

Native trees & shrubs for planting in different land-zones in South West Victoria

Rod Bird 2018

To select native species of trees and shrubs to plant on a particular landscape:

1. look at the **map** (p. 3) to decide which **Land Zone** your site is in.
2. then look at the description for that Land Zone (pp. 6-8) to confirm your choice.
3. then go to '*Tree & shrub lists for Land Units in SW Victoria*' for your selection (pp. 9-39). **Land Units**, based on landform, are indicated in the landscape diagrams. Select the appropriate unit and consider the species that are suggested for that part of the landscape.
4. **Site factors, attributes and uses** of a species will determine what may be selected: refer to *Native trees and shrubs for SW Victoria –site factors, attributes and uses* (Bird 2018).

Land-zone – this is a grouping of broadly similar land-systems (*e.g.* Hamilton, Branxholme, Dunkeld and other land-systems for the Basaltic Plains, or Dundas, Glenelg and other land-systems for the Laterised Tablelands).

Land-system – a grouping of land-units of similar geology, landform or vegetation structure (grassland, heath, woodland, forest) that may differ in climate, soils or tree-shrub associations.

Land units – considered here as those parts of a Land-system or Land-zone that are distinctly different in topography, geology, soils or vegetation alliances.

The Land-zones presented below are based on those mapped by Gibbons R & Downes R (1964) [*A study of land in SW Victoria*] and Sibley GT (1967) [*A study of the land in the Grampians area*] for the Soil Conservation Authority Victoria, with some modifications as follows:

- * Because of differing land-use and major species, separate Land-zones have been denoted for the Strathdownie and Heywood land-systems (Gibbons & Downes regarded these as a single land-zone). Geological Survey of Victoria maps were used to distinguish land-zones east of the region mapped by Gibbons & Downes. Areas of Tertiary sediments between Port Fairy and Port Campbell, and north to Hexham, have been included in the Coastal Plains land-zone, but the Naringal-Timboon-Port Campbell portion has a taller forest of messmate and other species and could be considered a separate land-zone
- * The large Kanawinka land-zone of Gibbons & Downes has been presented as North Kanawinka Sandplain zone and South Kanawinka Sandplain land-zone. This was an attempt to split the area into wet southern heathlands (*e.g.* Kentbruck and Wanwin) and drier northern heathlands (*e.g.* Dorodong, Youpayang and others).
- * The Wimmera Clay and Sand Plains land-zone includes Sibley's Horsham, East Wonwandah, Ullswater, Kowree, Warratong and Telangatuk land-systems (an area roughly between the Glenelg and Wimmera rivers and from Stawell to Apsley).
- * The Grampians Ranges and Plains land-zone is an amalgam of Sibley's Grampians, Grampians plains, Mirranatwa, Moora valley and Mt. William creek land-systems.
- * Sibley's Brimpaen Land-system (lateritic plains) and the laterised plain east of the Hopkins River (Chatsworth-Lake Bolac-Woorndoo) has been included with the Laterised Tablelands land-zone, which has rather similar vegetation.
- * Sibley's Ararat Land-system has been used as the Ararat Hills and Plains land-zone. A separate Glenthompson Rolling Hills land-zone (an area with a similar complex geology but higher rainfall), was based on the Geological Survey of Victoria maps.
- * Sibley's Parrie Yallock Land-system has been used as our Parrie Yallock Plains and Swamps land-zone. This area is distinctly different from the neighbouring Grampians land-zone in that it has swamps and lunettes and an absence of large streams.



River red gum (*E. camaldulensis*) woodland on the Dundas Tableland
(Laterised Tablelands)



Grey box (*E. microcarpa*) and Buloke (*Allocasuarina luehmannii*) woodland in the Wimmera
(Wimmera clay & sandplains)



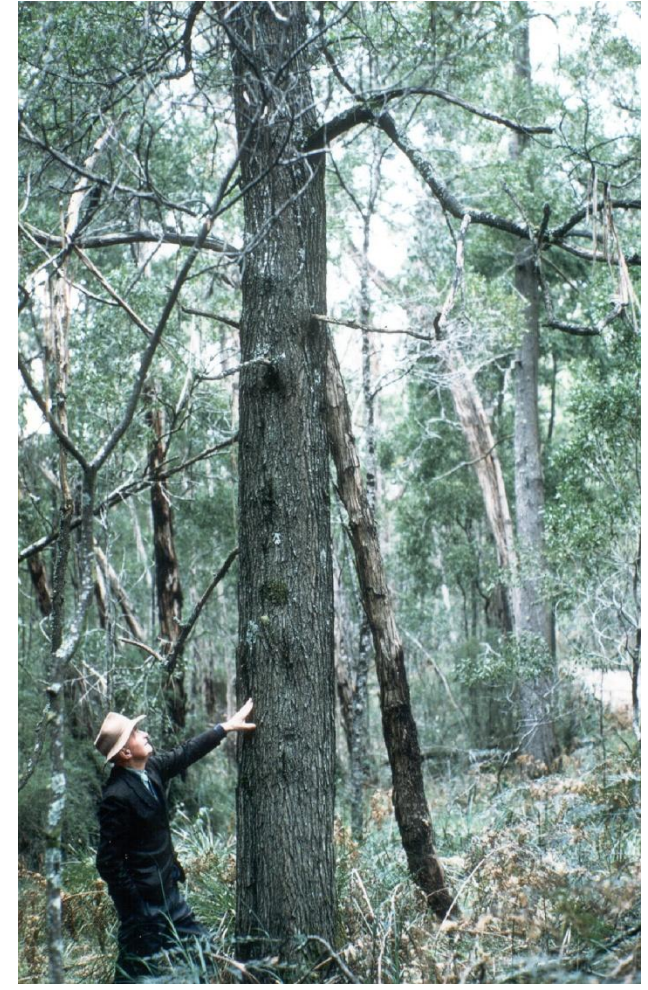
Yellow box (*E. melliodora*) & yellow gum (*E. leucoxylon*) woodland in the Black Range
(Grampians Ranges & Plains)



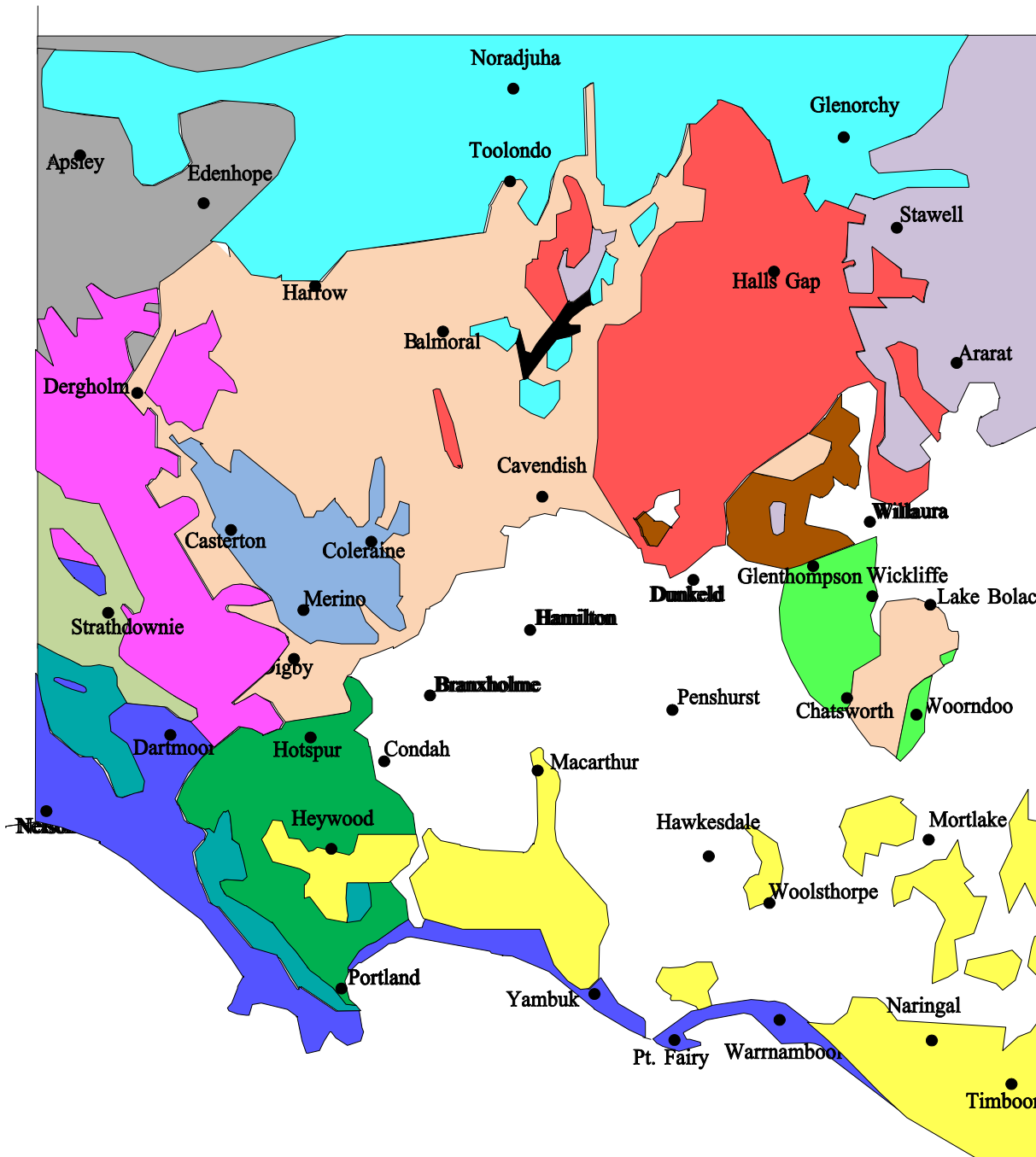
Drooping sheoak (*Allocasuarina verticillata*) on the banks of the Wannon River near Four Posts
(Laterised Tablelands)



Sweet bursaria (*Bursaria spinosa*) and swamp gum (*E. ovata*) woodland near Hamilton
(Basaltic Plains)



Blackwood (*Acacia melanoxylon*) on the Crawford River, near Hotspur
(Cobboboonee Basaltic Tableland)



SOUTH WEST

LAND-ZONES

- 1. Coastal Sandsheets & Dunes
- 2. Coastal Plains
- 3. Strathdownie Plain
- 4. South Kanawinka Sandplain
- 5. North Kanawinka Sandplain
- 6. Lowan Limestone Plain
- 7. Wimmera Clay and Sandplains
- 8. Laterised Tablelands (Dundas, Yarram, Wickliffe-Woorndoo)
- 9. Casterton Rolling Hills
- 10. Grampians Ranges & Plains
- 11. Parrie Yallock Plains & Swamps
- 12. Ararat Hills & Plains
- 13. Glenthompson Rolling Hills
- 14. Basaltic Plains
- 15. Cobbobboonee Basaltic Tableland

1. COASTAL SAND SHEETS AND DUNES 10

This comprises the Discovery Bay, Nelson and Long Swamp land-systems (Gibbons and Downes 1964).

Calcareous sand over basement limestone dunes running parallel with the coast, often separated by swamps from dunes of orange sand further inland. Areas of more acid grey-white sands may occur further inland.

The major tree species are manna gum, swamp gum, drooping she-oak, silver banksia, coastal wattle, boobialla and brown stringybark. The rainfall varies from 750 to 900 mm.

2. COASTAL PLAINS 12

This comprises the Heywood land-system (Gibbons and Downes 1964) and part of Heytesbury group sediments (GSV - Colac sheet, 1973).

A flat to gently undulating plain of alluvium overlying limestone, or basalt on the northern edge. For convenience, the Heytesbury Group Tertiary sediments (limestone, marl, gravel, grit, sand) to the east (Port Fairy-Mortlake-Port Campbell) are included in this land-zone. Limestone occasionally outcrops. The land is generally poorly drained with many small swamps and occasional slight sand ridges or rises. The soils are sandy loam or clay-loam.

The major tree species is swamp gum, with manna gum, shining peppermint, brown stringybark or messmate stringybark on better drained sites (as at Naringal). The shrub vegetation includes stunted silver banksia, prickly tea tree, scrub she-oak, black wattle, blackwood and prickly moses. Rainfall varies from 750 to 900 mm.

3. STRATHDOWNIE PLAIN 14

This comprises the Strathdownie land-system (Gibbons and Downes 1964).

A low-lying plain of sandy-clay river alluvium over a limestone basement, with many small to medium sized swamps, which are occasionally covered with sand. The major tree species are river red gum, swamp gum and silver banksia, with brown stringybark and manna gum on the sandy rises. The rainfall varies from 675 to 800 mm.

4. SOUTH KANAWINKA SANDPLAINS 16

This comprises the Follett land-system (Wanwin and Malanganee land-units) and Kanawinka land-system (Kentbruck, Cashmore, Richmond and Narrawong land-units), according to the classification of Gibbons and Downes (1964).

Sheets and dunes of acid white sand overlay clayey lagoon deposits of the coastal plain, occurring in patches from Narrawong, Portland and west of the Glenelg River through Mumbannar into South Australia. Sand overlies weathered Cobboboonee basalt in the Kanawinka land-system. The soils are poorly drained, highly leached, acidic sands which contain much organic matter.

The vegetation is wet heath with stunted trees. The major tree species is brown stringybark, with manna gum, swamp gum, shining peppermint, snow gum and Gippsland mallee in parts. Rainfall varies from 800 to 900 mm.

5. **NORTH KANAWINKA SAND PLAINS** 18

This comprises the Follett land-system (Dorodong, Tooloy, Killara and Myaring land-units) and Kanawinka land-system (Kanawinka, Bogalara, Roseneath, Youpayang, Mocamboro, Weecurra and Wataepoolan land-units), according to the classification of Gibbons and Downes (1964).

Sheets and dunes of acid white sand overlying clayey lagoon deposits of the coastal plain, extend north-south from Dartmoor to Edenhope. Parallel swamps occur in parts. Sand overlies laterised tableland in the eastern part of the zone (Kanawinka land-system). The major tree species on the sand is brown stringybark. Swamp gum, shining peppermint and river red gum occur on wetter areas in the south; yellow gum and pink gum occur in the north. Rainfall varies from 625 to 750 mm.

6. **LOWAN LIMESTONE PLAINS** 20

Comprises the Lowan land-system (Gibbons and Downes 1964) and Coonambidgal Formation sediments (GSV - Horsham sheet 1974).

A flat plain of Tertiary limestone, covered with a Quaternary veneer of alluvium, with many circular lakes and swamps. The major tree species are river red gum with some moonah and yellow gum; pink gum and silver banksia occur on slight sandy rises and ridges in the south. The alkaline soils are brown or reddish sandy loam, or dark clays on flats. Rainfall varies from 500 mm in the north to 675 mm in the area south of Apsley.

