

Wairau Plain Landscape Concept
GUIDELINES



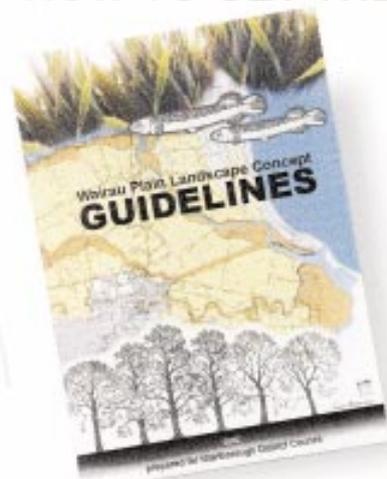
Lucas Associates

2002
prepared for Marlborough District Council

Wairau Plain Landscape Concept A VISION AND HOW TO GET THERE...



THE PLAN
(including **GUIDELINES**)



GUIDELINES
(this document)



THE ANALYSIS

Produced by the core team of:



Lucas Associates

Di Lucas, Ines Stäger, Jeremy Head
Marokapara
351 Manchester Street
Otautahi Christchurch
tel. (03) 365 0789
fax. (03) 365 0798
email. Lucas.chch@xtra.co.nz



co-ordinated by Ian Shapcott
Environmental Policy Group
Marlborough District Council
P.O. Box 443
Seymour Square
BLLENHEIM
tel. (03) 578 5249
fax. (03) 578 6866
email. Ish@marlborough.govt.nz
mdc@marlborough.govt.nz
website. www.marlborough.govt.nz

plus many local helpers through the participative process, May - August 2002

native plant species lists compiled with the assistance of the
Department of Conservation, South Marlborough Area Office



WHY GUIDELINES?

Considerable public concern has been expressed at large vineyard expansion causing rapid landscape change on the rural Wairau Plain. A key concern is the loss of trees. As a result, the Marlborough District Council resolved to develop a landscape concept plan.

A community consultation process has been undertaken to clarify issues and identify possible solutions. The concerns are generally about management of developed private land. People want more, and more diverse, vegetation in the area. Looking after the landscape and ecology of the Wairau Plain is considered of local and international importance.

The Council does not wish to dictate what vegetation people either establish or remove. Rather than a "Master Plan" trying to dictate what is wanted, Guidelines have been developed to encourage and guide Plain's landowners in their plantings and vegetation management. Landowners are encouraged to each take some responsibility for the character and health of the Wairau Plain landscape.

Sketches are included of various opportunities for plantings, particularly in the vineyards, along waterways and roads (pages G5-12). As well as native plants, a list of exotic deciduous trees is proposed for use on the Plain (pages G31-32). The preferred conditions and potential tree heights are noted.

This Guidelines booklet is intended for use in the field, to be a practical hands-on guide. It tells you what sorts of plants to purchase for different conditions, and then it tells you how to prepare, plant and manage them (pages G30,G35-36). Finally, there is a guide to what you don't want - the pest plants (pages G37-39), the ones to avoid, even if you are given them!

The Guidelines address the band of Rural 3 Zone land, from the Wairau River along the northern boundary to the Wither Hills on the south; and, from the Waihopai River to the coast. The Guidelines recognise that the characteristics of this Plain area varies from dry plains to very wet, and, from alluvial lands to dunes. To provide practical guidance as to the desired landscape character, the Plain has been divided into four types of country:

- DRY PLAIN seaward of the Waihopai River down to Rapaura and St. Leonards;
- SPRING COUNTRY around Blenheim and down to about S.H.1;
- OLD DUNE COUNTRY from S.H.1 down to Rarangi; and,
- COASTAL LANDS toward the shore of Cloudy Bay.

These types of country have been mapped (page G14) and the guidance recognizes these differing conditions. For each of these types of country, the native plants that belong there have been identified. Thus, if people want to recreate natural stream-sides or patches of woodland, shrubland,

grassland or forest, the appropriate local native species are all listed for each type of country (pages G16-28). Instead, you may want to develop non-natural designs but using species chosen from these lists.

A 'short list, a list of 24 native plant species that should suit anywhere on the Wairau Plain, has been included too (page G15). This list, with 9 trees, 5 shrubs and 10 different groundcovers (including grasses and ferns), provides a useful palette for all types of designs, whether naturalistic, formal or modernist. The accompanying notes provide lots of information on the look and usefulness of each plant. As a suggestion, plants from the 'short list' are shown in a sample planting design (page G11), which groups and masses the different species.

The Plain has such a complex network of waterways of various types that a specific guide for stream management has been included (page G13). Then there are plant lists specifically for native riparian planting (pages G33-34). Most of the waterways have been modified and have cleared banks. There are extensive opportunities for more vegetated riparian zones to help prevent contaminants washing into streams, to provide shade to reduce weed growth and improve fish habitat, and, to provide vegetated corridors through the landscape.

For all the native plant lists, there are "tolerance" charts, showing how much each plant tolerates sun, shade, moist, dry or windy sites. Because some species can cope with being planted out in an exposed open site, a guide is included as to whether a species is for use as a "first stage" or a "second stage" planting. A second stage plant needs to be planted in amongst existing vegetation that provides shelter. So in an open area, plant the 1st stage plants, and a few years later establish the 2nd stage plants in their shelter. Perhaps just pop the 2nd stage plants in between the established ones.

With each landowner making an effort to provide maximum non-crop vegetation on their land - not just grapes! - then the Wairau Plain can be enriched and made more healthy ecologically and a more attractive and interesting landscape. So, enjoy your planting.

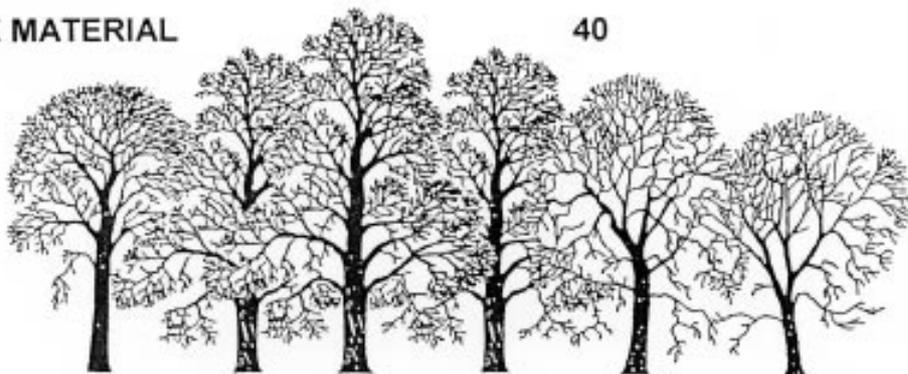
Wairau Plain Landscape Concept **GUIDELINES**

This document is a hands-on practical guide to be used 'in the field'. It divides the Wairau Plain into 4 different landscape types based on landform and soil type and provides informative native and exotic plant lists for each. It suggests some basic planting styles and advice on planting technique and maintenance. Alternative landscape treatment of the waterways has also been addressed. This **GUIDELINES** booklet enables the individual to work on a level great or small to progress towards realising the vision for the Wairau Plain as developed during the public participative process.

It is important to note that at any time there may be rules in the Operative Resource Management Plan that limit or direct the ability to plant beside watercourses

CONTENTS

	Page
A WAIRAU PLAIN VISION	5,6
PLANTING OPPORTUNITIES	7,8
PLANTING SHELTER IDEAS	9,10
PLANTING OPPORTUNITIES <i>detail</i>	11,12
RIPARIAN TREATMENT	13
TYPES OF COUNTRY MAP	14
NATIVE SPECIES LISTS	
A Short List	15
Dry Plain	16,17
Spring Country	18-20
Old Dune Country	22-25
Coastal Lands	26-28
EXOTIC SPECIES	
Exotic trees - design guidelines	30
Exotic trees planting and management	30
Exotic deciduous trees list	31,32
WATERWAYS REVEGETATION OPTIONS	33,34
MASS PLANTING GUIDELINES	35,36
UNWANTED PLANTS	37-39
REFERENCE MATERIAL	40



Wairau Plain Landscape Concept GUIDELINES

Through a local planning exercise (see described in **The Plan**), long-term visions were suggested for the Wairau Plain landscape. One of the long-term visions is shown below, and the drawing conveys something of this character. Whilst using characteristics that have been or are an important part of this place, the description and image is of a very different character to what is there today.

The many people involved in the planning exercise realise that to achieve such a vision, a lot of different effort by many different parties will be needed. As well as effort by individual persons, co-ordination and co-operation will be valuable.

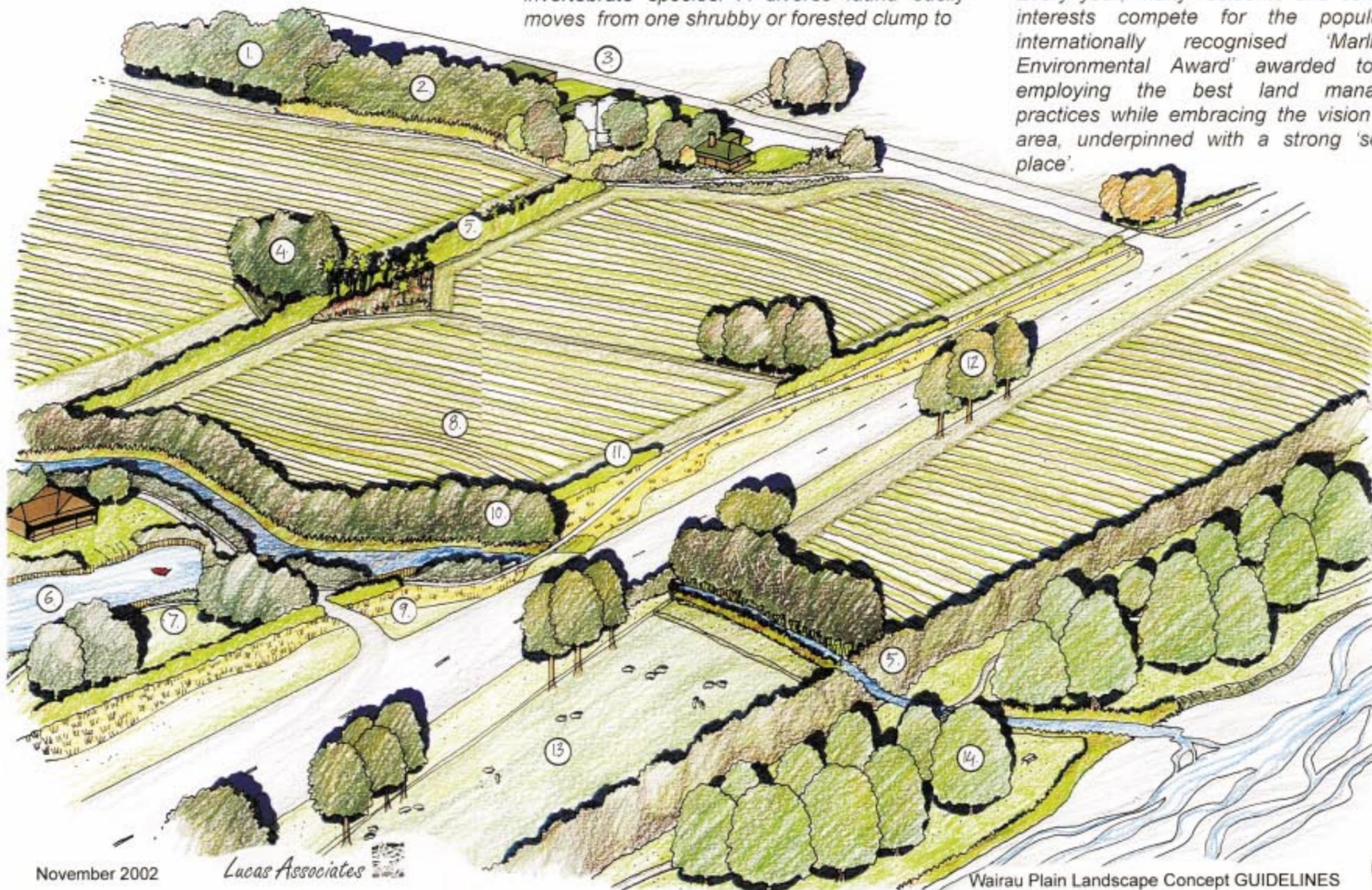
The Guidelines that follow provide some practical advice for persons wanting to make their contribution to achieving this visionary landscape of the Wairau Plain. These Guidelines recognise the diversity of lands, waters and limitations of the Plain.

It is intended the Guidelines be continually added to and updated, that there is support and encouragement to implementing them, and that progress toward achieving the vision be monitored and reported.

The team welcomes feedback on the usefulness of the guidelines, and on where there is room for improvement or the need for further information.

KEY to sketch of 'Vine Country'

- 1 A percentage of each land holding = trees (not forestry)
- 2 Opportunity to plant up effluent disposal areas
- 3 Buildings nestled into 'treed' nodes
- 4 Occasional corners in exotic or native plantings
- 5 Terrace risers planted in native vegetation, providing wildlife corridors and links to riparian strips and other planted clumps
- 6 Creation of water holding areas to reduce the need for drains
- 7 Cycleway and walkway links
- 8 Enhance subtle ground contours – don't flatten during site development
- 9 Road verges planted in 'soft' native planting of low stature, small stemmed (e.g. native grasses)
- 10 Riparian strips planted in native mix to trap nutrients, shade stream, increase habitat and provide strong links through the productive landscape
- 11 Occasional native hedgerows to 'soften' fencelines – leave some gaps to provide vistas.
- 12 Clumps of exotic trees break vineyard monotony and provide 'islands' for wildlife
- 13 Vary land use where possible
- 14 Plant lower wide river terraces in substantial amenity tree planting incorporating picnic areas, cycle / walkways



A Wairau Plain VISION

Imagine arriving in the Wairau Plain, where one is welcomed into a prosperous balanced landscape. A sense of community well being and pride in their place is strongly evident. The land is well managed, productive, and home to a diverse range of activities. Viticulture is by far the most prevalent land use but is tempered with a rich matrix of vegetated waterways, public parks, field copses of healthy exotic and native trees, well-mannered road verge plantings, and clearly responsible and forward thinking farming practices. The many rivers, streams, and small watercourses run clear and weed free, kindly shaded by sinuous ribbons of flax, shrubs, trees and grasses, providing home to a plethora of fish and invertebrate species. A diverse fauna easily moves from one shrubby or forested clump to

the next, which is never far away – strong vegetated corridor links have been formed, nurtured and maintained. Walkways and cycleways are abundant, locals and tourists alike enjoying the scenery, or sampling the local cuisine accompanied by a wide range of world famous wines at the winery stop of your choice.

The many who have been attracted to the Wairau Plain to live, reside in small 'hamlets' on the lower footslopes of the Wither Hills benefiting from expansive seasonally changing views across the plain to the Richmond Range, Wairau River and Cloudy Bay.

