Native Planting Guide

for

Lincoln and other Selwyn Communities

produced for the Lincoln Envirotown Trust

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www.lincolnenvirotown.org

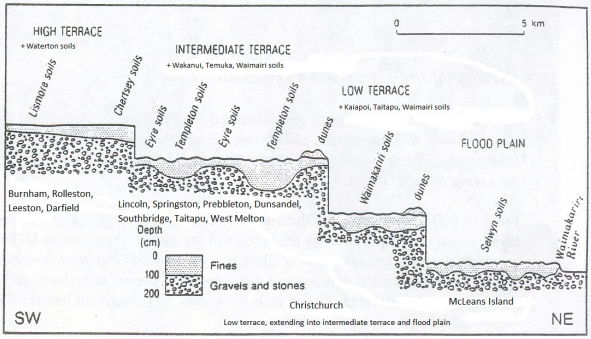
Geological and Biological
History of the Canterbury Plains

20,000 years ago huge fans of gravels issued from the glaciated Southern Alps to form the Canterbury Plains. Stony to loess-capped soils formed in what are now the HIGH TERRACES of the Plains – the *Lismore* and *Chertsey* soils (Fig.)

From 10,000-3,000 years ago the big rivers cut down through the gravels exposing fresh surfaces and laying down new deposits along the borders of the rivers. These are the INTERMEDIATE TERRACES in which deeper *Templeton* and shallow stony *Eyre* (with *Paparua* sandy) soils formed. In the finer-textured, poorer-drained sediments of this sequence *Wakanui* soils developed with mottled (seasonally wet) subsoils, whereas the permanently saturated gleyed soils are known as *Temuka* silt loams. *Waimairi* peats have formed on the most poorly-drained surfaces where organic matter has accumulated.

The youngest soils are only hundreds to a few thousand years old. These *Recent* soils are found on the LOW TERRACES (*Waimakariri* free-draining, *Kaiapoi* weakly drained, mottled soils, *Taitapu* gleyed soils, and *Waimairi* peats) and FLOODPLAINS (*Selwyn* soils).

The Plains were mostly wooded, but natural and later cultural disturbances eliminated much of the forests and woodlands so that by the time Europeans set foot on this land there was a mosaic of mature and more extensive pioneering types of vegetation.



Selwyn Soil Gradient Adapted from 'Soils in the NZ landscape' by Les Molloy with acknowledgement of input from Trevor Webb (pers. comm.)

Pre-Maori Native Vegetation and Flora

The more extensive and wetter lake margin (Te Waihora/Ellesmere) would have been dominated by vast areas of swampland with raupo, clubrushes, tussock sedges, NZ flax, toetoe, cabbage trees, mikimiki and manuka. In more saline parts of the lakeshore were sea rush, glasswort and marsh ribbonwood. Old sand dunes would have stood out

above these swamps like islands and supported matagouri and other small-leaved divaricating shrubs or vines like scrambling pohuehue. Back towards present day Lincoln township were freer draining loamy soils which may have supported patches of podocarp forest (podocarps are the southern native conifers that include the emergent grand trees of totara, matai and kahikatea). Canopies and understories would have been of pittosporum, lowland ribbonwood, lancewood, broadleaf, pokaka, mahoe, coprosmas, myrtles, etc rather similar to Riccarton Bush. On the driest stony ground the mature vegetation would have been mixes of kanuka, kowhai, cabbage trees and the divaricating shrubs again.

There were natural disturbances mainly caused by flooding and shifting of the channels of the major braided rivers such as the Waimakariri, and possibly there were some natural fires. These caused destruction of the tall vegetation and then slow rebuilding through plant succession. Accordingly the landscape would have been a mosaic of tall mature vegetation interspersed with various successional stages between grassland, shrubland, woodland and forest. And so it was up until about a millennium ago.