7. **WIMMERA CLAY AND SAND PLAINS** 22

This comprises the Horsham, East Wonwandah, Ullswater, Kowree, Warratong, Telangatuk and Darracourt land-systems (Sibley 1967).

This land-zone consists of a variable mixture of the following elements: extensive flat plains of marine and alluvial sediments (brown and grey heavy clay soils or red-brown earth duplex soils with sand/loam overlying clay); sand ridges (stranded coastal dunes); sand dunes and sand sheets over clay (wind-blown deposits); lunettes (wind-blown sand crescents found on the eastern side of swamps).

Originally there were woodlands of grey box, yellow gum, bull-oak, yellow box, black box and river red gum, with brown stringybark, silver banksia and some slender cypress pine, broom honey-myrtle and bundy on the deep sand. Rainfall varies from 450 to 650 mm.

8. **LATERISED TABLELANDS** 24

This comprises the Dundas and Glenelg land-systems (Gibbons and Downes 1964, Sibley 1967), the Brimpaen land-system (Sibley 1967) and the Chatsworth-Lake Bolac-Woorndoo laterite (GSV - Ballarat sheet 1973).

Laterised Tertiary sediments have been weathered to produce acidic brown sandy-loam soils over an impeding clay layer, usually with ironstone gravel over and in the clay. The Dundas Tableland is the major area, elevated 200 to 300 m and gently sloping to the north east. Rhyolite outcrops occur in the north. The plateau is moderately dissected below the level of the laterite, creating 'V' and 'U' shaped valleys. This is "red gum country" but contains drooping she-oak, blackwood, black wattle, sweet bursaria and other eucalypt species, including yellow box and yellow gum in the north, messmate in the south.

Other areas of laterised plain occur east of the Hopkins River and to the east of the Grampians near Yarram (Watgania), and these carry river red gums. The rainfall varies from 625 in the north to 800 mm near Digby.

9. **CASTERTON ROLLING HILLS** 26
- This comprises the Casterton land-system (Gibbons and Downes 1964).
- This zone is the area of steep grassland dissected up to 150 m below the level of the Dundas tableland. The lime-rich soils are brown sandy loams or dark cracking clays developed on Mesozoic sediments or Permian glacial deposits.
- Major trees are blackwood, river red gum, manna gum and swamp gum; snow gum, yellow gum, drooping she-oak, sweet bursaria, black wattle and varnish wattle also occur. Rainfall varies 625 to 750 mm.
10. **GRAMPIANS RANGES AND PLAINS** 28
- Comprises Grampians Ranges, Grampian Plains, Mirranatwa, Moora Valley, Mt. William Creek and Dryden land-systems (Sibley 1967).
- A range of mountains rises 350 m above the plain. The skeletal soils of the slopes are sand amongst quartzose sandstone. Outwash soils are generally infertile acidic deep sands over clay. The plains also include granite areas where the soil is a sandy-loam over clay (*e.g.* Mirranatwa and Lexington) and alluvial areas with sandy-loam or silty-loam over clay (*e.g.* Mt. William Creek, Dwyers Creek and Hopkins River).
- The tree species are varied, with brown stringybark, long-leaved box, yellow box, scent-bark, manna gum, river red gum, yellow gum, drooping she-oak, silver banksia, messmate and blackwood prominent on the margins of the ranges and the plains. Rainfall varies from 700 to 1000 mm, with topography and side of the range.
11. **PARRIE YALLOAK PLAINS AND SWAMPS** 30
- This comprises the Parrie Yalloak land-system (Sibley 1967).
- This is a flat depositional plain of sand and clay, with many fresh and saline swamps and associated lunettes located along the edge of the basalt plains. No defined drainage lines or flood plains. The freshwater swamps are large and the lunettes are extensive, deep, infertile and erodible sands. The saline swamps are small and the lunettes are formed from stable sandy loam or sandy clay-loam.
- The major trees are river red gum and swamp gum, with manna gum, drooping she-oak, black wattle and silver banksia on lunettes. Rainfall varies within the rain-shadow from 500 to 750 mm.
12. **ARARAT HILLS AND PLAINS** 32
- This comprises the Ararat land-system (Sibley 1967).
- Hills, rolling plains and undulating plains comprise the landscape. The erodible sandy-loam soils are derived from quartz from the intruding granite and quartz reefs and Ordovician and metamorphosed Ordovician sedimentary rock (mudstone, shale and sandstone).
- The major trees are long-leaf box, red stringybark, yellow box, scent-bark, yellow gum, drooping she-oak and river red gum. The rainfall varies from 500 to 650 mm, depending on the location within the Grampians "rain-shadow".

13. **GLENTHOMPSON ROLLING HILLS**34

This comprises areas of quartzose sandstone, shale, basic lava and metamorphics at Glenthompson & Woorndoo (GSV - Ballarat sheet 1973).

The rolling and steeply-rolling grasslands are, often deeply dissected. The sandy to sandy-loam duplex soils have developed on a complex of basement rock including: Ordovician sandstone, shales and metamorphics (schist, gneiss); laterised Tertiary sediments (sand, gravel, quartzite, ironstone); Devonian granodiorite and rhyolite; Cambrian basic lava (chert, greenstone, shale); and Silurian (Grampians group) quartzose sandstone. The soils are similar to those of the Ararat Hills and Plains land-zone and are very susceptible to wind and water erosion.

The main trees are river red gum, swamp gum, manna gum, blackwood, drooping she-oak, slaty she-oak, sweet bursaria, golden wattle and silver banksia. The rainfall varies from 650 to 700 mm.

14. **BASALTIC PLAINS**36

Comprises the Hamilton, Branxholme, Dunkeld, Eccles, Condah Swamp, Giringurrup land-systems (Gibbons and Downes 1964), Willaura land-system (Sibley 1967) and equivalent volcanics to the east (GSV – Colac and Ballarat sheets, 1973).

Extensive basalt plain, level to broadly undulating, with laterized soils varying from sandy loam to heavy brown or black cracking clay, or peat in swamps. These soils have drainage impeded by underlying clay. Rolling hills of older basalt and younger basaltic cones and "stony rises" provide soils which are freely draining. Underlying Tertiary sediments and limestone have been exposed by stream erosion on the Grange Burn, Muddy Creek and Violet Creek south of Hamilton, and more extensively near Branxholme and Wallacedale.

The original vegetation was mainly swamp gum, blackwood, black wattle, drooping she-oak, sweet bursaria and silver banksia. On the stony rises manna gum is often the only eucalypt – and blackwood the other major tree species. The Karabeal plains had few trees, due to the shallow and dense basalt sheet which impedes drainage and root development. Some areas (Dunkeld and Hamilton) are unusual in having river red gum as the dominant tree, perhaps because of a higher proportion of sand in the soil. On basalt, this species is usually confined to drainage lines. Rainfall varies from 650-825 mm, north to south.

15. **COBBOBOONEE BASALTIC TABLELAND**38

This comprises the Cobboboonee, Greenwald and Drumborg land-systems (Gibbons and Downes 1964).

These are gently rolling, well-drained, formerly mostly forested hills of weathered basalt, with a definite nodular ironstone (orstein) surface layer. The underlying limestone is sometimes exposed where streams have eroded the basalt. In the south-west the basalt may be covered by acid sand sheets. Swamps may occur on the flats. The major soils are gravelly sandy loams.

Messmate stringybark, blackwood and shining peppermint are the major tree species, with swamp gum, brown stringybark, manna gum and cherry ballart also prominent. Messmate forest grows best on fertile well drained sites, shining peppermint on slopes where limestone is exposed, swamp gum on the wetter flats and manna gum on chocolate soils of the cinder and lava cones. The rainfall varies from 750 to 900 mm.

TREE & SHRUB LISTS FOR LAND-UNITS IN SW VICTORIA

(Australian Native Species)

This guide to species selection is for those who wish to establish native species of trees and shrubs in shelterbelts, blocks, or dispersed in the landscape. The proposed purpose or function of the planting will determine what species may be useful (e.g. for a dense multi-species shelterbelts, habitat trees around a wetland, putting back nectar-producing species such as Silver Banksia and Sweet Bursaria into the landscape, or a firewood plantation). The attributes, site factors and uses of each species should determine what could be selected: refer to *Native trees and shrubs for SW Victoria – site factors, attributes and uses* (Bird 2018) for guidance. That report lists 245 species.

Use this guide to select the species of trees and shrubs that will flourish in your location and will meet your needs.

Footnotes in the tables relating to the selection of plants for a particular site:

* *species that are indigenous to the land-unit* - these species occur naturally in that landscape. All other listed species do not occur naturally there and probably did not occur there before settlement. Many come from areas in Australia far removed from SW Victoria.

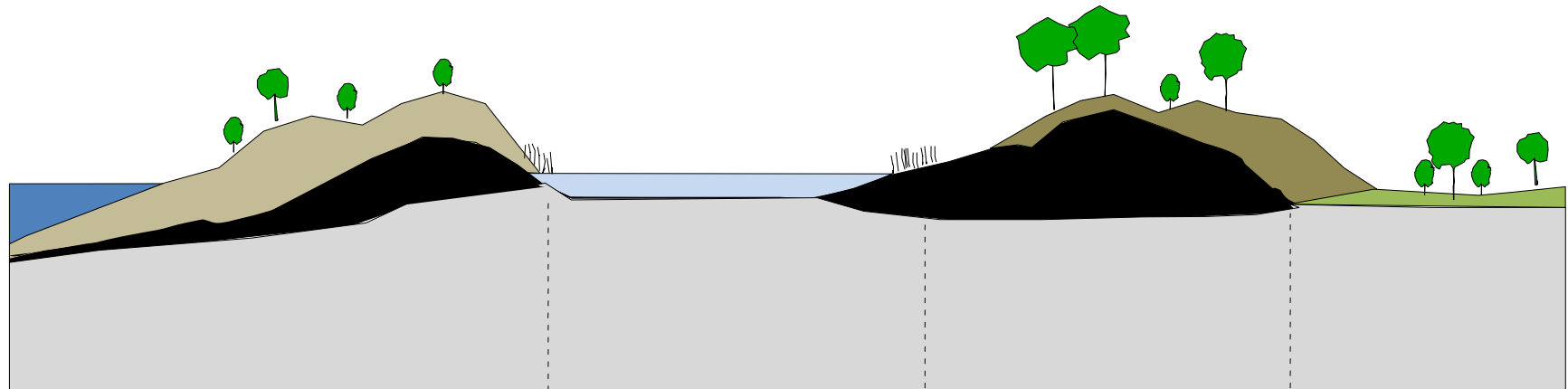
potential pest species (suckers, smothering or seeds prolifically and may be invasive)

- species such as *Casuarina glauca* (Grey Buloke) can reproduce by suckering and that may not be desirable in situations where it can escape into natural areas. Conversely, it may be a useful attribute in some shelterbelts where it can provide low cover and fill gaps.
- species such as *Acacia prominens* (Golden Rain Wattle) produce an enormous amount of litter from pads that smothers understory plants, which may not be desirable.
- species such as *A. longifolia* (Sallow Wattle), *A. pycnantha* (Golden Wattle) and *A. paradoxa* (Hedge Wattle) produce great quantities of seed and can swamp some sites with seedlings. While the Hedge Wattle is a valuable tall habitat shrub for small birds, due to its spiny stems and prickly foliage, it can form dense thickets that result in the destruction of understory flora.
- Species such as *Melaleuca ericifolia* (Swamp Paperbark) can reproduce prolifically in wet areas and may dominate the vegetation. In some cases that may not be desirable.
- Species that are NOT listed in these tables include *Acacia baileyana* (Cootamundra Wattle), *Leptospermum laevigatum* (Coast Tea-tree) and *Pittosporum undulatum* (Sweet Pittosporum) because they do not occur naturally here and may be extremely invasive when planted in some situations.

1. COASTAL SAND SHEETS & DUNES

Calcareous sand over basement limestone dunes running parallel with the coast, often separated from dunes of orange sand further inland by swamps. Areas of more acid grey-white sands may occur further inland.

The major tree species are manna gum, swamp gum, drooping she-oak, silver banksia and brown stringybark. The trees near the sea are stunted and the dunes are unstable.



LAND UNIT	CALCAREOUS DUNES	PEATY SWAMPS	ORANGE SAND DUNES	ACID WHITE SAND SHEET
Rainfall (mm)	825	825	825	825
Soil texture	sand	loam	sand	sand
pH	high	medium	medium	low
Drainage	good	poor	good	good
Frost	slight	slight	slight	slight
Salt problem	slight	no	no	no

TALL TREES	<p>Araucaria heterophylla * Eucalyptus baxteri Eucalyptus cornuta Eucalyptus gomphocephala * Eucalyptus leucoxylon ssp. megalocarpa * Eucalyptus obliqua * Eucalyptus ovata</p>	<p>Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus occidentalis * Eucalyptus ovata</p>	<p>* Eucalyptus baxteri Eucalyptus botryoides Eucalyptus cladocalyx Eucalyptus delegatensis Eucalyptus fraxinoides Eucalyptus globulus ssp. Eucalyptus gomphocephala Corymbia maculata Eucalyptus nitens * Eucalyptus obliqua Eucalyptus polyanthemos Eucalyptus regnans Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis ssp. cygnetensis * Eucalyptus willisii</p>	<p>* Eucalyptus baxteri * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus gomphocephala Corymbia maculata Eucalyptus polyanthemos Eucalyptus rubida Eucalyptus sideroxylon * Eucalyptus viminalis cygnetensis. * Eucalyptus willisii</p>
MEDIUM-SIZED TREES	<p>Acacia floribunda Acacia salicina Agonis flexuosa * Allocasuarina verticillata * Eucalyptus diversifolia Eucalyptus ficifolia Eucalyptus incrassata ssp. incrassata Eucalyptus landsdowneana Eucalyptus platypus var. heterophylla * Eucalyptus willisii Lagunaria patersonia Melaleuca armillaris * Melaleuca lanceolata</p>	<p>Acacia floribunda Acacia howittii * Acacia longifolia # * Acacia melanoxylon Acacia pravissima # Casuarina glauca Casuarina obesa Eucalyptus conferminata Eucalyptus cosmophylla Eucalyptus crenulata * Eucalyptus kitsoniana Melaleuca armillaris Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides</p>	<p>Acacia floribunda * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata * Bursaria spinosa * Eucalyptus diversifolia * Exocarpos cupressiformis Hakea laurina Melaleuca armillaris * Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare</p>	<p>Acacia floribunda * Acacia mearnsii Acacia pravissima * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Casuarina obesa Hakea laurina Melaleuca armillaris * Melaleuca lanceolata * Myoporum insulare</p>
SMALL TREES	<p>Acacia brachybotrya * Acacia longifolia sophorae # Allocasuarina muelleriana * Allocasuarina paludosa * Banksia marginata Dodonaea viscosa ssp. cuneata Hakea petiolaris * Leucopogon parviflorus Melaleuca nesophila * Myoporum insulare * Pomaderris oraria</p>	<p>* Acacia stricta * Acacia verticillata * Banksia marginata Callistemon rugulosus Callistemon salignus * Hakea nodosa Hakea salicifolia * Leptospermum lanigerum * Melaleuca decussata * Melaleuca ericifolia Melaleuca linariifolia</p>	<p>Acacia brachybotrya * Acacia longifolia # Acacia montana Acacia pycnantha * Acacia longifolia sophorae # Allocasuarina muelleriana * Bursaria spinosa Callistemon citrinus Hakea petiolaris Hakea salicifolia * Melaleuca decussata</p>	<p>Acacia brachybotrya * Acacia longifolia # Acacia pycnantha * Acacia longifolia sophorae # Allocasuarina muelleriana Hakea petiolaris Hakea salicifolia * Melaleuca decussata * Melaleuca gibbosa Melaleuca linariifolia</p>