Every year, many residents and commercial interests compete for the popular and internationally recognised 'Marlborough Environmental Award' awarded to those employing the best land management practices while embracing the vision for the area, underpinned with a strong 'sense of place'.

sketch ideas

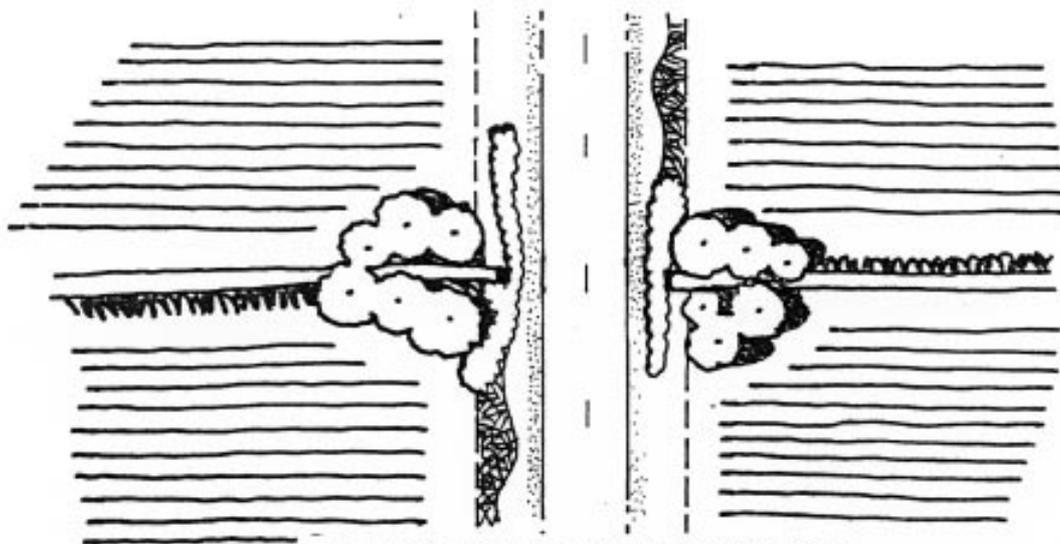
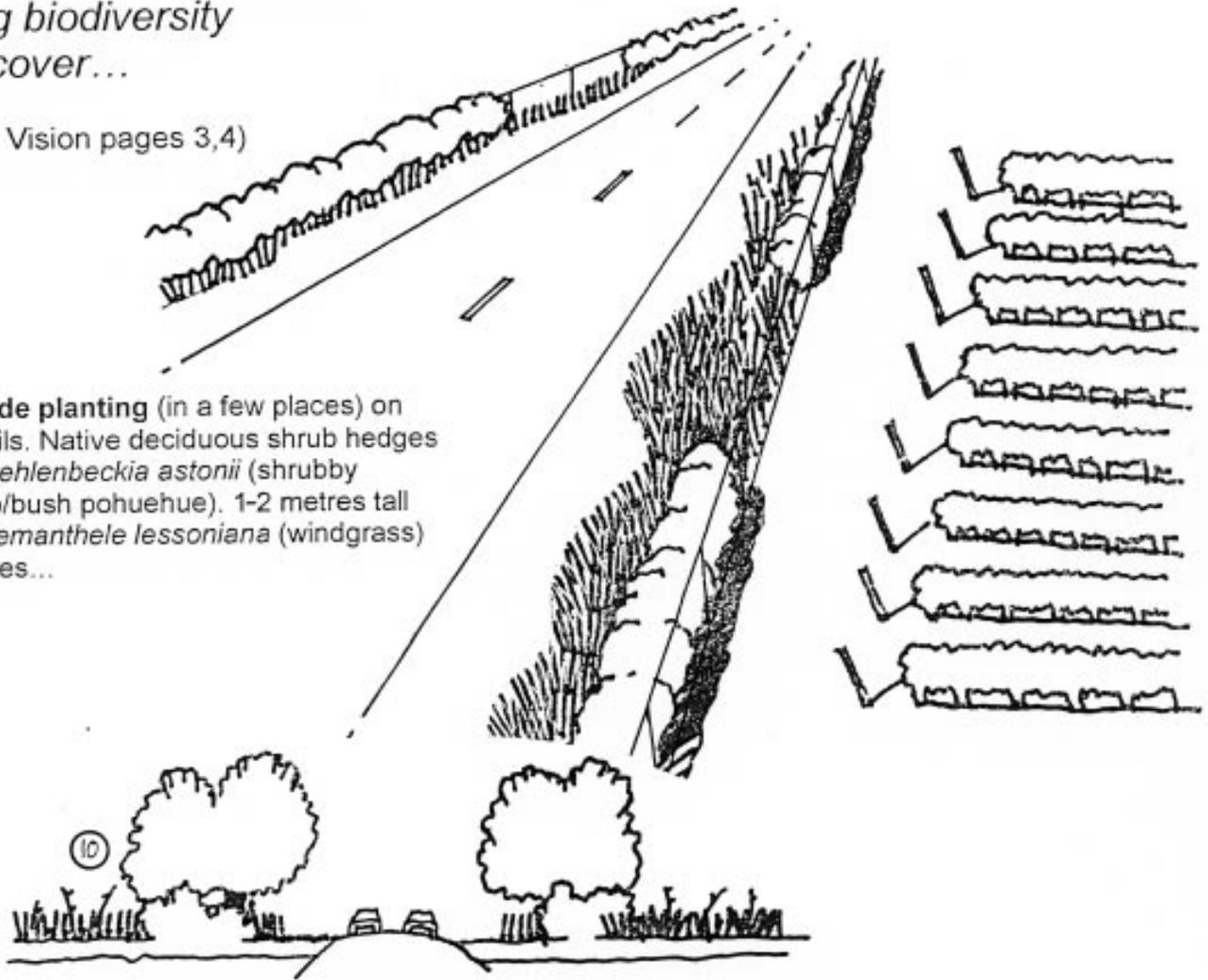
PLANTING OPPORTUNITIES

to contribute to a landscape framework and ecological health, increasing biodiversity and tree cover...

(no's refer to Vision pages 3,4)

9

Roadside planting (in a few places) on drier soils. Native deciduous shrub hedges e.g. *Muehlenbeckia astonii* (shrubby tororaro/bush pohuehue). 1-2 metres tall and *Anemanthele lessoniana* (windgrass) on verges...



10

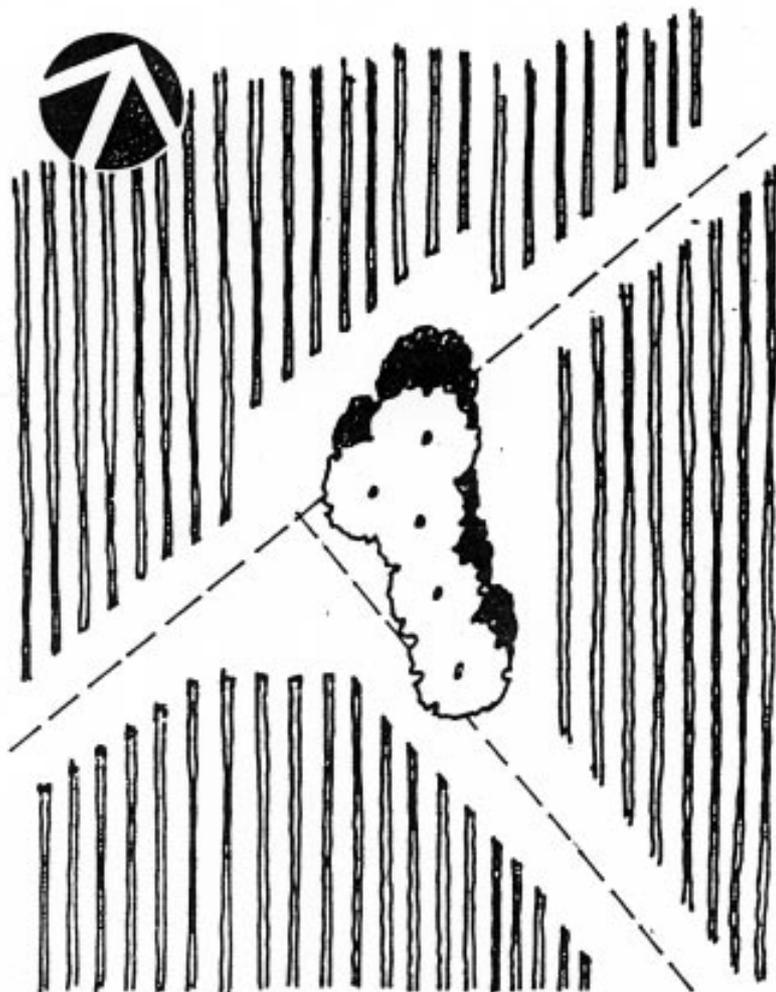
Expanding planting linkages. Continue watercourse under road via a culvert and keep planting going on other side of road along the watercourse...

G7

sketch ideas
PLANTING OPPORTUNITIES

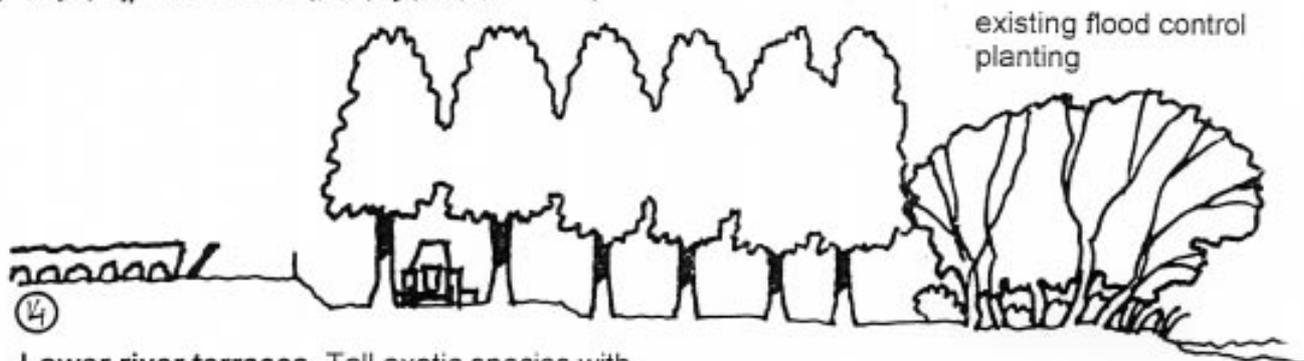
to contribute to a landscape framework and ecological health, increasing biodiversity and tree cover...

(no's refer to Vision pages 3,4)



④

Vineyard copse opportunities. Plant deciduous trees roughly aligned north-south...



④

Lower river terraces. Tall exotic species with clear trunks spaced so that a tractor and mower can maintain...

⑤

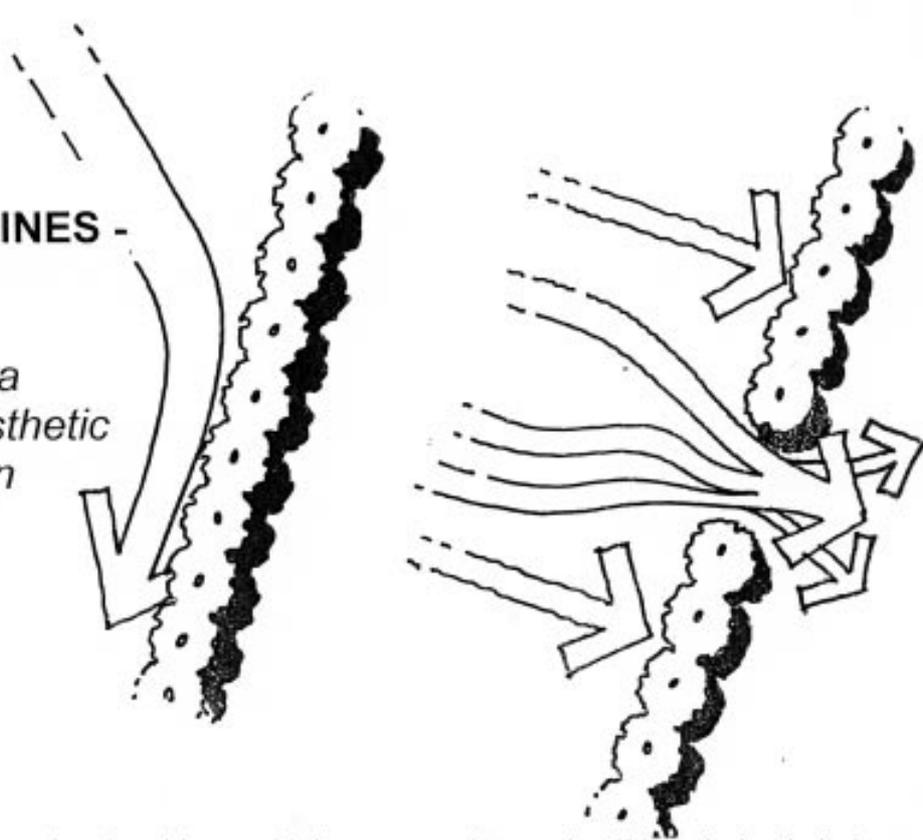
Change of slope planting opportunity. Plant deciduous trees with an underplanting of native grasses...



sketch ideas

PLANTING GUIDELINES - THE ELEMENT OF SHELTER

*to help contribute to a
logical, practical, aesthetic
shelter and specimen
tree framework*



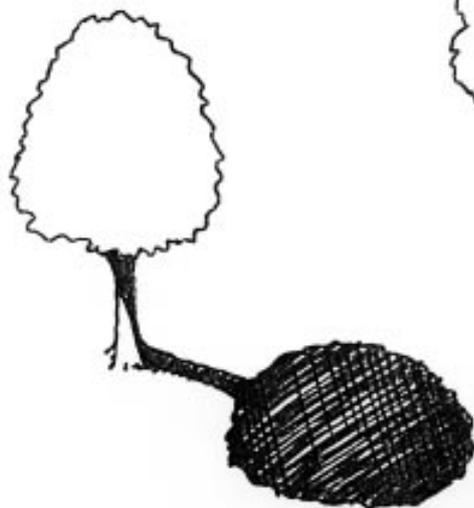
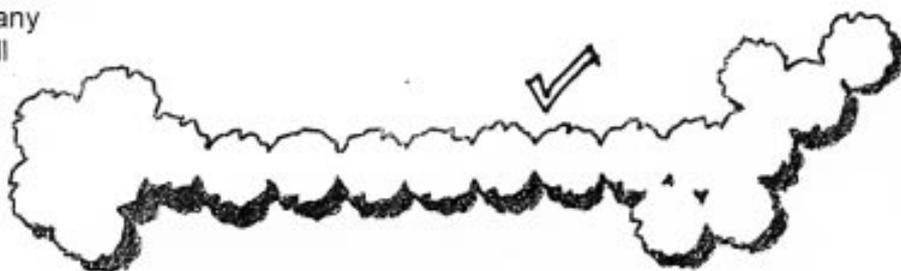
Shelterbelts. Not only are there visual problems with long rows of trees, but if the shelter belt does not lie at right angles to the path of the wind, then the wind can be accelerated along the belt. If the long row is broken by a gap for a gateway or power lines, this gap will become a wind funnel.

Where rows of windbreak planting are required, always try to run them *with* the lines of the land – the valleys, terraces, swales, waterways, soil boundaries, etc. A layout that does not relate to the landform will soon dominate the landscape. Permeable windbreaks of rounded form and soft colour will disrupt the landscape less than windbreaks of dark, dense, formal trees. Generally, broadleaved trees are less disruptive than conifers.

A straight row shelterbelt or roadway planting, should not suddenly start or stop. Each belt needs to be linked with other plantings, having a wider end group, and continue some way in another direction. If only lineal plantings are used, considerable care is needed with their siting as any straight line or geometric shape will become a dominant element



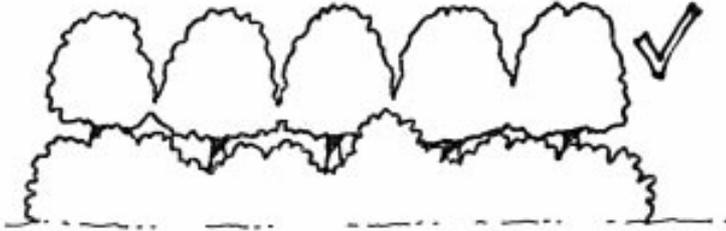
Avoid abrupt, straight shelterbelts



Deciduous trees with clear trunks at least 4m high provide good stock shade. The shade is projected away from the base of the tree and moves around during the day. The stock move with the shadow so that their camping is not concentrated in one place. Winter shade is minimal.



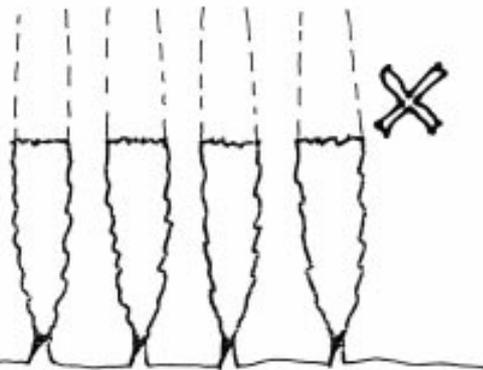
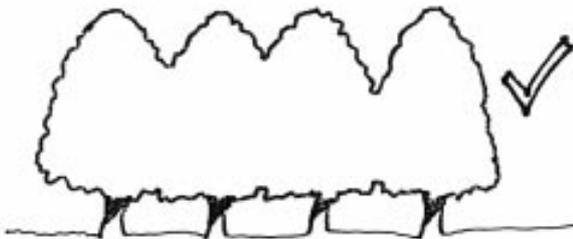
Add lower, denser shelter to the high permeable trees only if absolutely necessary, such as for critical stock or crop shelter. Any density immediately cuts the visual landscape flow (and could pond cold air). Soft form and colour in the lower storey is essential — never use conifers. If an understory is needed, use a mixture of the local native trees and shrubs e.g. South Island kowhai, tarata, kohuhu, manatu, kapuka, karamu, koromiko, mikimiki, shrubby tororaro, taupata, harakeke and toetoe, possibly adding some multi-use exotic plants such as fruiting, bee and stock fodder trees and shrubs.



Fussy, garden-style ornamental trees and shrubs should not be added to shelter belts or roadside plantings as they do not suit the broad rural landscape. Mix species informally in all plantings: never alternate different kinds.



Relatively even tree height is desirable for effective shelter. But avoid topping or hedging trees. Instead, plant trees that will grow to the desired height.



sketch ideas
**PLANTING GUIDELINES -
 THE ELEMENT OF SHELTER**
*to help contribute to a logical,
 practical, aesthetic
 shelter and specimen tree framework*

Expanding planting linkages (detail)

Maximise the planting opportunities wherever you can, and try to create linkages that will benefit both the ecological and the aesthetic.

Try and create a native grouping that has a dense surrounding to discourage predators from entering, and maximise the calm space inside.

When designing the plant layout, work outwards, keeping the long term taller tree species e.g. totara and matai, in the centre amongst other shade tolerant trees and shrubs, graduating outwards to the more hardy trees and shrubs that will tolerate climatic extremes better e.g. manatu, houhere, kohuhu, kapuka, tarata, ti kouka.

