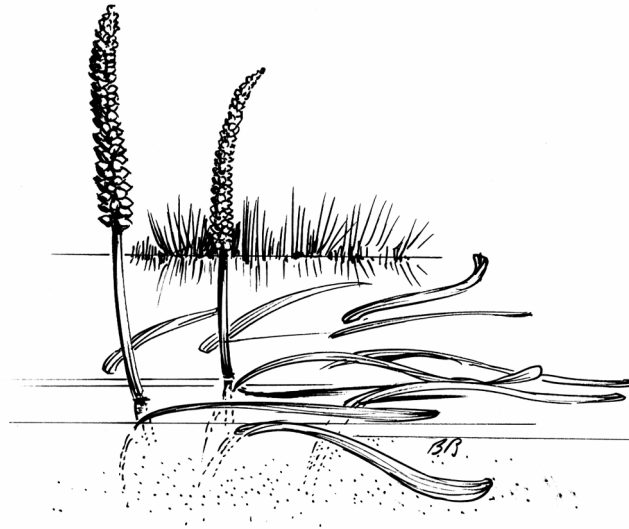


# Merri Creek Aquatic and Semi-Aquatic Planting Guide



**B. Bainbridge**

prepared for



**Moreland** City Council

**1999**



Merri Creek Management Committee

# Merri Creek Aquatic and Semi-Aquatic Planting Guide

## B. Bainbridge

### CONTENTS

<b>1</b>	<b>INTRODUCTION</b> .....	<b>3</b>
<b>2</b>	<b>HOW TO USE THIS GUIDE</b> .....	<b>3</b>
<b>3</b>	<b>DESCRIPTION OF SEMI-AQUATIC AND AQUATIC PROFILE TYPES</b> .....	<b>4</b>
<b>4</b>	<b>DESCRIPTION OF ZONES WITHIN PROFILES</b> .....	<b>5</b>
<b>5</b>	<b>'PROBLEM' PLANT SPECIES</b> .....	<b>6</b>
<b>6</b>	<b>PLANTING CONSTRAINTS</b> .....	<b>7</b>
6.1	Narrow (bottleneck) creek sections.....	7
6.2	Planting Constraints under Overhead Powerlines .....	8
6.3	Steep and high-energy flow banks.....	8
<b>7</b>	<b>PLANTING TECHNIQUES</b> .....	<b>8</b>
7.1	Provenance .....	8
<b>8</b>	<b>PLANT LISTS</b> .....	<b>9</b>
8.1	Typical Creek Profile .....	10
8.2	Shady Creek Profile .....	11
8.3	Gully / Drainage-line Profile .....	12
8.4	Anabranch / Billabong Profile.....	13
8.5	Saline spring affected Profile .....	14
8.6	Lake Profile, No seasonal water level variation .....	15
8.7	Lake Profile, Seasonal water level variation .....	16
8.8	Shallow, seasonal wetland profile.....	17

### REFERENCES

#### APPENDIX 1 SPECIES, REFERENCES AND REFERENCE SITES

#### APPENDIX 2 LOCATION OF REFERENCE SITES

#### APPENDIX 3 TREES AND SHRUBS FOR PLANTING WITHIN POWERLINE EASEMENTS

Report prepared for Moreland City Council  
by Brian Bainbridge Merri Creek Management Committee, 2 Lee St East Brunswick 3057

# Merri Creek Aquatic and Semi-Aquatic Planting Guide

## 1 Introduction

Aquatic and semi-aquatic environments in the Merri Creek are complex systems with respect to plant requirements. In carrying out revegetation projects, correct placement of particular plant species is essential for the plant's survival. This guide is designed specifically for revegetation designers and technicians in the lower Merri Creek Catchment. This guide lists appropriate plant species and placement within the zones of aquatic and semi-aquatic profiles.

## 2 How to use this guide

The tables of plant species and densities outlined in this guide can be used to develop a planting design or to estimate the extent and type of planting possible for a given budget.

The following is a systematic approach to designing a planting for a particular site.

- a) **Identify profile type or types present** in the planting area. Eight profiles with different environmental conditions have been identified and are described in the section 'Description of semi-aquatic and aquatic profiles'. Draw boundaries of different profile types within your site on a base map for the site.
- b) **Identify zones present in the profiles.** The profiles are further divided into zones which are described in the section 'Zones within profiles'. Draw limits of these zones onto the site base map and make an estimate of the area in metres of each zone.
- c) **Make species selections from the profile species lists.** Visualise what the area is to eventually look like. Ask the following questions:
  - Are there views that need to be retained, can shrubs and trees be used?
  - Is there an erosion problem that may be addressed by lots of fine rooted rushes and grasses?
  - Can planting densely with a tall rush or a thicket of shrubs solve an intractable weed problem?
  - Are there other issues at site that will affect the plantings (eg. nearby drains and powerlines)?

Check the notes on Constraints and Problem Plants later in this guide before finalising the species to be used.

- d) **Estimate plant numbers.**
  - i. Estimate the number of square metres that each **zone** covers at your site using a map or by eye. Subtract from this figure any extensive area of rock or remnants that can't be planted.
  - ii. Calculate plant numbers by multiplying the area in metres of each zone by the suggested density for each species: the suggested spacing will create dense cover within a year *except* where the spacing is marked '#'. Spacings marked '#' are deliberately sparse to mimic natural occurrence patterns. These species should be scattered through the continuous cover created by other species.

Appendix 1 lists sites where particular species can be observed as plantings or as remnants, to give an indication of mature plant size. Appendix 2 gives precise locations for each of these sites.

### 3 Description of semi-aquatic and aquatic profile types

#### ***Typical Creek Profile***

Most areas of the creek are described by this profile. It includes stream bed and stream verge and sometimes floodplains, bars, riparian slopes and rapids. The profile has a constant flow of water of moderate energy that normally affects the stream verge and bed zone. Occasional flooding leads to short periods of high energy flows over all parts but no sustained inundation.

#### ***Shady (East/South facing, narrow valley) Creek Profile***

Same as the Typical Creek Profile but having a lower light intensity due to aspect, tall valley sides or shading from overhanging trees.

#### ***Saline spring affected Creek Profile***

Same as Typical Creek Profile but affected by salty spring water. This is indicated by;

- encrustations of salts as spring seeps over rocks, usually with some algae, which is often black,
- existing salt tolerant species around the spring. These species include *Bolboschoenus caldwellii*, *Juncus kraussii*, *Baumea juncea*, *Triglochin striata*, *Selliera radicans*, *\*Atriplex prostrata*, *\*Critesion marinum*, *\*Puccinellia fascicularis*, *\*Spergularia sp.* *\*Lycium ferrocissimum* is frequently found in drier areas above the seep.

Several saline spring areas are known for Merri Creek. They typically occur at the junction where Basalt rock overlies Silurian rock and is intersected by the creek. The source of the salt is the breakdown products of the Basalt rock. High flows of water through the fractured Basalt are intercepted by the impervious Silurian clays and diverted sideways, eventually emerging as a spring. Known springs in Moreland include those on Merri Creek at Coburg Lake Coburg and Acheson Place North Coburg; and on Edgars Creek, a tributary of Merri Creek, at Cash Reserve and Melbourne Caravan Park North Coburg. Well-developed remnant vegetation occurs at saline springs on Merri Creek at Galada Tamboore, Campbellfield.

#### ***Anabranch/billabong (low energy, seasonal flooding) profile***

These are by-pass channels of the creek and usually only hold flowing water in floods. They may subsequently retain still water in a depression for days or weeks. In the narrow valley of the Merri Creek these environments are rare and not extensive.

