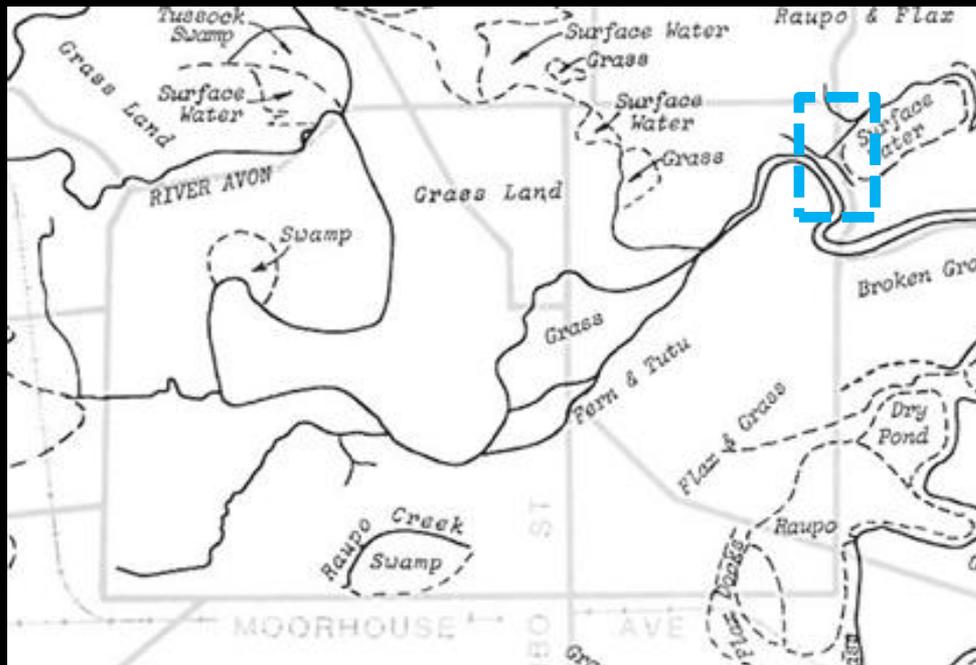
Typical River

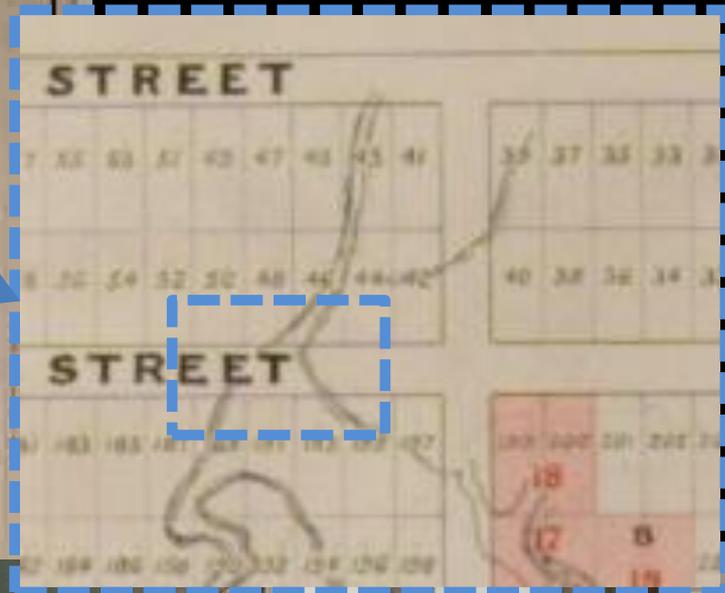
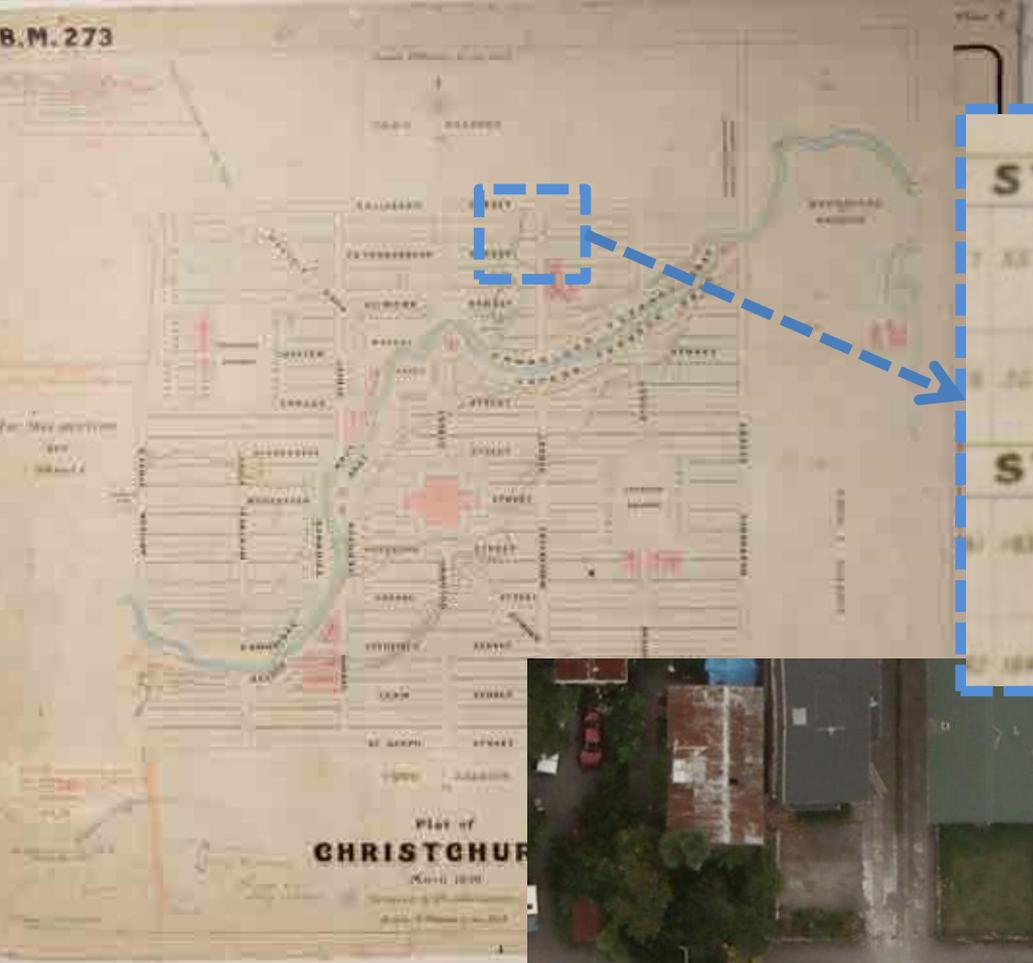
This river has an over-steepened bank on left with a broad flood-plain sequence on right.



