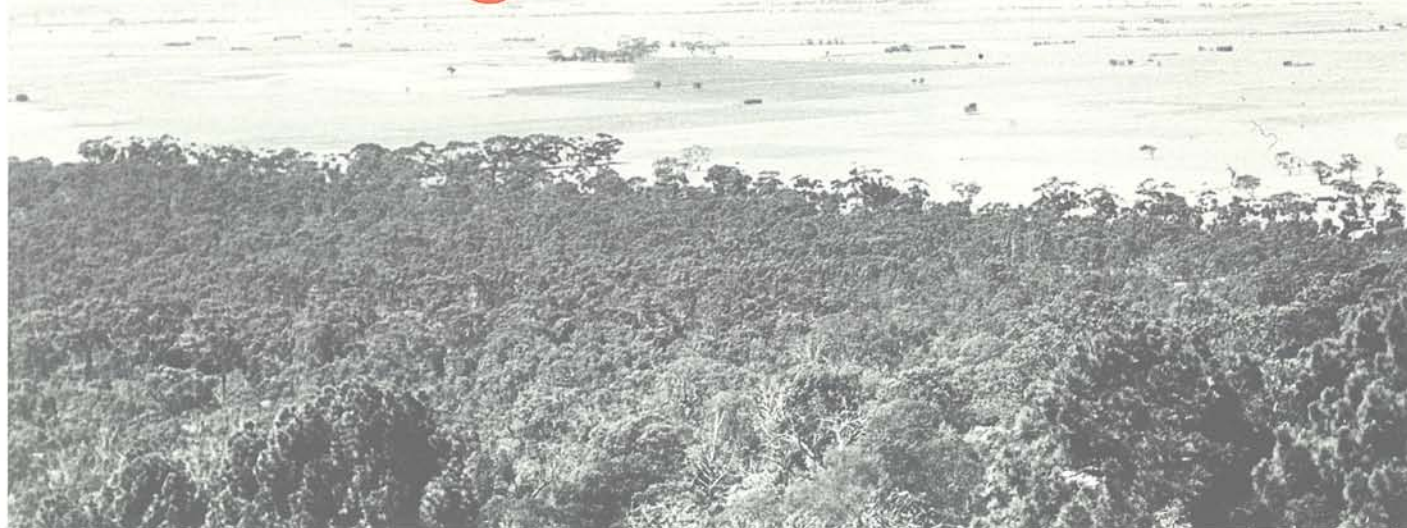


# Beautifying Melbourne's western edge

The Keilor plains.



Any traveller flying into Melbourne Airport at Tullamarine will notice that much of the land to the west of the city is very short on trees. Most of it is flat too. The area, sometimes known as the Keilor plains, is so harsh that it had few trees on it when the first European settlers arrived. In fact, it's hard to get trees to grow even when they are planted.

This didn't matter too much as long as the region was used mainly for grazing, some cropping, and irrigated market-gardening. A few tree species — mainly exotic — could be induced to grow to form the occasional windbreak, which was all that the land-owners needed. Settlements like Bacchus Marsh, Keilor, and Werribee developed in the shelter of the river valleys that cut deeply across the plains.

However, during the last decade, the ever-expanding city of Melbourne has been creeping westwards out of the milder environment around Port Phillip Bay onto the plains. Areas of development beyond the city's western fringe — such as that at Melton — have also been appearing.

Suburbs without trees and shrubs are pretty stark places. So are the roads and expressways that service them. Town planners have known for years that planting vegetation in suburban streets and along major roads can soften their impact, or even almost hide them altogether. However, in the naturally treeless