#### ***Gully, drainage-line profile***

These areas only hold flowing water above ground for a small amount of the year or after heavy rain. The soils remain damp for a large amount of the year and so support a range of semi-aquatic plant species.

#### ***Seasonally varying wetland profile***

On the Basalt Plains, these wetlands are likely to hold above ground water in the base of a depression for a few of the wetter months of the year. In summer, they tend to dry out completely. Seasonal wetlands also develop on other soil types and can be created by enhancing points of impeded drainage within the landscape.

#### ***Lake Profile, no seasonal water-level variation***

Coburg Lake has a largely static water level due to its 'flow in - flow out' weir. Such lakes develop a particular vegetation structure along the banks, which are generally lower in species diversity due to a lack of seasonal triggers for germination and growth for many semi-aquatic species (Oates, 1994).

#### ***Lake Profile, seasonal water-level variation***

Water level in lakes with seasonal variation will lower over summer. The drying phase is important in the germination and health of a range of sedges, rushes and other species along the lake banks.

## 4 Description of zones within Profiles

The following zones (or topographic components) of stream and wetland profiles are found within Merri Creek. Figure 1 illustrates these features.

### A. Stream Bed

The part of the stream that is typically inundated during base flow and does not become dry except in exceptionally dry summers. True aquatic plants are found in this zone.

### B. Stream Verge

The area of the creek profile occurring above the streambed. These zones experience inundation frequently following rain or during winter and spring. This zone is prone to erosion, sediment, and litter dumping by the creek floodwaters.

A *bar* is another topographic feature that shares similar conditions to the stream verge and can be planted with the same species list. A bar is a build-up of sediments within the streambed that form an area of soil that may emerge from the water during base flow. This build-up of sediments may be due to currents or may be associated with rocky outcrops.

Merri Creek has many areas where boulders are present in the streambed and verges. Some plant species, notably *Mentha australis*, seem to be restricted to these areas, which may provide protection or anchorage from high-energy stream-flow.

### C. Flood Plain

These may develop above the stream verge where annual or periodic flooding deposits sediments to form a flat even plain. In the lower Merri Creek these tend to be very narrow and not extensive.

### D. Riparian Slope

These slopes are found immediately above the semi-aquatic environment. These areas are typically covered in plants from the Riparian Shrubland community in the Merri Creek area. Parts of this zone may be inundated during floods.

### E. Depressions

In this guide, depression refers to the lowest level in the billabong, wetland or gully profiles. It is often dry for most of the year.

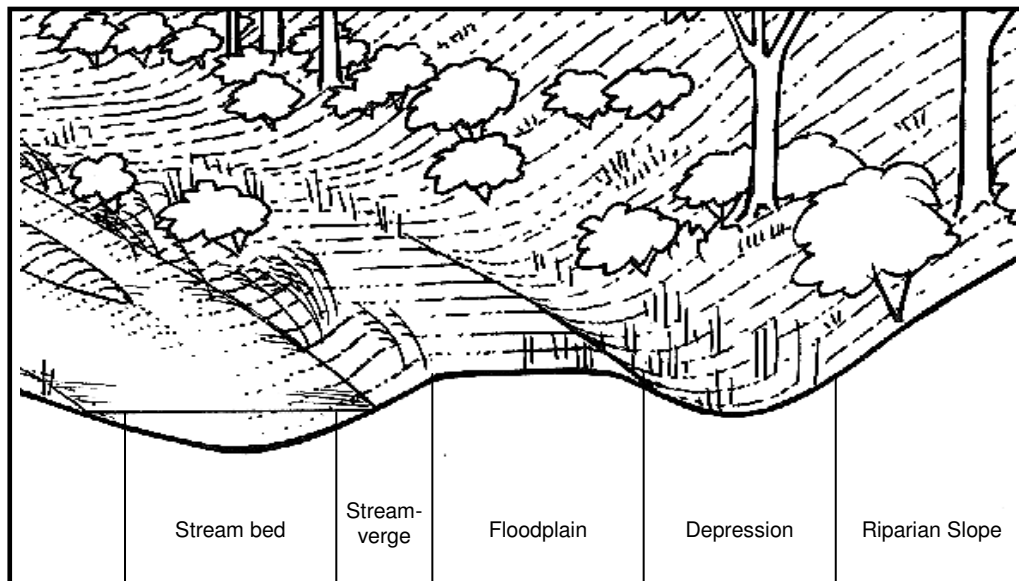


Figure 1. Topographic features within aquatic to riparian zones of Merri Creek.

## 5 'Problem' plant species

The following species must be used with discretion as they may grow and spread via rhizomes, stolons or suckers to such an extent as to cause problems for management objectives including access, aesthetics, water-flow and drainage requirements. The dense vegetation structure these species develop can be very useful as habitat for wildlife, 'nutrient soaking' and sediment deposition, erosion control and for out-competing exotic weeds. Their use in plantings should therefore not be automatically dismissed, nor should remnants be automatically eliminated. Evaluation of conditions, management objectives and prediction of the dynamics of the species in the site should precede management of stands of these species.

### ***Typha* spp. (*T. domingensis* and *T. orientalis*) Cumbungi, Bulrushes**

**Dynamics** Grows in fresh water to 2m (Sainty and Jacobs 1981). Growth is rapid from seed that may move in from many kilometres away. Individual colonies expand year by year. Growth is most rapid through spring to early autumn, proceeding in a series of flushes. This species has a particular importance for habitat provision where other wetland components (open water, other plants) are present. Dense stands in reservoirs are undesirable where they increase sedimentation around them, impede drainage and develop large mats of anaerobically decaying plant material. The stand at Coburg Lake upstream of the central footbridge shows some signs of developing this problem.

**Control** Hand-pulling, cultivation and mowing have been used to control the size of stands. Draining below the level of the stand and removing the plant mechanically has also been used. Burning after draining, followed by deep flooding in spring, may be effective. Another method is to cut stems 15 cm below the surface of the water. Providing the water level is held constant, the plants die from lack of oxygen. This is most effective if carried out at the end of flowering (October to early November) when the food reserves in the rhizomes are low and before the seeds are fully formed (Parsons and Cuthbertson 1992).

### ***Phragmites australis* Common Reed**

**Dynamics** Grows in fresh water up to two metres deep, mostly on a muddy substrate. The critical depth may be less in turbid water. It may also spread into seasonally wet soil and persist in moist soil where sediments containing rhizomes have been used as fill. The reed grows rapidly in summer and usually dies back after the first frosts. This species can impede water flows in channels; patches will therefore gradually expand as sediments are deposited around plants' bases. High velocity flows that remove sediments seem to keep the main channel free of this plant in some areas. Dense shading by trees also seems to prevent dense stands developing.

**Control** Grazing, burning or cutting in mid-summer are recorded as effectively reducing stand size. As mid-summer is also the time that many water birds are using these stands for nesting, control or removal should be done with care. Leaving part of any stand might be a good compromise between habitat objectives and flow or aesthetic objectives. Dredging of the rhizomes and sediments to below 2m has been used on Coburg Lake in the 1980's to reduce a particular stand (Fred Tuininga pers comm.). This provided longer term though still temporary control. Lake water flow dynamics cause sediments to deposit in the same areas and re-establishment has occurred in the last ten years. This species is also sensitive to Roundup Biactive herbicide and so application during the growth phase in spring – early summer will provide control.