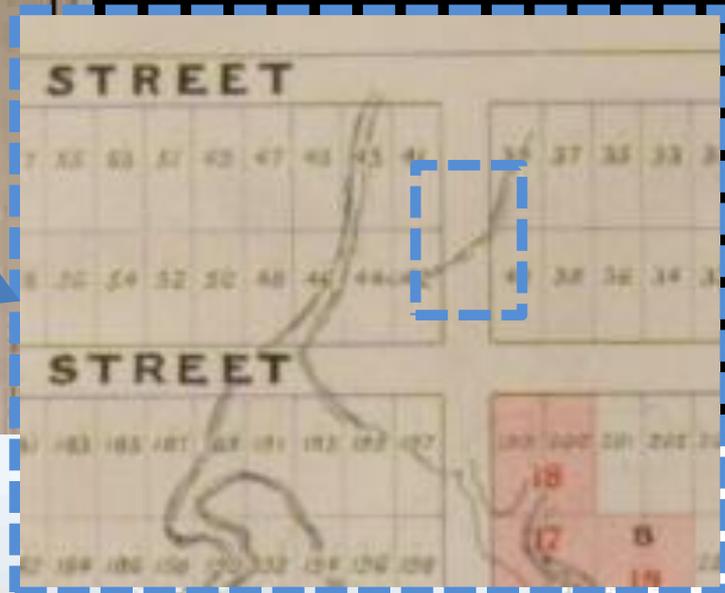
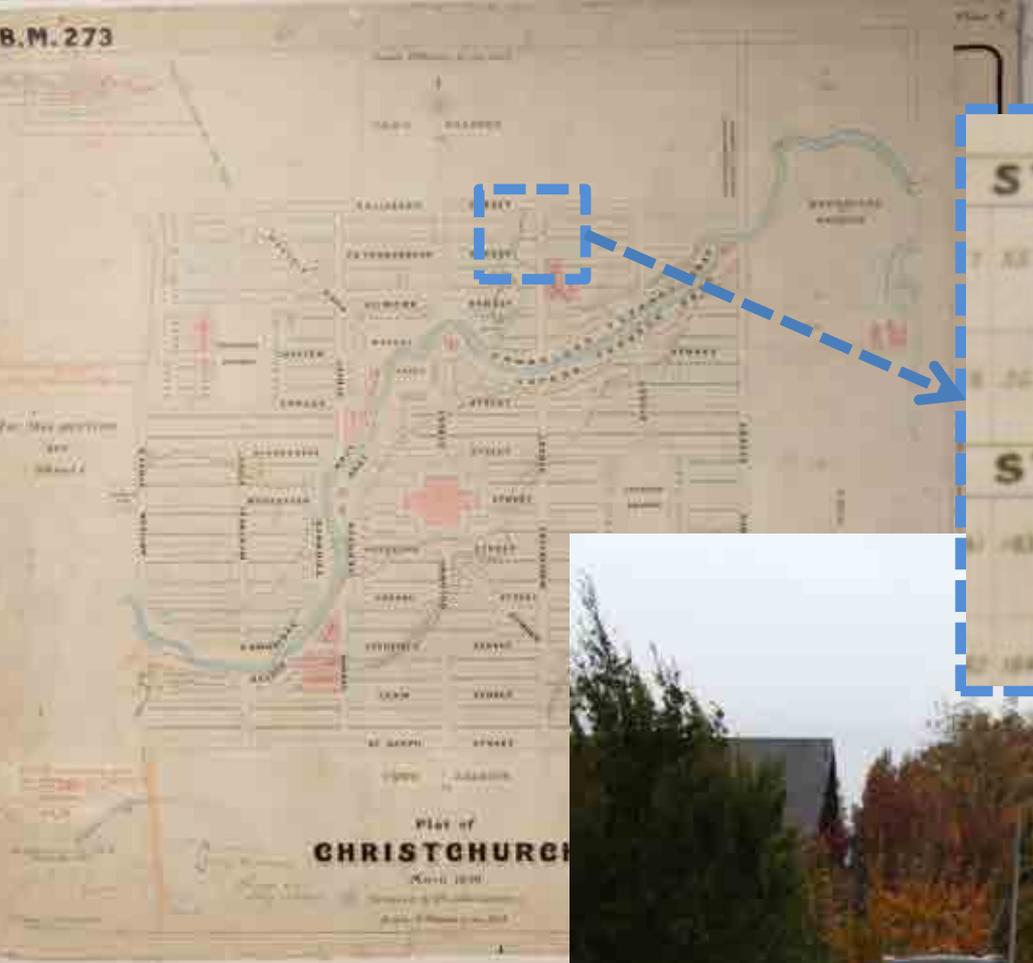
Halswell River levees ripped after the February earthquake

Fitzgerald Avenue-Avon River

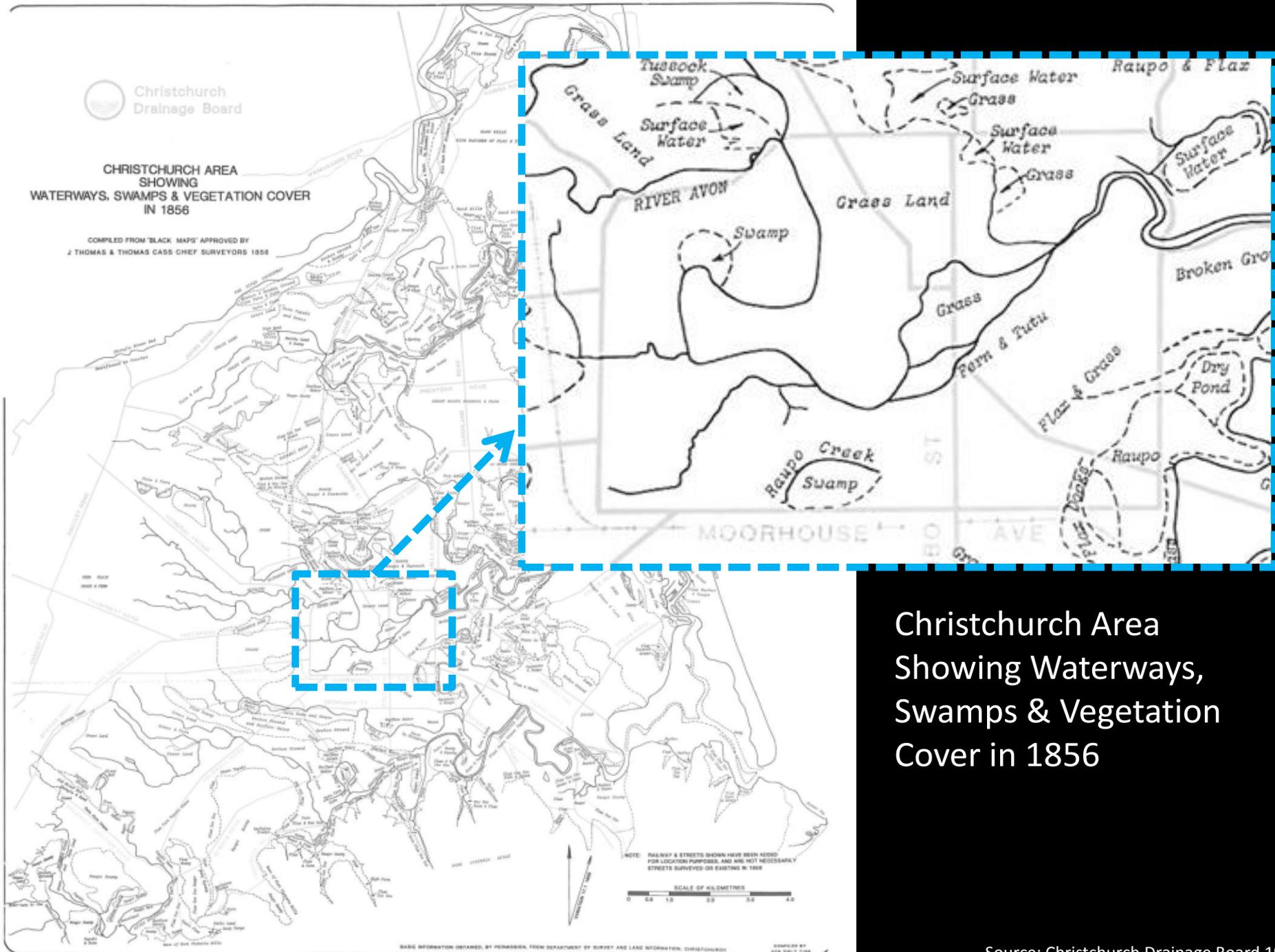




Peterborough Street



Manchester Street



Christchurch Area
Showing Waterways,
Swamps & Vegetation
Cover in 1856

Natural heritage

Christchurch before Settlement

Seven thousand years ago the site of Christchurch was below sea level. The land on which Christchurch stands was created by the accumulation of sediments in geologically recent times.

The site was swamps, waterways and sandhills drained by two small rivers. Christchurch was located up the Avon River/Ōtakaro, where the ground rises to between six and seven metres above sea level. Swampier ground lay to the east and north of the city. The natural vegetation was a mix of flax, tutu, grass, scrub and remnant patches of forest. The earlier, more extensive forest cover had been reduced by natural and Maori fires.

In the 1840s, the future site of Christchurch was considered for the Nelson and Otago settlements, but the wetlands persuaded those seeking sites for those settlements to look elsewhere.

The site of the city had another disadvantage - which the founders of the city recognised when water from the Waimakariri River flowed down the Avon River/Ōtakaro in 1868 - it was a flood plain. Earthquakes were not considered a hazard, although the city was shaken by minor earthquakes in 1869, 1881, 1888 and 1901.



Pre-1850's

Tangata Whenua Pre-1850

Before European settlement and establishment of Christchurch, Ngāi Tahu, and before them Ngāi Māmoë and Waitaha, maintained a number of permanent and temporary kāinga and pā (habitation sites) within the Central City area. From these settlements, Ngāi Tahu gathered and used natural resources from the network of springs, waterways, wetlands, grasslands and lowland podocarp forest patches that abounded the Avon River/Ōtakaro.

The principal settlements were Puati, Ōtautahi and Little Hagley Park. It has been documented that Puati was established by Waitaha more than 700 years ago on a large island-like area between what is known today as Carlton Mill Corner and the loop in the river near the Christchurch Hospital. In the 1500s, Ngāi Māmoë migrated from Te Ika a Maui (the North Island) and settled within the Canterbury area, before spreading further south.