As you emerge from the forest 'patch' use the sun-loving smaller leafy and divaricating shrubs, karamu, koromiko, mikimiki and shrubby pohuehue amongst the flax-like plants and finally fringe with a range of low grasses massed separately in clumps, planted closely together and punctuate with the occasional kowhai.

Use soft frangible plants on the road verge such as massed grasses and flax-like plants, and, furthest from the road, cabbage trees in small groupings. On the steeper stream banks inside, mass plant with sedges and hardy shield ferns and at the toe of the bank where the water interface is, plant up with rushes.

This general layout philosophy could apply to any native grouping that one may wish to add to the Wairau Plain.

Plants from the 'SHORT LIST'

code	common name	botanical name
Trees (<i>greater than 5 metres tall</i>)		
H	houhere, narrow-leaved lacebark	<i>Hoheria angustifolia</i>
BL	kapuka, broadleaf	<i>Griselinia littoralis</i>
BM	kohuhu, black matipo	<i>Pittosporum tenuifolium</i> spp <i>tenuifolium</i>
L	lancewood, horoeka	<i>Pseudopanax crassifolius</i>
LR	manatu, lowland ribbonwood	<i>Plagianthus regius</i>
K	South Island kowhai	<i>Sophora microphylla</i>
TL	tarata, lemonwood	<i>Pittosporum eugenioides</i>
TK	ti kouka, cabbage tree	<i>Cordyline australis</i>
T	totara	<i>Podocarpus totara</i>
Shrubs (<i>from 1 to 5 metres tall</i>)		
KA	karamu	<i>Coprosma robusta</i>
HE	koromiko	<i>Hebe salicifolia</i>
MK	mikimiki, mingimingi	<i>Coprosma propinqua</i>
BP	shrubby tororaro/bush pohuehue	<i>Muehlenbeckia astonii</i>
TP	taupata (pre-European introduction)	<i>Coprosma repens</i>
Groundcovers & flax-like plants (<i>less than 3 metres tall</i>)		
BG	bamboo grass, windgrass	<i>Anemanthele lessoniana</i>
C	carex	<i>Carex comans</i>
C	carex	<i>Carex testacea</i>
	harakeke, NZ flax	<i>Phormium tenax</i>
NZI	NZ iris, mikoikoi	<i>Libertia ixioides</i>
P	pukio, makura, tussock sedge	<i>Carex secta</i>
SF	shield ferns; pikopiko; puniu	<i>Polystichum richardii</i> ; <i>P. vestitum</i>
ST	silver tussock, wiwi	<i>Poa cita</i>
	toetoe	<i>Cortaderia richardii</i>
	wiwi, giant rush	<i>Juncus pallidus</i>

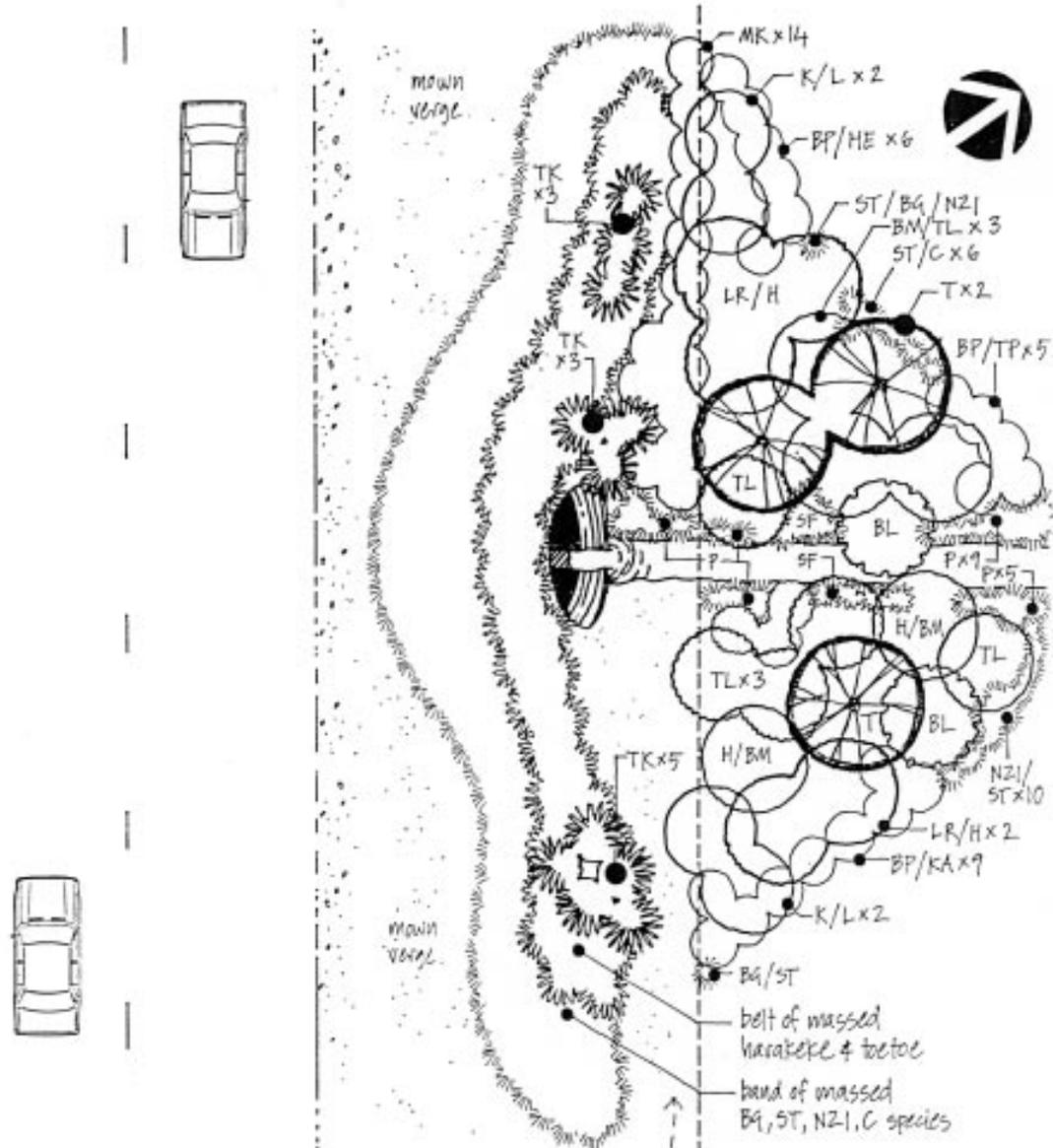
sketch ideas

PLANTING OPPORTUNITIES

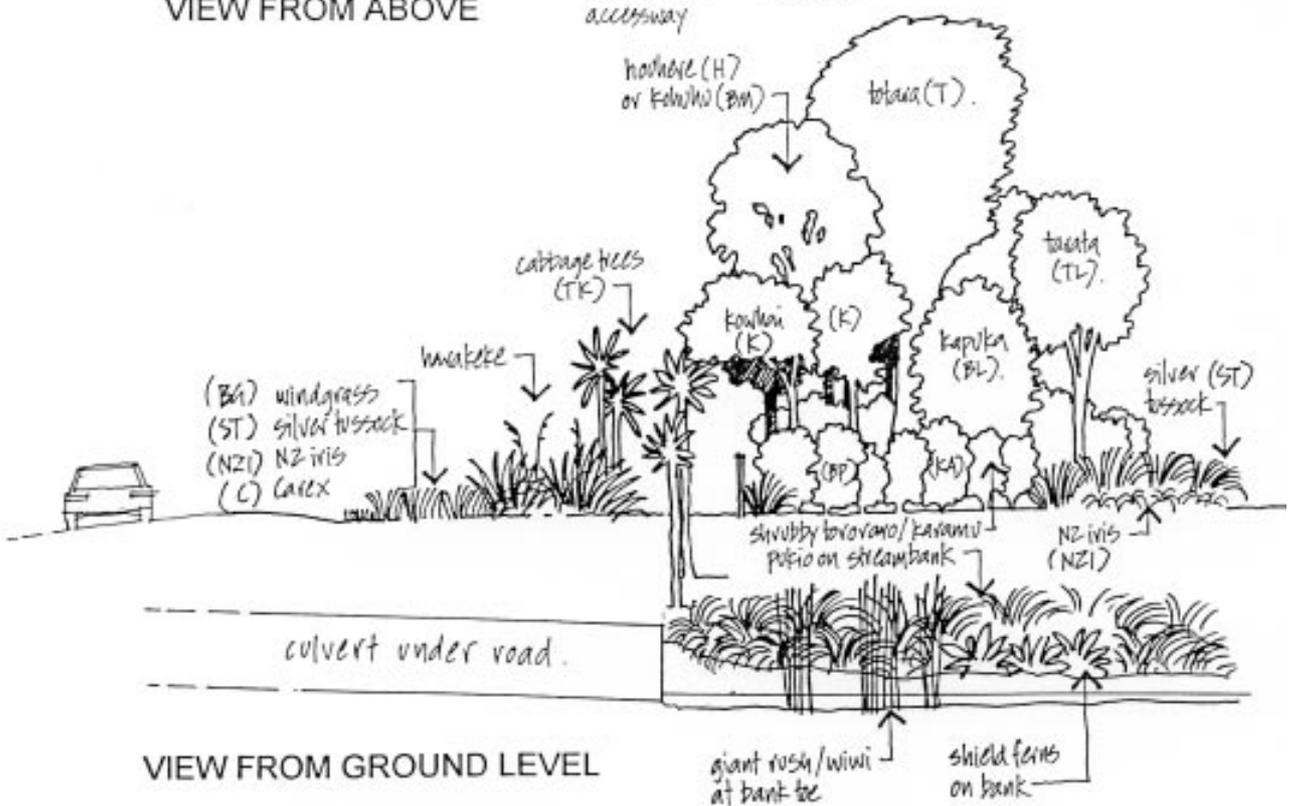
*to contribute to a landscape framework and ecological health,
increasing biodiversity and tree cover...*

(in reference particularly to point 10, 'A Wairau Plain Vision' pages 5 6)



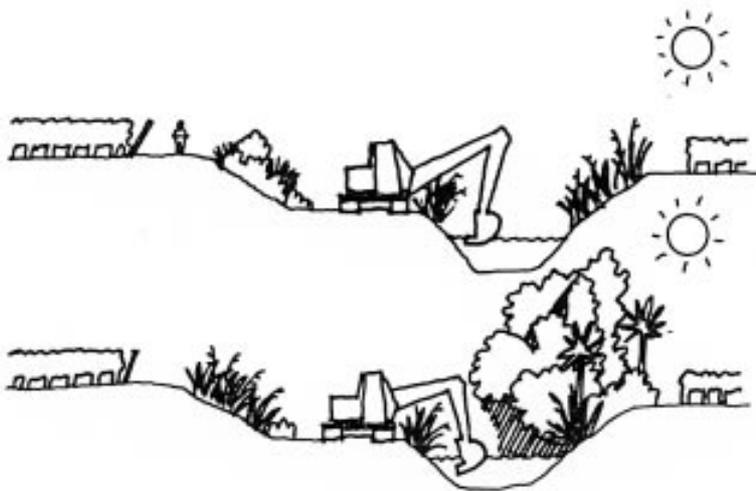


VIEW FROM ABOVE



VIEW FROM GROUND LEVEL

sketches illustrating RIPARIAN TREATMENT for various types of waterways



Large waterways

Good

- Planting on 'non-productive' slopes
- Leave terrace open for access to maintain
- Potential cycleway on level above

Better

- Full riparian corridor on northern side to shade stream as much as possible



Typical existing situation

- Narrow slot drain, steep sided
- Little opportunity for riparian planting
- Closely fenced, very little shade
- Minimum habitat value
- Minimal buffers to nutrient runoff

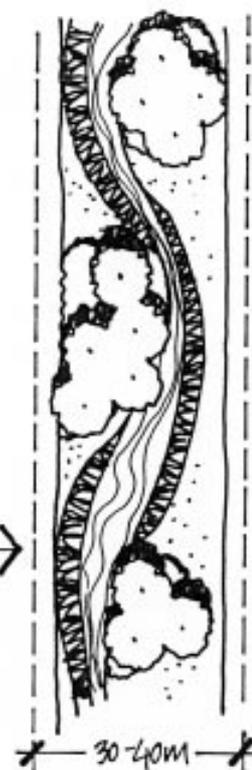


Small waterways

- Plant in clumps and drifts to enable access points for maintenance work
- Plant in between clumps with low grasses e.g. flax / sedges

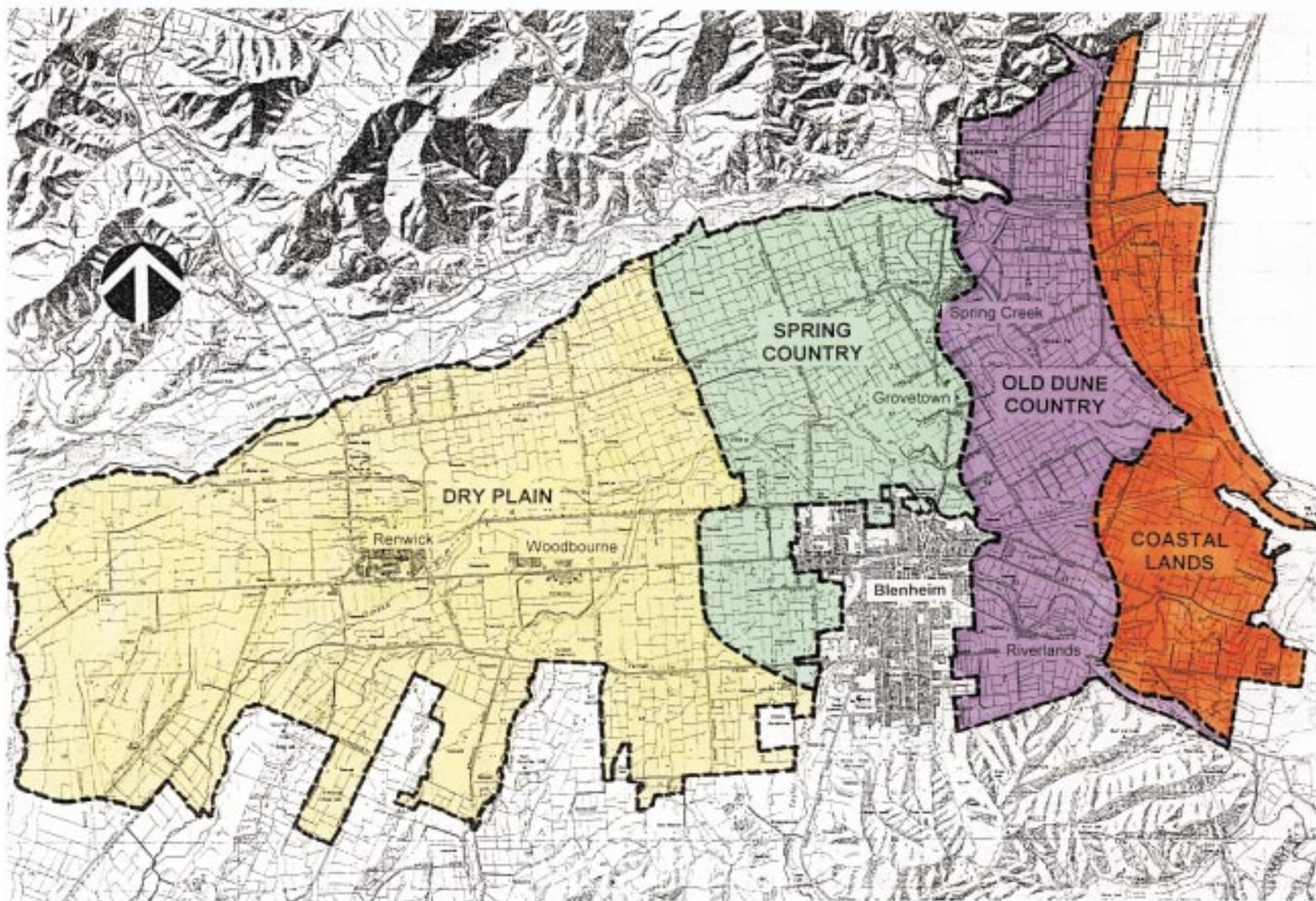
Potential situation

- Widen corridor and encourage meanders to reestablish; *through excavation (initially), then natural processes*
- Increased scope for larger scale shade planting etc. in clumps
- Semi-continuous belts of flax/sedges on banks
- Keep areas for sporadic access with excavator



Wairau Plain
Landscape Concept GUIDELINES

TYPES OF COUNTRY



NATIVE PLANTS FOR THE WAIRAU PLAIN

the 'short list' of recommended species to use in all types of country...