### ***Eleocharis sphacelata* Spike Rush**

**Dynamics** Grows in still water from shallows to water up to two metres deep. Can grow as tall as 2 metres above the water surface. This species has the potential to block views and access to open water. It provides very good habitat values and is probably less troublesome than *Typha* or *Phragmites* where heavy cover is desired.

**Control** This species should only be planted in areas where water-depth will limit its spread. It is unlikely to create problems unless planted where it could spread into areas where access and views are vital.

### **Melaleuca ericifolia Swamp Paperbark**

*Dynamics* Grows initially as a dense, single stemmed shrub but soon suckers to form a dense thicket in most moist areas. These thickets gradually grow larger in ideal conditions. The foliage is very dense and will impede views. Thickets will gather litter and sediments if grown near a stream so do not plant where this could cause problems. This plant forms superb habitat for birdlife.

*Control* Avoid planting where the suckering habitat will be undesirable. Where a plant has been placed in an inappropriate location, drilling and filling all stems with neat Roundup Biactive would achieve control. Partial removal of the thicket is not likely to provide any lasting control.

### **Potamogeton spp (P. crispus, P. ochreatus, P. pectinatus) Pondweeds**

*Dynamics* These aquatic plants develop rapidly in the spring and summer months and then decline or are destroyed by insects in the late summer and autumn. Regrowth occurs from seed or specialised over-wintering shoots. The species are important food plants for water-birds, instream invertebrates and fish. The public may perceive them as a weed species, especially in mid-summer when they are at their maximum growth. They may be hazardous to swimmers and to power-boats or sailing vessels but these problems are unlikely to be relevant to Merri Creek situations (Sainty and Jacobs 1981).

*Control* Control is unlikely to be required. Interpretation of the role of these species is perhaps needed for managers and the public. The fragility of the plant stems would make physical removal difficult. Monitoring of lakes and pools where these species occur should be undertaken to ensure that the superficially similar introduced weed \**Egeria densa* is not present. \**Egeria densa* requires similar conditions and has been observed in the lower reaches of the Merri Creek within Moreland's boundaries.

### **Acacia dealbata Silver Wattle**

*Dynamics* Initially grows as a single, very fast growing small tree. Within two to three years, suckers can begin to form, especially where disturbance to surrounding soil has caused root disturbance or damage. A dense thicket of suckers may surround mature trees. These tend to remain at 1-2 metres height while the original tree is still healthy but will grow quickly if the parent tree dies. Due to the dense foliage these trees form a visual barrier and will eventually shade out most understorey plantings.

*Control* This species is best used sparingly and well away from paths or views. Inappropriately planted specimens could be drill and filled or cut and painted with neat Roundup Biactive.

## **6 Planting Constraints**

### **6.1 Narrow (bottleneck) creek sections**

Melbourne Water has listed 'bottleneck' areas where 'dense plantings' (woody shrubs and trees) would be likely to cause problems to the creek's drainage function by impeding drainage. Areas within Moreland's boundaries where these constraints apply are listed below:

- Willowbank Road to Albert St, Brunswick East
- Parkview Ave-Albion St. Brunswick East
- Moreland Rd to The Grove, Coburg
- Harding St to Bell St Coburg
- Bell St to Booth St Coburg
- Murray Rd to bend in Outlook Rd Coburg
- Emma Crt to Queens Parade, Coburg North

For these areas and in other constricted areas of the creek where a build-up of litter may lead to erosion of the opposite bank, avoid planting shrubby species. Revegetation should consist mainly of understorey, non-woody species (although some woody species such as *Callistemon sieberi* and *Gynatrix pulchella* may be appropriate in some situations). In particular, *Leptospermum lanigerum*, with its capacity to catch large quantities of rubbish and litter is to be avoided.

## **6.2 Planting Constraints under Overhead Powerlines**

Plantings at mature heights must not affect overhead powerlines. Any plantings within powerline easements should not include trees or large shrubs that will grow to over three metres at maturity. GPU PowerNet has worked with Moreland and Darebin City Councils and MCMC to develop an agreed list of species for planting within easements (Appendix 3).

## **6.3 Steep and high-energy flow banks**

These zones, either natural or more frequently the result of channelisation works, present a challenge to establishment of indigenous vegetation. Only a limited range of species is capable of withstanding frequent high-energy flows. With altered sections of the creek, always consider whether it is feasible for a bank to be 'laid-back' to present a more favourable planting area and natural appearance. However, frequently this is not possible due to drainage and other structural constraints. Generally species selected for planting into the high-energy zones of the creek should have flexible above ground stems, strong root systems and / or deciduous above ground parts with strong growth in summer. Such species (for example *Bolboschoenus* spp. and *Schoenoplectus validus*) present no resistance to winter and early spring floods. *Juncus usitatus* is a non-deciduous species that copes well with high-energy zones. Remnant populations of *Callistemon sieberi* are known from this zone in the Moreland area and develop attractive gnarled habit with time. This species has flexible stems and a growth habit which presents little resistance to water-flow.

## **7 Planting techniques**

Weed control is essential preparation for any planting project and should take place preferably at least six months before planting.

Where a site cannot be intensively managed for several years, larger trees or shrubs can be scatter planted into untreated sites to establish an indigenous overstorey as a first step in revegetation of the site. The tree or shrub will establish best if a space is cleared within weeds and the plant has a jute mat square pegged firmly to the soil around it to maintain a degree of weed control around the plant.

Planting in summer is preferable for semi-aquatic and aquatic species when their growth is most rapid. This timing allows the plants to establish before flooding in winter and spring.

Most species are available in forestry tubes or herb pots. Species with vigorous rhizomes are sometimes available in boxes for plantings in high flow areas. Pegs (similar to those used for pegging jutemat) are available for securing these rhizomatous plants into high-energy flow zones of the creek profile. Some species are now available as 'strips' that can be pegged into a trench dug across a water flow. The suppliers of this plant product must be provided with seed and a significant lead-time if local provenance (see below) is to be planted.

During summer, taking cuttings of rhizomes from existing remnants and pegging them to suitable moist substrates can enlarge populations or create new ones without relying on purchased stock. In particular, use this technique with species such as *Typha*, *Phragmites*, *Schoenoplectus*, *Bolboschoenus*, *Crassula helmsii* and *Rumex bidens*. *Potamogeton* species will establish by casting large fragments into shallow water in summer. These methods should only take place if a large population of the parent plant is available for division.

Do not mulch or tree-guard in the flood zone as these materials will be washed away or may smother plants. Inserting a stake downstream and approximately 30cm to one side of the plant will reduce the risk of the stake catching litter that may smother the plant.

### **7.1 Provenance**

Revegetation with indigenous plants carries a serious responsibility with regard to the conservation of the biodiversity of genetic resources. Remnants have a very high value as the inheritors of the evolutionary history of the species at that site. Small ecological adaptations may have accumulated and be important in the future survival of that species. Cross-pollination of planted stock with remnants is likely. Where remnants are few, genes of the planted stock may eventually dominate. Planting with stock from close to the site and using as broad a genetic base as possible will probably best preserve the integrity of the remnants and create a viable population.

Aquatic and semi-aquatic plants may have a less stringent requirement in this regard. Propagules of many species disperse between suitable habitats over long distances due to their being carried on the bodies of nomadic waterbirds. Plant stock should still be sourced from as close to the site and from a similar geology / aspect as possible.



Purchase plants from an indigenous nursery. Don't use a species if a suitable provenance cannot be found. Planning ahead and ordering stock several months in advance will be the best guarantee of having appropriate stock. (In particular, avoid using large numbers of tissue-cultured plants and clones with very low genetic diversity, for example, cuttings from single stock plants.) Reliable indigenous nurseries for the Merri Creek area include Victorian Indigenous Nurseries Co-operative, Keelbundoora Indigenous Nursery (formerly the Latrobe Wildlife Reserve Nursery) and Western Plains Flora.