Pre-European Native Vegetation and Flora

The first European settlers were greeted with what they

described as a rather desolate plain as there had been several centuries of human-induced fires to add to the natural disturbances. So there was much more grassland – especially silver and blue tussock; scattered fire-resistant trees and shrubs such as cabbage tree, matagouri and tutu; and expansive tussock wetlands of sedges, NZ flax and toetoe. There were small patches of remnant forest. But in general, these settlers did not have an eye for the resources that Maori used.

Current Status of the Local Vegetation and Flora

The native vegetation of the lowlands is now in a sorry state in terms of natural character and biodiversity. Most people growing up in or travelling through the New Zealand countryside would believe that the natural environment comprised pine, macrocarpa, willow, poplar, oak, sycamore, hawthorn, gorse, broom, pasture grasses, various crops, sheep, cattle and possums! Every single one of these organisms has been imported from the wider world.

One is hard put to find a native plant or bird – you have to almost be an expert to spot the tiny slivers of nature. The odd cabbage tree or flax bush can be spotted here and there; pohuehue vine and bracken fern sometimes compete with gorse for hedge space, but these are mere bones, not even a complete skeleton. Through the north

Canterbury hills and downs there are however still some grey whisps of matagouri on the scarps too steep to be cultivated, mixed shrublands on hills, and bush remnants in gullies. A similar pattern is repeated around the country. It is up to us to bring back those native species we still have, before they are lost forever.

LIUDD Principles

Low Impact Urban Design and Development is about achieving sustainable cities through efficient management of energy, stormwater and waste. Greening of cities is also vital to overall urban health and well-being of citizens. Plants contribute to amenity, biodiversity (native plants and wildlife), sense of place, and natural stormwater filtration.

Principles of landscape, urban and catchment ecology can be applied from individual property to whole town scale. Even the smallest garden can contribute a habitat that provides a stepping-stone and together with other gardens can add up to make a green corridor to lead native birds and other native animals such as skinks back into towns and cities. Green planted roofs, rain-gardens, biodiverse lawns, open swales, detention ponds, and garden designs incorporating indigenous

plant signatures, contribute to overall biodiversity goals as well as providing natural water treatment.

Natural Patterns

Successful planting of local species must match the natural patterns of landforms and soils in the district. These range from dry stony or sandy soils (*Eyre-Paparua* soils) through deeper, loamy moister soils (*Wakanui* and *Templeton*) to wetter *Temuka gleys* and *Waimairi* peats. Moisture limitations can be overcome to some extent by irrigation, but this should be used sparingly and ideally only during establishment or natural patterns will be obscured. Winter frosts are common in the Lincoln area, but overhead shelter from tall trees or adjacent buildings can protect more sensitive plants.

The first steps to protecting and enhancing natural character and biodiversity are: identify and protect any existing natural values; respect existing topography and landforms as part of a legible landscape; utilise existing connections or links that can be developed into water treatment trains and green corridors.

Which Plant Species, Where?

The following native species lists are suitable for the first stages of planting. Latin names are used only at first mention or where there could be ambiguity. Acceptable exotic plants are those that provide some amenity value, provide food for native wildlife and importantly not be invasive. All native species meet these criteria, but the only really safe exotic species are those that are relatively small and coexist with native plants, or are sterile cultivars or hybrids, or are plants such as eucalyptus and some other myrtles, proteas and citrus relatives that do not spread - yet provide nectar for our honey eaters. Some species to avoid are sycamore, holly, cotoneaster (invasive), silver birch and plane trees (allogenic pollen), and aluminium plant, wandering willy, ivy, periwinkle (smothering ground cover) and honeysuckle (vines).

Streams, Waterways & *Treatment Trains*

Green Roofs

A green roof is a roof partially or fully covered by plants over a drainage layer and rooting medium. It provides insulation, reduces rapid storm-water runoff and is a habitat. Drought tolerant grasses, lichens,

rosette herbs, orchids and succulents can grow in these shallow soils. **Thin-layered green roofs** have a shallow soil layer (5-15cm). **Thick-layered green roofs** have deeper soil (15-30cm) and can support a greater variety of plants. Their weight requires a relatively strong supportive structure. The following list indicates suitable species for green roofs. Only bolded names can be considered for thin-layered roofs.