common name	botanical name	food	tolerances					use	notes	
			sun	shade	moist	dry	wind			
TREES (greater than 5 metres tall)										
houhere, narrow-leaved lacebark	<i>Hoheria angustifolia</i>	F,I	■	½	■	■	■	1 st	AQFUSJ	
kapuka, broadleaf	<i>Griselinia littoralis</i>	F,B,N,I	■	■	■	■	■	2 nd	ALHS	
kohuhu, black matipo	<i>Pittosporum tenuifolium</i> spp <i>tenuifolium</i>	F,I	■	■	■	■	■	1 st	QUHS	
lancewood, horoeka	<i>Pseudopanax crassifolius</i>	F,B,N,I	■	½	■	■	■	2 nd	AQUJ	
manatu, lowland ribbonwood	<i>Plagianthus regius</i>	F,I	■	½	■	■	■	1 st	AQDFUHS	
South Island kowhai	<i>Sophora microphylla</i>	N	■	½	½	■	■	2 nd	½DFJT	
tarata, lemonwood	<i>Pittosporum eugenioides</i>	F,I	■	■	½	■	□	1/2	AQULHS	
ti kouka, cabbage tree	<i>Cordyline australis</i>	F,N,I	■	½	■	■	■	1 st	AQFUP	
totara	<i>Podocarpus totara</i>	F,N,B,I	■	■	■	■	■	2 nd	AUHS	
SHRUBS (from 1 to 5 metres tall)										
karamu	<i>Coprosma robusta</i>	F	■	■	■	■	■	1 st	QBHS	
koromiko	<i>Hebe salicifolia</i>	I	■	½	½	½	■	1 st	QFHT	
mikimiki, mingimingi	<i>Coprosma propinqua</i>	F,I,L	■	■	■	■	■	1 st	AQBHST	
shrubby tororaro/bush pohuehue	<i>Muehlenbeckia astonii</i>	F,N,L	■	□	½	■	■	1 st	AQDHT	
taupata (pre-European introduction)	<i>Coprosma repens</i>	F	■	■	■	½	■	1 st	AQLBH	
GROUNDCOVERS & FLAX-LIKE PLANTS (less than 3 metres tall)										
bamboo grass, windgrass	<i>Anemanthele lessoniana</i>		½	■	■	½	½	1 st **	AQJ	
carex	<i>Carex comans</i>	F	■	½	□	■	■	1 st	AQJ	
carex	<i>Carex testacea</i>		■	□	□	■	■	1 st	AQJ	
harakeke, NZ flax	<i>Phormium tenax</i>	N,L	■	□	■	■	■	1 st	AQFHS	
NZ iris, mikoikoi	<i>Libertia ixioides</i>	F	½	■	■	■	■	1 st	AQFBJ	
pukio, makura, tussock sedge	<i>Carex secta</i>		■	½	■	□	□	W	1 st	AQ
shield ferns; pikopiko; puniu	<i>Polystichum richardii</i> ; <i>P. vestitum</i>		½	■	■	□	□		2 nd	AJ
silver tussock, wiwi	<i>Poa cita</i>	F	■	□	■	■	■		1 st	AQFJ
toetoe	<i>Cortaderia richardii</i>		■	□	■	■	■		1 st	AQFHS
wiwi, giant rush	<i>Juncus pallidus</i>		■	½	■	½	■	W	1 st	AQFJ

KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foliage; I = Insects. L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

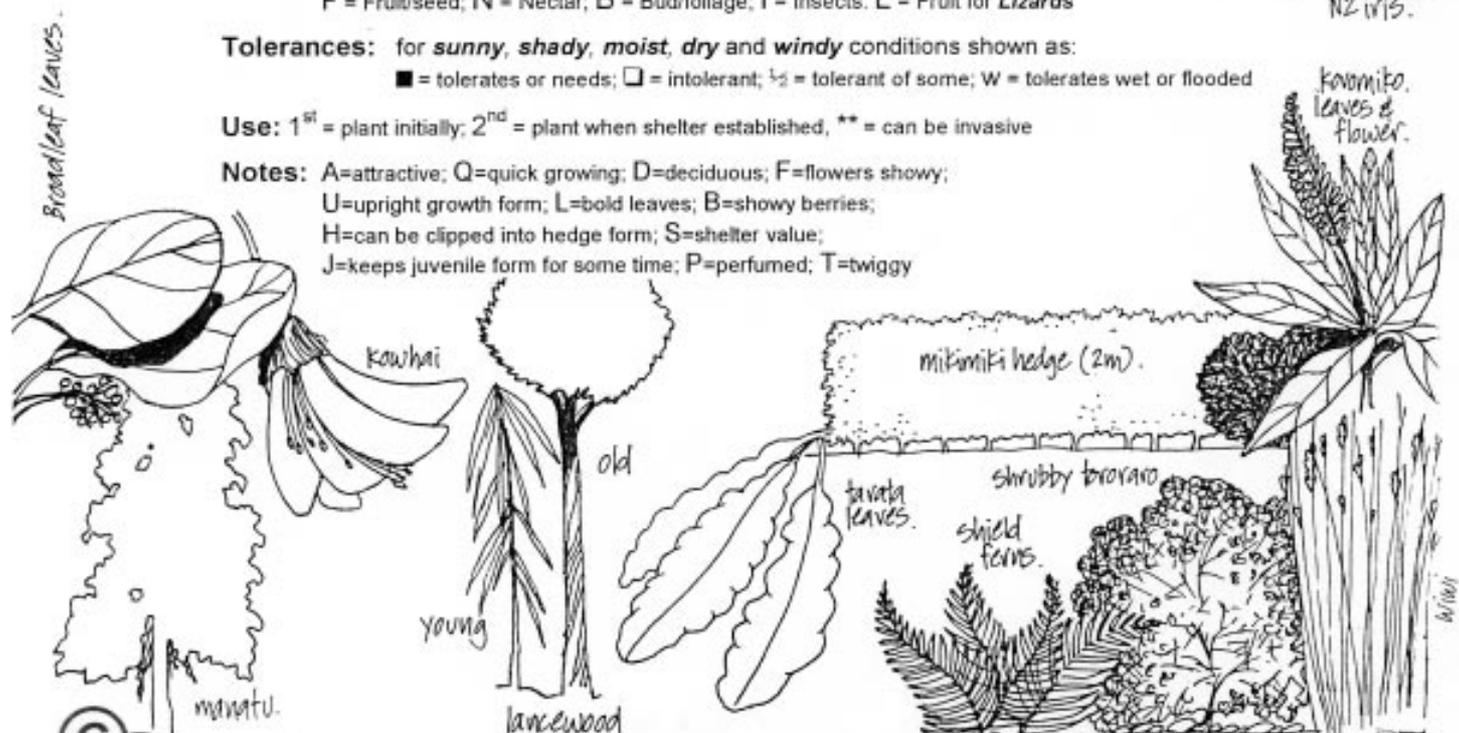
Use: 1st = plant initially; 2nd = plant when shelter established, ** = can be invasive

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy;

U=upright growth form; L=bold leaves; B=showy berries;

H=can be clipped into hedge form; S=shelter value;

J=keeps juvenile form for some time; P=perfumed; T=twiggly



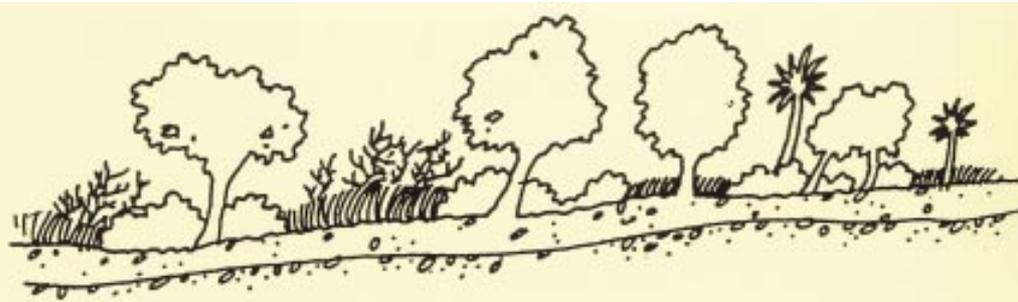
Wairau Plain
Landscape Concept **GUIDELINES**

DRY PLAIN



DRY PLAIN

Plants of the Kowhai, Pohuehue, Tussocklands Ecosystem



botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
SMALL TREES (between 5 & 8 metres tall)									
<i>Cordyline australis</i>	ti kouka, cabbage tree	F,N,I	■ ½	■	■	■	■	1 st	AQFUP
<i>Discaria toumatou</i>	matagouri	I	■ □ ½	■	■	■	■	1 st	FSPT
<i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark	F,I	■ ½	■	■	■	■	1 st	QFUHS
<i>Kunzea ericoides</i>	kanuka	N,I	■ □	■	■	■	■	1 st	FUHS
<i>Leptospermum scoparium</i>	manuka	N,I	■ □	■	■	■	■	1 st	FUHS
<i>Olearia avicenniifolia</i>	akiraho, golden akeake	I	■ □ □	■	■	■	■	1 st	FHS
<i>Olearia paniculata</i>	akiraho, golden akeake	I	■ □ □	■	■	■	■	1/2	
<i>Pittosporum tenuifolium</i> <i>ssp tenuifolium</i>	kohuhu	F,I	■	■	■	■	■	1 st	QUHS
<i>Plagianthus regius</i>	manatu, lowland ribbonwood	F,I	■ ½	■ ½	■	■	■	1 st	AQDFUHS
<i>Pseudopanax ferox</i>	fierce lancewood		□	■	■	□	□	2 nd	AQULJ
<i>Sophora microphylla</i>	South Island kowhai (<i>toxic</i>)	N	■ ½	½	■	■	■	2 nd	½DFJT
SHRUBS (from 1 to 5 metres tall)									
<i>Carmichaelia australis</i> var "ovata"	NZ broom, makaka	F,I	■ □ □	■	■	■	■	2 nd	J
<i>Carmichaelia carmichaeliae</i>	NZ broom, makaka	F,I	■ □ ½	½	■	■	■	2 nd	J
<i>Coprosma crassifolia</i>		F,N,L	■ ½	■	■	■	■	1 st	QBHJT
<i>Coriaria arborea</i>	tutu (<i>toxic</i>)	F	■ ½	■	■	■	■	1 st *	
<i>Corokia cotoneaster</i>	korokio	N	■ □ ½	■	■	■	■	1 st	AFHT
<i>Cyathodes juniperina</i>		F	□ ½	■	■	□	■	1 st	
<i>Helichrysum lanceolatum</i>			■ □ □	■	■	■	■	2 nd	F
<i>Heliohebe hulkeana</i> <i>ssp hulkeana</i>	NZ lilac	F	■ ½	■ □ □	■	■	■	2 nd	QFHT
<i>Melicytus</i> "waipapa bay"	porcupine shrub	F,L	■ □ □	■	■	■	■	2 nd	JT
<i>Muehlenbeckia astonii</i> (nr)	shrubby tororaro/bush pohuehue	F,N,L	■ □ ½	■	■	■	■	1 st	AQDHT
<i>Muehlenbeckia complexa</i>		F,N,L	■ □ ½	■	■	■	■	1 st	BHJ
<i>Ozothamnus leptophyllus</i> (<i>Cassinia</i>)	tauhinu, cottonwood	I	■ □	■	■	■	■	1 st	
<i>Sophora prostrata</i>	prostrate kowhai (<i>toxic</i>)	N	■ □	■	■	■	■	2 nd	JT
<i>Urtica ferox</i>	tree nettle (<i>toxic</i>)		□	■	■	□	□	2 nd *	L
GROUNDCOVER TUSSOCKS (less than 1 metres tall)									
<i>Anemanthele lessoniana</i>	bamboo grass, windgrass		½	■	■	½	½	1 st **	AQJ
<i>Coprosma acerosa</i> var "brunnea"	sand coprosma	L	■ □ ½	■	■	■	■	1 st	BJ
<i>Microlaena polynoda</i>	bamboo rice grass		□	■	■	□	□	2 nd	QJ
<i>Poa cita</i>	silver tussock, wiwi	F	■ □	■	■	■	■	1 st	AQFJ
<i>Polystichum richardii</i> ; <i>P. vestitum</i>	shield ferns; pikopiko; puniu		½	■	■	□	□	2 nd	AQJ
<i>Uncinia laxiflora</i>	hookgrass		□	■	■	■	□	1 st	QJ
<i>Uncinia leptostachya</i>	hookgrass		□	■	■	■	□	1 st	QJ

KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foilage; I = Insects. L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

Use: 1st = plant initially; 2nd = plant when shelter established, ** = can be invasive; * = plant that may colonize naturally

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy; U=upright growth form; L=bold leaves; B=showy berries
H=can be clipped into hedge form; S=shelter value; J=keeps juvenile form for some time; P=perfumed; T=twiggy

(nr) = nationally rare

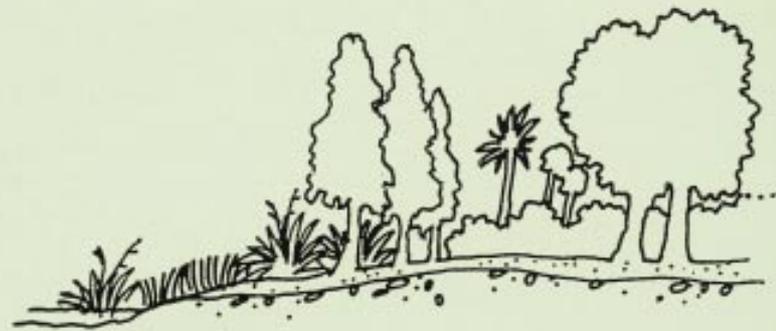
Wairau Plain
Landscape Concept **GUIDELINES**

SPRING COUNTRY



SPRING COUNTRY

Plants of the Houhere, Manatu, Mikimiki Ecosystem



KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foilage; I = Insects; L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

Use: 1st = plant initially; 2nd = plant when shelter established; ** = can be invasive; * = plant that may colonize naturally

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy; U=upright growth form; L=bold leaves; B=showy berries
H=can be clipped into hedge form; S=shelter value; J=keeps juvenile form for some time; P=perfumed; T=twiggy

botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
TALL TREES (greater than 8 metres tall)									
<i>Elaeocarpus dentatus</i>	hinau	F,I	■	½	□	□	□	2 nd	AU
<i>Nothofagus fusca</i>	red beech	F,I	½	½	■	□	□	2 nd	AU
<i>Nothofagus solandri var solandri</i>	black beech	F,I	½	½	■	□	□	2 nd	AU
<i>Nothofagus truncata</i>	hard beech	F,I	■	□	■	■	□	2 nd	AU
<i>Podocarpus totara</i>	totara	F,N,B,I	■	■	■	■	■	2 nd	AUHS
<i>Prumnopitys taxifolia</i>	matai, black pine	F,B,I	■	½	■	½	■	2 nd	AU

TREES & TALL SHRUBS (greater than 5 metres tall)

<i>Alectryon excelsus</i>	titoki	F,I	□	□	□	½	□	2 nd	AULH
<i>Aristotelia serrata</i>	makomako, wineberry	F,B,I	½	½	■	½	□	2 nd	AQB
<i>Carpodetus serratus</i>	putaputaweta, marbleleaf	F,B,I	□	½	■	■	□	2 nd	AU
<i>Coprosma linariifolia</i>	narrow-leaved coprosma	F,I,L	½	■	■	½	½	1 st	QBHST
<i>Coprosma lucida, C.robusta</i>	karamu	F	■	■	■	■	■	1 st	QBHS
<i>Coprosma rotundifolia</i>	round-leaved coprosma	F,I	½	■	■	½	½	1 st	QBHT
<i>Cordyline australis</i>	ti kouka, cabbage tree	F,N,I	■	½	■	■	■	1 st	AQFUP
<i>Fuchsia excorticata</i>	kotukutuku, tree fuchsia	F,N,B,I	½	■	■	□	□	2 nd	AFU
<i>Griselinia littoralis</i>	kapuka, broadleaf	F,B,N,I	■	■	■	■	■	2 nd	ALHS
<i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark	F,I	■	½	■	■	■	1 st	QFUHS
<i>Leptospermum scoparium</i>	manuka, tea tree	N,I	■	□	■	■	■	1 st	FUHS
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle	F,I	■	■	■	■	■	2 nd	QHS
<i>Melicytus ramiflorus</i>	mahoe, whiteywood	N,B,I	½	■	½	□	½	2 nd	AQFLHS
<i>Myrsine australis</i>	mapou, red mapou	F,I	■	■	½	½	½	2 nd	AHS
<i>Pennantia corymbosa</i>	kaikomako	F	½	½	■	½	□	2 nd	AULB
<i>Pittosporum eugenioides</i>	tarata, lemonwood	F,I	■	■	½	■	□	1/2	AQULHS
<i>Pittosporum tenuifolium spp tenuifolium</i>	kohuhu, black matipo	F,I	■	■	■	■	■	1 st	QUHS
<i>Plagianthus regius</i>	manatu, lowland ribbonwood	F,I	■	½	■	½	■	1 st	AQDFUHS
<i>Pseudopanax arboreus</i>	whauwhaupaku, fivefinger	F	□	■	■	□	□	2 nd	AFULHS
<i>Pseudopanax crassifolius</i>	lancewood, horoeka	F,B,N,I	■	½	■	■	■	2 nd	AQUJ
<i>Solanum aviculare</i>	poroporo	F	■	■	½	■	½	2 nd *	QFBHS
<i>Solanum laciniatum</i>	poroporo	F	■	■	½	■	½	2 nd *	QFBHS
<i>Streblus heterophyllus</i>	turepo, small-leaved milk tree	F	½	■	■	□	□	2 nd	T