## 8 Plant lists

A plant list for each profile type follows. These species have been selected from:

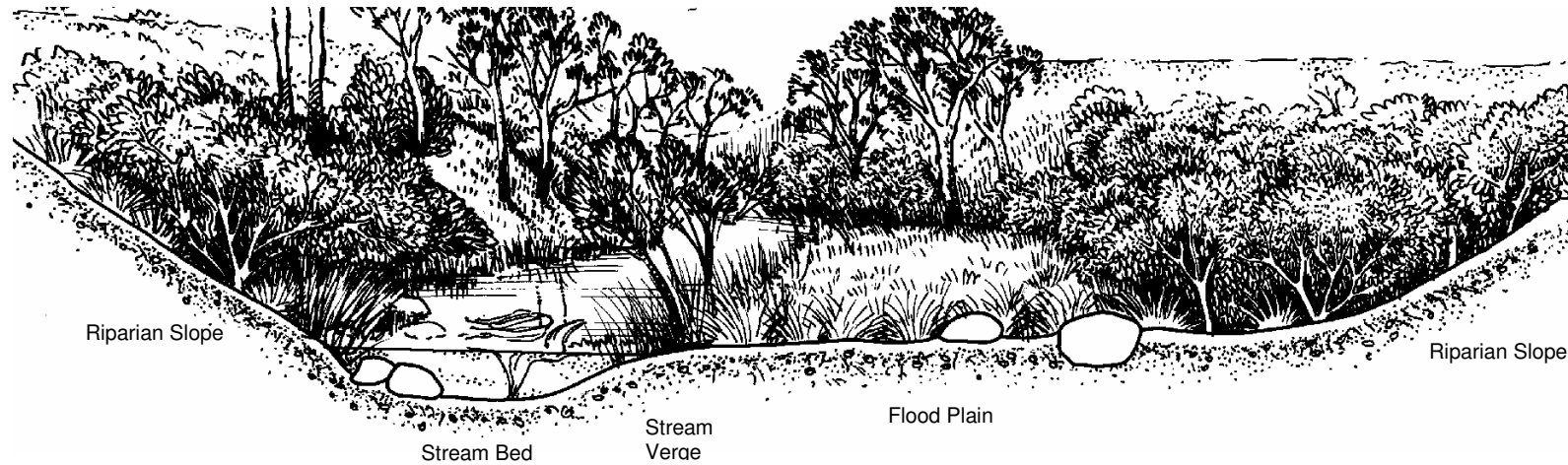
- Species currently available from local Indigenous plant nurseries, and / or
- Remnant species recorded for the Merri Creek and / or
- Species listed in 'Plants of the Merri Merri' (Wigney ed 1994) for In-stream Aquatic Herb-field, Riparian Shrubland and Grassy Wetland communities.

Species listed in bold should form the main framework for plantings. These species are considered good "colonisers", based on their possessing one or more of the following attributes:

- form and growth that is robust and competitive against weeds,
- proven reliability in plantings (as experienced by MCMC),
- survival as remnants in the local area.

These are most likely to survive, persist and out-compete weeds. If levels of weeds and litter remain low over a year, it may then be possible to increase diversity by planting other species on the list.

## 8.1 Typical Creek Profile



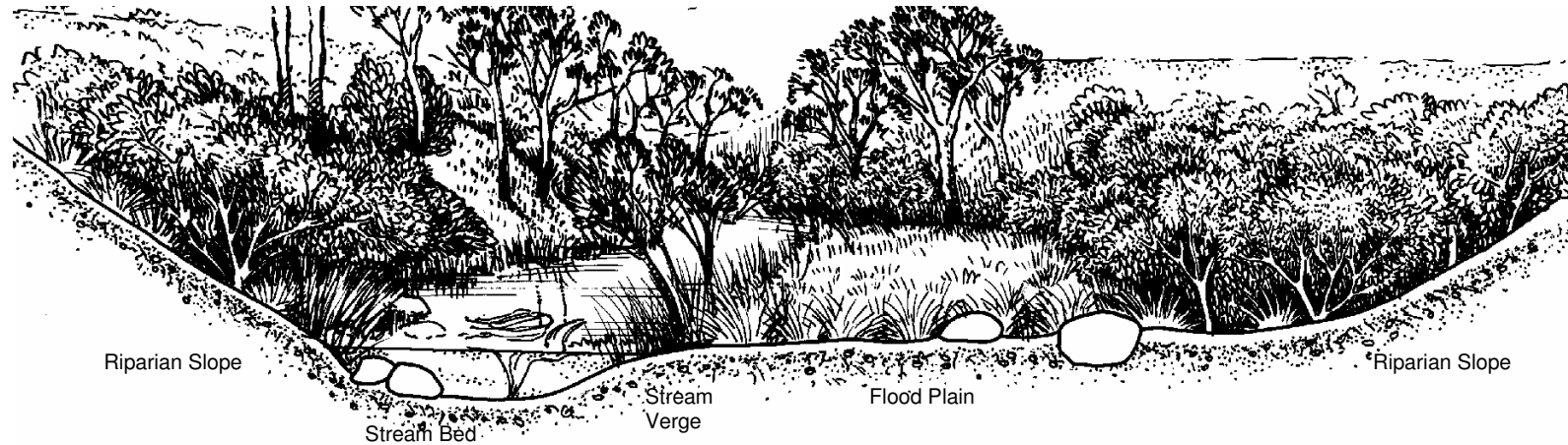
**Notes**

# low density planting

Plant names in bold are those species that should form the main planting framework.