- ❑ **Biddibid (*Acaena buchananii, Acaena microphylla*)**
- ❑ ***Carex breviculmis***
- ❑ *Convolvulus* ***verecundus***
- ❑ *Coprosma atropurpurea*
- ❑ *Coprosma petriei*
- ❑ *Cotula australis*
- ❑ ***Deyeuxia avenoides***
- ❑ ***Dichondra brevifolia***
- ❑ ***Dichondra repens***
- ❑ **NZ iceplant (*Disphyma australe*)**
- ❑ *Einadia* spp.
- ❑ willowherbs (*Epilobium brunnescens, Epilobium cinereum, Epilobium nummulariifolium, Epilobium rostratum*)
- ❑ ***Geranium sessiliflorum***
- ❑ ***Gnaphalium audax***
- ❑ *Gonocarpus aggregatus*
- ❑ *Haloragis erectus*
- ❑ *Helichrysum filicaule*
- ❑ holy grass (*Hierochloe redolens*)
- ❑ ***Hypericum gramineum***
- ❑ ***Lachnagrostis* spp.**

- ❑ **cotula (*Leptinella minor, Leptinella serrulata*)**
- ❑ *Leucopogon fraseri*
- ❑ ***Linum monogynum***
- ❑ **rice grass (*Microlaena stipoides*)**
- ❑ onion-leaved orchid (*Microtis unifolia*)
- ❑ mat pohuehue (*Muehlenbeckia axillaris*)
- ❑ **leafless pohuehue (*Muehlenbeckia ephedroides*)**
- ❑ ***Oxalis exilis***
- ❑ **blue tussock *(Poa colensoi*)**
- ❑ *Pyrrosia eleagnifolia*
- ❑ scabweed (*Raoulia monroi*
- ❑ *Raoulia tenuicaulis*)
- ❑ **danthonia (*Rytidosperma clavatum, Rytidosperma unarede*)**
- ❑ *Stellaria gracilenta*
- ❑ sun orchid (*Thelymitra longifolia*)
- ❑ **sand twitch (*Zoysia minima*)**
- ❑ NZ groundsels (Senecio spp.)

Rain Gardens

Rain gardens filter, detain and evaporate water. Suitable species are listed:

- ❑ Sedges (*Carex virgata, C. flagellifera, C. testacea*)
- ❑ ink berry/turutu (*Dianella nigra*)
- ❑ mikimiki (*Coprosma propinqua*)
- ❑ rushes (*Juncus* spp.)
- ❑ oioi (*Apodasmia similis*)
- ❑ red tussock (*Chionochloa rubra*)
- ❑ knobby clubrush (*Isolepis nodosa*)
- ❑ wind grass (*Anemanthele lessoniana*)
- ❑ scrambling pohuehue (*Muehlenbeckia complexa*)

Swales

- ❑ *Pratia* spp.
- ❑ *Leptinella dioica*
- ❑ *Gnaphalium* spp.
- ❑ *Selliera radicans*
- ❑ *Centella uniflora*
- ❑ *Gunnera* spp.
- ❑ *Nertera setulose*
- ❑ *Mazus* spp.
- ❑ oioi
- ❑ *Juncus gregiflorus*
- ❑ *J. sarophorus*
- ❑ *Carex virgata*
- ❑ raupo (*Typha orientalis*)
- ❑ umbrella sedge (*Cyperus ustulatus*)
- ❑ NZ flax/harakeke (*Phormium tenax*)

Ponds/Stream Banks/Riparian Zones

Stream banks have parallel lines of distinctive vegetation that reflect the underlying moisture conditions. These are known as zones: water's edge, lower bank, upper bank, levee crest, floodplain, back swamp, lower terrace scarp, upper terrace scarp, and terrace top (or tread). Not all zones are always present. Suitable species are described in various streamside planting guides but are summarised here - from water's edge to dry banks.