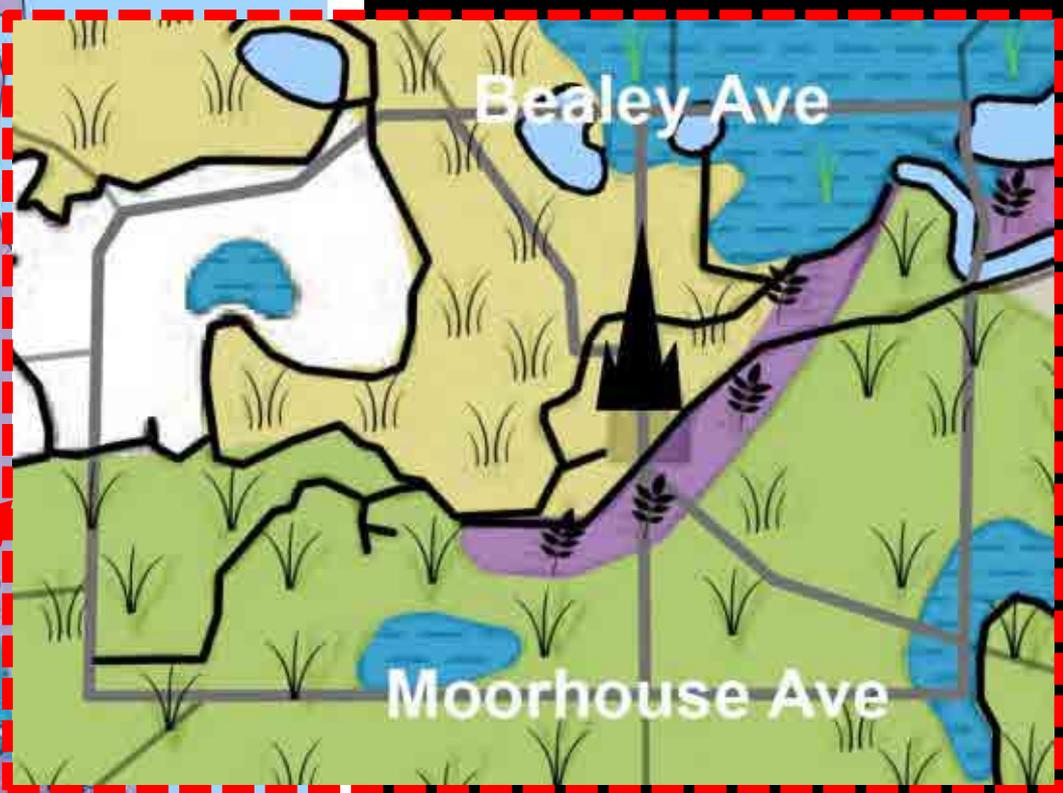
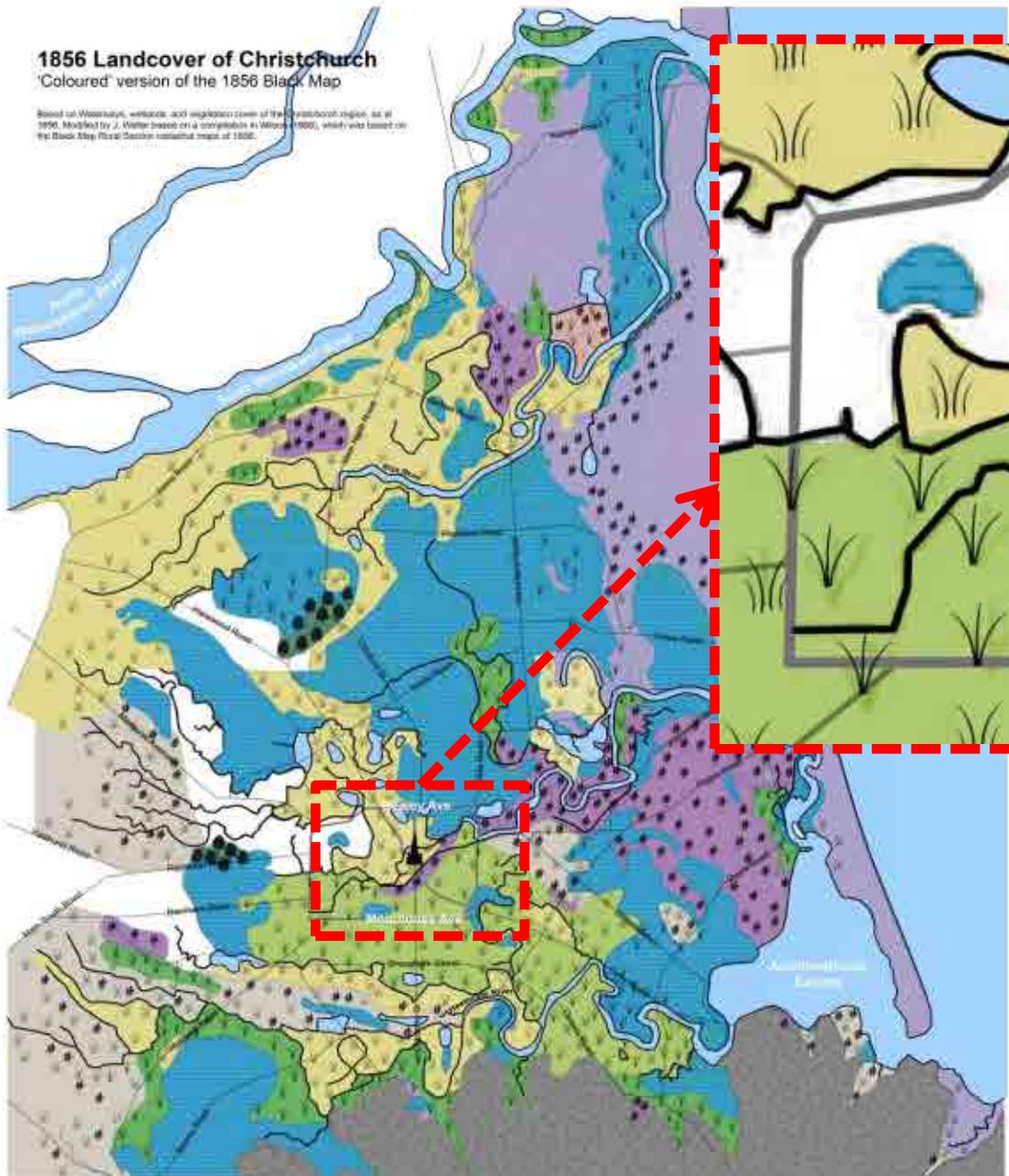
This was followed by the migration of Ngāi Tahu from the north onto Banks Peninsula, into Canterbury and throughout the South Island during the 1700s. With the establishment of Kaiapoi Pā by Ngāi Tūāhuriri chief Turakautahi, Puati became an important trading post and mahinga kai.

Later, Ngāi Huiāki chief Tautahi established a kāinga (settlement) further along the river near the Kilmore Street Fire Station between Madras and Barbadoes streets, and used several other mahinga kai within the Christchurch city area. His name is now taken as the contemporary Māori name for Christchurch, Ōtautahi.



1856 Landcover of Christchurch
 'Coloured' version of the 1856 Black Map

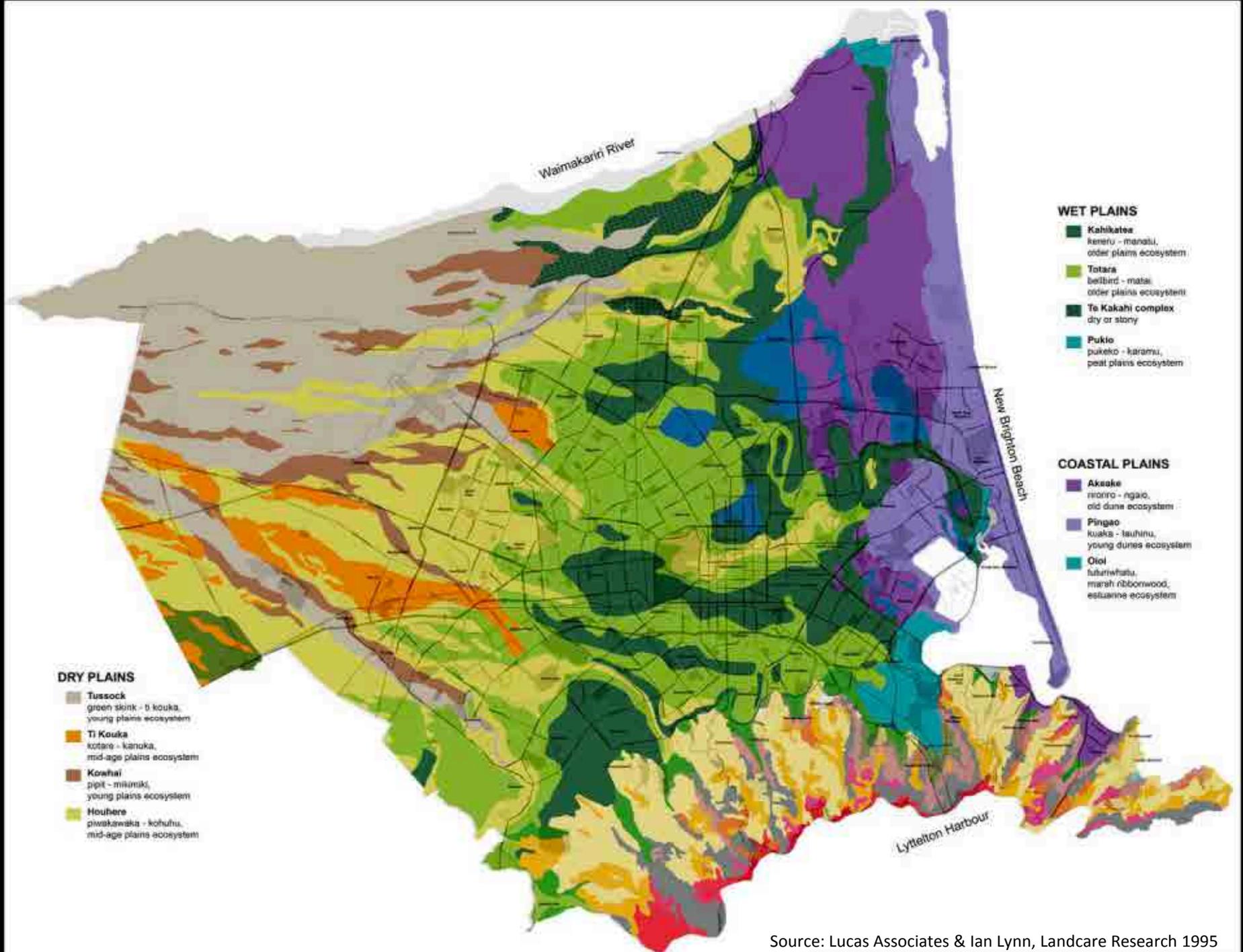
Based on Waterbury's original 1856 map of the Christchurch region, as of 1996. Modified by J. Walter based on a compilation of March 1900, which was based on the Black Map Road Section contour map of 1900.