Stream Bed	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
<b>SMALL PLANTS</b>			<b>SHRUBS</b>			<b>TREES</b>			<b>TREES</b>		
<i>Potamogeton crispus</i>	1	1	<i>Callistemon sieberi</i>	0.01 #	10	<i>Eucalyptus camaldulensis</i>	0.01 #	10	<i>Acacia dealbata</i>	0.01 #	10
<i>Potamogeton chreatus</i>	1	1	<i>Gynatrix pulchella</i>	0.1 #	3				<i>Acacia mearnsii</i>	0.25	2
<i>Potamogeton pectinatus</i>	1	1	<i>Leptospermum lanigerum</i>	0.5	1.5	<b>SHRUBS</b>			<i>Acacia melanoxylon</i>	0.25	2
<i>Triglochin procera</i>	0.5	1.5	<b>SMALL PLANTS</b>			<i>Acacia verticillata</i>	0.01 #	10	<i>Allocasuarina verticillata</i>	0.25	2
			<i>Lomandra longifolia</i>	4	0.5	<i>Callistemon sieberi</i>	0.01 #	10	<i>Eucalyptus camaldulensis</i>	0.0025 #	20
			<i>Alternanthera dentata</i>	4	0.5	<i>Gynatrix pulchella</i>	0.1 #	3			
			<i>Mentha australis</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5	<b>SHRUBS</b>		
			<i>Carex gaudichaudiana</i>	4	0.5	<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Acacia verticillata</i>	0.01 #	10
			<i>Crassula helmsii</i>	4	0.5	<b>SMALL PLANTS</b>			<i>Bursaria spinosa</i>	0.5	1.5
			<i>Juncus pauciflorus</i>	4	0.5	<i>Dichondra repens</i>	1	1	<i>Cassinia longifolia</i>	0.5	1.5
			<i>Juncus usitatus</i>	4	0.5	<i>Poa labillardierei</i>	4	0.5	<i>Correa glabra</i>	1	1
			<i>Persicaria decipiens</i>	2	0.7	<i>Lomandra longifolia</i>	4	0.5	<i>Dodonea viscosa</i>	0.5	1.5
			<i>Persicaria hydropiper</i>	2	0.7	<i>Alternanthera dentata</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5
			<i>Alisma plantago-aquatica</i>	1	1	<i>Carex gaudichaudiana</i>	4	0.5	<i>Pomaderris racemosa</i>	1	1
			<i>Bolboschoenus caldwellii</i>	4	0.5	<i>Carex inversa</i>	10	0.2	<b>SMALL PLANTS</b>		
			<i>Bolboschoenus medianus</i>	4	0.5	<i>Crassula helmsii</i>	4	0.5	<i>Dichondra repens</i>	1	1
			<i>Lycopus australis</i>	4	0.5	<i>Juncus pallidus</i>	0.25 #	2	<i>Glycine clandestina</i>	6	0.4
			<i>Phragmites australis</i>	1	1	<i>Juncus pauciflorus</i>	4	0.5	<i>Glycine tabacina</i>	6	0.4
			<i>Rumex bidens</i>	1	1	<i>Alisma plantago-aquatica</i>	0.25 #	2	<i>Clematis microphylla</i>	0.01 #	10
			<i>Schoenoplectus pungens</i>	4	0.5	<i>Phragmites australis</i>	1	1	<i>Danthonia caespitosa</i>	10	0.2
			<i>Schoenoplectus validus</i>	4	0.5				<i>Danthonia racemosa</i>	10	0.2
			<i>Triglochin procera</i>	0.5	1.5				<i>Microlaena stipoides</i>	10	0.2
			<i>Typha spp.</i>	0.5	1.5				<i>Poa labillardierei</i>	4	0.5
									<i>Lomandra filiformis</i>	6	0.4
									<i>Lomandra longifolia</i>	4	0.5
									<i>Acaena echinata</i>	4	0.5
									<i>Mentha australis</i>	4	0.5
									<i>Carex inversa</i>	10	0.2
									<i>Juncus pallidus</i>	0.25 #	2

## 8.2 Shady Creek Profile



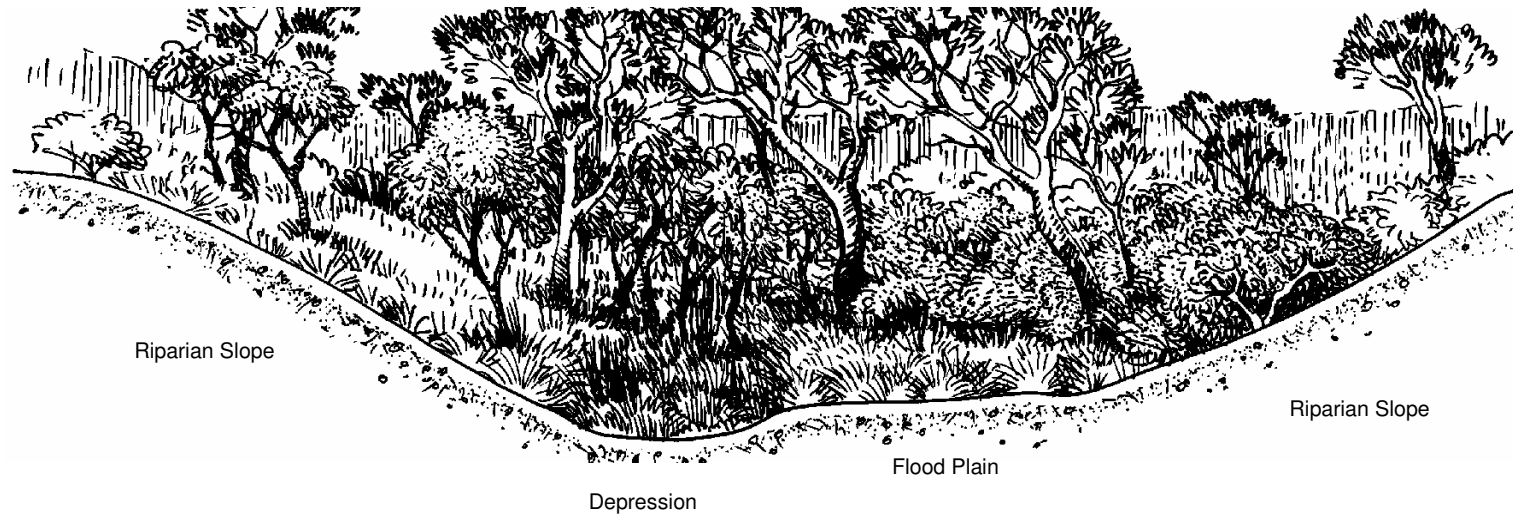
### Notes

# low density  
planting

Plant names in bold are those species that should form the main planting framework.

Stream Bed	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
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<i>Potamogeton chreatus</i>	1	1	<b>SMALL PLANTS</b>			<i>Eucalyptus viminalis</i>	0.01 #	10	<i>Acacia melanoxylon</i>	0.25	2
<i>Potamogeton pectinatus</i>	1	1	<i>Lomandra longifolia</i>	4	0.5	<b>SHRUBS</b>	0.01 #	10	<i>Eucalyptus camaldulensis</i>	0.0025 #	20
<i>Triglochin procera</i>	0.5	1.5	<i>Alternanthera dentata</i>	4	0.5	<i>Acacia verticillata</i>	#	10	<i>Eucalyptus viminalis</i>	0.01 #	10
			<i>Mentha australis</i>	4	0.5	<i>Goodenia ovata</i>	1	1	<b>SHRUBS</b>		
			<i>Crassula helmsii</i>	4	0.5	<i>Gynatrix pulchella</i>	0.1	3	<i>Acacia verticillata</i>	0.01 #	10
			<i>Juncus pauciflorus</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5	<i>Bursaria spinosa</i>	0.5	1.5
			<i>Juncus usitatus</i>	4	0.5	<i>Rapanea howittiana</i>	0.5	1.5	<i>Cassinia aculeata</i>	0.5	1.5
			<i>Persicaria decipiens</i>	2	0.7	<i>Rapanea howittiana</i>			<i>Cassinia longifolia</i>	0.5	1.5
			<i>Persicaria hydropiper</i>	2	0.7	<i>Dichondra repens</i>	1	1	<i>Correa glabra</i>	1	1
			<i>Schoenoplectus validus</i>	4	0.5	<i>Poa labillardierei</i>	4	0.5	<i>Goodenia ovata</i>	2	0.7
			<i>Triglochin procera</i>	0.5	1.5	<i>Lomandra longifolia</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5
			<i>Typha spp.</i>	0.5	1.5	<i>Alternanthera dentata</i>	4	0.5	<i>Olearia lirata</i>	4	0.5
						<i>Carex inversa</i>	10	0.2	<i>Ozothamnus ferrugineus</i>	0.5	1.5
						<i>Carex tereticaulis</i>	4	0.5	<i>Pomaderris aspera</i>	1	1
						<i>Crassula helmsii</i>	4	0.5	<i>Solanum laciniatum</i>	0.01 #	10
						<i>Juncus pauciflorus</i>	4	0.5	<b>SMALL PLANTS</b>		
									<i>Dichondra repens</i>	1	1
									<i>Glycine clandestina</i>	6	0.4
									<i>Danthonia racemosa</i>	10	0.2
									<i>Microlaena stipoides</i>	10	0.2
									<i>Poa labillardierei</i>	4	0.5
									<i>Lomandra longifolia</i>	4	0.5
									<i>Acaena echinata</i>	4	0.5
									<i>Mentha australis</i>	4	0.5

### 8.3 Gully / Drainage-line Profile



**Notes**

# low density  
planting

Plant names in bold are those species that should form the main planting framework.