SHRUBS (from 1 to 5 metres tall)

<i>Carmichaelia australis var "ovata"</i>	NZ broom, makaka	F,I	■	□	□	■	■	2 nd	J
<i>Carmichaelia carmichaeliae</i>	NZ broom, makaka	F,I	■	□	□	■	■	2 nd	J
<i>Coprosma crassifolia</i>	thin-leaved coprosma	F,L	■	■	■	½	□	1 st	QBHJT
<i>Coprosma foetidissima</i>	stinking coprosma	F,I,L	■	■	■	■	■	2 nd	FUHPT
<i>Coprosma propinqua</i>	mikimiki, mungimungi	F,I,L	■	■	■	■	■	1 st	AQBHST

PLANT LISTS (cont)

botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
<i>Coprosma rigida</i>		F,I,L	■	■	■	■	■	2 nd	B
<i>Coprosma rotundifolia</i>	round leaved coprosma	F,I,L	■	■	■	■	■	2 nd	QBHT
<i>Coprosma rubra</i>	red-stemmed coprosma	F,I,L	■	½	■	½	■	2 nd	B
<i>Coprosma taylorae</i>		F,I,L	■	■	■	■	■	2 nd	
<i>Coriaria arborea</i>	tutu (toxic)	F	■	½	■	■	■	2 nd *	
<i>Corokia cotoneaster</i>	korokio	N	■	□	½	■	■	1 st	AFHT
<i>Cyathodes juniperina</i>		F	□	½	■	■	□	1/2	
<i>Hebe gracillima</i>		I	■	½	½	½	■	1 st	
<i>Hebe salicifolia</i>	koromiko	I	■	½	½	½	■	1 st	QFHT
<i>Hebe stenophylla</i>	koromiko	I	■	½	½	½	■	1 st	L
<i>Hebe stricta var atkinsonii</i>	koromiko	I	■	½	½	½	■	1 st	
<i>Macropiper excelsum</i>	kawakawa	F	½	½	■	■	½	2 nd	AQLP
<i>Melicope simplex</i>	poataniwha	F,I	½	■	■	□	■	2 nd	HS
<i>Myrsine divaricata</i>	weeping mapou	F,I	■	■	■	½	□	2 nd	AT
<i>Neomyrtus pedunculata</i>	rohutu	F	□	■	■	□	□	2 nd	T
<i>Raukawa anomalus</i>	shrub pseudopanax	F,N	½	½	■	½	½	2 nd	AHJT

GROUNDCOVERS & FLAX-LIKE PLANTS (less than 3 metres tall)

<i>Anemanthele lessoniana</i>	bamboo grass, windgrass		½	■	■	½	½	1 st **	AQJ
<i>Astelia fragrans</i>	bush flax, kakaha	F,I	½	■	■	□	□	2 nd	AQLJ
<i>Carex comans</i>		F	■	½	□	■	■	1 st	AQJ
<i>Carex dipsacea</i>			■	□	□	■	■	1 st	AQJ
<i>Carex dissita; C. flagellifera; C. forsteri</i>			■	■	■	□	■	1 st	AQJ
<i>Carex lambertiana; C. solandri</i>	sedges		■	½	■	□	□	1 st	AQJ
<i>Carex testacea</i>			■	□	□	■	■	1 st	AQJ
<i>Coriaria sarmentosa</i>	tutu (toxic)		■	□	■	■	■	2 nd *	
<i>Cortaderia richardii</i>	toetoe		■	□	■	■	■	1 st	
<i>Dianella nigra</i>	turutu, blue berry	F	½	■	■	□	□	2 nd	AQBJ
<i>Fuchsia perscandens</i>		F	□	■	■	□	□	2 nd	F
<i>Hebe parviflora; Hebe traversii</i>	hebes	I	■	□	□	■	■	2 nd	F
<i>Heliohebe hulkeana ssp hulkeana</i>	hebe, NZ lilac	I	½	½	■	□	□	2 nd	
<i>Libertia ixioides</i>	NZ iris, mikoikoi	F	½	■	■	■	■	1 st	AQFBJ
<i>Melicytus "waipapa bay"</i>	porcupine shrub	F	■	□	□	■	□	2 nd	JT
<i>Microlaena polynoda</i>	bamboo rice grass		□	■	■	□	□	1 st	QJ
<i>Phormium tenax</i>	harakeke, NZ flax	N,L	■	□	■	■	■	1 st	AQFHS
<i>Uncinia ferruginea; U. laxiflora</i>	hook grasses		□	■	■	□	□	1 st	QJ
<i>Uncinia leptostachya; U. scabra</i>	hook grasses		□	■	■	□	□	1 st	QJ
<i>Uncinia uncinata</i>	watau, hook sedge		□	■	■	□	□	1 st	QJ

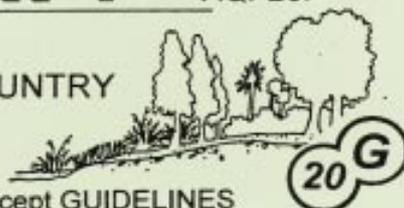
TREE & GROUND FERNS

<i>Blechnum novae zelandiae</i>	kiokio, small hardfern		■	½	■	□	□	2 nd	AQJ
<i>Cyathea dealbata</i>	ponga, silver fern, a tree fern		□	■	■	□	□	2 nd	AU
<i>Cyathea medullaris</i>	mamaku, a tree fern		□	■	■	□	□	2 nd	AU
<i>Cyathea smithii</i>	katote, soft tree fern	I	□	■	■	□	□	2 nd	AU
<i>Dicksonia squarrosa</i>	wheki, rough tree fern	I	½	■	■	□	□	2 nd	AU
<i>Polystichum richardii; P. vestitum</i>	shield ferns; pikopiko; puniu		½	■	■	□	□	2 nd	AQJ

VINES

<i>Parsonsia</i> spp.	NZ jasmine	B	½	■	½	□	□	2 nd	AQFBJP
<i>Passiflora tetrandra</i>	kohia, native passionvine		□	■	½	□	□	2 nd	AQFBJP

SPRING COUNTRY



Wairau Plain
Landscape Concept **GUIDELINES**

OLD DUNE COUNTRY



OLD DUNE COUNTRY

Plants of the Kahikatea, Raupo, Flaxlands Ecosystem



KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foilage; I = Insects. L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

Use: 1st = plant initially; 2nd = plant when shelter established, ** = can be invasive; * = plant that may colonize naturally

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy; U=upright growth form; L=bold leaves; B=showy berries

H=can be clipped into hedge form; S=shelter value; J=keeps juvenile form for some time; P=perfumed; T=twiggy

(nr) = nationally rare

botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
TALL TREES (<i>greater than 8 metres tall</i>)									
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine	F,I	■	½	□	■	2 nd	AUB	
<i>Dacrydium cupressinum</i>	rimu	F,I	■	½	□	■	2 nd	AU	
<i>Elaeocarpus dentatus</i>	hinau	F,I	■	½	□	□	2 nd	AU	
<i>Laurelia novaeseelandiae</i>	pukatea	F	■	■	□	□	2 nd	FUJ	
<i>Nothofagus fusca</i>	red beech	F,I	½	½	■	□	2 nd	AU	
<i>Nothofagus solandri var solandri</i>	black beech	F,I	½	½	□	□	2 nd	AU	
<i>Nothofagus truncata</i>	hard beech	F,I	■	□	□	□	2 nd	AU	
<i>Podocarpus hallii</i>	mountain totara	F,N,B,I	■	■	■	■	2 nd		
<i>Podocarpus totara</i>	totara	F,N,B,I	■	■	■	■	2 nd	AUHS	
<i>Prumnopitys taxifolia</i>	matai, black pine	F,B,I	■	½	■	½	2 nd	AU	
TREES & TALL SHRUBS (<i>greater than 5 metres tall</i>)									
<i>Alectryon excelsus</i>	titoki	F,I	□	■	□	½	□	2 nd	AULH
<i>Aristotelia serrata</i>	makomako, wineberry	F,B,I	½	½	■	½	□	2 nd	AQB
<i>Carpodetus serratus</i>	putaputaweta, marbleleaf	F,B,I	□	½	■	■	□	2 nd	AU
<i>Coprosma linariifolia</i>	narrow-leaved coprosma	F,I,L	½	■	■	½	½	1 st	QBHST
<i>Coprosma lucida, C.robusta</i>	shining karamu	F	■	■	■	■	■	1 st	QBHS
<i>Coprosma rotundifolia</i>	round-leaved coprosma	F,I	½	■	■	½	½	1 st	QBHT
<i>Cordyline australis</i>	ti kouka, cabbage tree	F,N,I	■	½	■	■	■	1 st	AQFUP
<i>Dodonaea viscosa</i>	akeake		■	□	□	■	■	2 nd	AULHS
<i>Fuchsia excorticata</i>	kotukutuku, tree fuchsia	F,N,B,I	½	■	■	□	□	2 nd	AFU
<i>Griselinia littoralis</i>	kapuka, broadleaf	F,B,N,I	■	■	■	■	■	2 nd	ALHS
<i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark	F,I	■	½	■	■	■	1 st	QFUHS
<i>Leptospermum scoparium</i>	manuka, tea tree	N,I	■	□	■	■	■	1 st	FUHS
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle	F,I	■	■	■	■	■	2 nd	QHS
<i>Meliccytus ramiflorus</i>	mahoe, whiteywood	N,B,I	½	■	½	□	½	2 nd	AQFLHS
<i>Myoporum laetum</i>	ngaio		■	□	■	■	■	2 nd	AQLHS
<i>Myrsine australis</i>	mapou, red mapou	F,I	■	■	½	½	½	2 nd	AHS
<i>Olearia paniculata</i>	akiraho	I	■	□	■	½	■	1/2	
<i>Pennantia corymbosa</i>	kaikomako	F	½	½	■	½	□	2 nd	AULB
<i>Pittosporum eugenioides</i>	tarata, lemonwood	F,I	■	■	½	■	□	1/2	AQULHS
<i>Pittosporum tenuifolium</i>									
<i>spp tenuifolium</i>	kohuhu, black matipo	F,I	■	■	■	■	■	1 st	QUHS
<i>Plagianthus regius</i>	manatu, lowland ribbonwood	F,I	■	½	■	½	■	1 st	AQDFUHS
<i>Pseudopanax arboreus</i>	whauwhaupaku, fivefinger	F	□	■	■	□	□	2 nd	AFULHS
<i>Pseudopanax crassifolius</i>	lancewood, horoeka	F,B,N,I	■	½	■	■	■	2 nd	AQUJ
<i>Solanum aviculare</i>	poroporo	F	■	■	½	■	½	2 nd *	QFBHS

PLANT LISTS (cont')

botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
<i>Solanum laciniatum</i>	poroporo	F	■	■	½	■	½	2 nd *	QFBHS
<i>Streblus heterophyllus</i>	turepo, small-leaved milk tree	F	½	■	■	□	□	2 nd	B
<i>Syzygium maire</i>	swamp maire	F	½	■	■	□	□	2 nd	U

SHRUBS (from 1 to 5 metres tall)

<i>Brachyglottis repanda</i>	Rangiora		■	□	□	■	■	1 st	AQL
<i>Carmichaelia australis</i> var "ovata"	NZ broom, makaka	F,I	■	□	□	■	■	2 nd	J
<i>Carmichaelia carmichaeliae</i>	NZ broom, makaka	F,I	■	□	□	■	■	2 nd	J
<i>Coprosma crassifolia</i>	thin-leaved coprosma	F,L	■	■	■	½	□	1 st	QBHJT
<i>Coprosma foetidissima</i>	stinking coprosma	F,I,L	■	■	■	■	■	2 nd	QHPT
<i>Coprosma linariifolia</i>	narrow leaved cop', yellow-wood	F,I,L	■	■	■	■	■	1 st	AQBHT
<i>Coprosma lucida</i>	shining karamu	F,I,L	■	■	■	■	■	2 nd	AQLH
<i>Coprosma propinqua</i>	mikimiki, mingimingi	F,I,L	■	■	■	■	■	1 st	AQBHST
<i>Coprosma rigida</i>		F,I,L	■	■	■	■	■	2 nd	AQBHST
<i>Coprosma rotundifolia</i>	round leaved coprosma	F,I,L	■	■	■	■	■	2 nd	AQBHST
<i>Coprosma rubra</i>	red-stemmed coprosma	F,I,L	■	½	■	½	■	2 nd	(nr)
<i>Coprosma taylorae</i>		F,I,L	■	■	■	■	■	2 nd	
<i>Coriaria arborea</i>	tutu (toxic)	F	■	½	■	■	■	2 nd *	
<i>Corokia cotoneaster</i>	korokio	N	■	□	½	■	■	1 st	AFHT
<i>Cyathodes juniperina</i>	mingimingi	F	□	½	■	■	□	1/2	
<i>Discaria toumatou</i>	matagouri		■	□	½	■	■	1 st	FSPT
<i>Hebe gracillima</i>	hebe	I	■	½	½	½	■	1 st	QFHT
<i>Hebe parviflora</i>	hebe	I	■	□	□	■	■	2 nd	QFHT
<i>Hebe salicifolia</i>	koromiko	I	■	½	½	½	■	1 st	QFHT
<i>Hebe stenophylla</i>	koromiko	I	■	½	½	½	■	1 st	QFHT
<i>Hebe stricta</i> var <i>atkinsonii</i>	koromiko	I	■	½	½	½	■	1 st	QFHT
<i>Hebe traversii</i>	hebe	I	■	□	□	■	■	2 nd	QFHT
<i>Helichrysum lanceolatum</i>			■	□	□	□	□	2 nd	F
<i>Leucopogon fasciculatus</i>	mingimingi		½	½	□	■	□	2 nd	B
<i>Macropiper excelsum</i>	kawakawa	F	½	½	■	■	½	2 nd	AQL
<i>Melicope simplex</i>	poataniwha	F,I	½	■	■	□	■	2 nd	UHS
<i>Muehlenbeckia astonii</i> R	shrubby tororaro/bush pohuehue	F,N,L	■	□	½	■	■	1 st	AQDHT
<i>Myrsine divaricata</i>	weeping mapou	F,I	■	■	■	½	□	2 nd	
<i>Neomyrtus pedunculata</i>	rohutu	F	□	■	■	□	□	2 nd	
<i>Raukawa anomalus</i>	shrub pseudopanax	F,N	½	½	■	½	½	2 nd	T
<i>Sophora prostrata</i>	prostrate kowhai	N	■	□	□	■	■	1 st	JT
<i>Urtica ferox</i>	tree nettle (toxic)		□	■	■	□	□	2 nd *	L

GROUNDCOVERS (less than 3 metres tall)

<i>Anemanthele lessoniana</i>	bamboo grass, windgrass		½	■	■	½	½	1 st **	AQJ
<i>Astelia fragans</i>	bush flax, kakaha	F,I	½	■	■	□	□	2 nd	AQJ
<i>Carex comans</i>	carex	F	■	½	□	■	■	1 st	AQJ
<i>Carex dipsacea</i>	carex		■	□	□	□	■	1 st	AQJ
<i>Carex dissita</i>	carex		■	■	■	□	■	1 st	AQJ
<i>Carex flagellifera</i>	carex		■	■	■	□	■	1 st	AQJ
<i>Carex forsteri</i>	carex		■	■	■	□	■	1 st	AQJ
<i>Carex lambertiana; C. solandri</i>	sedges		■	½	■	□	□	1 st	AQJ
<i>Carex testacea</i>	carex		■	□	□	■	■	1 st	AQJ

OLD DUNE COUNTRY



PLANT LISTS (cont')

botanical name	common name	food tolerances	use notes						
			sun	shade	moist	dry	wind		
<i>Coprosma acerosa</i> var "brunnea"			■	□	□	■	■	1 st	BJ
<i>Coriaria sarmentosa</i>	tutu (toxic)		■	□	■	■	■	2 nd *	
<i>Cortaderia richardii</i>	toetoe		■	□	■	■	■	1 st	AQFHS
<i>Dianella nigra</i>	turutu, blue berry	F	½	■	■	□	□	2 nd	AQBJ
<i>Fuchsia perscandens</i>		F	□	■	■	□	□	2 nd	F
<i>Heliohebe hulkeana</i> ssp <i>hulkeana</i>	hebe, NZ lilac	I	½	½	■	□	□	2 nd	QFHT
<i>Libertia ixioides</i>	NZ iris, mikoikoi	F	½	■	■	■	■	1 st	AQFBJ
<i>Meliccytus "waipapa bay"</i>	porcupine shrub	F	■	□	□	■	□	2 nd	US
<i>Muehlenbeckia complexa</i>			■	□	□	■	□	1 st	BHJ
<i>Microlaena polynoda</i>	bamboo rice grass	I	□	■	■	□	□	1 st	QJ
<i>Olearia arborescens</i>			■	□	½	■	□	2 nd	F
<i>Olearia rani</i>	heketara		■	□	½	■	□	2 nd	F
<i>Olearia solandri</i>	coastal tree daisy		■	□	□	■	□	2 nd	QFSPT
<i>Ozothamnus leptophyllus</i> (<i>Cassinia</i>)	tauhinu, cottonwood	I	■	□	■	■	■	1 st	
<i>Phormium tenax</i>	harakeke, NZ flax	N,L	■	□	■	■	■	1 st	AQFHS
<i>Poa cita</i>	silver tussock, wiwi	F	■	□	■	■	■	1 st	AQFJ
<i>Typha orientalis</i>	raupo, bullrush		■	□	■	□	■	1 st	AQDFS
<i>Uncinia ferruginea</i>	hook grass		□	■	■	□	□	1 st	QJ
<i>Uncinia laxiflora</i>	hook grass		□	■	■	□	□	1 st	QJ
<i>Uncinia leptostachya</i>	hook grass		□	■	■	□	□	1 st	QJ
<i>Uncinia scabra</i>	hook grass		□	■	■	□	□	1 st	QJ
<i>Uncinia uncinata</i>	watau, hook sedge		□	■	■	□	□	1 st	QJ