1856 Landcover of Christchurch
 Coloured version of 1856 Black Map

Surface Water	Sand	Rock	Fern	Flax & Grass	Grass & Fern	Raupo
Streams/Rivers	Swamp	Trees	Flax	Grass	Fern & Flax	

(Based on Waterbury's original 1856 map of the Christchurch region, as of 1996. Modified by J. Walter based on a compilation of March 1900, which was based on the Black Map Road Section contour map of 1900.)
 © 2011 Lucas Associates Ltd.

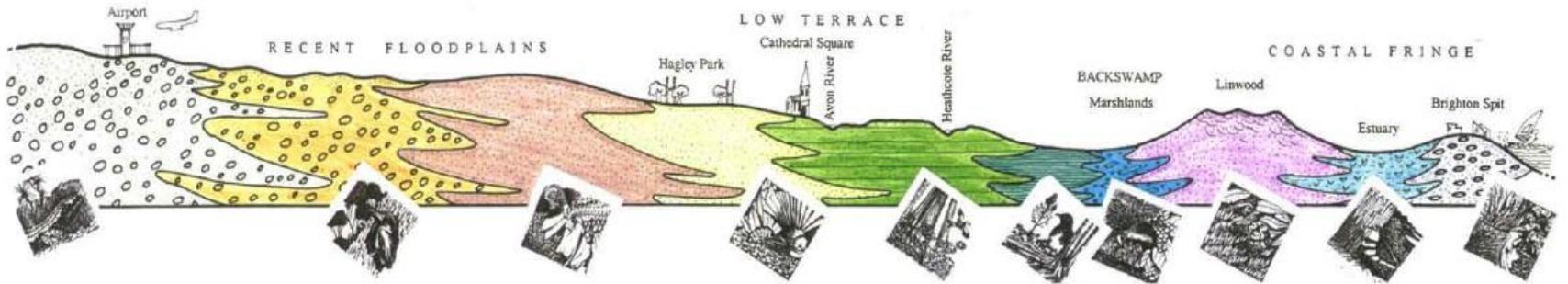
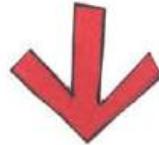
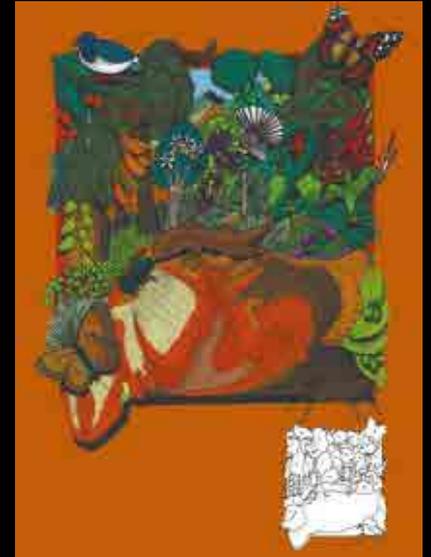
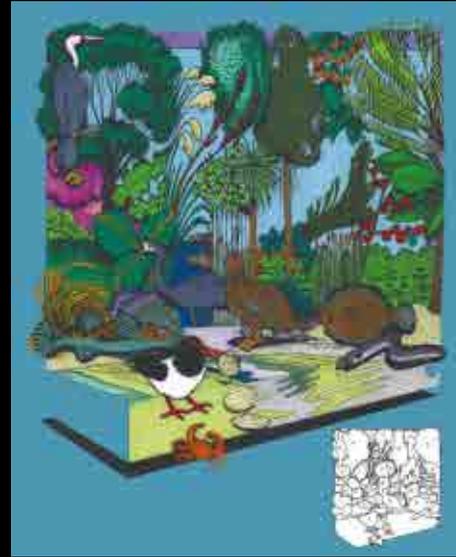
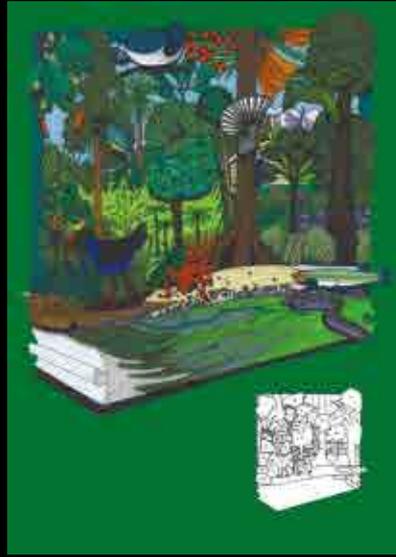
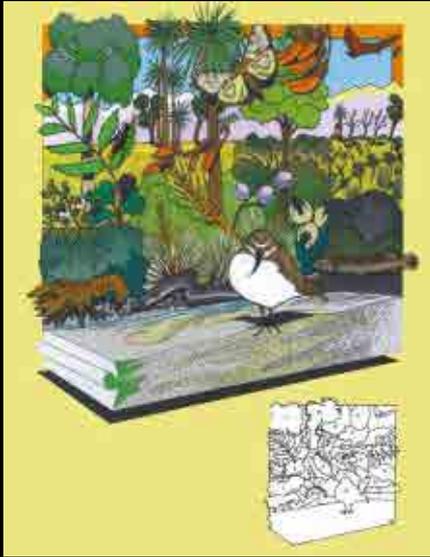