Depression	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
<b>TREES</b>			<b>TREES</b>			<b>TREES</b>		
<i>Eucalyptus camaldulensis</i>	0.0025 #	20	<i>Eucalyptus camaldulensis</i>	0.01 #	10	<i>Acacia melanoxylon</i>	0.25 #	2
<i>Eucalyptus ovata</i>	0.0025 #	20	<i>Eucalyptus ovata</i>	0.0025 #	20	<i>Eucalyptus camaldulensis</i>	0.01 #	10
<b>SMALL PLANTS</b>			<i>Eucalyptus viminalis</i>	0.01 #	10	<i>Eucalyptus ovata</i>	0.0025 #	20
<i>Calocephalus lacteus</i>	4	0.5	<b>SHRUBS</b>			<i>Eucalyptus viminalis</i>	0.01 #	10
<i>Dichondra repens</i>	1	1	<i>Acacia verticillata</i>	0.01 #	10	<b>SHRUBS</b>		
<i>Veronica gracilis</i>	6	0.4	<i>Goodenia ovata</i>	1	1	<i>Acacia verticillata</i>	0.01 #	10
<i>Poa labillardierei</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5	<i>Bursaria spinosa</i>	0.5	1.5
<i>Lomandra longifolia</i>	4	0.5	<b>SMALL PLANTS</b>			<i>Cassinia aculeata</i>	0.5	1.5
<i>Acaena echinata</i>	4	0.5	<i>Dichondra repens</i>	1	1	<i>Cassinia longifolia</i>	0.5	1.5
<i>Alternanthera denticulata</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4	<i>Goodenia ovata</i>	1	1
<i>Carex appressa</i>	4	0.5	<i>Poa labillardierei</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5
<i>Carex inversa</i>	10	0.2	<i>Lomandra longifolia</i>	4	0.5	<i>Olearia lirata</i>	4	.5
<i>Crassula helmsii</i>	4	0.5	<i>Alternanthera denticulata</i>	4	0.5	<i>Ozothamnus ferrugineus</i>	0.5	1.5
<i>Juncus pallidus</i>	0.25 #	2	<i>Carex appressa</i>	4	0.5	<b>SMALL PLANTS</b>		
<i>Juncus sarophorus</i>	4	0.5	<i>Carex gaudichaudiana</i>	4	0.5	<i>Dichondra repens</i>	1	1
<i>Juncus subsecundus</i>	0.5 #	1.5	<i>Carex inversa</i>	10	0.2	<i>Veronica gracilis</i>	6	0.4
<i>Eleocharis acuta</i>	4	0.5	<i>Crassula helmsii</i>	4	0.5	<i>Clematis microphylla</i>	0.01 #	10
			<i>Juncus pallidus</i>	0.25 #	2	<i>Danthonia racemosa</i>	10	0.2
			<i>Juncus sarophorus</i>	4	0.5	<i>Microlaena stipoides</i>	10	0.2
			<i>Juncus subsecundus</i>	0.5 #	1.5	<i>Poa labillardierei</i>	4	0.5
			<i>Alisma plantago-aquatica</i>	0.25 #	2	<i>Lomandra longifolia</i>	4	0.5
			<i>Eleocharis acuta</i>	4	0.5	<i>Alternanthera denticulata</i>	4	0.5
						<i>Carex appressa</i>	4	0.5
						<i>Carex inversa</i>	10	0.2
						<i>Juncus pallidus</i>	0.25 #	2

## 8.4 Anabranch / Billabong Profile



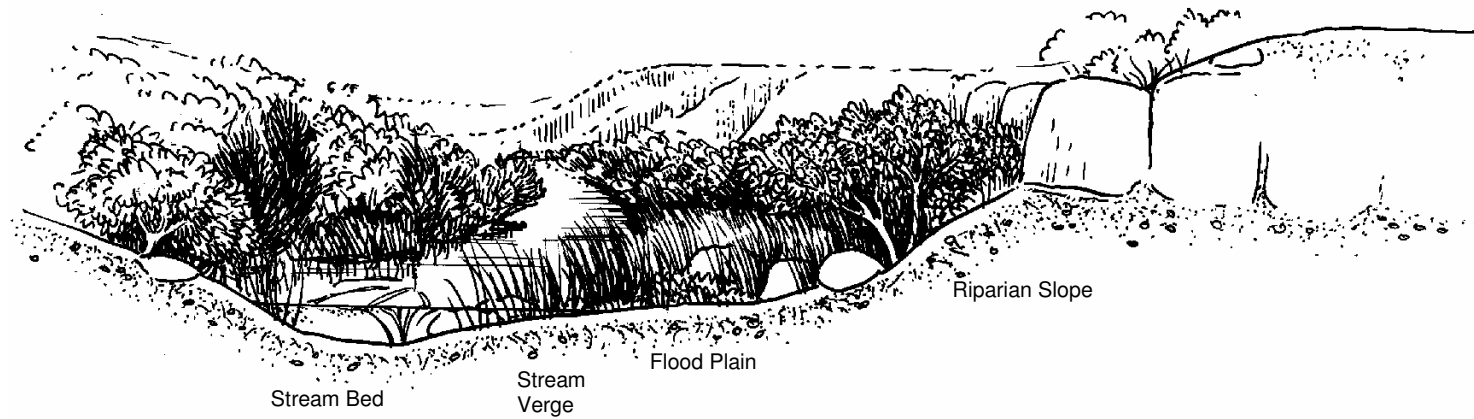
**Notes**

# low density planting

Plant names in bold are those species that should form the main planting framework.

Depression	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
TREES	0.0025 #	20	SHRUBS			TREES		
<i>Eucalyptus camaldulensis</i>			<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Eucalyptus camaldulensis</i>	0.0025 #	20
SHRUBS			<i>Melaleuca ericifolia</i>	0.25	2	<i>Acacia melanoxylon</i>	0.25	2
<i>Melaleuca ericifolia</i>	0.25	2	SMALL PLANTS			SHRUBS		
SMALL PLANTS			<i>Lomandra longifolia</i>	4	0.5	<i>Acacia verticillata</i>	0.01 #	10
<i>Calocephalus lacteus</i>	4	0.5	<i>Alternanthera denticulata</i>	4	0.5	<i>Bursaria spinosa</i>	0.5	1.5
<i>Dichondra repens</i>	1	1	<i>Mentha australis</i>	4	0.5	<i>Leptospermum lanigerum</i>	0.5	1.5
<i>Veronica gracilis</i>	6	0.4	<i>Carex fascicularis</i>	4	0.5	<i>Correa glabra</i>	1	1
<i>Poa labillardierei</i>	4	0.5	<i>Crassula helmsii</i>	4	0.5	<i>Goodenia ovata</i>	2	0.7
<i>Lomandra longifolia</i>	4	0.5	<i>Juncus pauciflorus</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5
<i>Acaena echinata</i>	4	0.5	<i>Juncus usitatus</i>	4	0.5	<i>Solanum laciniatum</i>	0.01 #	10
<i>Alternanthera denticulata</i>	4	0.5	<i>Persicaria decipiens</i>	2	0.7	SMALL PLANTS		
<i>Carex fascicularis</i>	4	0.5	<i>Persicaria hydropiper</i>	0.25 #	2	<i>Dichondra repens</i>	1	1
<i>Carex tereticaulis</i>	4	0.5	<i>Alisma plantago-aquatica</i>	1	1	<i>Glycine clandestina</i>	6	0.4
<i>Crassula helmsii</i>	4	0.5	<i>Bolboschoenus medianus</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4
<i>Marsilea drummondii</i>	2	0.7	<i>Eleocharis acuta</i>	4	0.5	<i>Clematis microphylla</i>	0.01 #	10
<i>Persicaria decipiens</i>	2	0.7	<i>Lycopus australis</i>	4	0.5	<i>Danthonia racemosa</i>	10	0.2
<i>Eleocharis acuta</i>	4	0.5	<i>Triglochin procera</i>	0.5	1.5	<i>Microlaena stipoides</i>	10	0.2
<i>Myriophyllum crispatum</i>	4	0.5				<i>Poa labillardierei</i>	4	0.5
<i>Triglochin procera</i>	0.5	1.5				<i>Lomandra longifolia</i>	4	0.5
						<i>Acaena echinata</i>	4	0.5
						<i>Mentha australis</i>	4	0.5