TREE & GROUND FERNS

<i>Blechnum novae zelandiae</i>	kiokio, small hardfern		■	½	■	□	□	2 nd	AQJ
<i>Cyathea dealbata</i>	ponga, silver fern, a tree fern		□	■	■	□	□	2 nd	AU
<i>Cyathea medullaris</i>	mamaku, a tree fern		□	■	■	□	□	2 nd	AU
<i>Cyathea smithii</i>	katote, soft tree fern	I	□	■	■	□	□	2 nd	AU
<i>Dicksonia squarrosa</i>	wheki, rough tree fern	I	½	■	■	□	□	2 nd	AU
<i>Polystichum richardii</i> ; <i>P. vestitum</i>	shield ferns; pikopiko; puniu		½	■	■	□	□	2 nd	AQJ

VINES

<i>Parsonsia</i> spp.	NZ jasmine	B	½	■	½	□	□	2 nd	AQFBJP
<i>Passiflora tetrandra</i>	kohia, native passionvine		□	■	½	□	□	2 nd	AQFBJP

KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foilage; I = Insects. L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

Use: 1st = plant initially; 2nd = plant when shelter established, ** = can be invasive; * = plant that may colonize naturally

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy; U=upright growth form; L=bold leaves; B=showy berries
H=can be clipped into hedge form; S=shelter value; J=keeps juvenile form for some time; P=perfumed; T=twiggy

(nr) = nationally rare

OLD DUNE COUNTRY



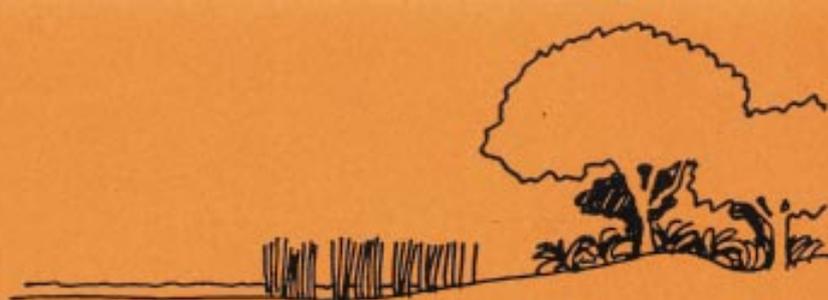
Wairau Plain
Landscape Concept GUIDELINES

COASTAL LANDS



COASTAL LANDS

Plants of the Ngaio, Pingao, Wiwi Ecosystem



KEY

Food: for *native birds* shown as:

F = Fruit/seed; N = Nectar; B = Bud/foilage; I = Insects. L = Fruit for *Lizards*

Tolerances: for *sunny, shady, moist, dry* and *windy* conditions shown as:

■ = tolerates or needs; □ = intolerant; ½ = tolerant of some; W = tolerates wet or flooded

Use: 1st = plant initially; 2nd = plant when shelter established, ** = can be invasive; * = plant that may colonize naturally

Notes: A=attractive; Q=quick growing; D=deciduous; F=flowers showy; U=upright growth form; L=bold leaves; B=showy berries

H=can be clipped into hedge form; S=shelter value; J=keeps juvenile form for some time; P=perfumed; T=twiggy

(nr) = nationally rare

botanical name	common name	food	tolerances					use	notes
			sun	shade	moist	dry	wind		
TREES & LARGE SHRUBS (greater than 5 metres tall)									
<i>Cordyline australis</i>	ti kouka, cabbage tree	F,N,I	■	½	■	■	■	1 st	AQFUP
<i>Corynocarpus laevigatus</i>	karaka (pre-European introduction)	F	■	½	½	■	■	2 nd	AFULBHS
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine	F,I	■	½	□	□	■	2 nd	AUB
<i>Dodonaea viscosa</i>	akeake		■	□	□	■	■	2 nd	AULHS
<i>Griselinia lucida</i>	puka		■	■	½	½		2 nd	AL
<i>Kunzea ericoides</i>	kanuka	N,I	■	□	■	½	■	1 st	FUHS
<i>Leptospermum scoparium</i>	manuka, teatree	N,I	■	□	■	■	■	1 st	FUHS
<i>Melicope ternata</i>	wharangi		½	½	½	½	½	2 nd	ALP
<i>Melicytus ramiflorus</i>	mahoe, whiteywood	N,B,I	■	■	□	□	■	2 nd	AQFLHS
<i>Myoporum laetum</i>	ngaio	F,N	■	□	½	■	■	2 nd	AQLHS
<i>Myrsine australis</i>	mapou, red matipo	F,I	■	■	□	■	■	1 st	AHS
<i>Olearia avicenniifolia</i>	akiraho, a tree daisy	N,I	■	□	½	■	■	1 st	FHS
<i>Olearia paniculata</i>	akiraho, golden akeake	I	■	□	■	½	■	1 st	
<i>Pittosporum tenuifolium</i> ssp <i>tenuifolium</i>		F,I	■	■	■	■	■	1 st	QUHS
<i>Pseudopanax arboreus</i>	whauwhaupaku, fivefinger	F,N,I	■	■	½	½	½	2 nd	AFULHS
<i>Pseudopanax ferox</i>	fierce lancewood	F,N,B,I	■	½	■	■	■	1 st	AQULJ
<i>Solanum laciniatum</i>	poroporo		■	□	½	■	■	1 st	QFBHS
SHRUBS (from 1 to 5 metres tall)									
<i>Brachyglottis repanda</i>	Rangiora		■	□	□	■	■	1 st	LS
<i>Carmichaelia "robusta"</i>	NZ broom, makaka	L	■	□	½	■	■	1 st	J
<i>Carmichaelia appressa</i>	NZ broom	L	■	□	□	■	■	1 st	J
<i>Carmichaelia australis</i> var <i>"ovata"</i>	broom	L	■	□	½	■	■	2 nd	J
<i>Carmichaelia muritai</i>	Muritai broom		■	□	½	■	■	1 st	J
<i>Coprosma crassifolia</i>	a thick-leaved mikimiki	L	■	■	½	■	■	1 st	QBHJT
<i>Coprosma propinqua</i>	mikimiki, mingimingi	F,I,L	■	■	■	■	■	1 st	AQBHST
<i>Coprosma repens</i>	taupata (pre-European introduction)	F	■	■	■	½	■	1 st	AQLBH
<i>Coriaria arborea</i>	tutu (<i>toxic</i>)	F	■	½	■	■	■	2 nd	*
<i>Corokia cotoneaster</i>	korokio	F,N	■	□	□	■	■	1 st	AFHT
<i>Discaria toumatou</i>	matagouri		■	□	□	■	■	1 st	FSPT
<i>Hebe stricta</i> var <i>macrouria</i>	koromiko, hebe	I	■	½	½	½	■	1 st	
<i>Helichrysum lanceolatum</i>	niniaio		■	□	□	■	■	1 st	F
<i>Heliohebe hulkeana</i> ssp <i>hulkeana</i>	hebe	I	■	½	½	½	■	1 st	
<i>Macropiper excelsum</i>	kawakawa	F	½	½	■	■	½	2 nd	AQLP
<i>Melicytus "waipapa"; M. crassifolius</i>	porcupine shrubs	F,L	■	□	□	■	■	1 st	JT
<i>Melicytus alpinus</i>	porcupine shrub	F,L	■	□	□	■	■	1 st	JT
<i>Muehlenbeckia astonii</i> (nr)	shrub pohuehue	F,L	■	□	½	■	■	1 st	AQDHT

PLANT LISTS (cont')

botanical name	common name	food	tolerances					use notes
			sun	shade	moist	dry	wind	
<i>Muehlenbeckia complexa</i>	pohuehue	F,L	■	□	■	■	■	1 st BHJ
<i>Muehlenbeckia ephedroides</i>	pohuehue	F,L	■	□	■	■	■	1 st
<i>Olearia odorata; O. solandri</i>	fragrant shrub ¹ ; coastal tree daisies		■	□	□	■	■	1 st QFHSP
<i>Ozothamnus leptophyllus (Cassinia)</i>	tauhinu, cottonwood	I	■	□	■	■	■	1 st
<i>Plagianthus divaricatus</i>	marsh ribbonwood		■	□	■	½	■	1 st AQHST
<i>Pomaderris ericifolia</i>	tauhinu		■	□	□	■	■	1 st
<i>Sophora prostrata</i>	prostrate kowhai (<i>toxic</i>)	N	■	□	□	■	■	1 st JT
<i>Urtica linariifolia</i>			□	■	■	□	□	2 nd

TUSSOCK GRASSES & FLAXES (less than 3 metres tall)

<i>Austrofestuca littoralis</i>	sand fescue		■	□	□	■	■	1 st U
<i>Cortaderia richardii</i>	toetoe		■	□	■	■	■	1 st
<i>Leptocarpus similis</i>	oioi, jointed wire rush		■	□	□	■	w	1 st AQFUJ
<i>Phormium cookianum</i>	whararikiki, flax	N,L	■	□	■	■	w	1 st AQFHS
<i>Phormium tenax</i>	harakeke, NZ flax	N,L	■	□	■	■	w	1 st AQFHS
<i>Poa cita</i>	wiwi, silver tussock	F	■	□	■	■	■	1 st AQFJ
<i>Schoenoplectus validus</i>	lake club rush		■	□	■	□	w	1 st

GROUNDCOVERS & others (less than 2 metres tall)

<i>Apium prostratum</i>	sea celery		■	½	½	½	■	1 st
<i>Calystegia soldanella</i>	nihinihi, sand convolvulus		■	□	□	■	■	1 st
<i>Carex flagellifera</i>			■	□	□	□	■	1 st AQJ
<i>Carex pumila</i>	sand sedge		■	□	□	■	■	1 st AQJ
<i>Clematis afoliata</i>	leafless scrambling clematis, pohuehue		■	□	□	■	■	1 st AFP
<i>Coprosma acerosa</i>	sand coprosma	L	■	□	½	■	■	1 st BJ
<i>Desmoschoenus spiralis</i>	pingao, golden sand sedge		■	□	□	■	■	1 st AQLJ
<i>Discaria toumatou var "prostrata"</i>	matagouri		■	□	□	■	■	1 st FSPT
<i>Euphorbia glauca</i>	shore spurge		■	□	□	■	■	1 st AQFL
<i>Limosella lineata</i>	NZ mudwort		■	□	■	½	■	1 st
<i>Linum monogynum</i>	raubuia		■	□	□	■	■	1 st AF
<i>Microlaena polynoda</i>	bamboo rice-grass		½	■	■	½	½	2 nd QJ
<i>Pimelea arenaria; P. prostrata</i>	sand daphne		■	□	½	■	■	1 st
<i>Pteridium esculentum</i>	bracken fern, rahurahu		■	½	½	■	■	1 st QLJ
<i>Samolus repens</i>	sea primrose, moakoako		■	□	■	½	■	1 st
<i>Spinifex hirsutus; S. sericeus</i>	spinifex		■	□	□	■	■	1 st AQ

NICHE PLANTS FOR DAMP OR WET SITES (less than 2 metres tall)

<i>Bolboschoenus caldwellii</i>	a sedge		■	□	■	□	w	1 st
<i>Carex geminata</i>	cutty grass, rautahi, purei		■	□	■	□	w	1 st AQJ
<i>Cyperus ustulatus</i>	umbrella sedge, upoko-tangata		■	□	½	½	w	1 st AQJ
<i>Epilobium billardioreanum</i>	willowherb		■	□	■	□	w	1 st
<i>Gunnera dentata</i>	sand gunnera		■	½	■	½	w	1 st
<i>Hierochloa redolens</i>	holy grass, karetu		■	□	■	½	w	1 st
<i>Isolepis basilaris; Isolepis nodosa</i>	a turf club-rush; knobby club-rush		■	□	■	½	w	1 st
<i>Juncus maritimus</i>	sea rush		■	□	■	□	w	1 st AQF
<i>Juncus pallidus</i>	wiwi, giant rush		■	½	■	½	w	1 st AQF
<i>Leptinella dioica</i>	cotula		■	½	■	½	w	1 st
<i>Mazus novaezeelandiae</i>	a carpet musk		■	□	■	½	w	1 st
<i>Schoenoplectus pungens; S. concinnus</i>	three-square; a turf sedge		■	□	■	□	w	1 st AQ
<i>Scirpoides nodosa</i>	wiwi, knobby clubrush		■	□	■	■	w	1 st
<i>Selliera radicans</i>	remuremu, a mat plant		■	□	■	½	w	1 st

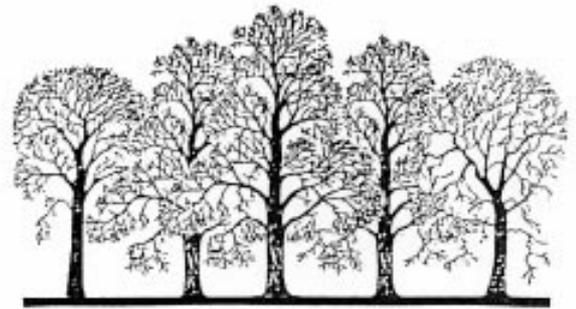
COASTAL LANDS



exotic trees

DESIGN GUIDELINES

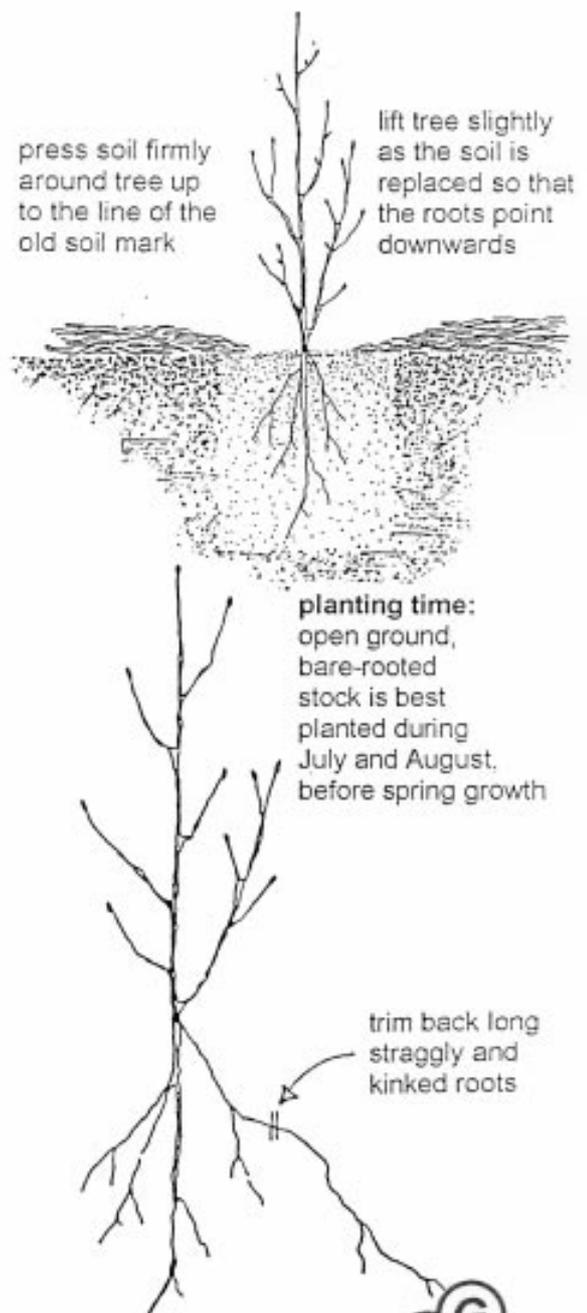
- Clumps of trees add interest and visual scale, they provide some shade and can diffuse winds.
- Moisture limitations may decide the minimum spacing between trees; in drier areas, trees need to be wider spaced than in moist areas.
- Mass trees together, close enough to touch in time, so none appears as an individual.
- Choose a tree type(s) that will grow to the desired height. Avoid topping trees.
- Choose several of one type (minimum 3, but preferably more), rather than one of each.
- For mixed groups choose tree types that complement each other, rather than strong contrast. Keep the contrast subtle.
- Plant summer-green foliaged trees, avoid golden summer foliage as it visually dominates. Interest comes from seasonal changes, spring growth, autumn colours and the varied surrounds.