Dry Plains

Wet Plains

Coastal

Port Hills



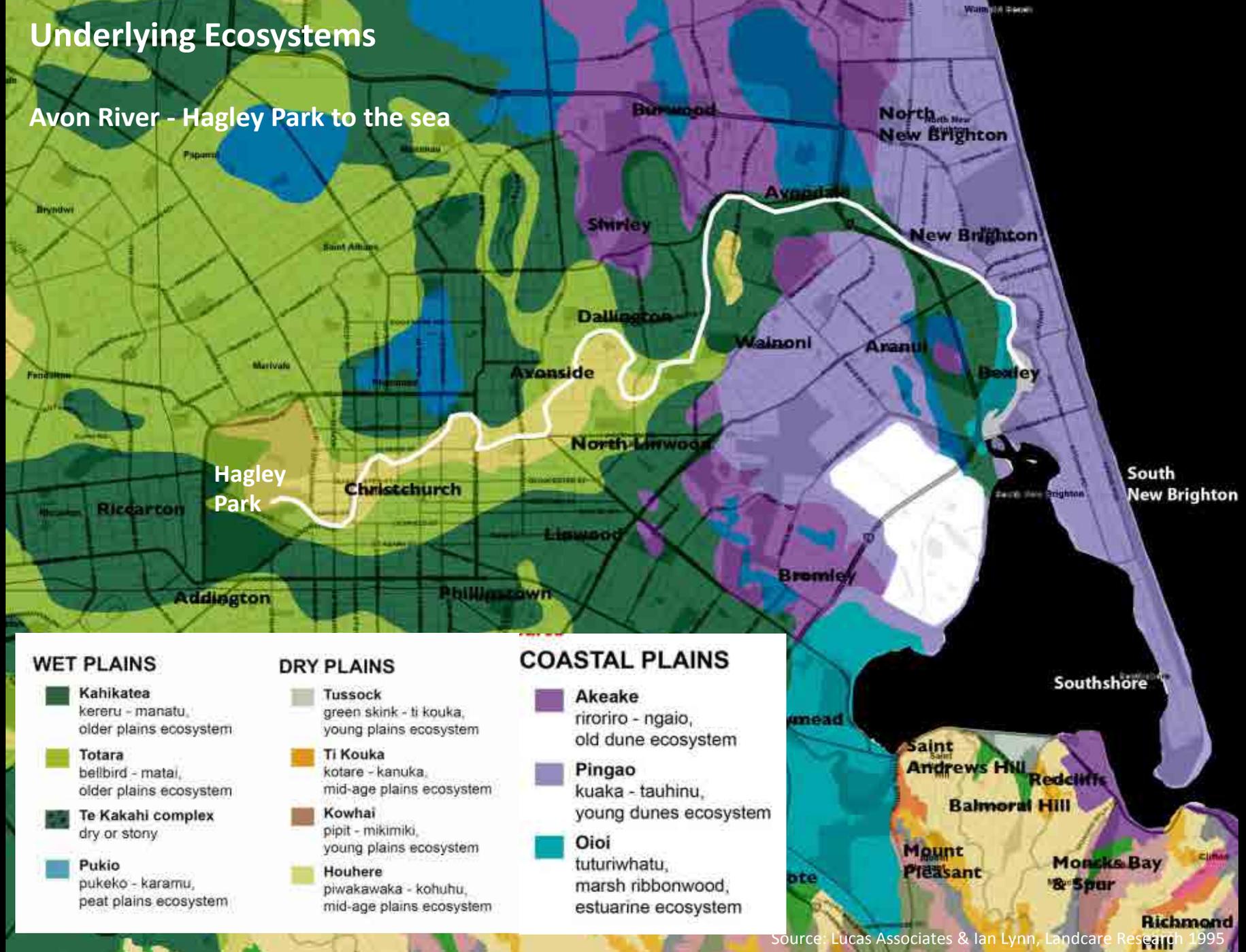
Dry Plains

Wet Plains

Coastal

Underlying Ecosystems

Avon River - Hagley Park to the sea



WET PLAINS

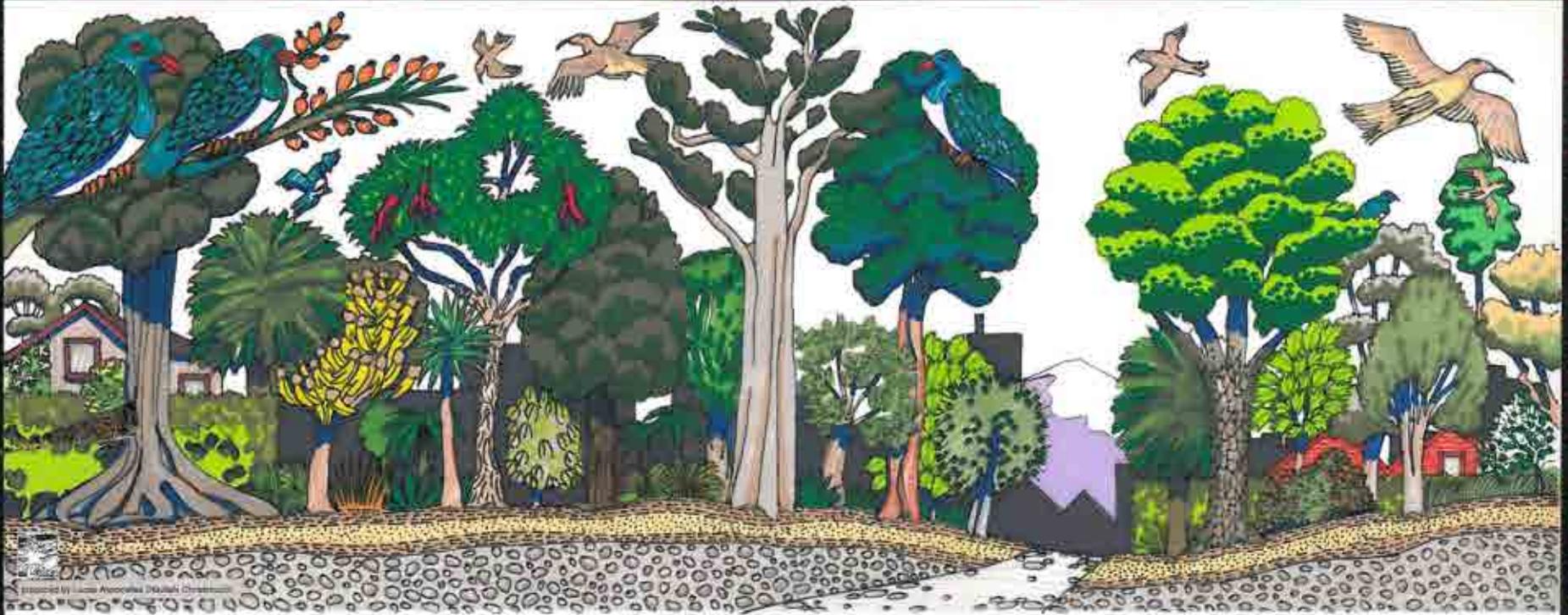
- Kahikatea**
kereru - manatu,
older plains ecosystem
- Totara**
bellbird - matai,
older plains ecosystem
- Te Kakahi complex**
dry or stony
- Pukio**
pukeko - karamu,
peat plains ecosystem

DRY PLAINS

- Tussock**
green skink - ti kouka,
young plains ecosystem
- Ti Kouka**
kotare - kanuka,
mid-age plains ecosystem
- Kowhai**
pipit - mikimiki,
young plains ecosystem
- Houhere**
piwakawaka - kohuhu,
mid-age plains ecosystem

COASTAL PLAINS

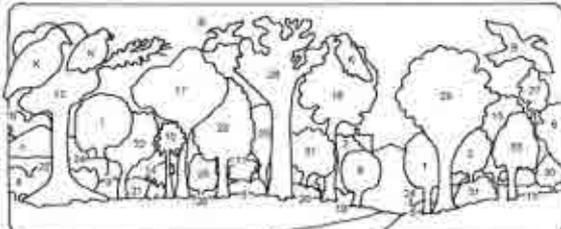
- Akeake**
riroriro - ngaio,
old dune ecosystem
- Pingao**
kuaka - tauhinu,
young dunes ecosystem
- Oioi**
tuturiwhatu,
marsh ribbonwood,
estuarine ecosystem



No	Botanical Name	Common Name
1	<i>Asplenium platyneuron</i>	Wai
2	<i>Asplenium platyneuron</i>	Wai
3	<i>Asplenium platyneuron</i>	Wai
4	<i>Asplenium platyneuron</i>	Wai
5	<i>Asplenium platyneuron</i>	Wai
6	<i>Asplenium platyneuron</i>	Wai
7	<i>Asplenium platyneuron</i>	Wai
8	<i>Asplenium platyneuron</i>	Wai
9	<i>Asplenium platyneuron</i>	Wai
10	<i>Asplenium platyneuron</i>	Wai
11	<i>Asplenium platyneuron</i>	Wai
12	<i>Asplenium platyneuron</i>	Wai
13	<i>Asplenium platyneuron</i>	Wai
14	<i>Asplenium platyneuron</i>	Wai
15	<i>Asplenium platyneuron</i>	Wai
16	<i>Asplenium platyneuron</i>	Wai
17	<i>Asplenium platyneuron</i>	Wai
18	<i>Asplenium platyneuron</i>	Wai
19	<i>Asplenium platyneuron</i>	Wai
20	<i>Asplenium platyneuron</i>	Wai
21	<i>Asplenium platyneuron</i>	Wai
22	<i>Asplenium platyneuron</i>	Wai
23	<i>Asplenium platyneuron</i>	Wai
24	<i>Asplenium platyneuron</i>	Wai
25	<i>Asplenium platyneuron</i>	Wai
26	<i>Asplenium platyneuron</i>	Wai
27	<i>Asplenium platyneuron</i>	Wai
28	<i>Asplenium platyneuron</i>	Wai
29	<i>Asplenium platyneuron</i>	Wai
30	<i>Asplenium platyneuron</i>	Wai
31	<i>Asplenium platyneuron</i>	Wai
32	<i>Asplenium platyneuron</i>	Wai
33	<i>Asplenium platyneuron</i>	Wai

AGENDA 21

OTAUTAHU CHRISTCHURCH PLANTS of the...