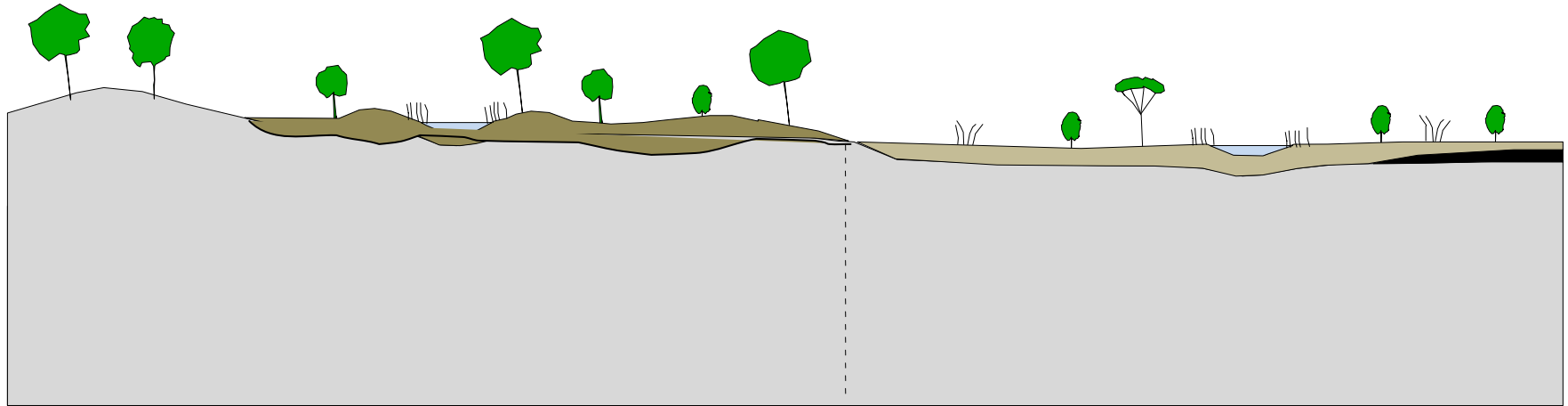
* species that is indigenous to the land-unit

potential pest species (suckers, smothering or seeds prolifically and may be invasive)

2. COASTAL PLAIN

Flat to gently undulating plain of alluvium overlying limestone, or basalt on the northern edge. For convenience, the Heytesbury Group Tertiary sediments (limestone, marl, gravel, grit, sand) to the east (Port Fairy-Mortlake-Port Campbell) are included in this land-zone. Limestone occasionally outcrops. The land is generally poorly drained with many small swamps and occasional slight sand ridges or rises. The soils are sandy loam or clay-loam.

The major tree species is swamp gum, with manna gum, shining peppermint, brown stringybark or messmate stringybark on the better-drained sites (as at Naringal). The shrub vegetation includes stunted silver banksia, prickly tea tree, scrub she-oak, black wattle, blackwood and prickly moses.



LAND UNIT	SANDY RISES AND LIMESTONE OUTCROPS	ALLUVIAL PLAIN AND SWAMP
Rainfall (mm)	825	825
Soil texture	loam/sandy loam/sand	clay-loam/sandy loam/peaty clay
pH	medium-high	medium
Drainage	poor-good	poor
Frost	slight	slight
Salt problem	no	slight

<p>TALL TREES</p>	<p>Casuarina cunninghamiana * Eucalyptus baxteri * Eucalyptus camaldulensis Eucalyptus globulus spp. Eucalyptus gomphocephala Eucalyptus grandis Eucalyptus nitens * Eucalyptus obliqua * Eucalyptus ovata Eucalyptus saligna * Eucalyptus viminalis ssp. viminalis</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus crenulata * Eucalyptus willisii Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus viminalis ssp. viminalis</p>
<p>MEDIUM-SIZED TREES</p>	<p>Acacia floribunda * Acacia meamsii * Acacia melanoxylon Acacia salicina * Allocasuarina verticillata * Banksia marginata # Casuarina glauca * Eucalyptus willisii * Exocarpos cupressiformis Eucalyptus diversifolia Eucalyptus platypus var. heterophylla * Ozothamnus ferrugineus Melaleuca armillaris Melaleuca halmaturorum * Melaleuca lanceolata</p>	<p>Acacia floribunda Acacia howittii * Acacia meamsii * Acacia melanoxylon Acacia pravissima * Acacia pycnantha # Casuarina glauca Casuarina obesa Eucalyptus conferminata Eucalyptus cosmophylla Eucalyptus kitsomiana Melaleuca armillaris Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides</p>
<p>SMALL TREES</p>	<p>Acacia brachybotrya # Acacia iteaphylla * Acacia longifolia # * Acacia myrtifolia * Acacia paradoxa # * Acacia retinodes * Acacia stricta * Acacia verticillata * Allocasuarina paludosa * Bursaria spinosa Banksia ericifolia Banksia spinulosa Callistemon rigidus Callistemon rugulosus Hakea salicifolia * Leptospermum myrsinoides # Melaleuca ericifolia</p>	<p>* Acacia longifolia # * Acacia myrtifolia * Acacia retinodes * Acacia verticillata * Allocasuarina paludosa * Banksia marginata * Bursaria spinosa Callistemon rugulosus Callistemon salignus Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia * Melaleuca gibbosa * Melaleuca squamea * Melaleuca squarrose * Viminaria juncea</p>

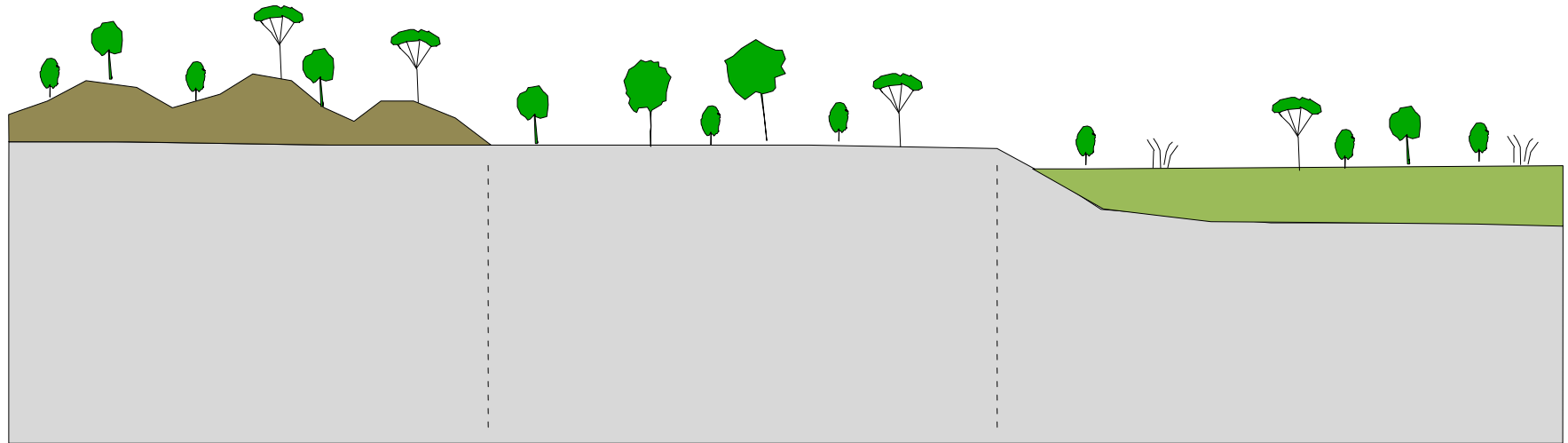
* species that is indigenous to the land-unit

potential pest species (suckering or prolific seeding habit and may be invasive)

3. STRATHDOWNIE PLAIN

Low-lying plain of sandy-clay river alluvium over a limestone basement, with many small to medium sized swamps that are occasionally covered with sand.

The major tree species are river red gum, swamp gum, blackwood and silver banksia, with brown stringybark, shining peppermint or manna gum on the sandy rises.



LAND UNIT	SAND SHEET	PLAIN	PEATY SWAMP OR CLAY FLAT
Rainfall (mm)	700	700	800
Soil texture	sand	loam	loam
pH	low	low	medium
Drainage	good	poor	poor
Frost	slight-moderate	slight-moderate	slight-moderate
Salt problem	no	no	no

TALL TREES	<ul style="list-style-type: none"> * Eucalyptus baxteri Eucalyptus botryoides Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus cytellocarpa Eucalyptus delegatensis Eucalyptus grandis Corymbia maculata Eucalyptus nitens * Eucalyptus obliqua Eucalyptus polyanthemus Eucalyptus saligna Eucalyptus sideroxylon * Eucalyptus viminalis ssp. cygnetensis 	<ul style="list-style-type: none"> Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus crenulata Eucalyptus grandis Eucalyptus globulus ssp. Eucalyptus nitens Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus robusta Eucalyptus saligna * Eucalyptus viminalis ssp. cygnetensis 	<ul style="list-style-type: none"> Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus crenulata Eucalyptus largiflorens Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus robusta
MEDIUM-SIZED TREES	<ul style="list-style-type: none"> Acacia dealbata Acacia decurrens * Acacia longifolia # * Acacia mearnsii Acacia pravissima * Allocasuarina verticillata Eucalyptus rubida * Eucalyptus willisii Melaleuca armillaris * Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare 	<ul style="list-style-type: none"> Acacia dealbata Acacia decurrens Acacia howittii * Acacia longifolia # * Acacia mearnsii * Acacia melanoxylon Acacia pravissima Casuarina obesa Eucalyptus cosmophylla Eucalyptus kitsoniana Melaleuca armillaris * Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides 	<ul style="list-style-type: none"> Acacia howittii * Acacia longifolia # * Acacia melanoxylon Acacia pravissima # Casuarina glauca Casuarina obesa Eucalyptus cosmophylla Eucalyptus kitsoniana Melaleuca armillaris * Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides
SMALL TREES	<ul style="list-style-type: none"> # Acacia iteaphylla Acacia montana * Acacia myrtifolia * Acacia retinodes * Banksia marginata * Bursaria spinosa * Dodonaea viscosa ssp. cuneata * Hakea nodosa Hakea petiolaris Hakea salicifolia * Leptospermum continentale * Leptospermum myrsinoides * Melaleuca decussata Melaleuca linariifolia 	<ul style="list-style-type: none"> * Acacia myrtifolia * Acacia pycnantha * Acacia verniciflua * Acacia verticillata * Bursaria spinosa Callistemon rugulosus * Hakea nodosa Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia * Melaleuca squarrosa 	<ul style="list-style-type: none"> Acacia brachybotrya * Acacia verticillata Callistemon rugulosus * Casuarina paludosa * Hakea nodosa Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia * Melaleuca gibbosa * Melaleuca neglecta * Melaleuca linariifolia * Melaleuca squarrose * Viminaria juncea

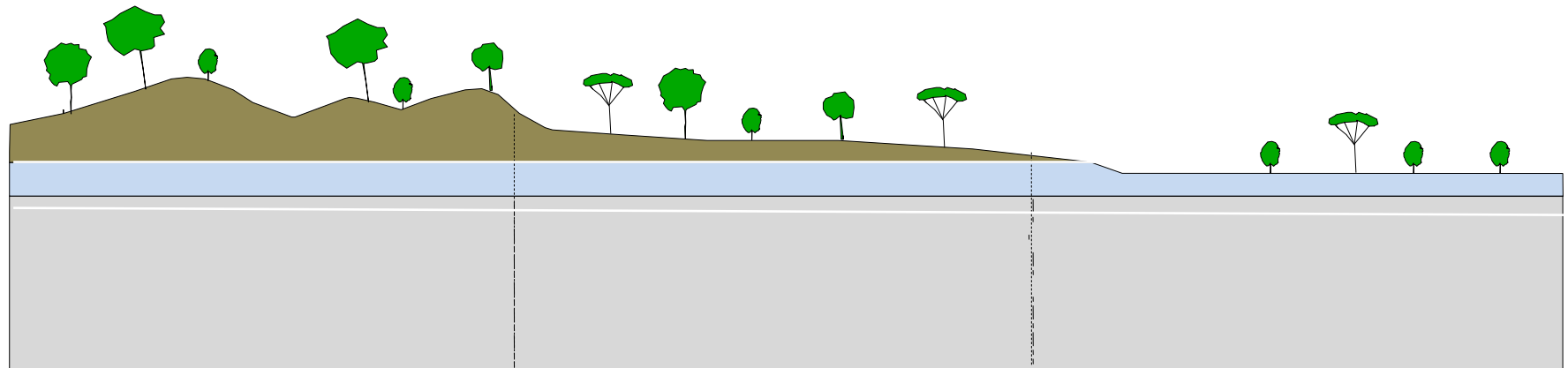
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

4. SOUTH KANAWINKA SAND PLAINS

Sheets and dunes of acid white sand overlying clayey lagoon deposits of the coastal plain, occurring in patches from Narrawong, Portland and west of the Glenelg River through Mumbannar into South Australia. Sand overlies weathered Cobboboonee basalt to the east (Kanawinka land-system). The soils are poorly drained, highly leached, acidic sands that contain much organic matter.

The vegetation is wet heath (including *Leptospermum* and *Melaleuca*) with stunted trees. The major tree species is brown stringybark, with manna gum, swamp gum, shining peppermint, snow gum, yellow gum and Gippsland mallee (bog gum) occurring in particular parts.