exotic trees

TREE PLANTING AND MANAGEMENT

1. Good site preparation is essential for any planting to be successful. Remove the ground cover from each site prior to planting, either by chipping it off with a spade to expose the soil, or by using a herbicide.
2. Planting time for open ground, bare-rooted stock is best during July and August (the dormant stage), before spring growth.
3. Open ground plants have to be planted straight away after purchase or delivery, alternatively they have to be heeled-in, in a cool sheltered place and kept moist until the appropriate planting time.
4. Plant quality: Open ground, bare-rooted stock should have a well developed root system which points straight down, that is with no large kinks in the main tap root area.
5. Choose tree types that generally are not dependent on irrigation once they are established.
6. Mulching and adequate weed control reduces the need for watering.
7. Keep the root zone free from moisture competition from grass.
8. Form pruning may be necessary to ensure good form of a tree. Avoid a highly managed look e.g. pollarding trees.



exotic deciduous trees - suggestions for different areas / soil types

SPECIES LIST

Dry: e.g. suited to the droughty & shallow *Rapaura* soils

Moist: e.g. suited to *Wairau* & *Gibsons* soils

Wet: e.g. suited to the *Paynter*, *Grovetown* & *Spring Creek* soils



Botanical name	common name		height
Maples			
		dry moist wet	
<i>Acer davidii</i>	David's maple	■ ■ □	10 – 15 m
<i>Acer negundo</i>	box elder	■ ■ □	12 – 20 m
<i>Acer rubrum</i>	swamp maple	□ □ ■	15 – 25 m
<i>Acer saccharum</i>	sugar maple	■ ■ □	25 – 35 m

Alders			
<i>Alnus cordata</i>	Italian alder	■ □ □	20 – 25 m
<i>Alnus rubra</i>	red alder	□ ■ ■	25 – 30 m

Birch			
<i>Betula nigra</i>	river birch	□ □ ■	15 – 25 m
<i>Carpinus betulus</i>	hornbeam	□ ■ □	15 – 20 m
<i>Carya ovata</i>	shagbark hickory	□ □ ■	20 – 30 m
<i>Castanea sativa</i>	Spanish chestnut	■ ■ □	25 – 30 m
<i>Celtis occidentalis</i>	American hackberry	■ □ □	20 – 25 m
<i>Cladastria lutea</i>	yellow wood	□ □ ■	10 – 15 m
<i>Cornus mas</i>	cornelian cherry	□ ■ □	5 – 10 m

Beech			
<i>Fagus sylvatica</i>	European beech	□ ■ ■	30 – 40 m

Ashes			
<i>Fraxinus angustifolia</i> (syn. <i>oxycarpa</i>)		■ ■ □	20 – 25 m
<i>Fraxinus ornus</i>	flowering ash	■ □ □	10 – 15 m
<i>Fraxinus pennsylvanica</i>	green ash	□ □ ■	20 – 25 m
<i>Fraxinus velutina</i>	ash	■ □ □	9 – 12 m

Walnuts			
<i>Juglans ailantifolia</i>	Japanese walnut	□ □ ■	20 – 30 m
<i>Juglans nigra</i>	black walnut	■ ■ □	25 – 35 m
<i>Juglans regia</i>	edible walnut	■ ■ □	20 – 30 m

<i>Liquidambar styraciflua</i>	liquidamber	□ ■ ■	20 – 35 m
<i>Maackia amurensis</i>	amur maackia	■ □ □	10 – 15 m
<i>Maclura pomifera</i>	Osage orange	□ ■ □	8 – 12 m
<i>Parotia persica</i>	Persian ironwood	□ ■ □	10 – 15 m

Planes			
<i>Platanus orientalis</i>	oriental plane	□ ■ □	25 – 30 m
<i>Platanus x acerifolia</i>	London plane	□ ■ □	20 – 25 m
<i>Populus hybrids</i>		□ ■ □	20 – 30 m
<i>Pterocarya stenoptera</i>	Chinese wingnut	□ □ ■	15 – 25 m

Oaks			
<i>Quercus alba</i>	American white oak	□ ■ □	20 – 30 m
<i>Quercus canar. x robur</i>	Algerian oak	□ ■ □	20 – 30 m
<i>Quercus canariensis</i>	mirbeck oak	■ ■ □	20 – 30 m
<i>Quercus cerris</i>	Turkey oak	□ ■ □	25 – 35 m

Botanical name	common name		height
Oaks (continued)			
		dry moist wet	
<i>Quercus ellipsoidalis</i>	Northern pin oak	□ ■ □	20 – 25 m
<i>Quercus faginea</i>	Portuguese oak	□ ■ □	15 – 20 m
<i>Quercus falcata</i>	southern red oak	□ ■ □	20 – 25 m
<i>Quercus imbricaria</i>	shingle oak	■ □ □	20 – 25 m
<i>Quercus macrocarpa</i>	bur oak	□ □ ■	5 – 10 m
<i>Quercus palustris</i>	pin oak	□ ■ ■	25 – 30 m
<i>Quercus petraea x robur</i>	hybrid English oak	□ ■ ■	25 – 35 m
<i>Quercus pubescens</i>	downy oak	□ ■ □	20 – 25 m
<i>Quercus pyrenaica</i>	Pyrenean oak	■ □ □	15 – 20 m
<i>Quercus robur v fastig.</i>	Upright oak	□ ■ ■	20 – 25 m
<i>Quercus robur</i>	English oak	□ ■ ■	25 – 30 m
<i>Quercus variabilis</i>	Chinese cork oak	■ □ □	20 – 25 m
Cypresses			
<i>Taxodium ascendens</i>	pond cypress	□ □ ■	15 – 25 m
<i>Taxodium mucronatum</i>	swamp cypress	□ □ ■	25 – 35 m
Limes			
<i>Tilia amurensisa</i>	amur linden	□ □ ■	20 – 25 m
<i>Tilia cordata</i>	small-leaved lime	□ □ ■	20 – 30 m
<i>Tilia platyphyllos</i>	broad-leaved lime	□ □ ■	25 – 35 m
Elm			
<i>Ulmus parvifolia</i>	Chinese elm	□ ■ □	10 – 15 m
<i>Zelkova carpinifolia</i>	Caucasian zelkova	□ ■ ■	20 – 25 m

Dry: e.g. suited to the droughty & shallow *Rapaura* soils

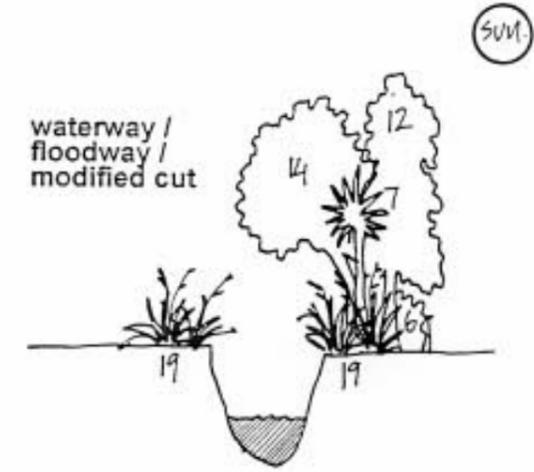
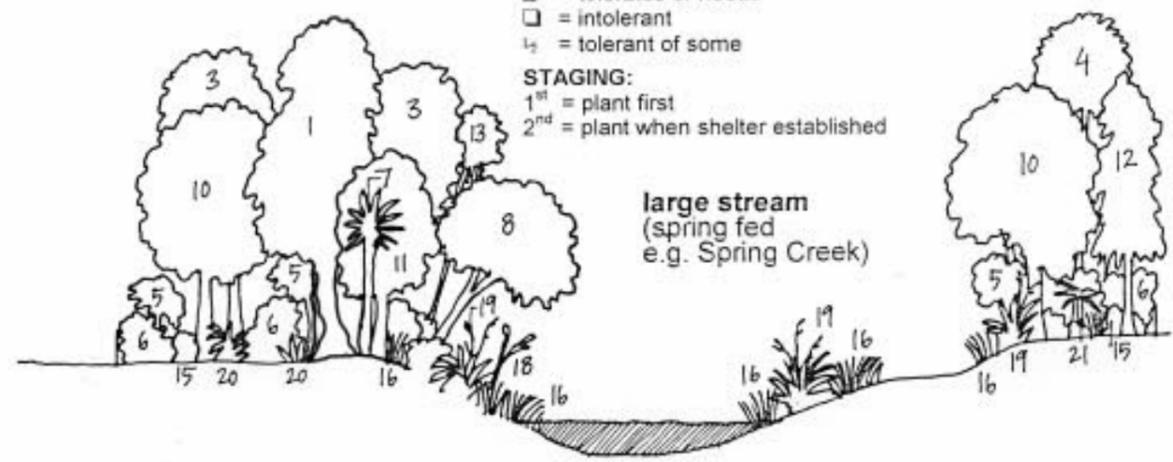
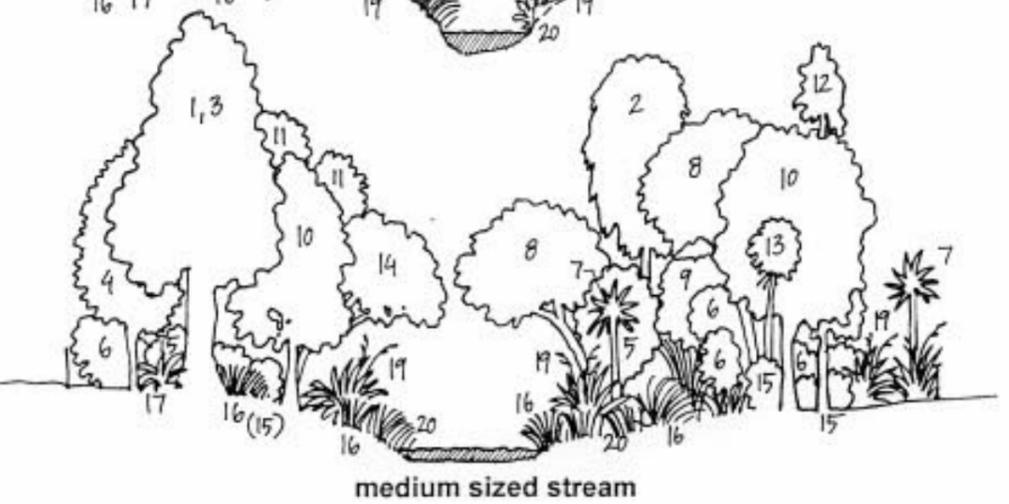
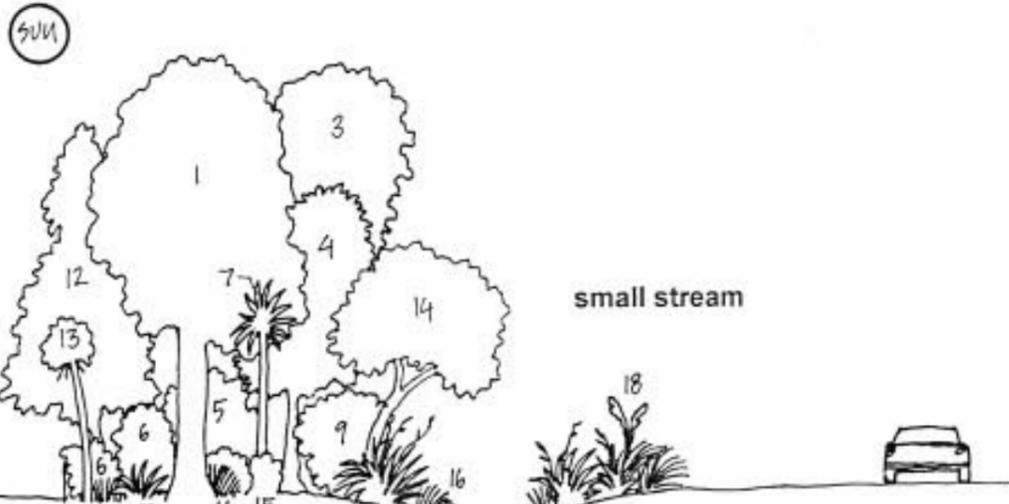
Moist: e.g. suited to *Wairau* & *Gibsons* soils

Wet: e.g. suited to the *Paynter*, *Grovetown* & *Spring Creek* soils

Suitable RIPARIAN plants

Botanical name	common name	food	tolerances	stage
			sun shade moist dry wind	
TALL TREES				
1 <i>Dacrycarpus dacrydioides</i>	kahikatea, white pine	F,I	■ ½ ■ □ ■	2 nd
3 <i>Elaeocarpus dentatus</i>	hinau	F,I	■ ½ ■ □ □	2 nd
3 <i>Prumnopitys taxifolia</i>	matai, black pine	F,B,I	■ ½ ■ ½ ■	2 nd
TREES & TALL SHRUBS				
5 <i>Aristotelia serrata</i>	makomako, wineberry (semi-deciduous)	F,B,I	½ ½ ■ ½ □	2 nd
5 <i>Carpodetus serratus</i>	putaputaweta, marbleleaf	F,B,I	½ ■ ■ □ □	2 nd
6 <i>Coprosma lucida; C. robusta</i>	karamu	F	■ ■ ■ ■ ■	1 st
6 <i>Coprosma linariifolia</i>	narrow-leaved coprosma, yellow-wood	F,N,L	½ ■ ■ ½ ½	1 st
7 <i>Cordyline australis</i>	ti kouka, cabbage tree	F,N,I	■ ½ ■ ■ ■	1 st
8 <i>Dodonaea viscosa</i>	akeake		■ □ □ ■ ■	1 st
9 <i>Griselinia littoralis</i>	kapuka, broadleaf	F,B,N,I	■ ■ ■ ■ ■	2 nd
10 <i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark	I	■ ½ ■ ■ ■	1 st
5 <i>Melicytus ramiflorus</i>	mahoe, whiteywood	F,N,B,I	½ ■ □ ½	2 nd
8 <i>Myoporum laetum</i>	ngaio	F,N	■ □ ■ ■ ■	1 st
4 <i>Pennantia corymbosa</i>	kaikomako	F,N,I	½ ½ ■ □ ½	2 nd
11 <i>Pittosporum eugenioides</i>	tarata, lemonwood	F,I	■ ■ ½ ■ □	2 nd
11 <i>Pittosporum tenuifolium</i> <i>ssp. tenuifolium</i>	kohuhu, black matipo	F,I	■ ■ ■ ■ ■	1 st

Botanical name	common name	food	tolerances	stage
			sun shade moist dry wind	
TREES & TALL SHRUBS (continued)				
12 <i>Plagianthus regius</i>	manatu, lowland ribbonwood (deciduous)	F,I	■ ½ ■ ½ ■	1 st
8 <i>Pseudopanax arboreus</i>	fivefinger, whauwhaupaku	F,N,I	■ ■ ½ ½ ½	2 nd
13 <i>Pseudopanax crassifolius</i>	lancewood, horoeka	F,B,N,I	■ ½ ■ ■ ■	2 nd
13 <i>Pseudopanax ferox</i>	fierce lancewood	F,B,N,I	■ ½ ■ ■ ■	2 nd
14 <i>Sophora microphylla</i>	South Island kowhai (toxic seeds)	N,I	■ ½ ½ ■ ■	2 nd
5 <i>Streblus heterophyllus</i>	turepo, small-leaved milk tree	F	½ ■ ■ □ □	2 nd
SHRUBS				
6 <i>Cop' crassifolia; C. grandifolia</i>	thin-leaved & large leaved coprosmas	F,I,L	■ ■ ■ ■ ■	2 nd
6 <i>Coprosma propinqua</i>	mikimiki, mingimingi	F,I,L	■ ■ ■ ■ ■	1 st
6 <i>Coprosma rotundifolia</i>	round-leaved coprosma	F,I	½ ■ ■ ½ ½	2 nd
6 <i>Coprosma rubra</i>	red-stemmed coprosma	F,I,L	■ ½ ■ ½ ■	2 nd
15 <i>Hebe gracillima, H. salicifolia</i>	koromiko	I	■ ½ ½ ½ ■	1 st
5 <i>Melicope simplex</i>	poataniwha	F,I	½ ■ ■ □ ■	2 nd
6 <i>Muehlenbeckia astonii</i>	shrubby tororaro / bush pohuehue	F,L	■ □ ½ ■ ■	1 st
GROUNDCOVERS				
16 <i>Anemanthele lessoniana</i>	bamboo grass, wind grass		■ ■ ■ ■ ■	1 st
17 <i>Astelia fragrans</i>	bush flax, kakaha	F,I	½ ■ ■ □ □	2 nd
16 <i>Carex comans</i>	tussock sedge, maurea	F	■ □ ½ ■ □	1 st
16 <i>Carex lambertiana; C. solandri</i>	sedges		■ ½ ■ □ □	1 st
16 <i>Carex secta</i>	pukio, tussock sedge	F	■ ½ ■ □ □	1 st
18 <i>Cortaderia richardii</i>	toetoe, (toitoi)		■ □ ■ ■ ■	1 st
19 <i>Phormium tenax</i>	harakeke, NZ flax	N,L	■ □ ■ ■ ■	1 st
16 <i>Poa cita</i>	silver tussock, wiwi	F	■ □ ■ ■ ■	1 st
16 <i>Uncinia spp.</i>	hookgrasses		□ ■ ■ □ □	1 st
FERNS				
20 <i>Blechnum minus</i>	swamp kiokio		■ ■ □ □ □	2 nd
20 <i>Blechnum novae zelandiae</i>	kiokio, small hardfern		■ ½ ■ □ □	2 nd



KEY No's refer to plants shown on cross sections

FOOD for native birds shown as:
 F = Fruit / seed;
 N = Nectar;
 B = Bud foliage and
 I = Insects.
 L = Fruit for Lizards

PLANT TOLERANCES:
 For sunny, shady, moist, dry and
 windy conditions shown as:
 ■ = tolerates or needs
 □ = intolerant
 ½ = tolerant of some

STAGING:
 1st = plant first
 2nd = plant when shelter established

Wairau Plain MASS PLANTING GUIDELINES

SITE PREPARATION



If using chemicals, blanket spray the entire area to be planted. Avoid spray drift going onto any existing native plants. Use biodegradable herbicides. Only spray in warm, still conditions with a knapsack sprayer. Spray at least 10 days prior to planting. Or, manually clear the area of unwanted growth.