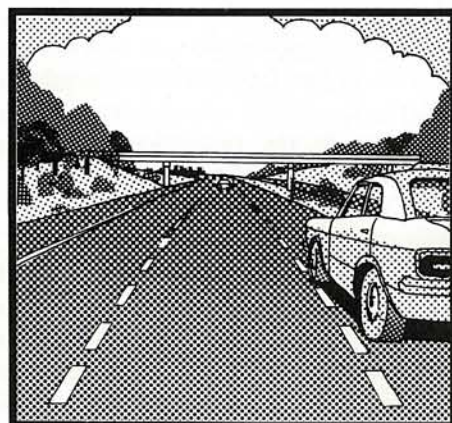
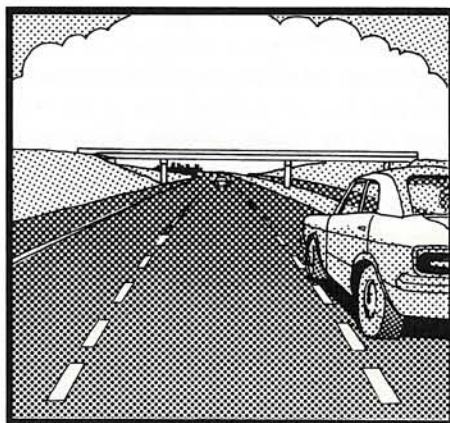
areas to the west of Melbourne this isn't so easy.

Some years ago the local councils that administer Melbourne's more westerly suburbs and the shires beyond came together to form the Western Region Commission. In 1973, with financial help from the then Federal Department of Urban and Regional Development, the Commission began a project that looked into tree- and shrub-planting as a way of improving the living conditions in the

region. Questions immediately arose: where could trees and shrubs be grown in the region, what species would be suitable for such a program, and, since there were no commercial nurseries in the area, what should be the source of supply?

To answer these questions the Department approached Melbourne's Royal Botanic Gardens. Dr David Churchill, Director of the Gardens, realized that the job of answering them would be a major task, particularly as the Department wanted the answers quickly. He just didn't have enough staff to carry it through.

Dr Churchill therefore asked the Department to allow CSIRO's Dr Milton Moore, leader of what is now the Woodland Ecology Section of the Organization's Division of Land Use Research, to help. The two came to an arrangement with the



How planting trees can soften engineering works.



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Department of Urban and Regional Development by which CSIRO would act as a subcontractor to the Botanic Gardens and carry out background studies of the region's environmental features.

### Maps wanted

In its brief, the Woodland Ecology group was asked to produce maps, at a scale of 1:100 000, showing the following features of the western region: its rainfall, drainage basins, and run-off; its soils; its existing land uses and proposed developments; and the present composition and density of its vegetation. In addition, if possible, a map should be prepared of the vegetation's distribution before settlement began so that European Man's impact could be assessed.

Under Dr Moore's supervision, Mr Garry Forster and Mr Mark Hallam carried out the field work for this project in about 4 months. It consisted partly of making rapid surveys of the 3000-sq-km region, and partly of gathering together existing information from various sources.

Thus, much of the information about its soils came from the local representative of the Soil Conservation Authority at Bacchus Marsh and from Dr Keith Grant of the CSIRO Division of Applied Geomechanics, who had already mapped the area using his PUCE system (see *Ecos* 8). On the other hand the researchers mapped the vegetation first-hand from their own observations. Unfortunately these vegetation surveys had to be carried out in the middle of winter, when very few species were flowering.

The maps and the report that accompanies them show that the region is a windy place much of the time, and nearly all of it suffers from summer droughts. Indeed, it contains the driest spot in Victoria — in the rain-shadow of Mt. Cotterell. Nevertheless both Dr Churchill and Dr Moore agree dryness is not the main reason for the lack of trees on the plains. Enough rain falls over most of the area to permit trees to grow.

The soils appear to be the problem. Much of the region is covered by two types — red duplex soils, where a relatively light topsoil overlies a heavy clay, and black or grey clays that expand when



**Deep alluvial soil along the Werribee River.**



**If not prevented, artichoke thistle will take over disturbed ground in Melbourne's western suburbs.**

wet then contract and form deep cracks when dry. The black or grey clays and the clay beneath the red soils may be almost completely impervious to water, so the soils waterlog very quickly in wet weather and the water does not sink in.

Most authorities now think that this waterlogging followed by drying out and cracking make it impossible for tree seedlings to get established. Grasses, on the other hand, with their shallow mat-like roots and quick growth, can take advantage of any rain that falls. Researchers from Melbourne University's Botany Department are at present looking in detail into why tree seedlings will not establish themselves.