LAND UNIT	SAND DUNES	SAND SHEET	PEATY SWAMP
Rainfall (mm)	850	850	850
Soil texture	sand	peaty sandy loam	peaty sandy clay
pH	low	low	medium
Drainage	good	poor	poor
Frost	slight-moderate	slight-moderate	slight-moderate
Salt problem	no	no	no

<p>TALL TREES</p>	<ul style="list-style-type: none"> * Eucalyptus baxteri Eucalyptus bosistoana Eucalyptus botryooides Eucalyptus cladocalyx Eucalyptus delegatensis Eucalyptus fraxinoides Eucalyptus globulus Eucalyptus grandis Eucalyptus nitens * Eucalyptus obliqua * Eucalyptus ovata Eucalyptus regnans Eucalyptus saligna * Eucalyptus viminalis ssp. cygnetensis 	<ul style="list-style-type: none"> Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana * Eucalyptus camaldulensis * Eucalyptus leucoxyloides ssp. leucoxyloides Eucalyptus occidentalis Eucalyptus grandis * Eucalyptus ovata * Eucalyptus pauciflora ssp. pauciflora Eucalyptus robusta 	<ul style="list-style-type: none"> * Eucalyptus camaldulensis Eucalyptus occidentalis * Eucalyptus ovata
<p>MEDIUM-SIZED TREES</p>	<ul style="list-style-type: none"> * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Acacia retinodes * Allocasuarina verticillata * Banksia marginata Eucalyptus diversifolia * Eucalyptus willisii * Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare 	<ul style="list-style-type: none"> Acacia howittii * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus cosmophylla Eucalyptus crenulata * Eucalyptus kitsoniana * Eucalyptus willisii Melaleuca armillaris * Melaleuca halmaturorum Melaleuca styphelioides 	<ul style="list-style-type: none"> # Casuarina glauca Casuarina obesa * Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides * Eucalyptus kitsoniana
<p>SMALL TREES</p>	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia * Acacia pycnantha * Acacia longifolia sophorae # Acacia verniciflua * Bursaria spinosa Hakea petiolaris Hakea salicifolia Melaleuca armillaris * Melaleuca decussata * Melaleuca lanceolata Melaleuca linariifolia * Myoporum petiolatum 	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia * Acacia verticillata * Bursaria spinosa Callistemon rugulosus Hakea salicifolia * Hakea nodosa * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia * Melaleuca lanceolata Melaleuca linariifolia 	<ul style="list-style-type: none"> * Acacia verticillata * Allocasuarina pusilla * Leptospermum continentale * Leptospermum lanigerum * Hakea nodosa Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia * Melaleuca neglecta * Melaleuca squarrosa * Melaleuca squamea * Viminaria juncea

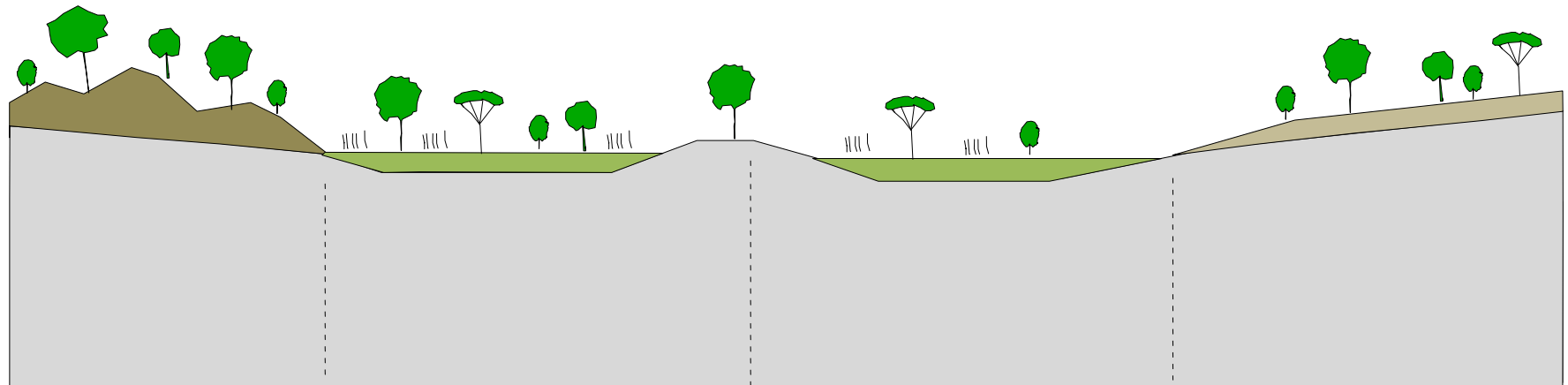
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

5. NORTH KANAWINKA SAND PLAINS

Sheets and dunes of acid white sand overlying clayey lagoon deposits of the coastal plain, extending north-south from Dartmoor to Edenhope. Parallel swamps occur in parts. Sand overlies laterised tableland in the eastern part of the zone (Kanawinka land-system).

The major tree species on the sand is brown stringybark. Swamp gum, shining peppermint, river red gum and some yellow gum occur on wetter areas in the south; river red gum, yellow gum and pink gum occur in the north.



LAND UNIT	SAND DUNES & SHEETS	FLATS & SWAMPS	SALT-AFFECTED FLATS	BUCKSHOT RISES
Rainfall (mm)	650-750	650-750	650	725
Soil texture	sand	loam	loam	loam
pH	low	low	low	low
Drainage	good	poor	poor	good
Frost	moderate	moderate	moderate	moderate
Salt problem	no	no	slight	no

TALL TREES	<p>Casuarina cunninghamiana * Eucalyptus baxteri Eucalyptus benthamii Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus fasciculosa Eucalyptus fraxinoides * Eucalyptus leucoxyloides ssp. leucoxyloides Eucalyptus globulus ssp. Eucalyptus grandis Eucalyptus longifolia Corymbia maculata * Eucalyptus obliqua Eucalyptus polyanthemus Eucalyptus rubida Eucalyptus sideroxyloides * Eucalyptus viminalis ssp. cygnetensis</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cornuta Eucalyptus crenulata * Eucalyptus fasciculosa Eucalyptus globulus ssp. bicostata Eucalyptus grandis Eucalyptus largiflorens Eucalyptus nitens Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus robusta Eucalyptus saligna * Eucalyptus willisii</p>	<p>Casuarina cunninghamiana Eucalyptus astringens Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus largiflorens Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata</p>	<p>* Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus fasciculosa * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus leucoxyloides ssp. pruinosa Eucalyptus macrorhyncha Corymbia maculata Eucalyptus melliodora Eucalyptus microcarpa Eucalyptus muelleriana Eucalyptus nicholii Eucalyptus occidentalis Eucalyptus polyanthemus Eucalyptus sideroxyloides/tricarpa Eucalyptus rubida * Eucalyptus viminalis cygnetensis</p>
MEDIUM-SIZED TREES	<p>* Acacia longifolia # * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus viridis * Eucalyptus willisii * Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare</p>	<p>Acacia howittii * Acacia longifolia # * Acacia melanoxylon Acacia pravissima * Acacia retinodes * Allocasuarina luehmannii # Casuarina glauca Eucalyptus cosmophylla Eucalyptus kitsoniana Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides</p>	<p>Allocasuarina luehmannii # Casuarina glauca Melaleuca armillaris Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides</p>	<p>* Acacia mearnsii * Acacia melanoxylon * Banksia marginata Callistemon salignus * Allocasuarina verticillata Eucalyptus alpina (serraensis) Eucalyptus viridis Hakea laurina Melaleuca armillaris * Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare</p>
SMALL TREES	<p>Acacia montana * Acacia myrtifolia * Acacia pycnantha * Acacia verniciflua * Banksia ornata * Bursaria spinosa * Dodonaea viscosa ssp. cuneata Eucalyptus incrassata Eucalyptus porosa Hakea petiolaris Hakea salicifolia * Melaleuca decussata * Myoporum petiolatum</p>	<p>* Acacia verticillata * Allocasuarina paludosa * Callistemon rugulosus * Hakea nodosa * Hakea rugosa Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata Melaleuca ericifolia * Melaleuca gibbosa * Melaleuca squarrosa * Viminaria juncea</p>	<p>Atriplex nummularia * Leptospermum continentale * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia * Melaleuca neglecta</p>	<p>Acacia brachybotrya # Acacia iteaphylla * Acacia longifolia # Acacia montana * Acacia myrtifolia * Acacia pycnantha * Acacia verniciflua * Allocasuarina muelleriana * Bursaria spinosa * Callistemon rugulosus * Dodonaea viscosa ssp. cuneata * Melaleuca decussata * Myoporum petiolatum</p>

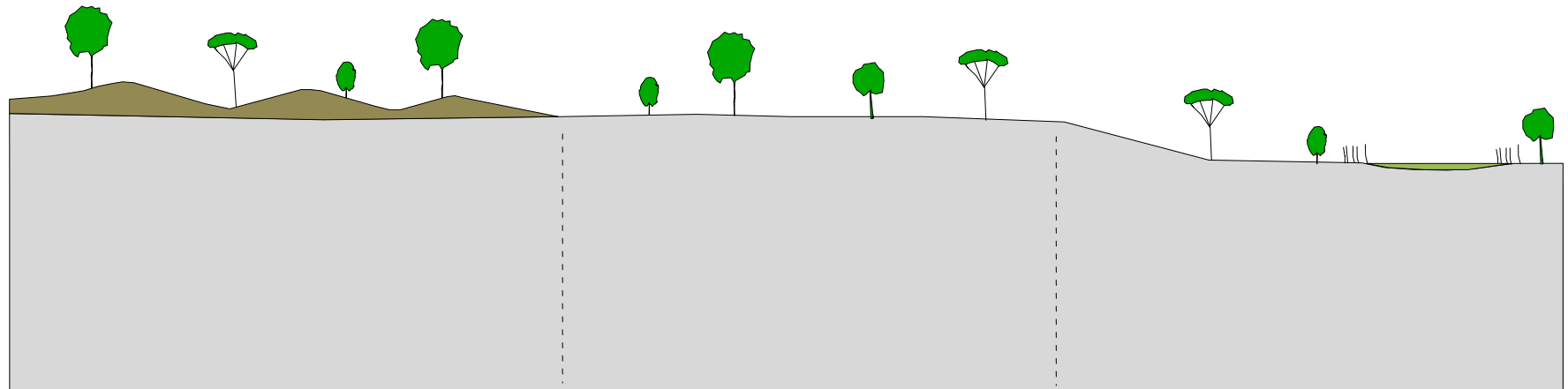
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

6. LOWAN LIMESTONE PLAINS

These are generally flat plains of Tertiary limestone, covered with a Quaternary veneer of alluvium, with many circular lakes and swamps. The alkaline soils are a brown or reddish sandy-loam of medium texture, or dark clays on lower sites. Low sandy ridges overlie the plains limestone in some parts.

The major tree species are river red gum with some moonah, yellow gum; pink gum. Desert stringybark (*Eucalyptus arenacea*), silver banksia, desert banksia, golden wattle and other wattles occur on the slight sandy rises and ridges.



LAND UNIT	LOW SAND RIDGES	PLAIN	SWAMP
Rainfall (mm)	500-650	500-650	500-650
Soil texture	sandy	sandy loam	clay-loam
pH	medium	medium	high
Drainage	poor	poor	poor
Frost	moderate-severe	moderate-severe	moderate-severe
Salt problem	no	no	some

TALL TREES	<ul style="list-style-type: none"> Eucalyptus cladocalyx * Eucalyptus fasciculosa Eucalyptus globulus ssp. bicostata * Eucalyptus leucoxylon ssp. leucoxylon * Eucalyptus leucoxylon ssp. pruinosa * Eucalyptus microcarpa * Eucalyptus viminalis ssp. cygnetensis * Pittosporum phillyreoides 	<ul style="list-style-type: none"> Casuarina cunninghamiana Eucalyptus botryooides * Eucalyptus camaldulensis Eucalyptus gomphocephala * Eucalyptus largiflorens * Eucalyptus leucoxylon ssp. leucoxylon * Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata 	<ul style="list-style-type: none"> Casuarina cunninghamiana * Eucalyptus camaldulensis Eucalyptus camphora * Eucalyptus largiflorens Eucalyptus occidentalis * Eucalyptus ovata
MEDIUM-SIZED TREES	<ul style="list-style-type: none"> Acacia dealbata * Acacia mearnsii * Acacia melanoxylon * Allocasuarina verticillata Banksia ericifolia Banksia integrifolia * Banksia marginata * Callitris gracilis ssp. murrayensis * Callitris rhomboidea * Eucalyptus arenacea * Eucalyptus gracilis * Hakea muelleriana 	<ul style="list-style-type: none"> Acacia dealbata Acacia floribunda # Acacia prominens * Acacia pycnantha * Allocasuarina luehmannii Casuarina pauper (cristata) # Casuarina glauca Eucalyptus astringens Eucalyptus cornuta Eucalyptus crenulata Eucalyptus kitsoniana Melaleuca armillaris * Melaleuca halmaturorum * Melaleuca lanceolata 	<ul style="list-style-type: none"> Acacia salicina * Allocasuarina luehmannii Callistemon citrinus Callistemon pallidus # Casuarina glauca * Casuarina obesa (Wimmera form) Eucalyptus cornuta Eucalyptus cosmophylla * Eucalyptus gracilis Eucalyptus spathulata * Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides
SMALL TREES	<ul style="list-style-type: none"> * Acacia brachybotrya * Acacia myrtifolia * Acacia paradoxa # * Acacia pycnantha * Acacia rigens * Allocasuarina muelleriana * Baeckea behrii * Banksia marginata * Banksia ornata * Callitris verrucosa * Dodonaea viscosa ssp. viscosa * Hakea rostrata * Leptospermum myrsinoides * Melaleuca uncinatum 	<ul style="list-style-type: none"> # Acacia iteaphylla Acacia howittii * Acacia longifolia # Acacia salicina * Allocasuarina pusilla * Baeckea behrii * Banksia marginata * Bursaria spinosa * Callistemon rugulosus Callistemon wimmerensis * Melaleuca decussata # Melaleuca ericifolia 	<ul style="list-style-type: none"> * Acacia verticillata * Callistemon rugulosus * Hakea nodosa * Hakea rostrata * Hakea rugosa Melaleuca armillaris # Melaleuca ericifolia * Melaleuca gibbosa * Melaleuca neglecta * Leptospermum lanigerum

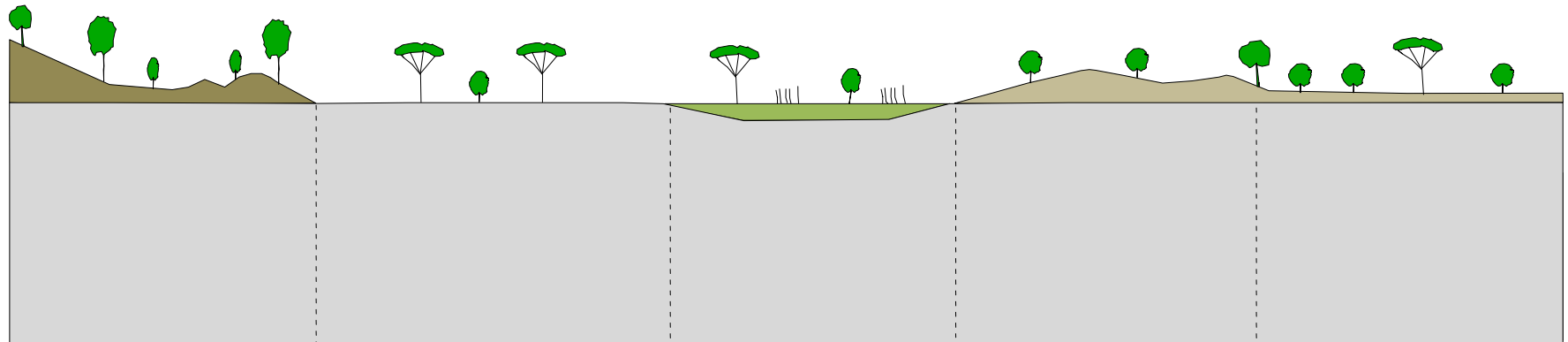
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

7. WIMMERA CLAY & SAND PLAINS

This land-zone consists of a variable mixture of the following elements: extensive flat plains of marine and alluvial sediments (brown and grey heavy clay soils or red-brown earth duplex soils with sand/loam overlying clay); sand ridges (stranded coastal dunes); sand dunes and sand sheets over clay (wind-blown deposits); lunettes (wind-blown sand crescents found on the eastern side of swamps).