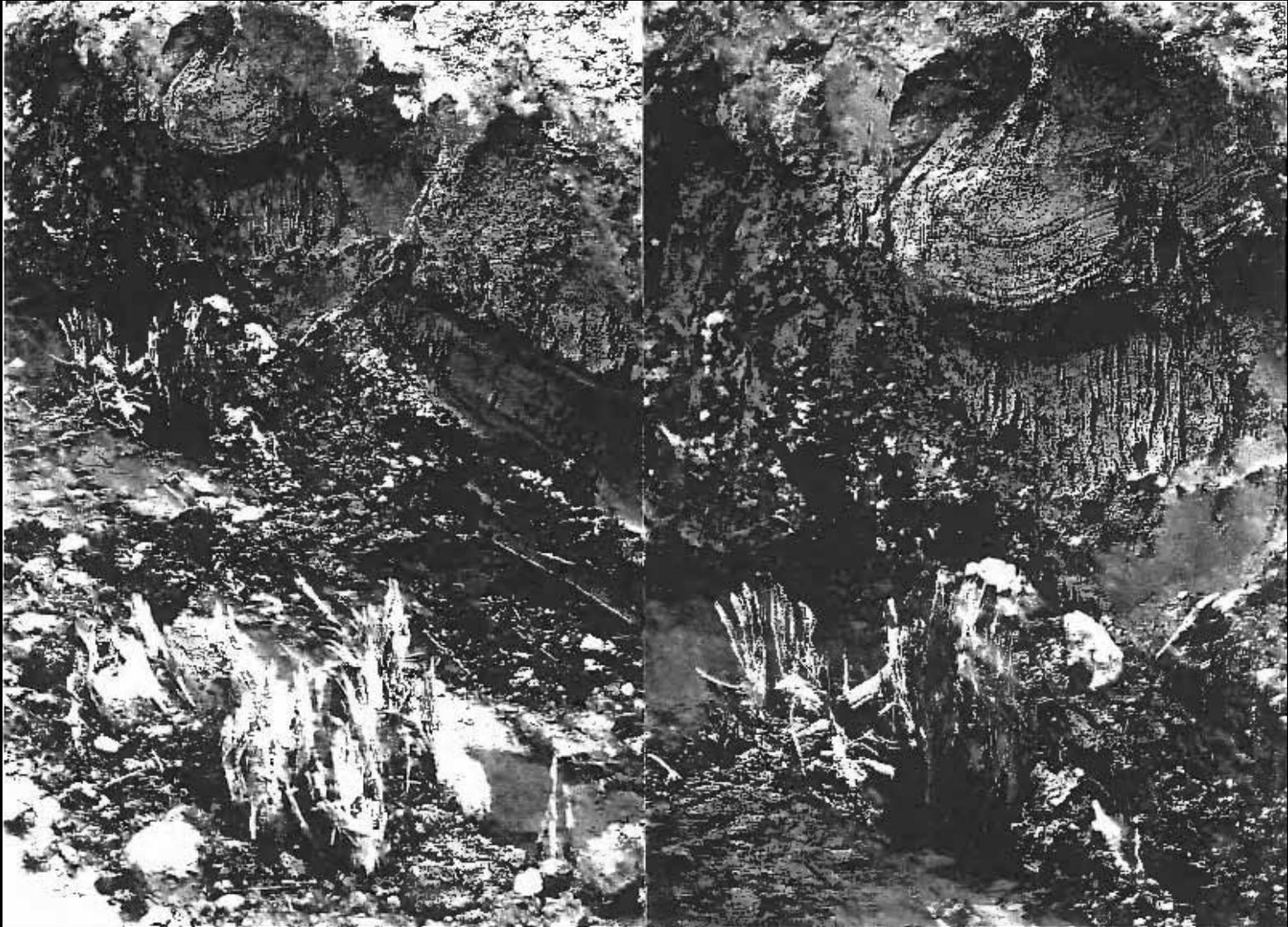


KAHIKATEA kereru, manatu,
lush, older plains ecosystem
&
TOTARA bellbird, matai,
older plains ecosystem



The Nature of Place





Totara stumps 1m below ground under Convention Centre, 1997

**a RARE plant,
well worth sculptural
interpretation**

(gate to tiny urban domestic courtyard)

Muehlenbeckia astonii
(shrubby tororaro / pohuehue shrub)

Tim Galloway

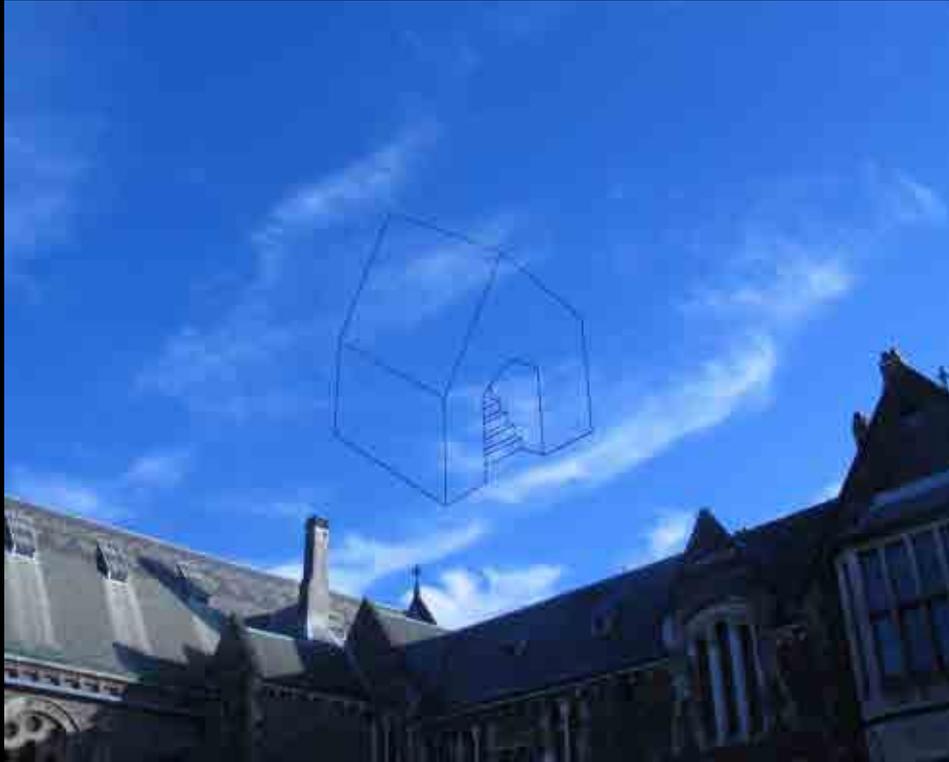


**tapping the underlayers, letting
the ancient flora vent forth...**

'Chalice'
by sculptor Neil Dawson
(Cathedral Square Christchurch)



Clock Tower, Christchurch
re 'remembering nature & culture through art'

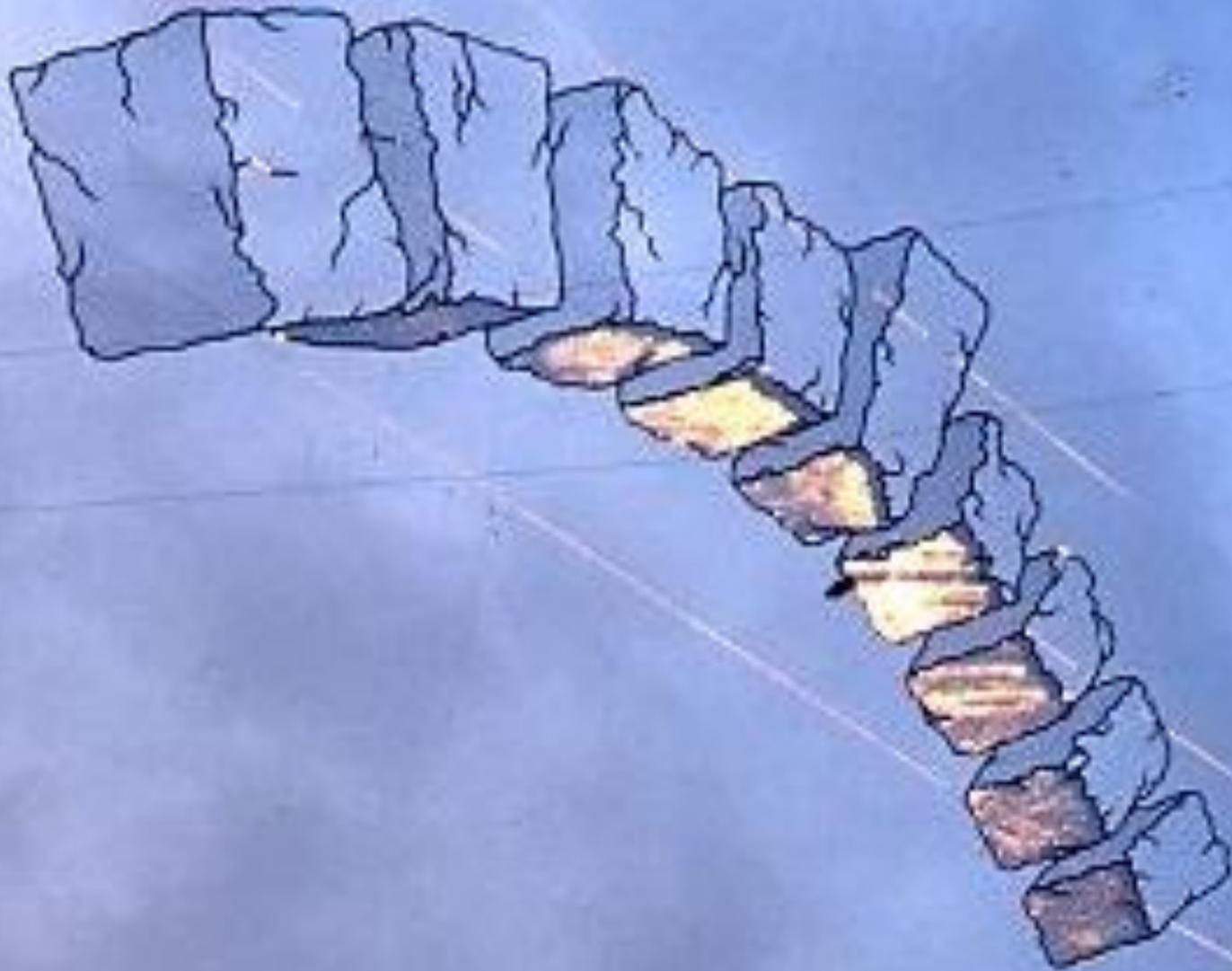


sculpture by Neil Dawson

'Caught in the Act of Losing You –
'*Sporadanthus Ferrugineus*'