### Volcanic cones

Additional evidence that the climate is not the feature limiting the growth of trees on the basalt soils has come from research carried out by biologists from the Royal Botanic Gardens in the crater lakes of extinct volcanic cones that occur on the basalt plains near Camperdown. They have analysed the pollen and remains of algae occurring in the sediments on the bottom of these crater lakes. Their results suggest that, although the vegetation of the surrounding countryside has hardly changed at all in 10 000 years,

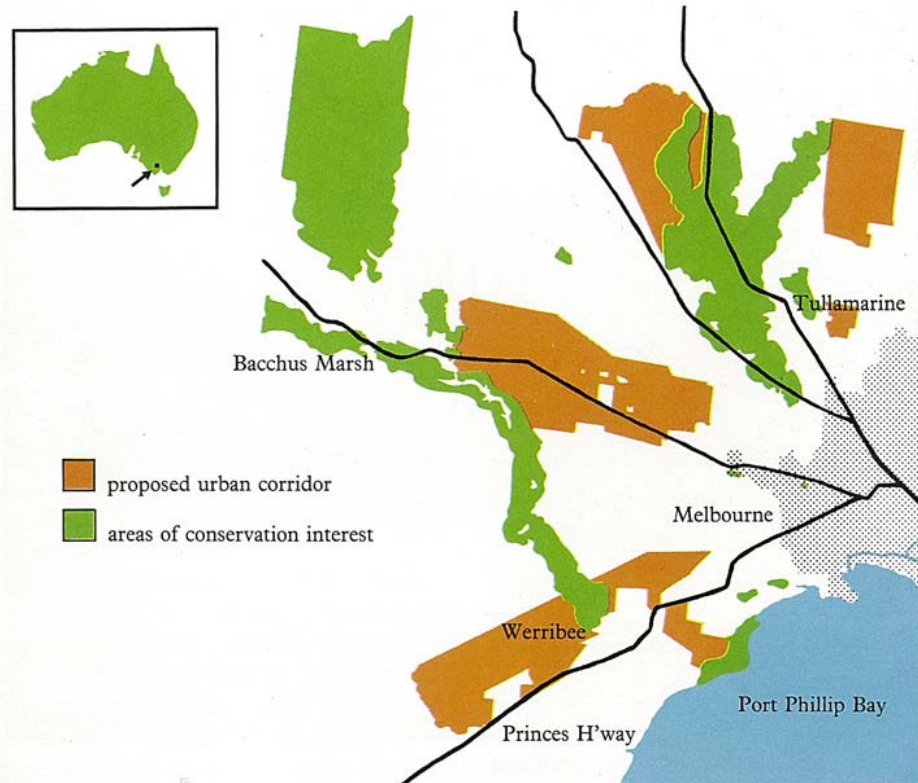
the climate has probably changed considerably.

Pollen counts indicated the types of vegetation, and evidence from the remains of algae suggested the climate. Many species of algae will only thrive in water with the right degree of saltiness, and different ones require different degrees. Thus the presence of certain species of algae at any particular time indicates the salinity of the water in the crater lakes at that time. In its turn, the salinity of the lakes points to whether rainfall was high or low — high salinity in the lakes suggests low water levels caused by low rainfall. The studies of the crater lakes showed that even substantial increases in the rainfall never seemed to bring about a greater proportion of tree pollen. Grasses, herbs, and shrubs continued to predominate.

Even though large parts of the region have always been treeless, the CSIRO maps show that a substantial part of the scattered woodlands that did exist when European settlement started have been cleared to make way for pasture. The surface soils of the areas that used to carry woodland and those that didn't appear to be very similar; but, deeper down, the subsoils of former woodland areas contain quartz pebbles, whose presence was



The western region survey area



Proposed urban corridors and areas of conservation interest in the western region.

*People from the western region were getting poor advice about what species to buy.*

what species they would recommend for growing in the region, and they asked people like park superintendents and government authorities with experience of growing plants there what they would plant.

The biggest users of plants in the region are the Country Roads Board, which maintains all roads including the Tullamarine freeway, and the Federal Department of Transport, which has carried out large areas of plantings to improve the landscape at the Tullamarine airport.