The landscape was originally a woodland of grey box, yellow gum, bull-oak, yellow box, black box and river red gum, with brown stringybark, silver banksia and some slender cypress pine, broom honey-myrtle and bundy on the deep sand.



LAND UNIT	SAND RIDGE	DUNE	FLAT PLAIN	SWAMP	LUNETTE	SAND SHEET
Rainfall (mm)	450-500		450-600	650-600	550-600	550-600
Soil texture	deep sand		heavy clay	heavy	deep sand	shallow sand
pH	low		medium	high	low	low
Drainage	good		poor	poor	good	good
Frost	moderate-severe		severe	moderate-severe	moderate-severe	severe
Salt problem	no		minor	some	no	minor

TALL TREES	<ul style="list-style-type: none"> * Eucalyptus aromaphloia Eucalyptus cladocalyx * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus melliodora * Callitris gracilis 	<ul style="list-style-type: none"> .. Eucalyptus astringens * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus largiflorens * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus microcarpa * Eucalyptus melliodora Eucalyptus occidentalis 	<ul style="list-style-type: none"> Casuarina cunninghamiana * Eucalyptus camaldulensis * Eucalyptus largiflorens * Eucalyptus microcarpa * Eucalyptus ovata Eucalyptus occidentalis 	<ul style="list-style-type: none"> Callitris glaucophylla * Callitris gracilis * Callitris rhomboidea * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus melliodora 	<ul style="list-style-type: none"> Eucalyptus astringens * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus leucoxyloides ssp. leucoxyloides Eucalyptus maculata * Eucalyptus melliodora Eucalyptus muelleriana * Eucalyptus microcarpa Eucalyptus occidentalis Eucalyptus polyanthemus * Eucalyptus viminalis
MEDIUM-SIZED TREES	<ul style="list-style-type: none"> * Allocasuarina luehmannii * Allocasuarina verticillata * Banksia marginata * Callitris rhomboidea * Eucalyptus arenacea Eucalyptus astringens * Eucalyptus baxteri * Eucalyptus goniocalyx * Eucalyptus gracilis * Pittosporum phillyreoides 	<ul style="list-style-type: none"> Acacia stenophylla * Allocasuarina luehmannii # Casuarina glauca * Casuarina obesa (Wimmera prov.) Casuarina pauper Eucalyptus behriana Eucalyptus ficifolia Eucalyptus porosa 	<ul style="list-style-type: none"> Acacia salicina Acacia stenophylla * Allocasuarina luehmannii # Casuarina glauca * Casuarina obesa (Wimm. prov.) * Eucalyptus largiflorens Eucalyptus sargentii 	<ul style="list-style-type: none"> * Acacia pycnantha * Allocasuarina luehmannii * Allocasuarina verticillata * Banksia marginata * Callitris rhomboidea * Eucalyptus arenacea * Eucalyptus gracilis * Pittosporum phillyreoides 	<ul style="list-style-type: none"> Acacia falciformis * Acacia implexa * Acacia mearnsii * Acacia melanoxylon * Allocasuarina luehmannii * Allocasuarina verticillata * Banksia marginata Eucalyptus ficifolia Eucalyptus porosa * Pittosporum phillyreoides
SMALL TREES	<ul style="list-style-type: none"> # Acacia iteaphylla * Acacia brachybotrya * Acacia myrtifolia * Acacia rigens * Acacia verniciflua * Allocasuarina muelleriana * Banksia ornata * Baeckea behrii * Bursaria spinosa * Dodonaea viscosa cuneata * Eucalyptus behriana * Eucalyptus dumosa * Eucalyptus leptophylla * Eucalyptus incrassata * Eucalyptus froggattii * Eucalyptus porosa * Eucalyptus viridis Eucalyptus steedmannii * Leptospermum myrsinoides 	<ul style="list-style-type: none"> * Acacia brachybotrya * Acacia montana * Acacia paradoxa # * Acacia rigens * Callistemon rugulosus Callistemon pallidus Eucalyptus salubris Eucalyptus viridis * Leptospermum continentale * Melaleuca decussata 	<ul style="list-style-type: none"> * Acacia verticillata * Allocasuarina paludosa * Callistemon rugulosus * Callistemon salignus * Leptospermum continentale Melaleuca armillaris * Melaleuca decussata * Melaleuca halmaturorum * Melaleuca lanceolata * Melaleuca neglecta * Melaleuca wilsonii * Muehlenbeckia cunninghamii 	<ul style="list-style-type: none"> Acacia acuminata * Acacia brachybotrya # Acacia iteaphylla * Acacia myrtifolia * Acacia rigens * Allocasuarina pusilla * Banksia ornata * Callitris verrucosa Eucalyptus calycogona * Eucalyptus dumosa * Eucalyptus froggattii * Eucalyptus incrassata * Eucalyptus leptophylla * Eucalyptus porosa Eucalyptus viridis * Leptospermum myrsinoides 	<ul style="list-style-type: none"> * Acacia brachybotrya * Acacia calamifolia * Acacia enterocarpa # Acacia iteaphylla * Acacia myrtifolia * Acacia longifolia # * Acacia pycnantha * Acacia retinodes * Acacia rigens * Acacia verticillata * Allocasuarina muelleriana * Allocasuarina paludosa * Baeckea behrii * Dodonaea viscosa cuneata * Melaleuca decussata * Melaleuca uncinata * Melaleuca wilsonii

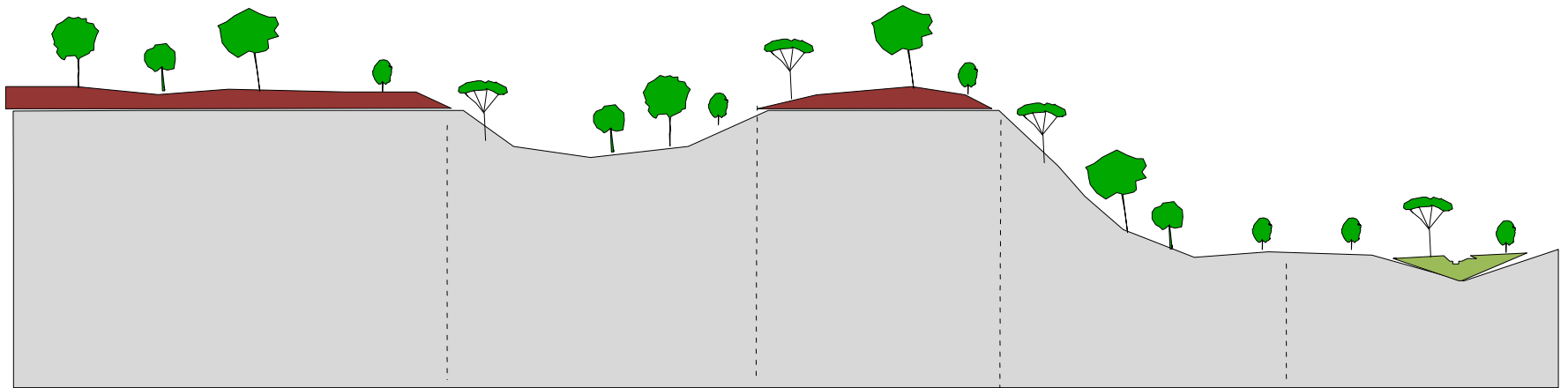
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

8. LATERISED TABLELANDS

Laterised Tertiary sediments have been weathered to produce acidic brown sandy-loam soils over an impeding clay layer, usually with ironstone gravel over and in the clay. The Dundas Tableland is the major area, elevated 200 to 300 m and sloping gently down to the north-east. Rhyolite outcrops occur in the north. The plateau is slightly to moderately dissected below the level of the laterite, creating 'V' and 'U' shaped valleys.

This landform is widely recognised as the "red gum country" of SW Victoria but contains drooping she-oak, blackwood, black wattle, sweet bursaria and a number of other eucalypt species, including yellow box and yellow gum in the north and messmate in the south. Other areas of laterised plain occur east of the Hopkins River (between Wickliffe and Woorndoo) and to the east of the Grampians near Yarram, and these also carry river red gums.



LAND UNIT	PLATEAU	HIGHER SLOPES	GRAVEL RISES	LOWER SLOPES/FLATS	SALINE VALLEYS
Rainfall (mm)	650-800	650-800	650-750	650-700	650-700
Soil texture	loam	loam	gravel loam	loam	clay-loam
pH	low	low	low	low	low
Drainage	poor	poor	good	poor	poor
Frost	moderate	moderate	moderate	moderate-severe	moderate-severe
Salt problem	no	no	no	some seepages	yes

<p>TALL TREES</p>	<p>Casuarina cunninghamiana * Eucalyptus aromaphloia Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus cypellocarpa Eucalyptus globulus Eucalyptus grandis Corymbia maculata * Eucalyptus melliodora Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus pauciflora ssp. pauciflora Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis ssp. cygnetensis</p>	<p>Casuarina cunninghamiana * Eucalyptus aromaphloia Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus cypellocarpa Eucalyptus globulus Eucalyptus grandis * Eucalyptus leucoxylon leucoxylon Eucalyptus muelleriana Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus pauciflora pauciflora Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis</p>	<p>Eucalyptus bosistoana Eucalyptus botryoides Eucalyptus cladocalyx Eucalyptus globulus ssp. * Eucalyptus leucoxylon Eucalyptus macrorhyncha ... Corymbia maculata * Eucalyptus melliodora Eucalyptus muelleriana Eucalyptus microcarpa Eucalyptus nicholii Eucalyptus obliqua Eucalyptus occidentalis * Eucalyptus pauciflora pauciflora Eucalyptus polyanthemus Eucalyptus rubida Eucalyptus sideroxylon/tricarpa</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cornuta Eucalyptus crenulata Eucalyptus cypellocarpa Eucalyptus globulus Eucalyptus grandis * Eucalyptus leucoxylon leucoxylon Eucalyptus largiflorens * Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus saligna</p>	<p>Casuarina cunninghamiana Eucalyptus astringens Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus largiflorens Eucalyptus leucoxylon Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus polyanthemus</p>
<p>MEDIUM-SIZED TREES</p>	<p>Acacia decurrens Acacia howittii * Acacia mearsii * Acacia melanoxylon Acacia pravissima * Acacia retinodes * Allocasuarina verticillata * Banksia marginata # Casuarina glauca * Eucalyptus alpina (serraensis) Eucalyptus kitsoniana Melaleuca armillaris Melaleuca halmaturorum Melaleuca stypelioides</p>	<p>Acacia howittii # Acacia longifolia * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus alpina (serraensis) Eucalyptus kitsoniana Melaleuca armillaris Melaleuca halmaturorum Melaleuca stypelioides</p>	<p>Acacia dealbata Acacia falciformis # Acacia longifolia * Acacia mearsii * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata Eucalyptus alpina (serraensis) * Eucalyptus baxteri Eucalyptus viridis Melaleuca armillaris Melaleuca stypelioides</p>	<p># Acacia longifolia * Acacia mearsii * Acacia melanoxylon Acacia pravissima * Banksia marginata # Casuarina glauca Eucalyptus cosmophylla Eucalyptus kitsoniana Melaleuca armillaris Melaleuca halmaturorum Melaleuca lanceolata Melaleuca stypelioides</p>	<p># Casuarina glauca Casuarina obesa Eucalyptus felmelica Eucalyptus halophila Eucalyptus rigens Eucalyptus sargentii Melaleuca halmaturorum Melaleuca lanceolata Melaleuca stypelioides</p>
<p>SMALL TREES</p>	<p>* Acacia longifolia Acacia pravissima * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Allocasuarina paludosa * Bursaria spinosa Callistemon rugulosus * Leptospermum continentale Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia</p>	<p>* Acacia myrtifolia * Allocasuarina muelleriana * Bursaria spinosa Callistemon rugulosus * Goodia medicaginea Hakea salicifolia * Leptospermum myrsinoides * Melaleuca decussata # Melaleuca ericifolia * Melaleuca gibbosa Melaleuca lanceolata Melaleuca linariifolia * Solanum laciniatum</p>	<p>Acacia montana * Acacia myrtifolia * Acacia verniciflua * Banksia ornata * Bursaria spinosa Callistemon rugulosus * Allocasuarina muelleriana * Dodonaea viscosa ssp. cuneata Hakea petiolaris Hakea salicifolia * Melyctus dentata * Melaleuca decussata * Myoporum petiolatum</p>	<p>Acacia howittii * Acacia verticillata Callistemon rugulosus * Goodenia ovata Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia Melaleuca neglecta Melaleuca squarrosa Melaleuca wilsonii</p>	<p>Atriplex nummularia Callistemon rugulosus * Leptospermum continentale * Leptospermum lanigerum Melaleuca armillaris Melaleuca cuticularis * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia Melaleuca neglecta * Viminaria juncea</p>