- ❑ Pukio (Carex secta, C. virgata),
- ❑ toetoe (*Cortaderia richardii*)
- ❑ NZ flax/harakeke
- ❑ rushes (*Juncus australis, J. gregiflorus, J. sarophorus*)
- ❑ mikimiki (*Coprosma propinqua*)
- ❑ koromiko (*Hebe salicifolia*)
- ❑ cabbage tree (*Cordyline australis*)
- ❑ lowland ribbonwood/manatu (*Plagianthus regius*)
- ❑ pokaka (*Elaeocarpus hookerianus*)
- ❑ kahikatea (*Dacrycarpus dacrydioides*)
- ❑ kohuhu (*Pittosporum tenuifolium*)
- ❑ karamu (*Coprosma robusta*)
- ❑ narrow-leaved lacebark (*Hoheria angustifolia*)
- ❑ lemonwood (*Pittosporum eugenioides*)
- ❑ broadleaf (*Griselinia littoralis*)

Streets & Parks

Street Trees & Parklands

Some indigenous trees have suitable form, stature, growth rate and resilience for parks and streets. These may be called **noble trees** of Canterbury as oak, elm and linden are in Europe. For Canterbury to be recognisably New Zealand (and to attract native birds), all public and large-scale plantings should have a conspicuous proportion of New Zealand noble trees.

Potentially large evergreen trees should not be planted in a continuous line where they will permanently shade houses or gardens. It is desirable to use local provenances of plants especially where they may cross with local gene pools rather than North Island lacebark, for example.

- ❑ Lowland ribbonwood (deciduous)
- ❑ narrow-leaved lacebark (white blossoms in mid summer)
- ❑ kanuka (*Kunzea ericoides* - white blossoms at Christmas time)
- ❑ cabbage trees
- ❑ kowhai (South Island Form – even though it may go through an early tangled form – it has yellow blossoms with nectar in late winter-early spring for honey-eating birds)
- ❑ totara (*Podocarpus totara* - not golden totara as these are sterile and provide no berries for wildlife)
- ❑ broadleaf (needs low branch trimming)
- ❑ pokaka (on wet soils)
- ❑ kahikatea (on wet soils)
- ❑ lemonwood (lemon fragrant blossoms in spring)
- ❑ lancewood (*Pseudopanax crassifolius* - needs protection from vandalism at early stage)
- ❑ black beech or red beech (*Nothofagus* spp.)

Roundabouts & Portals

Entranceways and other highly visible but small locations can feature vertical elements and textural forms such as divaricating shrubs and tussocks.

- ❑ Cabbage trees
- ❑ Kanuka
- ❑ Lancewood
- ❑ fierce lancewood (*Pseudopanax ferox*)
- ❑ narrow-leaved lacebark
- ❑ kowhai, mikimiki (*Coprosma propinqua*, *C. virescens, C. crassifolia*)
- ❑ shrub daisies (*Olearia bullata*, *O. fragrantissima, O. lineata, Ozothamnus leptophylla*)
- ❑ weeping mapau (*Myrsine divaricata*)
- ❑ koromiko
- ❑ *Teucridium parvifolium*
- ❑ NZ flax