It fairly quickly became apparent that the plants the nurserymen recommended differed from those that the experienced users planted. In fact only about 20% of all the species recommended appeared on both lists. From this, it seemed that people from the western region buying from nurseries outside were getting poor advice about what species to buy.

Dr Churchill and his colleagues were able to come up with a list of about 600 species, some half of which are native to Australia, suitable for planting in different parts of the region depending on the conditions.

And this is where the surveys of the Division of Land Use Research come in. Trees and shrubs that grow in one area under a particular set of conditions do not necessarily grow in another. In particular, many plants have preferences for certain types of soils.

The CSIRO soil maps revealed that, although 17 different types of soil occur in the western region, two predominate. As mentioned earlier, these are the red calcareous duplex soils and grey cracking calcareous clays. It happens that these are the two soils with which major users of plants like the Country Roads Board and the Department of Transport have the most experience.

#### Freeway experience

The freeway westward from Melbourne to Geelong passes across red calcareous duplex soils for much of its length, and the Tullamarine freeway passes almost exclusively through grey calcareous cracking clays. Both these roads are very well planted along their entire lengths, and both are maintained by the Victorian



Inside the mallee pocket near Melton.

originally detected by Miss P. A. Geraghty of Melbourne University. The woodland ecologists think that quite possibly these pebbles allow better percolation of rainwater into the soil, and hence allow tree seedlings to get started.

The map of present and proposed land uses for the region shows four major urban corridor developments that have been under consideration. In addition, it delineates areas regarded by the State authorities and conservation groups as being of conservation interest. These are areas with unique botanical, geological, or other features of value for recreation or wildlife. Of particular interest is a small area of mallee a few kilometres north of Melton. This is an isolated pocket, the only one between Melbourne and the main belt 130 km away.

#### Finding the right trees

As the woodland ecology team was doing its field work and preparing its maps, Dr Churchill, assisted by Miss Nerina du Preez from the Royal Botanic Gardens, set about finding out what trees and shrubs were suitable for growing in the region. They began by approaching two groups of people. They asked the main suppliers of plants (mostly nurserymen located in Melbourne's eastern suburbs)





Coastal tea-tree along the edge of Port Phillip Bay in the south of the western region.

Country Roads Board. Melbourne Airport, where the Department of Transport has also carried out a large planting program, is also located exclusively on the grey cracking clays.

Thus, using the experience of these two government departments on these two soils, it was possible to confidently draw up lists of plants that would grow in the other parts of the region with similar soils.

Admittedly in some areas both these departments ensured the growth of their trees by removing the topsoil and replacing it with other more suitable soil shipped in from elsewhere. Nevertheless, it's much cheaper for town councils, factory-owners, or other people who may wish to beautify large areas if the trees they plant can survive on what's there naturally. The list of 600 species is tailored for this situation.

This list is being printed on computer punch cards. Each card represents a particular species and contains about a dozen pieces of information — for example, the tree's dimensions when full-grown, the soils it will grow on, and how well it tolerates urban pollution. The cards will come in four folders suitable for putting on a bookshelf. Using them should make it quick and easy to pick out species suitable for practically any situation in the western region. The folders of punch cards will be available from the

Royal Botanic Gardens, and from the Western Region Commission.

As well as preparing a species list, the Botanic Gardens was asked to make recommendations on setting up an experimental plant introduction unit, which would test the suitability of new plants for the western region in addition to those already recommended. Federal funds for this project were withdrawn following the demise of the Department of Urban and Regional Development. Nevertheless, it has been taken up by the Western Region Commission, which hopes to set up the unit at Werribee Park.

This historic property, bought recently by the State government, is now being developed as a cultural centre. It was here that the Chirnside family had a traditional 18th Century English landscaped garden planted. This garden contains a remarkable blending of Northern Hemisphere species with natives from all over Australia. Thus oaks, elms, and poplars stand side by side with Moreton Bay figs, Bunya pines, eucalypts, and she-oaks.

Dr Churchill regards the result as being most successful, the more so since the unknown landscape gardener who laid it out could not have known which species would grow on the treeless plains around Werribee. So the choice of Werribee Park as a site for the experimental introduction unit would be apt indeed.

### More about the topic

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