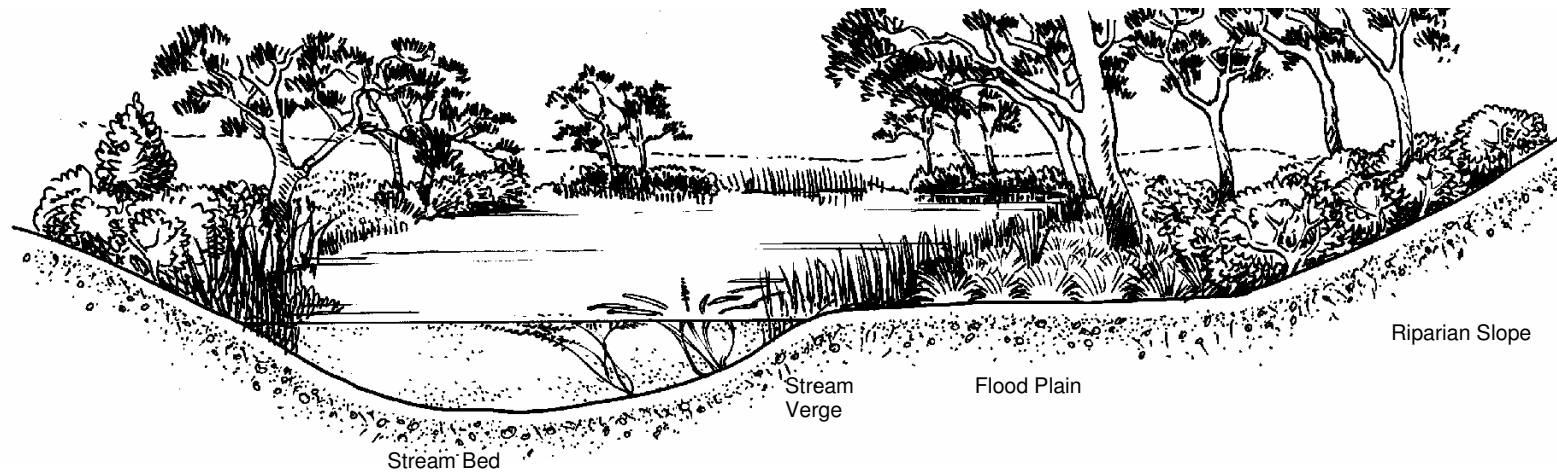
## 8.5 Saline spring affected Profile



**Notes**  
 # low density planting  
 Plant names in bold are those species that should form the main planting framework.

Stream Bed	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
SMALL PLANTS <i>Potamogeton pectinatus</i> <i>Triglochin procera</i>	1 0.5	1 1.5	SHRUBS <b><i>Leptospermum lanigerum</i></b> <i>Melaleuca ericifolia</i> SMALL PLANTS <b><i>Baumea juncea</i></b> <i>Crassula helmsii</i> <b><i>Isolepis nodosa</i></b> <b><i>Juncus kraussii</i></b> <i>Juncus usitatus</i> <i>Samolus usitatus</i> <b><i>Selliera radicans</i></b> <b><i>Bolboschoenus caldwellii</i></b> <b><i>Triglochin procera</i></b>	0.5 0.25 4 4 4 4 4 4 4 4 4 4 0.5	1.5 2 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 1.5	SHRUBS <b><i>Leptospermum lanigerum</i></b> <i>Melaleuca ericifolia</i> SMALL PLANTS <b><i>Baumea juncea</i></b> <i>Crassula helmsii</i> <b><i>Isolepis nodosa</i></b> <b><i>Juncus kraussii</i></b> <i>Mimulus repens</i> <i>Samolus repens</i> <b><i>Selliera radicans</i></b> <i>Triglochin striata</i> <b><i>Triglochin procera</i></b>	0.5 0.25 4 4 4 4 4 4 4 10 0.5	1.5 2 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.2 1.5	SHRUBS <i>Dodonea viscosa</i> <i>Rhagodia candolleana</i>	0.5 1	1.5 1

## 8.6 Lake Profile, No seasonal water level variation



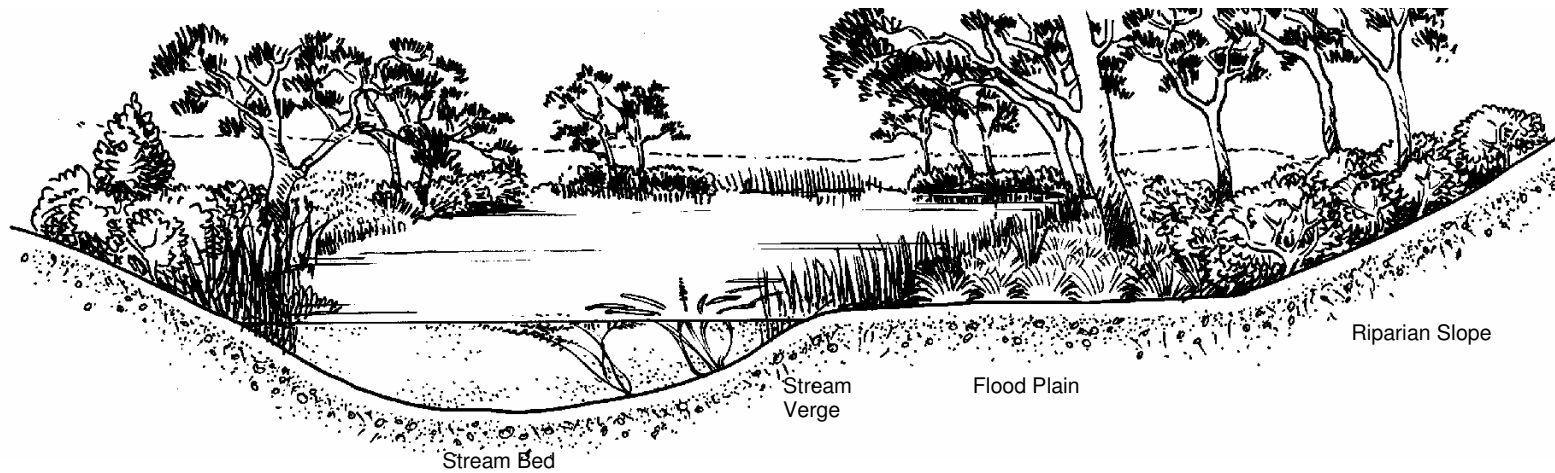
**Notes**

# low density planting

Plant names in bold are those species that should form the main planting framework.