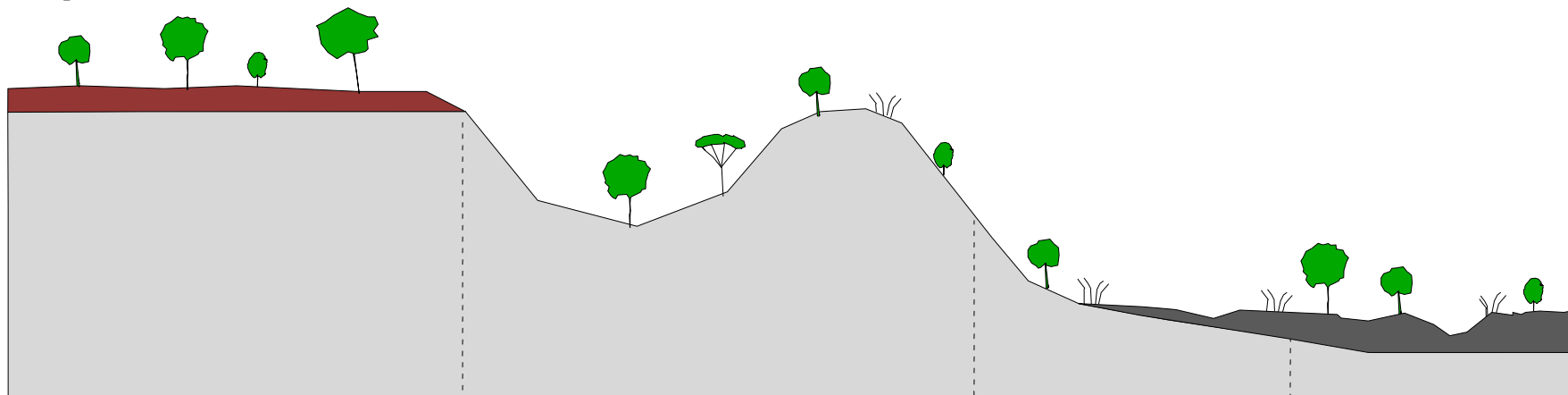
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

9. CASTERTON ROLLING HILLS

This zone is the area of steep rolling grassland dissected up to 150 m below the level of the surrounding Dundas Tableland. The lime-rich soils are brown sandy loams or dark cracking clays developed on soft Mesozoic sediments or Permian glacial deposits. Land-slip and gully erosion is common. This area was a grassland relatively free of trees and the first stations were established here.

The major trees are river red gum, manna gum, swamp gum and blackwood; snow gum, yellow gum, drooping she-oak, sweet bursaria, black wattle and varnish wattle is also prominent.



LAND UNIT	TABLELAND REMNANT	SLOPES	SALINE SEEPS/FLATS	FLATS
Rainfall (mm)	650-800	650-800	650-800	650-800
Soil texture	loam	clay loam	clay loam	clay
pH	low	medium	medium	medium
Drainage	poor	good	poor	poor
Frost	moderate	moderate	moderate	moderate-severe
Salt problem	no	no	yes	no

TALL TREES	<p>Casuarina cunninghamiana * Eucalyptus aromaphloia Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus crenulata Eucalyptus cypellocarpa Eucalyptus globulus ssp. Eucalyptus grandis Corymbia maculata * Eucalyptus ovata Eucalyptus occidentalis * Eucalyptus pauciflora ssp. pauciflora Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis ssp. cygnetensis</p>	<p>Casuarina cunninghamiana * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus leucoxylon ssp. leucoxylon Eucalyptus macrorhyncha Corymbia maculata Eucalyptus melliodora Eucalyptus muelleriana Eucalyptus nicholii Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus pauciflora ssp. pauciflora Eucalyptus polyanthemus Eucalyptus rubida Eucalyptus sideroxylon</p>	<p>Eucalyptus astringens Eucalyptus bosistoana * Eucalyptus camaldulensis * Eucalyptus largiflorens Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus polyanthemus</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryooides * Eucalyptus camaldulensis Eucalyptus cornuta Eucalyptus crenulata Eucalyptus cypellocarpa Eucalyptus grandis Eucalyptus globulus ssp. Eucalyptus leucoxylon Eucalyptus nicholii Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus saligna</p>
MEDIUM-SIZED TREES	<p>Acacia dealbata Acacia decurrens * Acacia mearnsii * Acacia melanoxylon * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus kitsoniana Melaleuca halmaturorum Melaleuca lanceolata Melaleuca styphelioides</p>	<p>Acacia falciformis * Acacia melanoxylon * Acacia retinodes * Allocasuarina verticillata * Banksia marginata Eucalyptus alpine (serraensis) Eucalyptus cladocalyx v nana Eucalyptus cornuta Eucalyptus kitsoniana Eucalyptus viridis Melaleuca armillaris * Melaleuca lanceolata Melaleuca styphelioides Myoporum insulare</p>	<p># Casuarina glauca Casuarina obesa Eucalyptus sargentii Eucalyptus famelica Eucalyptus halophila Eucalyptus rigens Melaleuca halmaturorum Melaleuca lanceolata Melaleuca styphelioides</p>	<p>* Acacia melanoxylon Acacia howittii # Casuarina glauca Eucalyptus cosmophylla Eucalyptus crenulata Eucalyptus kitsoniana Eucalyptus platypus Melaleuca armillaris Melaleuca halmaturorum Melaleuca lanceolata Melaleuca styphelioides</p>
SMALL TREES	<p>Acacia iteaphylla Acacia howittii * Acacia verniciflua * Acacia verticillata * Bursaria spinosa Callistemon rugulosus * Melyctus dentata Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia</p>	<p>Acacia brachybotrya # Acacia iteaphylla * Acacia pycnantha * Acacia verticillata * Bursaria spinosa Callistemon rugulosus * Dodonaea viscosa ssp. cuneata * Melyctus dentata * Melaleuca decussata * Melaleuca gibbosa * Myoporum petiolatum</p>	<p>Atriplex nummularia * Leptospermum continentale * Leptospermum lanigerum Melaleuca armillaris Melaleuca cuticularis * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia * Melaleuca neglecta</p>	<p>* Acacia verticillata * Allocasuarina paludosa Callistemon rugulosus * Leptospermum lanigerum Melaleuca cuticularis * Melaleuca decussata # Melaleuca ericifolia * Melaleuca gibbosa Melaleuca linariifolia * Melaleuca neglecta * Viminaria juncea</p>

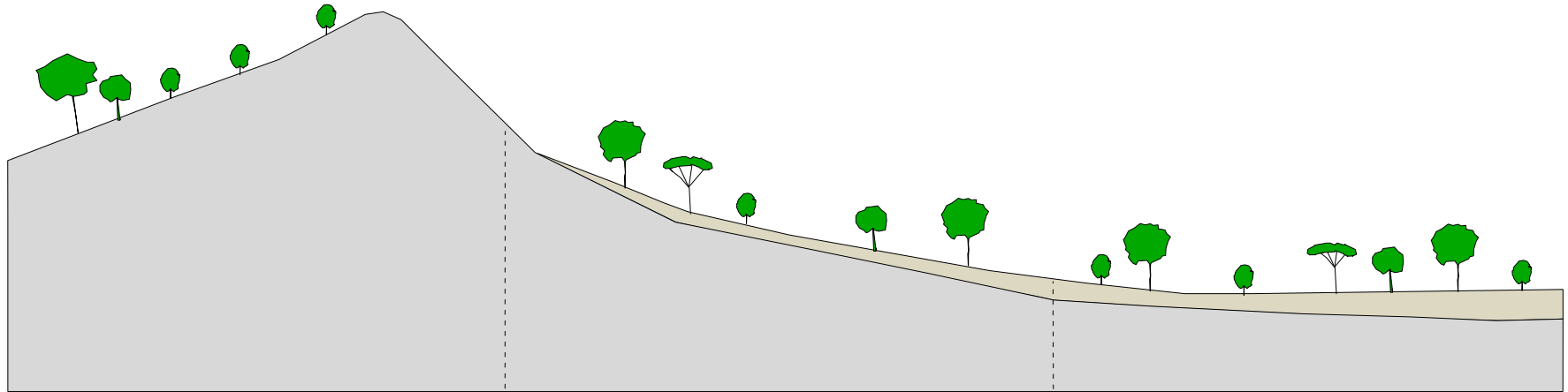
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

10. GRAMPIANS RANGES & PLAINS

Range of mountains rising 350 m above surrounding plain. The skeletal soils of the slopes are sand amongst quartzose sandstone. The outwash soils are generally infertile acidic deep sands over clay. The plains also include granite areas where the soil is a sandy-loam over clay (*e.g.* Mirranatwa and Lexington) and alluvial areas with sandy-loam or silty-loam over clay (*e.g.* Mt. William Creek, Dwyers Creek and Hopkins River).

The tree species are varied, with brown stringybark, long-leaved box, yellow box, scent-bark, manna gum, river red gum, yellow gum, drooping she-oak, silver banksia, messmate and blackwood prominent on the margins of the ranges and the plains.



LAND UNIT	MID OR HIGH ROCKY SLOPES	SCREE SLOPES & GULLIES	OUTWASH SLOPES & FLATS
Rainfall (mm)	700-900	700-800	650-800
Soil texture	sandy loam - stony loam	stony loam - sandy loam	deep sandy loam
pH	low	low	low
Drainage	good	good	poor
Frost	moderate	moderate	moderate-severe
Salt problem	no	no	some

TALL TREES	<ul style="list-style-type: none"> * Eucalyptus aromaphloia * Eucalyptus baxteri * Eucalyptus goniocalyx * Eucalyptus melliodora * Eucalyptus obliqua 	<ul style="list-style-type: none"> * Acacia melanoxylon * Eucalyptus aromaphloia * Eucalyptus baxteri * Eucalyptus camaldulensis * Eucalyptus cypellocarpa * Eucalyptus dalrympleana * Eucalyptus goniocalyx * Eucalyptus melliodora * Eucalyptus obliqua * Eucalyptus ovata * Eucalyptus rubida * Eucalyptus viminalis ssp. viminalis 	<ul style="list-style-type: none"> * Eucalyptus aromaphloia * Eucalyptus baxteri * Eucalyptus camaldulensis * Eucalyptus cypellocarpa * Eucalyptus goniocalyx * Eucalyptus leucoxyton ssp. leucoxyton * Eucalyptus melliodora * Eucalyptus microcarpa * Eucalyptus obliqua * Eucalyptus ovata * Eucalyptus viminalis ssp. viminalis * Eucalyptus yarraensis
MEDIUM-SIZED TREES	<ul style="list-style-type: none"> * Acacia mearnsii * Acacia melanoxylon * Banksia saxicola * Callitris rhomboidea * Eucalyptus alpina (serraensis) * Eucalyptus pauciflora ssp. pauciflora * Eucalyptus willisii * Exocarpos cupressiformis 	<ul style="list-style-type: none"> * Acacia dealbata * Acacia mearnsii * Allocasuarina verticillata * Banksia marginata * Banksia saxicola * Eucalyptus alpina (serraensis) * Eucalyptus willisii * Exocarpos cupressiformis 	<ul style="list-style-type: none"> * Acacia mearnsii * Acacia melanoxylon * Acacia pycnantha * Allocasuarina verticillata * Banksia marginata * Callitris rhomboidea * Eucalyptus kitsoniana * Eucalyptus willisii
SMALL TREES	<ul style="list-style-type: none"> * Acacia myrtifolia * Acacia mitchellii * Acacia oxycedrus * Acacia paradoxa # * Acacia retinodes * Acacia verticillata * Allocasuarina muelleriana * Banksia marginata * Bursaria spinosa * Dodonaea viscosa ssp. cuneata * Grevillea aquifolium * Grevillea ilicifolia * Hakea sericea * Hakea teretifolia * Hakea ulicina * Leptospermum continentale * Leptospermum myrsinoides * Leptospermum turbinatum * Leptospermum scoparium * Micromyrtus ciliata * Myoporum insulare * Myoporum petiolatum * Thryptomene calycina 	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia * Acacia oxycedrus * Acacia paradoxa # * Acacia pycnantha * Acacia suaveolens * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Allocasuarina paludosa * Bursaria spinosa * Dodonaea viscosa ssp. cuneata * Goodia lotifolia * Hakea rostrata * Hakea teretifolia * Hakea ulicina * Leptospermum continentale * Leptospermum myrsinoides * Leptospermum scoparium * Myoporum insulare * Myoporum petiolatum * Pomaderris apetala * Prostanthera lasianthos 	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia * Acacia pycnantha * Acacia retinodes * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Allocasuarina paludosa * Bursaria spinosa * Banksia ornata * Callistemon rugulosus * Hakea nodosa * Hakea rugosa * Leptospermum continentale * Leptospermum lanigerum * Leptospermum myrsinoides * Leptospermum scoparium * Melaleuca decussata * Melaleuca gibbosa * Melaleuca neglecta * Melaleuca squarrosa * Melaleuca squamea * Thryptomene calycina

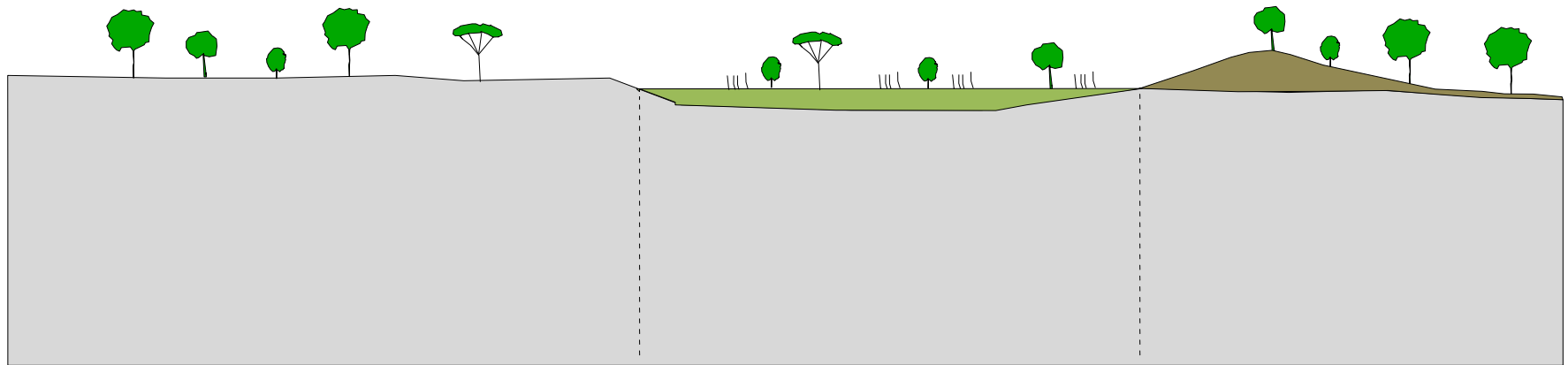
* species that is indigenous to the land-unit

potential pest species (suckering or prolific seeding habit and may be invasive)

11. PARRIE YALLOAK PLAINS & SWAMPS

This landform is a flat depositional plain of sand and clay, a few hills and many fresh and saline swamps and associated lunettes located along the edge of the basalt plains. No defined drainage lines or flood plains. The freshwater swamps are large and the lunettes are extensive, deep, infertile, erodible sands. The saline swamps are small (but increasing in area) and the lunettes are formed from stable sandy loam or sandy clay-loam.