House Sections

Shrubberies

Trees (over 2.5 m tall) suitable for limited space

- ❑ Kanuka
- ❑ cabbage tree
- ❑ akeake
- ❑ golden akeake
- ❑ lancewood

- ❑ fierce lancewood
- ❑ kowhai
- ❑ five-finger
- ❑ rohutu
- ❑ kaikomako (*Pennantia corymbosa*)
- ❑ turepo
- ❑ pepperwood
- ❑ tree fuchsia (needs shelter)
- ❑ wineberry
- ❑ titoki (needs shelter)
- ❑ marble leaf
- ❑ *Coprosma rotundifolia*
- ❑ *Coprosma linariifolia*
- ❑ *Coprosma robusta*
- ❑ narrow-leaved lacebark
- ❑ pigeonwood (needs shelter)
- ❑ mahoe
- ❑ red mapau
- ❑ *Olearia fragrantissima*
- ❑ lowland ribbonwood
- ❑ kohuhu
- ❑ NZ cedar (*Libocedrus bidwillii*)

Shrubs (woody plants less than 2.5 m tall)

- ❑ Coprosmas
- ❑ *Corokia cotoneaster*
- ❑ prostrate kowhai
- ❑ *Cyathodes juniperina*
- ❑ *Leucopogon fasciculatus*
- ❑ niniao (*Helichrysum lanceolatum*)
- ❑ *Melicytus micranthus*
- ❑ prostrate kowhai (*Sophora prostrata*)
- ❑ porcupine shrub (*Melicytus alpinus*)
- ❑ shrub pohuehue (*Muehlenbeckia astonii*)
- ❑ mountain wineberry (*Aristotelia fruticosa*)
- ❑ *Pomaderris ericifolia*

Hedges

Many native shrubs can be trimmed for hedges or topiary. The vines below can also twine through the shrubs.

- ❑ Divaricating coprosmas (mikimiki)
- ❑ scrambling pohuehue
- ❑ rohutu
- ❑ broadleaf
- ❑ olearias
- ❑ pittosporums
- ❑ mapau
- ❑ totara
- ❑ leafless lawyer (*Rubus squarrosus*)
- ❑ *Helichrysum dimorphum*

Vines for Pergolas

Although not as robust as many introduced vines, many of which are now serious weeds, the following can be nurtured to provide some subtle variety and coverage of fences, trellises or pergolas.

- ❑ NZ jasmine (*Parsonsia* spp.)
- ❑ bush lawyer (*Rubus* schmidelioides, R. cissoides)
- ❑ clematis (*Clematis paniculata*, *C. foetida*, *C. forsteri*, *C. quadribracteolata*)
- ❑ climbing broom (*Carmichaelia kirkii*)
- ❑ climbing daisy (*Brachyglottis sciadophilus*)

Herbaceous Borders

These species are not necessarily local to the Canterbury Plains, but using native species of any type in these highly managed garden situations is desirable. By definition these are artificial communities and the species (including cultivars) do not pose any threat to local gene pools.

- ❑ Rengarenga (Arthropodium cirratum)
- ❑ Inkberry
- ❑ Chatham Island forget-me-not (*Myosotidium hortense*)
- ❑ bush lily (Astelia spp.)
- ❑ Maori onion (*Bulbinella* spp.)
- ❑ ferns (*Polystichum*, *Blechnum*, *Pellaea*, *Asplenium*)
- ❑ tree ferns (*Dicksonia*, *Cyathea* – most ferns need shelter and shade)
- ❑ mountain flax (*Phormium cookianum*)
- ❑ *Chionochloa flavicans*
- ❑ *Jovellana sinclairii*
- ❑ prostrate fuchsia (*Fuchsia procumbens*)
- ❑ *Euphorbia glauca*
- ❑ *Parahebe* spp.
- ❑ puha (*Sonchus kirkii*)

Native Lawns

Lawns can be species rich meadows if they are not pampered with water, fertiliser or herbicide. It cuts down on resource use and lawn mowing too. You probably already have the native hydrocotyle, tiny

yellow-flowering oxalis, dichondra and cotula in your lawn. But here are some others:

- Pratias
- dichondras (*D. repens, D. brevifolia*)
- pennyworts (*Hydrocotyle heteromeria*, *H. moschata*, *H. novae-zelandiae*, *H. microphylla*)
- cotulas (*Leptinella dioica* and other spp.)
- biddibids
- *Centella uniflora* (moist)
- musk (*Mazus* spp.)
- plantain (*Plantago triandra* - moist)

Rock Gardens

In Canterbury it is recommended that riverbed, coastal and rock ledge species are used rather than alpine species, most of which burn themselves out in the hot dry summers.