sculpture by Colleen Priest

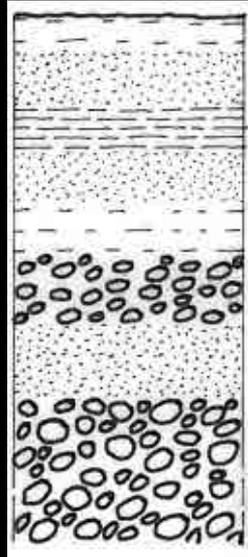
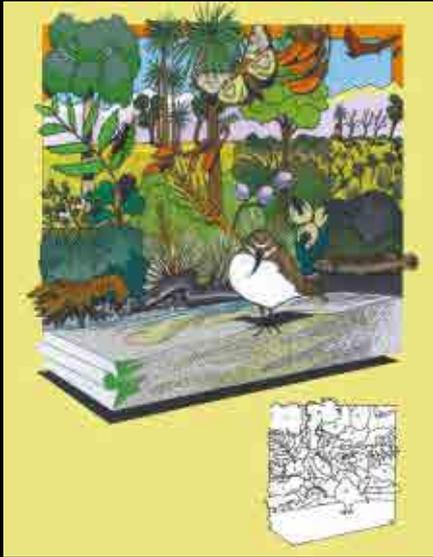


Neil Dawson "Nor-west Arch"

Underlayers to the Provincial Buildings

- landforms, waterway, biota
- Puari
- building stone
- timber planks
- ritual, memories & stories

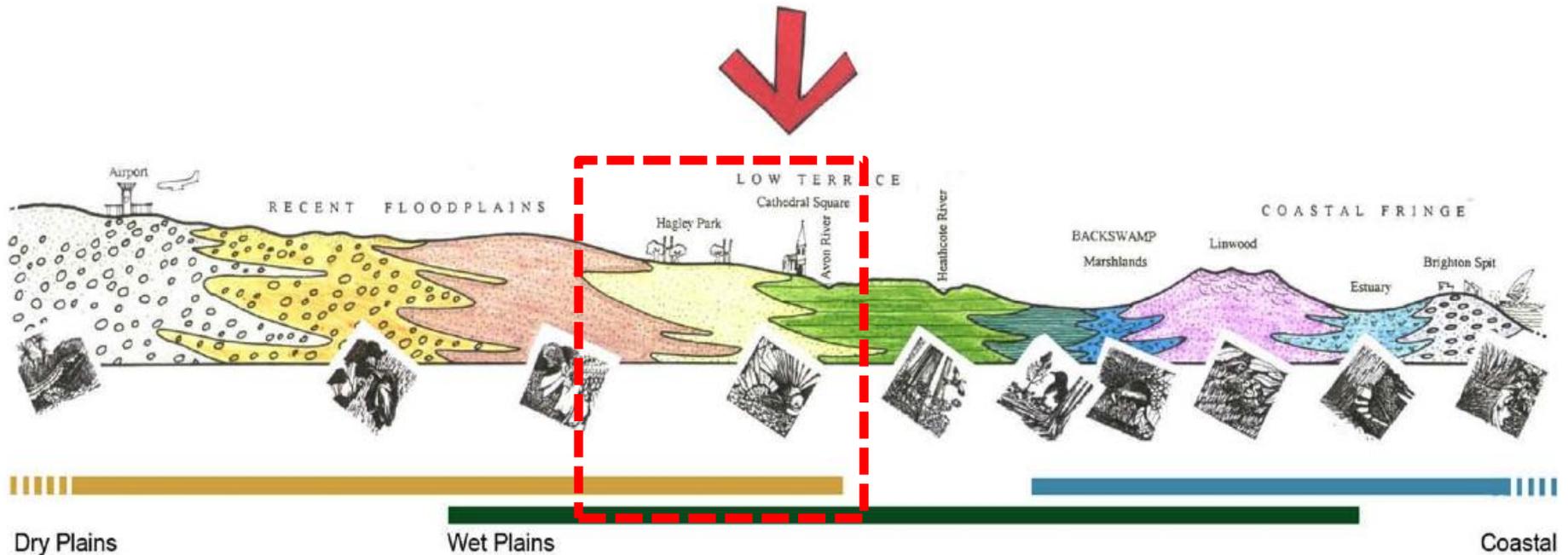




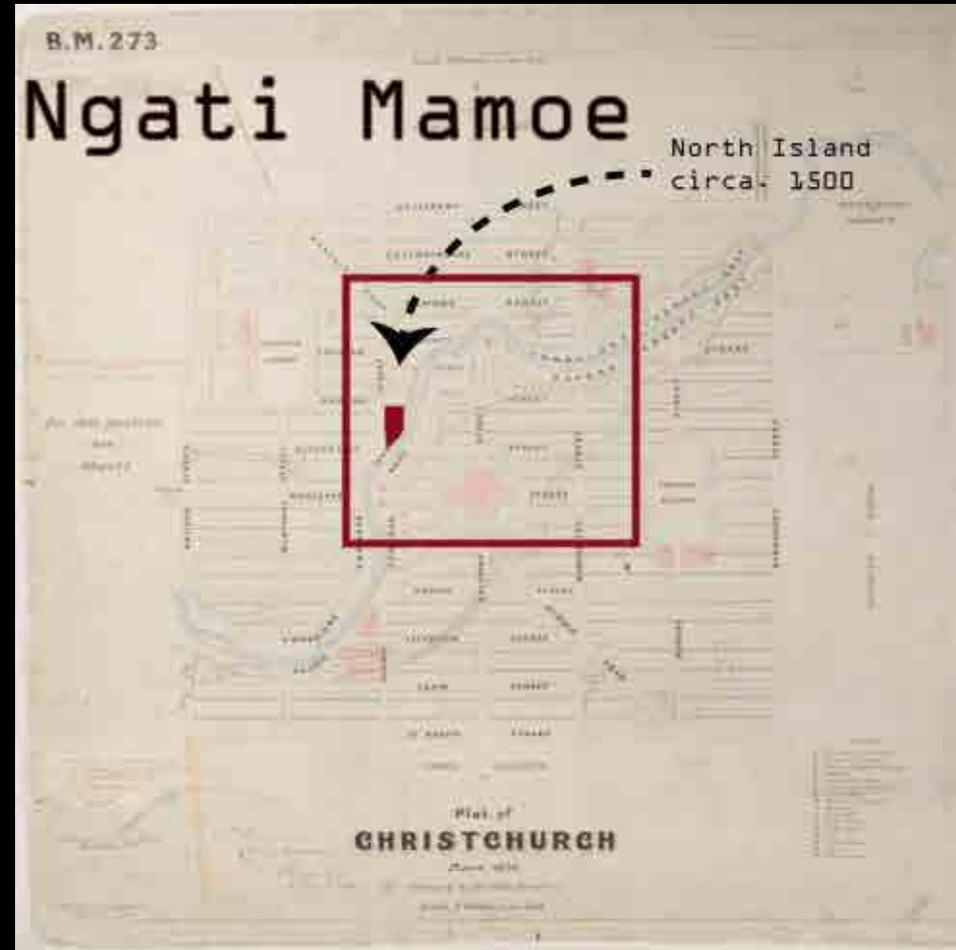
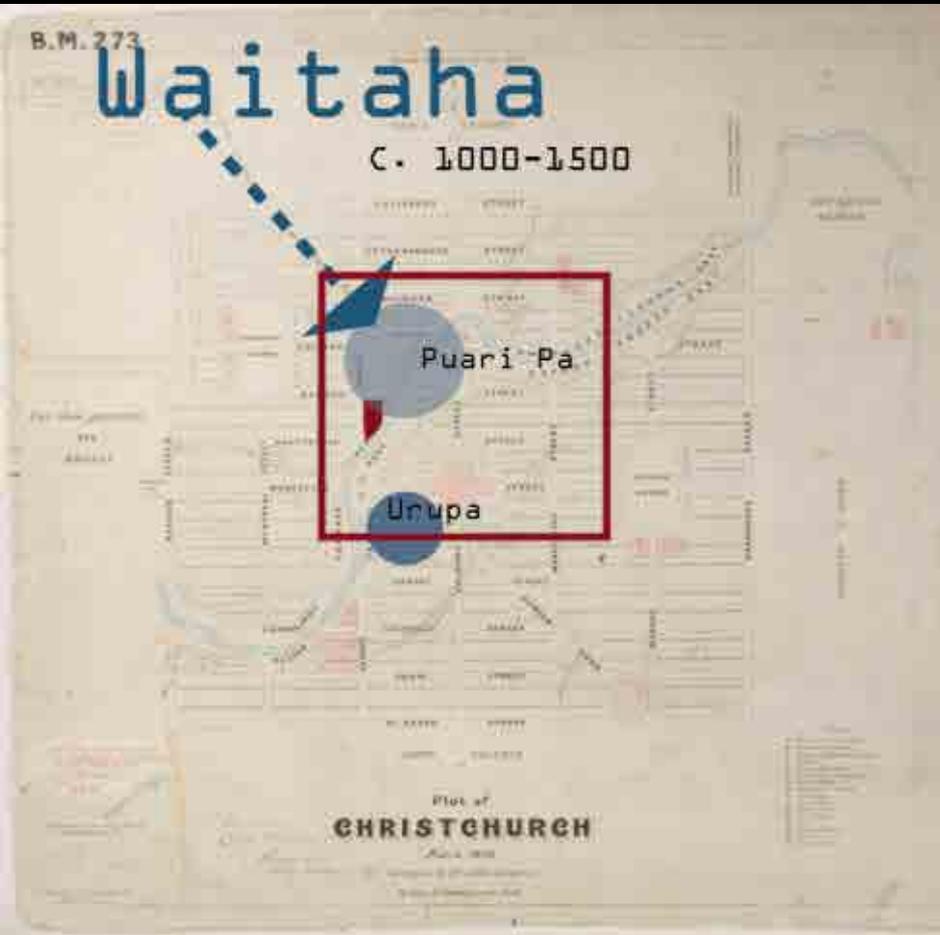
Natural Forms