The major trees are (or were) river red gum and swamp gum, with manna gum, drooping she-oak, black wattle and silver banksia on the lunettes and hills.



LAND UNIT	FLAT PLAIN	SWAMP	LUNETTE
Rainfall (mm)	500-750	500-750	500-650
Soil texture	sandy clay	clay	sandy, clay-loam
pH	low	low	low
Drainage	poor	poor	good
Frost	moderate-severe	moderate-severe	moderate-severe
Salt problem	some	severe	no

TALL TREES	<p>Casuarina cunninghamiana * Eucalyptus aromaphloia Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus crenulata Eucalyptus globulus Eucalyptus leucoxyton ssp. leucoxyton Corymbia maculata Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus polyanthemos Eucalyptus tereticornis * Eucalyptus viminalis ssp. cygnetensis * Eucalyptus yarraensis</p>	<p>Casuarina cunninghamiana Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cornuta Eucalyptus largiflorens Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus polyanthemos</p>	<p>* Eucalyptus baxteri Eucalyptus cladocalyx Eucalyptus gomphocephala Eucalyptus leucoxyton leucoxyton Corymbia maculata Eucalyptus macrorhyncha * Eucalyptus melliodora Eucalyptus muelleriana * Eucalyptus ovata Eucalyptus polyanthemos Eucalyptus sideroxyton/tricarpa * Eucalyptus viminalis ssp. cygnetensis * Eucalyptus willisii</p>
MEDIUM-SIZED TREES	<p>Acacia dealbata Acacia decurrens * Acacia meamsii * Acacia melanoxylon * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus kitsoniana Eucalyptus cosmophylla Eucalyptus platypus ssp. heterophylla</p>	<p>* Acacia retinodes * Callistemon wimmerensis # Casuarina glauca Casuarina obesa Eucalyptus astringens Eucalyptus sargentii Eucalyptus spathulata Melaleuca halmaturorum Melaleuca linariifolia Melaleuca styphelioides</p>	<p>Acacia implexa Acacia dealbata Acacia decurrens * Acacia meamsii * Acacia melanoxylon * Acacia pycnantha * Allocasuarina verticillata * Banksia marginata Callitris glaucophylla Callitris rhomboidea Callitris gracilis</p>
SMALL TREES	<p>Acacia howittii * Acacia longifolia # Acacia pravissima * Acacia retinodes * Acacia verticillata * Bursaria spinosa Callistemon rugulosus Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia * Viminaria juncea</p>	<p>Atriplex nummularia Callistemon rugulosus Melaleuca armillaris Melaleuca cuticularis * Melaleuca decussata # Melaleuca ericifolia Melaleuca lanceolata Melaleuca linariifolia Melaleuca neglecta * Leptospermum continentale * Leptospermum lanigerum</p>	<p>Acacia acuminata Acacia brachybotrya # Acacia iteaphylla # Acacia longifolia * Acacia myrtifolia * Acacia retinodes Acacia rigens * Acacia verticillata * Bursaria spinosa * Allocasuarina muelleriana * Allocasuarina paludosa Banksia ornata Dodonaea viscosa ssp. cuneata Eucalyptus viridis Myoporum petiolatum</p>

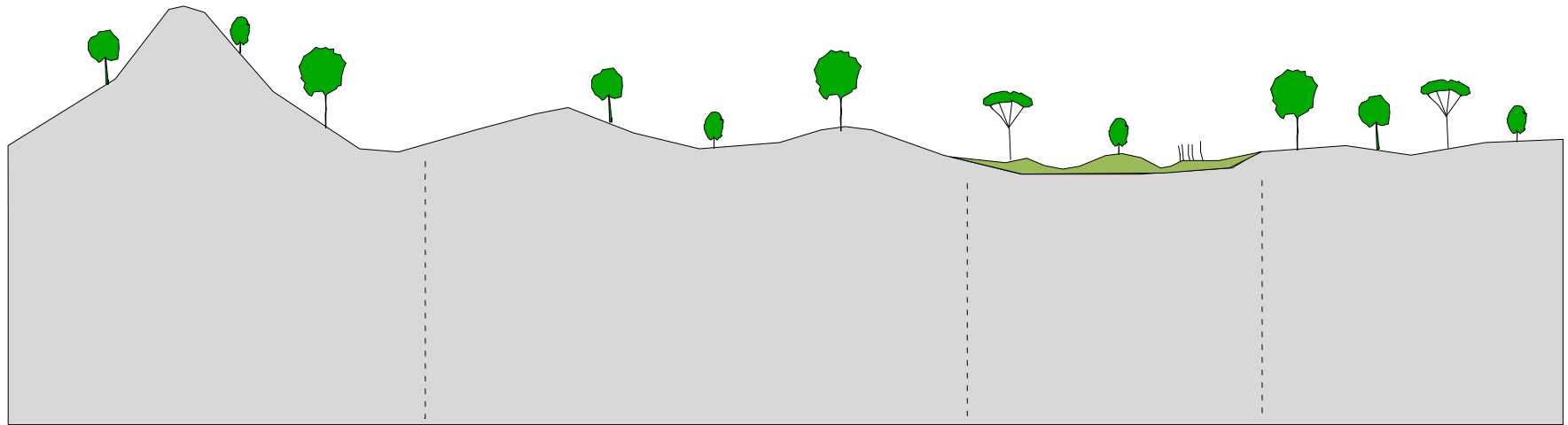
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

12. ARARAT HILLS & PLAINS

Hills, rolling plains and undulating plains comprise the landscape. The erodible sandy-loam soils are derived from Ordovician and metamorphosed Ordovician sedimentary rock (mudstone, shale and sandstone) and quartz from the intruding granite and quartz reefs

The major tree species are river red gum, scent-bark, drooping she-oak, black wattle, blackwood, long-leaf box, red stringybark, yellow box and yellow gum.



LAND UNIT	HILLS	ROLLING PLAIN	SALINE FLATS/SEEPS	UNDULATING PLAIN
Rainfall (mm)	500-650	500-600	500-600	500-600
Soil texture	shallow clay-loam	gritty sandy-loam	clay-loam	gritty loamy sand
pH	low	low	low	low
Drainage	good	good	poor	poor
Frost	moderate-severe	moderate-severe	moderate-severe	moderate-severe
Salt problem	no	some	yes	some

TALL TREES	<ul style="list-style-type: none"> * Eucalyptus aromaphloia * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus macrorhyncha * Eucalyptus melliodora Eucalyptus nicholii Eucalyptus occidentalis * Eucalyptus polyanthemus * Eucalyptus rubida * Eucalyptus tricarpa * Eucalyptus viminalis ssp. viminalis * Eucalyptus willisii 	<ul style="list-style-type: none"> * Eucalyptus aromaphloia * Eucalyptus camaldulensis Eucalyptus cladocalyx * Eucalyptus leucoxyloides ssp. leucoxyloides * Eucalyptus macrorhyncha Corymbia maculata * Eucalyptus melliodora Eucalyptus microcarpa Eucalyptus nicholii Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus rubida * Eucalyptus tricarpa * Eucalyptus viminalis ssp. viminalis 	<ul style="list-style-type: none"> Casuarina cunninghamiana * Eucalyptus camaldulensis Eucalyptus cornuta Eucalyptus largiflorens Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata 	<ul style="list-style-type: none"> Casuarina cunninghamiana Eucalyptus cornuta Eucalyptus largiflorens * Eucalyptus leucoxyloides leuc. * Eucalyptus melliodora Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata * Eucalyptus polyanthemus * Eucalyptus rubida
MEDIUM-SIZED TREES	<ul style="list-style-type: none"> Acacia decurrens Acacia falciformis * Acacia implexa * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Acacia pycnantha * Allocasuarina verticillata Eucalyptus alpina (serraensis) Eucalyptus astringens * Eucalyptus goniocalyx Eucalyptus kitsoniana Eucalyptus viridis 	<ul style="list-style-type: none"> Acacia acuminata Acacia falciformis * Acacia mearnsii * Acacia melanoxylon * Acacia pycnantha * Allocasuarina verticillata Callistemon wimmerensis Eucalyptus alpina (serraensis) * Eucalyptus goniocalyx Eucalyptus kitsoniana Eucalyptus viridis 	<ul style="list-style-type: none"> # Casuarina glauca Casuarina obesa Casuarina pauper Eucalyptus astringens Eucalyptus sargentii Melaleuca armillaris Melaleuca halmaturorum Melaleuca lanceolata Melaleuca styphelioides 	<ul style="list-style-type: none"> Acacia acuminata * Acacia implexa # Acacia longifolia * Acacia mearnsii * Acacia pycnantha * Allocasuarina luehmannii * Allocasuarina verticillata * Bursaria spinosa # Casuarina glauca Casuarina obesa * Eucalyptus goniocalyx * Eucalyptus willisii * Viminaria juncea
SMALL TREES	<ul style="list-style-type: none"> Acacia howittii * Acacia longifolia # * Acacia myrtifolia * Acacia paradoxa # * Acacia retinodes * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Banksia marginata * Bursaria spinosa * Leptospermum continentale * Melaleuca decussata 	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia Acacia pravissima * Acacia retinodes * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Bursaria spinosa Callistemon rugulosus * Leptospermum continentale Melaleuca armillaris * Melaleuca decussata 	<ul style="list-style-type: none"> * Acacia retinodes * Acacia verticillata Atriplex amnicola Atriplex cinerea Atriplex halimus Atriplex nummularia Atriplex undulata * Leptospermum lanigerum * Melaleuca decussata Melaleuca ericifolia Melaleuca linariifolia Melaleuca neglecta 	<ul style="list-style-type: none"> * Acacia longifolia # * Acacia myrtifolia * Acacia retinodes * Acacia verniciflua * Acacia verticillata * Allocasuarina muelleriana * Bursaria spinosa Callistemon rugulosus * Leptospermum continentale * Leptospermum myrsinoides Melaleuca armillaris * Melaleuca decussata

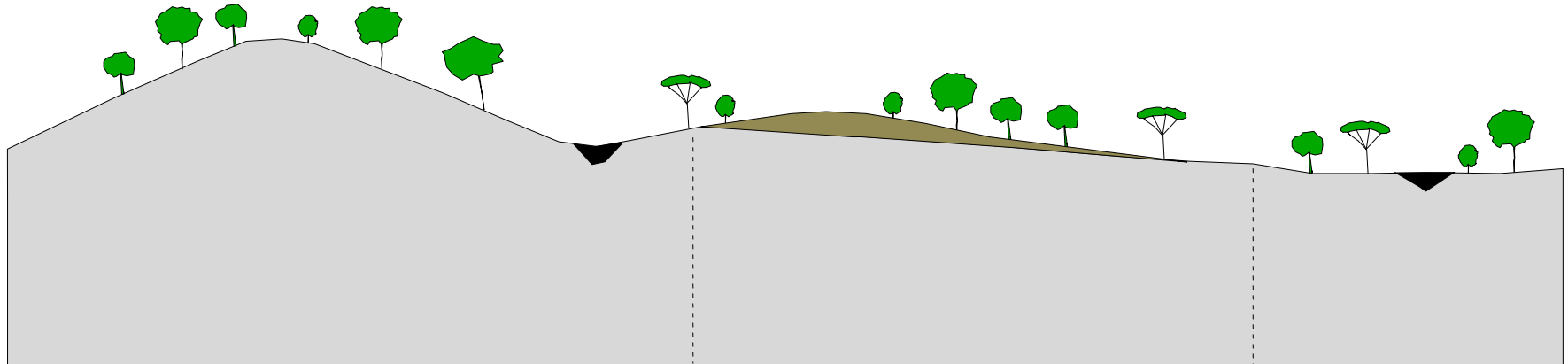
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

13. GLENTHOMPSON ROLLING HILLS

These are rolling and steeply-rolling grasslands, often deeply dissected. The sandy to sandy-loam duplex soils have developed on a complex of basement materials including: Ordovician sandstone, shales and metamorphics (schist, gneiss); laterised Tertiary sediments (sand, gravel, quartzite, ironstone); Devonian granodiorite and rhyolite; Cambrian basic lava (chert, greenstone, shale); and Silurian (Grampians group) quartzose sandstone. The soils are similar to those of the Ararat Hills and Plains land-zone and are very susceptible to wind and water erosion.

The main trees are river red gum, swamp gum, manna gum, blackwood, drooping she-oak, slaty she-oak, sweet bursaria, golden wattle and silver banksia.