- ❑ Grasses (*Poa colensoi*
- ❑ *P. lindsayi*
- ❑ *P. imbecilla*
- ❑ *Zoysia minima*
- ❑ *Festuca actae*
- ❑ *F. novae-zelandiae*
- ❑ *F. coxii*
- ❑ *Dichelachne crinita*
- ❑ *Deyeuxia avenoides*
- ❑ *Lachnagrostis* spp.
- ❑ Danthonias
- ❑ elymus
- ❑ *sedges (Carex comans, Carex resectans*)
- ❑ cotulas (*Leptinella minor*, *L. serrulata*)
- ❑ mat pohuehue
- ❑ leafless pohuehue
- ❑ NZ aniseed (*Gingidia montana*)
- ❑ spear grasses (*Aciphylla* spp.)
- ❑ St Johnswort (*Hypericum gramineum*)
- ❑ dwarf brooms (*Carmichaelia uniflora*, *C. corrugata*, *C. monroi*, *C. vexillata*)
- ❑ scabweeds (*Raoulia* spp.)
- ❑ *Geranium sessiliflorum*
- ❑ *Leucopogon fraseri*
- ❑ Orchids

- ❑ *Blechnum penna-marina*
- ❑ *Celmisia gracilenta*
- ❑ *Einadia* spp.
- ❑ Woodrushes (*Luzula banksiana*, *L. ulophylla, L. celata*)
- ❑ biddibids
- ❑ forget-me-nots (Myosotis spp.)
- ❑ dwarf shrub daisies (*Helichrysum selago*)
- ❑ Marlborough rock daisy (*Pachystegia* spp.)
- ❑ NZ iris (*Libertia* spp.)
- ❑ cushions (*Scleranthus* spp.)
- ❑ *Leonohebe* spp.
- ❑ NZ daphne (*Pimelea* spp.)
- ❑ *Brachyglottis lagopus*
- ❑ dwarf coprosmas
- ❑ *Anisotome aromatica*
- ❑ Buttercups
- ❑ NZ linen flax (*Linum monogynum*)
- ❑ harebells (*Wahlenbergia* spp.)
- ❑ willowherbs
- ❑ cloakfern (*Cheilanthes* spp.)

Plant Availability
Nurseries providing native plants:

Motukarara Conservation Nursery & Resource Centre, RD2 Christchurch 7672, Phone 03 329 7846
All the plants sold here are eco-sourced natives.
www.doc.govt.nz/conservationnursery

Southern Woods Nursery Ltd, Main South Road, Templeton
PO Box 16-148, Christchurch, Phone 03 347 9221
Email info@southernwoods.co.nz
Some of the native plants sold here are eco-sourced. They will provide information if you ask.
www.southernwoods.co.nz

Trees For Canterbury, 42 Charlesworth St., Christchurch
Phone 03 982 1028, Email t4c@clear.net.nz
www.treesforcanterbury.org.nz

KiwiFlora Nurseries Ltd, 851 Waterholes Road, Templeton
Christchurch 7678, Phone 03 349 4582, Email info@kiwiflora.co.nz
www.kiwiflora.co.nz

Wai-ora Forest Landscapes Ltd, Watsons Road, Harewood, Christchurch 8051, Phone 03 359 2458, Email soren@wai-ora.nz
All our Native plants are Canterbury eco-sourced.
www.wai-ora.nz

Living Streams Community Nursery- Eco-sourced native plants for Peninsula Chch/Akaroa Highway (behind CCC Service Centre), Little River
Phone 03 329 0171 or 03 325 1229, Email waggie@xtra.co.nz or annelies.pekelharing@gmail.com

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