HOUHERE – piwakawaka - kohuhu,
mid age plains system

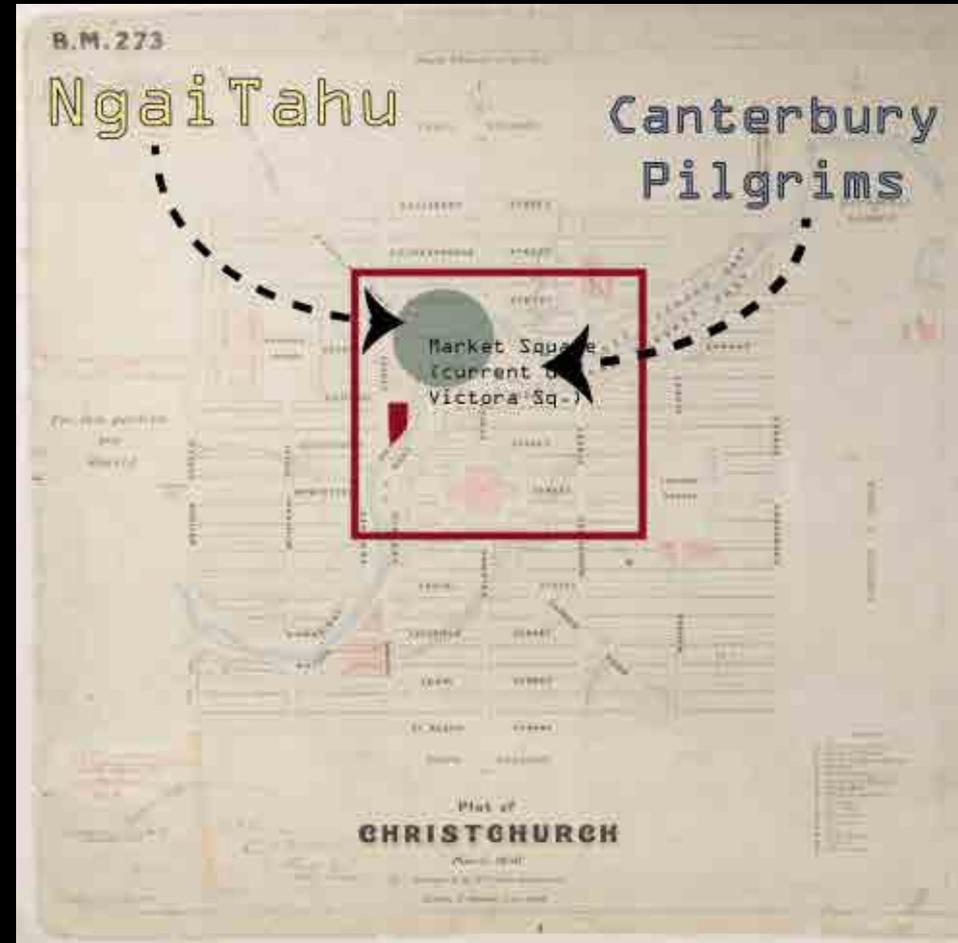
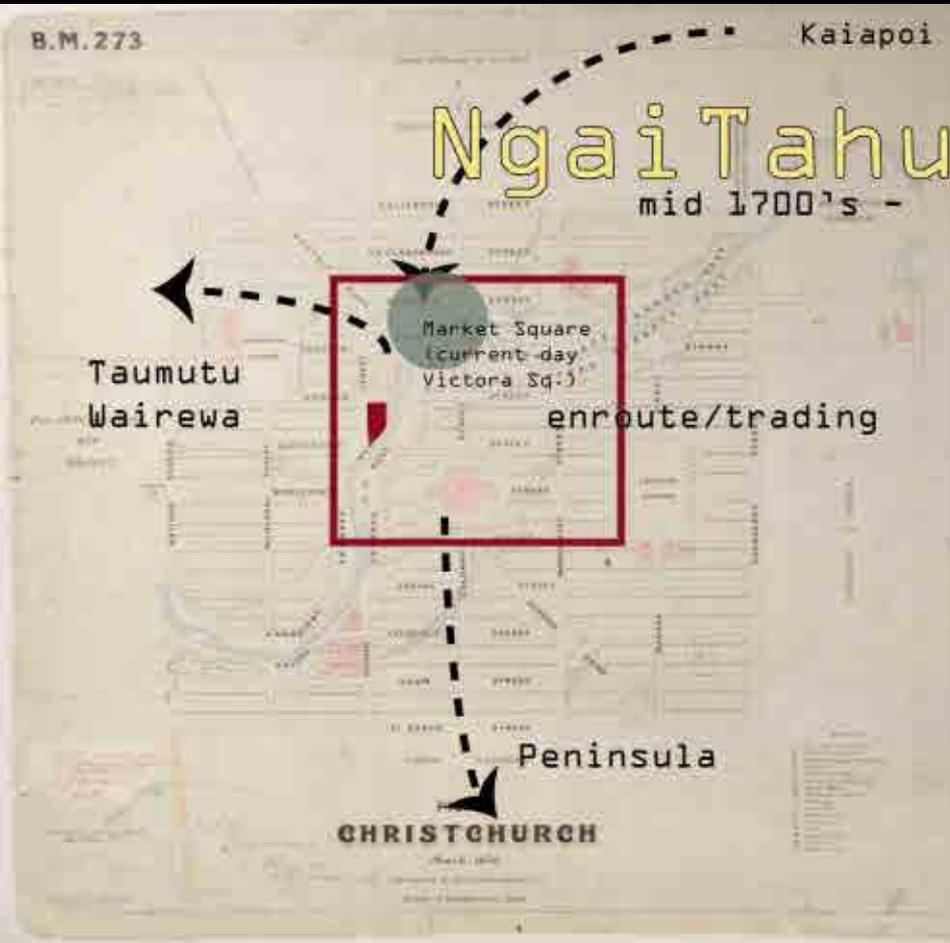
Underlayers: Alternating silt & sand (minor clay)
on greywacke river stones (2-100mm rounded)
on sand on more stones



Human relationship with landscape



Human relationship with landscape



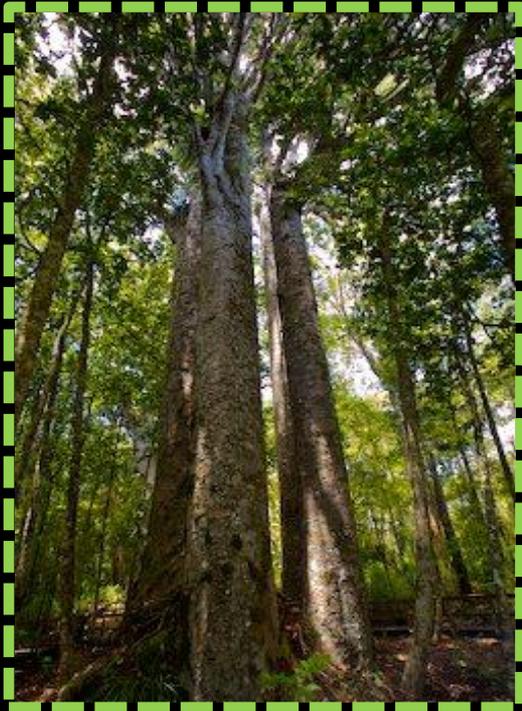
Stones of the Provincial Buildings

- basecourse green Heathcote trachyte
- walls of Port Hills trachyte
- facings of Oamaru limestone



Timbers of the Provincial Buildings

Rimu from Banks Peninsula
& Oxford in the
Canterbury Plains



Kauri came from the
North Island



R u i n s of the Provincial Buildings' Stone Chamber



Ninfa, Italy





Ninfa, Italy

lets ROC!
(Renew Our City)



Lucas Associates



Registered
R.L.A.
Landscape
Architect