LAND UNIT	ROLLING HILLS (Ordovician sediments/ Cambrian greenstone and chert/Devonian granodiorite)	SANDY PLAIN (Silurian sandstone)	SALINE FLATS & SEEPS
Rainfall (mm)	650-750	650-750	650-700
Soil texture	sandy loam	sandy	clay-loam
pH	low	low	low
Drainage	moderate	good	poor
Frost	moderate	moderate	moderate-severe
Salt problem	some	some	yes

TALL TREES	<p>Casuarina cunninghamiana Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus globulus Eucalyptus leucoxyton ssp. leucoxyton Eucalyptus macrorhyncha Corymbia maculata Eucalyptus melliodora Eucalyptus microcarpa Eucalyptus nicholii Eucalyptus occidentalis Eucalyptus polyanthemus Eucalyptus rubida Eucalyptus sideroxyton/tricarpa * Eucalyptus viminalis ssp. cygnetensis</p>	<p>Casuarina cunninghamiana Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus leucoxyton ssp. leucoxyton Eucalyptus macrorhyncha Eucalyptus melliodora Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus polyanthemus Eucalyptus sideroxyton/tricarpa * Eucalyptus viminalis ssp. cygnetensis Eucalyptus willisii</p>	<p>Casuarina cunninghamiana Eucalyptus bosistoana * Eucalyptus camaldulensis Eucalyptus largiflorens Eucalyptus leucoxyton Eucalyptus microcarpa Eucalyptus occidentalis * Eucalyptus ovata</p>
MEDIUM-SIZED TREES	<p>Acacia dealbata Acacia decurrens # Acacia longifolia * Acacia mearnsii Acacia pravissima * Acacia pycnantha # * Allocasuarina verticillata * Banksia marginata # Casuarina glauca Eucalyptus alpina (serraensis) Eucalyptus kitsoniana Eucalyptus pauciflora ssp. pauciflora Myoporum insulare</p>	<p>Acacia floribunda Acacia howittii * Acacia implexa # Acacia longifolia * Acacia melanoxylon Acacia pravissima * Acacia pycnantha # * Acacia retinodes * Allocasuarina verticillata * Banksia marginata Callistemon wimmerensis Eucalyptus kitsoniana Melaleuca styphelioides</p>	<p>* Acacia mearnsii * Acacia melanoxylon Acacia retinodes # Casuarina glauca Casuarina obesa Eucalyptus astringens Eucalyptus cornuta Eucalyptus sargentii Melaleuca armillaris Melaleuca halmaturorum Melaleuca styphelioides</p>
SMALL TREES	<p>* Acacia myrtifolia * Acacia verticillata * Allocasuarina muelleriana * Bursaria spinosa Callistemon rugulosus Eucalyptus viridis Hakea petiolaris * Melyctus dentata Melaleuca armillaris * Melaleuca decussata Melaleuca ericifolia</p>	<p>* Acacia verticillata Acacia brachybotrya # Acacia iteaphylla * Acacia verniciflua * Allocasuarina muelleriana * Bursaria spinosa * Leptospermum continentale Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca linariifolia</p>	<p>* Acacia verticillata Atriplex nummularia * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia Melaleuca lanceolata Melaleuca linariifolia * Viminaria juncea</p>

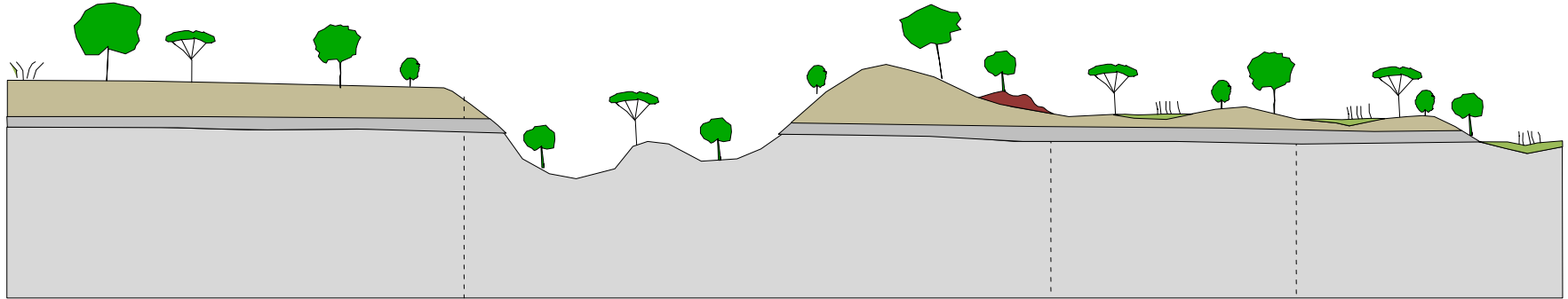
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

14. BASALTIC PLAINS

Extensive basalt plain, level to broadly undulating, with laterized soils varying from sandy loam to heavy brown or black cracking clay, or peat in swamps. These soils have drainage impeded by underlying clay. Rolling hills of older basalt and younger basaltic cones and "stony rises" provide soils which are freely draining. Underlying Tertiary sediments and limestone have been exposed by stream erosion on the Grange Burn, Muddy Creek and Violet Creek south of Hamilton, and more extensively near Branhholme and Wallacedale.

The original vegetation was mainly swamp gum, blackwood, black wattle, drooping she-oak, sweet bursaria and silver banksia. On the stony rises manna gum is invariably the only eucalypt - and blackwood the only other major tree species. Areas like the Karabeal plains had few trees, due perhaps to the shallow and dense basalt sheet that impedes drainage and root development. Some areas (notably near Dunkeld and Hamilton) are uncharacteristic in that they have river red gum as the dominant tree, a result of a substantial proportion of Aeolian sand in the soil profile; on basalt this species is usually confined to drainage lines.



LAND UNIT	UNDULATING PLAIN	WELL DRAINED SLOPES, HILLS & STONY RISES	WET FLATS	SALINE FLATS
Rainfall (mm)	650-825	650-825	650-825	650-700
Soil texture	loamy-clay	loam	clay-loam	clay-loam
pH	low-medium	medium	low-medium	low-medium
Drainage	poor-good	good	poor	poor
Frost	moderate	moderate	moderate	moderate
Salt problem	no	no	no	yes

TALL TREES	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryooides * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus cytellocarpa Eucalyptus gomphocephala Eucalyptus globulus Corymbia maculata Eucalyptus occidentalis * Eucalyptus ovata Eucalyptus pauciflora ssp. pauciflora Eucalyptus polyanthemos Eucalyptus tereticornis * Eucalyptus viminalis ssp. cyngetensis</p>	<p>Casuarina cunninghamiana Eucalyptus bosistoana Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus globulus Corymbia maculata Eucalyptus melliodora Eucalyptus muelleriana Eucalyptus microcarpa Eucalyptus nicholii Eucalyptus obliqua Eucalyptus occidentalis Eucalyptus polyanthemos Eucalyptus rubida Eucalyptus sideroxylon * Eucalyptus viminalis ssp. viminalis</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus botryooides * Eucalyptus camaldulensis Eucalyptus crenulata Eucalyptus occidentalis * Eucalyptus ovata</p>	<p>Casuarina cunninghamiana Eucalyptus astringens Eucalyptus cornuta * Eucalyptus camaldulensis Eucalyptus largiflorens Eucalyptus microcarpa Eucalyptus occidentalis Eucalyptus polyanthemos * Eucalyptus ovata</p>
MEDIUM-SIZED TREES	<p>Acacia dealbata Acacia howittii # Acacia longifolia * Acacia mearnsii * Acacia melanoxylon Acacia pravissima Acacia retinodes * Allocasuarina verticillata * Banksia marginata * Bursaria spinosa Eucalyptus alpina (serraensis) Eucalyptus kitsoniana Eucalyptus viridis * Exocarpos cupressiformis Melaleuca armillaris</p>	<p>Acacia dealbata Acacia falciformis Acacia implexa # Acacia longifolia * Acacia mearnsii * Acacia melanoxylon Acacia pravissima # Acacia prominens # Acacia pycnantha * Allocasuarina verticillata * Banksia marginata * Bursaria spinosa Eucalyptus alpina Eucalyptus kitsoniana Eucalyptus scoparia</p>	<p>Acacia dealbata Acacia decurrens Acacia howittii * Acacia mearnsii * Acacia melanoxylon Acacia pravissima # Acacia pycnantha * Bursaria spinosa # Casuarina glauca Casuarina obesa Callistemon wimmerensis Eucalyptus kitsoniana Melaleuca armillaris * Melaleuca squarrosa Melaleuca styphelioides ...Melaleuca lanceolata * Ozothamnus ferrugineus</p>	<p># Casuarina glauca Casuarina obesa Eucalyptus sargentii Eucalyptus spathulata Melaleuca halmaturorum Melaleuca lanceolata Melaleuca styphelioides</p>
SMALL TREES	<p># Acacia iteaphylla Acacia myrtifolia * Acacia paradoxa # * Acacia verniciflua * Acacia verticillata Callistemon rugulosus * Leptospermum continentale * Melaleuca decussata Melaleuca ericifolia * Ozothamnus ferrugineus</p>	<p>* Acacia verniciflua Callistemon rugulosus * Dodonaea viscosa ssp. cuneata * Goodia medicaginea * Melyctus dentata * Leptospermum continentale Melaleuca armillaris Melaleuca decussata * Myoporum petiolatum * Solanum laciniatum</p>	<p>* Acacia paradoxa # Acacia retinodes * Acacia verticillata Callistemon rugulosus Goodenia ovata * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata # Melaleuca ericifolia * Melaleuca lanceolata * Viminaria juncea</p>	<p>Atriplex nummularia * Leptospermum continentale * Leptospermum lanigerum Melaleuca armillaris * Melaleuca decussata # Melaleuca ericifolia Melaleuca lanceolata Melaleuca linariifolia</p>

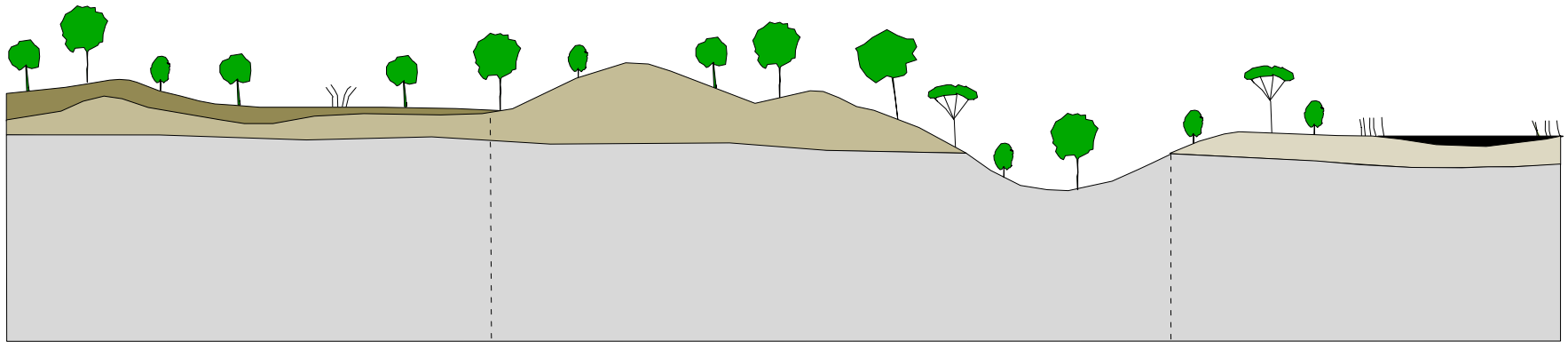
* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)

15. COBBOBOONEE BASALTIC TABLELAND

Gently rolling, well-drained, formerly mostly forested hills of weathered basalt, with a definite nodular ironstone (*orstein*) surface layer. To the north (e.g. Greenwald land-system) the underlying limestone is exposed where streams have eroded the basalt. In the south-west the basalt may be covered by acid sand sheets. Swamps may occur on the flats. The major soils are gravelly sandy loams.

Messmate stringybark, blackwood, cherry ballart and shining peppermint are the major tree species, with swamp gum, brown stringybark, manna gum and cherry ballart also prominent. Messmate forest grows best on fertile well-drained sites, shining peppermint dominates slopes where limestone is exposed, swamp gum dominates the wetter flats; manna gum and blackwood dominate the chocolate soils of the old cinder and lava cones.



LAND UNIT	SAND SHEETS	ROLLING HILLS AND VALLEYS	FLATS AND SWAMPS
Rainfall (mm)	750-950	750-950	750-950
Soil texture	sand	gravelly sandy-loam	sandy clay-loam
pH	low	low	low
Drainage	good	good	poor
Frost	slight-moderate	slight-moderate	slight-moderate
Salt problem	no	no	no

<p>TALL TREES</p>	<p>Casuarina cunninghamiana * Eucalyptus baxteri Eucalyptus bosistoana Eucalyptus botryoides Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus globulus Eucalyptus grandis Eucalyptus nitens * Eucalyptus obliqua * Eucalyptus ovata Eucalyptus pauciflora ssp. pauciflora Eucalyptus polyanthemos Eucalyptus regnans Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis ssp. viminalis * Eucalyptus willisii</p>	<p>* Acacia melanoxylon Casuarina cunninghamiana Eucalyptus baxteri Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus cladocalyx Eucalyptus delegatensis Eucalyptus grandis Eucalyptus globulus Eucalyptus nicholii Eucalyptus nitens * Eucalyptus obliqua Eucalyptus occidentalis Eucalyptus rubida Eucalyptus saligna * Eucalyptus viminalis ssp. viminalis * Eucalyptus willisii</p>	<p>Casuarina cunninghamiana Eucalyptus aggregata Eucalyptus bosistoana Eucalyptus botryoides * Eucalyptus camaldulensis Eucalyptus crenulata * Eucalyptus willisii Eucalyptus occidentalis * Eucalyptus ovata</p>
<p>MEDIUM-SIZED TREES</p>	<p>Acacia faliciformis Acacia howittii * Acacia longifolia # * Acacia mearnsii * Acacia melanoxylon Acacia pravissima * Allocasuarina verticillata * Banksia marginata Eucalyptus kitsoniana * Exocarpos cupressiformis Melaleuca armillaris Melaleuca lanceolata Melaleuca styphelioides</p>	<p>Acacia faliciformis * Acacia longifolia # * Acacia mearnsii Acacia pravissima * Allocasuarina verticillata * Banksia marginata Callistemon wimmerensis * Eucalyptus kitsoniana * Ozothamnus ferrugineus Eucalyptus pauciflora * Exocarpos cupressiformis Melaleuca lanceolata Melaleuca styphelioides * Myoporum insulare</p>	<p>Acacia howittii * Acacia longifolia # * Acacia mearnsii * Acacia melanoxylon * Banksia marginata # Casuarina glauca Eucalyptus cosmophylla * Eucalyptus kitsoniana Melaleuca armillaris Melaleuca ericifolia Melaleuca halmaturorum * Melaleuca lanceolata Melaleuca styphelioides * Pomaderris apetala</p>
<p>SMALL TREES</p>	<p># Acacia iteaphylla * Acacia verticillata * Allocasuarina paludosa * Bursaria spinosa Dodonaea viscosa ssp. cuneata Hakea petiolaris Hakea salicifolia * Leptospermum continentale * Leptospermum myrsinoides * Melaleuca decussata</p>	<p>* Acacia retinodes * Acacia verticillata * Bursaria spinosa Callistemon rugulosus Dodonaea viscosa ssp. cuneata Hakea petiolaris * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata Melaleuca linariifolia</p>	<p>* Acacia verticillata * Allocasuarina pusilla Callistemon rugulosus Hakea salicifolia * Leptospermum continentale * Leptospermum lanigerum * Melaleuca decussata Melaleuca linariifolia * Melaleuca squamea * Melaleuca squarrosa</p>

* species that is indigenous to the land-unit

potential pest species (suckering, smothering or prolific seeding habit and may be invasive)