Organise planting days for either Autumn, late winter or early Spring when weather and ground conditions are moist.



Keep organised. Lay the different species out in groups of the same species. Keep plants in a shady, cool spot if possible, keep watered and make sure plants are put into the ground soon after arriving on site.

Keep tools and footwear clean before entering the planting area to prevent weed invasion.

PLANTING



Pick up the plants by the container, not the foliage and go and find the appropriate area or ground condition for each plant. See the notes on the plant schedule to double check what the particular conditions are that your plant likes.

If the plants are supplied in long narrow root trainers, don't separate each plant from the RT (root-trainer) 'book' yet as the roots will dry out, killing the plant. Take the whole RT book and mass plant the four plants in one group at the appropriate spacings.



Screen the turf off the spot to dig the hole. Leave a bare 'target' patch of earth 1 m in diameter.



Dig the hole at least twice the size of the plant's container in all directions. Shatter the sides and bottom of the hole (in drier spots) to help the roots spread out and down.



Tease out the roots if they are compacted or root bound. Roots should be loose. Expose the longer roots and cut back with secateurs.



Fill the bottom third of the hole with loose soil. Place plant gently in and pack soil firmly and evenly around the roots. Firm down in layers to prevent air gaps. Don't put stones back in the hole - only soil.



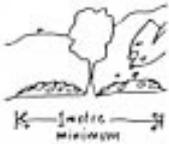
In areas permanently wet, leave the top of the root mass at or above the existing ground surface level.



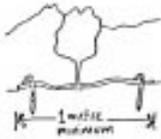
But the most important thing is to set the plant so that the soil level comes to the same point on the stem as it was when it came out of its container.

Give each plant 2 litres of water immediately after planting and just before mulching. This won't be necessary if you are planting in a waterlogged area.

MULCHING



Mulch with a minimum of 10cm of bark chips, newspaper (weighted down with bark chips), woollen mats, non-rubberised carpet underlay or any biodegradable material. Don't mulch on wet soils or in areas prone to waterlogging.



Make sure that any material that can catch the wind and blow is either weighted down or pinned down with bent no'8 wire 'staples' every half metre. Don't let the mulch build up against the stem.

PEST CONTROL



To stop rabbits and hares eating or damaging the plants, either spray on a suitable natural and biodegradable repellent, especially around the stem and spread in an area at least 40 cm radius on the ground around the plant. This will need to be re-applied regularly as over time rain will wash it away.



Or use a rabbit sleeve on plants with an upright growth habit. Drive 3 or 4 stakes firmly in around the plant to hold the plastic sleeve away from the plant, allowing it to breathe. Pin the sleeve down with bent no'8 wire to stop rabbits etc nosing under by lifting the sleeve. Remove these after 3 years or when the plant has grown tall enough that it won't be targeted. Leave grass long between different groups of plants - rabbits and hares don't like brushing through grass.

Monitor pests in the planted areas and their surroundings - possums, rabbits, hares, mustelids. When monitoring indicates, undertake pest control using one of the many approved methods. If the use of trapping, shooting or pesticides is envisaged, the animal welfare and other regulations covering these methods should be adhered to. View Marlborough District Council's website www.marlborough.govt.nz

PLANT MAINTENANCE



Stake the plant. For the first 1-2 years, the plant may not be visible above surrounding weed and grass growth making the plants hard to spot when checking needs to be done.



Regularly maintain. Replace any plants that die. Keep weeds away from the base of the plant. With close rather than far spacings, the plants will soon merge together, preventing light from striking the ground, allowing weeds to germinate. This maintenance will need to be done on a six monthly basis, for the first two or three years or until the area is self maintaining.

Do regular fence checks (generally around the perimeter of the valley and road boundaries) to make sure stock hasn't caused damage and gained access to the planted areas. This needs to be carried out on an ongoing basis indefinitely.

Once there is full canopy closure, the planted area can be 'beefed' up with interplanting in long term and special species appropriate to the ecosystem and microsite.



Sit back and look at the forest you have helped create, bringing back the birds and other animals, providing enjoyment for many generations to come.

REGIONAL / DISTRICT LEVEL UNWANTED PLANTS

Control & Surveillance Weed Lists

1. Total Control Plant Pests

These species must be removed. Marlborough District and the Department of Conservation carry out the control. Please contact either organisation if you believe you have found a new site

Common Name	Scientific Name
African Feather Grass	<i>Pennisetum macrourum</i>
Bathurst Bur	<i>Xanthium spinosum</i>
Boneseed	<i>Chrysanthemoides monilifera</i>
Bur Daisy	<i>Calotis lappulacea</i>
Climbing Spindleberry	<i>Celastrus orbiculatus</i>
Eel grass	<i>Vallisneria gigantea</i>
Giant Needlegrass	<i>Stipa rudis</i>
Madeira Vine	<i>Anredera cordifolia</i>
Moth plant	<i>Arauja sericifera</i>
Saffron Thistle	<i>Carthamus lanatus</i>

2. Containment Control Plant Pests

Obligation on occupiers to control, as specified in strategy

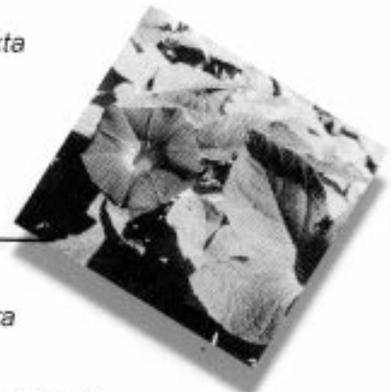
Common Name	Scientific Name
Nassella Tussock	<i>Stipa trichotoma</i>
Chilean needlegrass	<i>Stipa neesiana</i>
Chinese Pennisetum	<i>Pennisetum alecuroides</i>
Broom	<i>Cytisus scoparius</i>
Gorse	<i>Ulex europeus</i>
Kangaroo grass	<i>Themeda triandra</i>
Nodding Thistle	<i>Carduus nutans</i>
Ragwort	<i>Senecio jacobaea</i>
White-edged nightshade	<i>Solanum marginatum</i>

NATIONAL LEVEL UNWANTED PLANTS

Control & Surveillance Weed Lists

3. National Surveillance Plant Pests

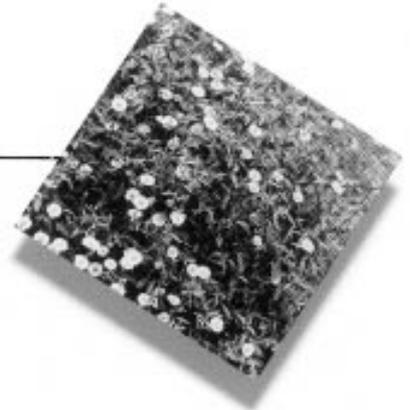
National Surveillance Plant Pests are plants that have (or are capable of having) a serious adverse effect on production, human enjoyment or natural ecosystems. These plant pests were either introduced to New Zealand accidentally, or imported as garden plants for their scent, colour or beauty. They have since escaped from gardens or properties (naturally or by deliberate spread) and become environmental or agricultural problems. The sale, propagation and distribution of these plants is prohibited. Marlborough District Council monitors the impacts / spread and also funds education about identification and control methods



Common Name	Scientific Name
All <i>Stipa</i> (except natives)	<i>Stipa</i> spp.
Alligator Weed	<i>Alternanthera philoxeroides</i>
Artillery plant	<i>Galeobdolon luteum</i>
Australian sedge	<i>Carex longebrachiata</i>
Banana Passionfruit	<i>Passiflora molissima, P. mixta</i>
*Barberry	<i>Berberis glaucocarpa</i>
Bartlettina	<i>Bartlettina sordida</i>
Bathurst Bur	<i>Xanthium spinosum</i>
Blackberry (wild aggregates)	<i>Rubus fruticosus</i> agg.
Bladderwort	<i>Utricularia gibba</i>
*Blue Morning Glory	<i>Ipomoea indica</i>
Blue Passion Flower	<i>Passiflora caerulea</i>
Bog Bean	<i>Menyanthes trifoliata</i>
Boneseed	<i>Chrysanthemoides monilifera</i>
Boxthorn	<i>Lycium ferocissimum</i>
Broomsedge	<i>Andropogon virginicus</i>
*Buddleia	<i>Buddleia davidii</i> (excluding hybrids)
Burdock	<i>Arctium minus</i>
Cape Honey Flower	<i>Melianthus major</i>
Cape ivy	<i>Senecio angulatus</i>
*Cathedral Bells	<i>Cobaea scandens</i>
Chinese Pennisetum	<i>Pennisetum alopecuroides</i>
Chilean Needle Grass	<i>Stipa neesiana</i>
Clasped Pondweed	<i>Potamogeton perfoliatus</i>
Climbing Asparagus	<i>Asparagus scandens</i>
Eel Grass	<i>Vallisneria</i> (Lake Pupuke, Meola Creek varieties)
Egeria Oxygen Weed	<i>Egeria densa</i>
Fountain Grass	<i>Pennisetum setaceum</i>
Fringed Water Lily	<i>Nymphoides peltata</i>
German Ivy	<i>Senecio mikanioides</i>
Goats Rue	<i>Galega officinalis</i>
Green Cestrum	<i>Cestrum parqui</i>
*Hawthorn	<i>Crataegus monogyna</i>
Heather	<i>Calluna vulgaris</i> (excluding double flowered cultivars)
Hemlock	<i>Conium maculatum</i>
Himalayan Honeysuckle	<i>Leycesteria formosa</i>
Hornwort	<i>Ceratophyllum demersum</i>
Horse Nettle	<i>Solanum carolinense</i>
Horsetail	<i>Equisetum arvense</i>
Houttuynia	<i>Houttuynia cordata</i>
Hydrilla	<i>Hydrilla verticillata</i>
Italian Buckthorn	<i>Rhamnus alaternus</i>
*Japanese Honeysuckle	<i>Lonicera japonica</i> (including cultivars but not hybrids)
Japanese Spindle Tree	<i>Euonymus japonicus</i>

Surveillance Plant Pests (continued)

Common Name	Scientific Name
Lagarosiphon Oxygen Weed	<i>Lagarosiphon major</i>
Lodgepole Pine	<i>Pinus contorta</i>
Manchurian Wild Rice	<i>Zizania latifolia</i>
*Mexican Daisy	<i>Erigeron karvinstianus</i>
Mignonette Vine	<i>Anredera cordifolia</i>
Mile-a-Minute	<i>Dipogon lignosus</i>
Mistflower	<i>Ageratina riparia</i>
Moth Plant	<i>Araujia sericifera</i>
Nardoo	<i>Marsilea mutica</i>
Noogoora Bur	<i>Xanthium occidentale</i>
Nutgrass	<i>Cyperus rotundus</i>
Oxylobium	<i>Oxylobium lanceolatum</i>
Palm Grass	<i>Setaria palmifolia</i>
Pampas Gras	<i>Cortaderia selloana, C. jubata</i>
Parrots Feather	<i>Myriophyllum aquaticum</i>
Perrenial Nettle	<i>Urtica dioica</i>
Phragmites	<i>Phragmites australis aquaticum</i>
Phragmites	<i>Phragmites australis</i>
Plectranthus	<i>Plectranthus ecklonii, P. ciliatus, P. grandis</i>
Plumeless Thistle	<i>Carduus acanthoides</i>
Port Jackson Fig	<i>Ficus rubiginosa</i>
Privet - Chinese	<i>Ligustrum sinense</i>
Privet - tree	<i>Ligustrum lucidum</i>
Sagittaria	<i>Sagittaria graminea ssp. Platyphylla</i>
Senegal Tea	<i>Gymnocoronis spilanthoides</i>
Sheeps Bur	<i>Acaena agripila</i>
Skeleton Weed	<i>Chondrilla juncea</i>
Smilax	<i>Asparagus asparagoides</i>
Spanish Heath	<i>Erica lusitanica</i> (excluding double flowered cultivars)
Spartina	<i>Spartina spp.</i>
Spiny Broom	<i>Calicotome spinosa</i>
*St Johns Wort	<i>Hypericum perforatum</i>
Sweet Briar	<i>Rosa rubiginosa</i>
Sweet Pea Shrub	<i>Polygala myrtifolia</i> (excluding cultivar "Grandiflora")
Tuber Ladder Fern	<i>Nephrolepis cordifolia</i>
Tutsan	<i>Hypericum androsaemum</i>
Variagated Thistle	<i>Silybum marianum</i>
Velvet Groundsel	<i>Senecio petasitis</i>
Water Poppy	<i>Hydrocleys nymphoides</i>
Water Primrose	<i>Ludwigia peploides ssp. Montevidensis</i>
White Monkey Apple	<i>Acmena smithii</i>
*Wild Cotoneaster	<i>Cotoneaster glaucophyllus, C. franchettii</i>
Wild Elaeagnus	<i>Elaeagnaceae x reflexa</i>
*Wild Lantana	<i>Lantana camara var aculeata</i> (Yellow-pink and Yellow-red varieties)
Wild Ginger	<i>Hedychium gardnerianum, H. flavescens</i>
Woolly Nightshade	<i>Solanum mauritianum</i>
Yellow Flag	<i>Iris pseudacorus</i>
Yellow Water Lily	<i>Nuphar lutea</i>



This booklet (includes photographs and a description of each plant) is still available at the Marlborough District Council but will soon be out of print. Ask at the counter for the replacement weed species lists



Wairau Plain Landscape Concept

USEFUL REFERENCES

Anon. 2000. *Muehlenbeckia astonii Shrubby tororaro*. Department of Conservation Te Papa Atawhai. Brochure.

Auckland Regional Council, 1996, reprinted 2001. *National Surveillance Plant Pests*. Auckland Regional Council.

Basher, L.R., Lynn, I.H., Whitehouse, I.E. 1995. *Geomorphology of the Wairau Plains – Implications for Floodplain Management Planning*. Landcare Research Science Series No.11. (see soils, map1 and page 21). Manaaki Whenua Press, Lincoln, Canterbury.

Bell, D.C. 2001. *Trees for New Zealand Town and Country*. David Bateman, Auckland.

Cadenhead, L.C. 1994. *Spring Creek Streamside Enhancement*. Department of Conservation Te Papa Atawhai, Nelson/Marlborough Conservancy.

Davis, M., Meurk, C. 2001. *Protecting and Restoring our Natural Heritage. A Practical Guide*. Department of Conservation Te Papa Atawhai, Christchurch.

Metcalf, L. 1972, reprinted 2000. *New Zealand Trees and Shrubs. A Comprehensive Guide to Cultivation and Identification*. Reed Books, Auckland.

Metcalf, L. 1998. *The Cultivation of New Zealand Native Grasses. A Godwit New Zealand Gardening Guide*. Random House NZ, Auckland.

Mortimer, J & B. 1984. *Trees for the New Zealand Countryside. A Planters Guide*. Whitcoulls Ltd. Christchurch.

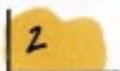
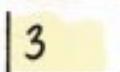
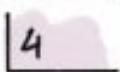
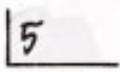
Salmon, J.T. 1980. *The Native Trees of New Zealand*. A.H. & A.W. Reed, Wellington.

Website: NZERN – The New Zealand Ecological Restoration Network.
www.bush.org.nz/planterguide

Wilson, H., Galloway, T. 1993. *Small-Leaved Shrubs of New Zealand*. Manuka Press, Christchurch.

Wairau Plain LANDSCAPE CONCEPT PLAN *Landforms*

KEY

-  1 Active riverbed
-  2 Protected and higher floodplain
-  3 Young terrace lands
-  4 Old terrace lands
-  5 Coastal lands
-  6 Hill country