Stream Bed	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
<b>SMALL PLANTS</b>			<b>SHRUBS</b>			<b>TREES</b>			<b>TREES</b>		
<i>Potamogeton crispus</i>	1	1	<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Eucalyptus camaldulensis</i>	0.1	3.0	<i>Acacia dealbata</i>	0.01 #	10
<i>Potamogeton ochreatus</i>	1	1	<i>Melaleuca ericifolia</i>	0.25	2	<i>Eucalyptus ovata</i>	0.0025 #	20	<i>Acacia melanoxylon</i>	0.25	2
			<b>SMALL PLANTS</b>			<b>SHRUBS</b>			<i>Eucalyptus camaldulensis</i>	0.0025 #	20
			<i>Lomandra longifolia</i>	4	0.5	<i>Acacia verticillata</i>	0.01 #	10	<i>Eucalyptus ovata</i>	0.0025 #	20
			<i>Carex fascicularis</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5	<b>SHRUBS</b>		
			<i>Crassula helmsii</i>	4	0.5	<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Acacia verticillata</i>	0.01	10
			<i>Persicaria decipiens</i>	2	0.7	<i>Melaleuca ericifolia</i>	0.25	2	<i>Bursaria spinosa</i>	0.5	1.5
			<i>Bolboschoenus medianus</i>	4	0.5	<b>SMALL PLANTS</b>			<i>Hymenanthera dentata</i>	0.5	1.5
			<i>Eleocharis sphacelata</i>	1	1	<i>Dichondra repens</i>	1	1	<i>Solanum laciniatum</i>	0.01 #	10
			<i>Phragmites australis</i>	1	1	<i>Poa labillardierei</i>	4	0.5	<b>SMALL PLANTS</b>		
			<i>Rumex bidens</i>	1	1	<i>Lomandra longifolia</i>	4	0.5	<i>Dichondra repens</i>	1	1
			<i>Schoenoplectus validus</i>	4	0.5	<i>Carex fascicularis</i>	4	0.5	<i>Austrodanthonia racemosa</i>	10	0.2
			<i>Typha spp.</i>	0.5	1.5	<i>Crassula helmsii</i>	4	0.5	<i>Microlaena stipoides</i>	10	0.2
						<i>Phragmites australis</i>	1	1	<i>Poa labillardierei</i>	4	0.5
									<i>Lomandra longifolia</i>	4	0.5

## 8.7 Lake Profile, Seasonal water level variation



**Notes**

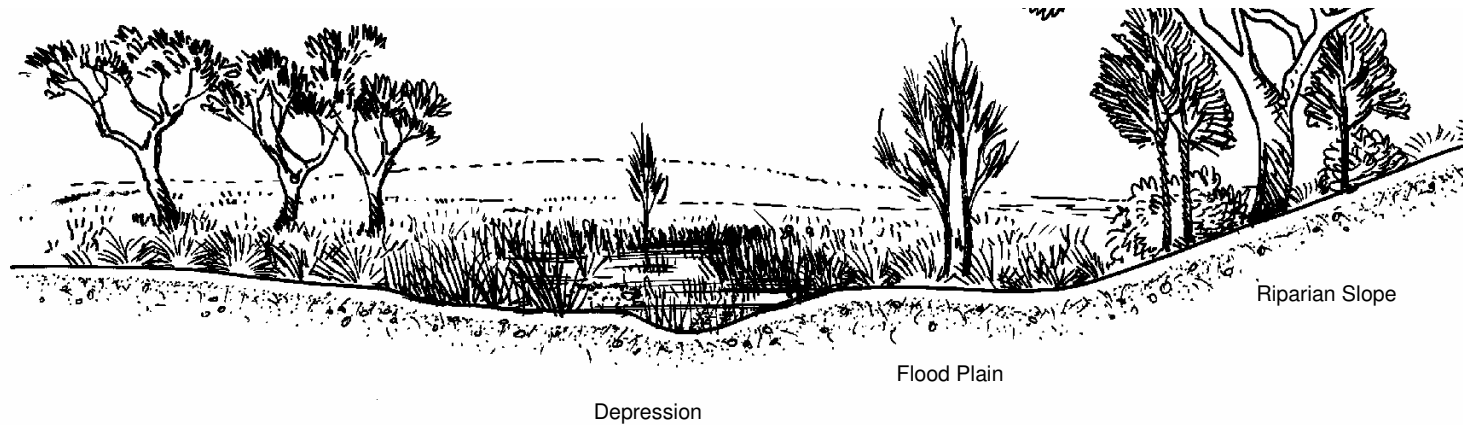
# low density planting

Plant names in bold are those species that should form the main planting framework.

Stream Bed	Density Per m <sup>2</sup>	Spacing m	Stream Verge	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
<b>SMALL PLANTS</b>			<b>SHRUBS</b>			<b>TREES</b>			<b>TREES</b>		
<i>Potamogeton crispus</i>	1	1	<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Eucalyptus camaldulensis</i>	0.1	3.0	<i>Acacia dealbata</i>	0.01 #	10
<i>Potamogeton ochreatus</i>	1	1	<i>Melaleuca ericifolia</i>	0.25	2	<i>Eucalyptus ovata</i>	0.0025 #	20	<i>Acacia melanoxylon</i>	0.25	2
<i>Triglochin procera</i>	0.5	1.5	<i>Gynatrix pulchella</i>	0.1 #	3	<b>SHRUBS</b>			<i>Eucalyptus camaldulensis</i>	0.0025 #	20
			<b>SMALL PLANTS</b>			<i>Acacia verticillata</i>	0.01 #	10	<i>Eucalyptus ovata</i>	0.0025 #	20
			<i>Lomandra longifolia</i>	4	0.5	<i>Gynatrix pulchella</i>	0.1 #	3	<b>SHRUBS</b>		
			<i>Alternanthera denticulata</i>	4	0.5	<i>Hymenanthera dentata</i>	0.5	1.5	<i>Acacia verticillata</i>	0.01 #	10
			<i>Carex fascicularis</i>	4	0.5	<i>Leptospermum lanigerum</i>	0.5	1.5	<i>Bursaria spinosa</i>	0.5	1.5
			<i>Carex gaudichaudiana</i>	4	0.5	<i>Melaleuca ericifolia</i>	0.25	2	<i>Hymenthera dentata</i>	0.5	1.5
			<i>Crassula helmsii</i>	4	0.5	<i>Goodenia ovata</i>	1	1	<i>Solanum laciniatum</i>	0.01 #	10
			<i>Juncus pauciflorus</i>	4	0.5	<b>SMALL PLANTS</b>			<i>Goodenia ovata</i>	2	0.7
			<i>Juncus sarophorus</i>	4	0.5	<i>Dichondra repens</i>	1	1	<b>SMALL PLANTS</b>		
			<i>Juncus usitatus</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4	<i>Dichondra repens</i>	1	1
			<i>Persicaria decipiens</i>	2	0.7	<i>Poa labillardierei</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4
			<i>Persicaria hydroppiper</i>	0.25 #	2	<i>Lomandra longifolia</i>	4	0.5	<i>Austrodanthonia racemosa</i>	10	0.2
			<i>Alisma plantago-aquatica</i>	1	1	<i>Alternanthera denticulata</i>	4	0.5	<i>Microlaena stipoides</i>	10	0.2
			<i>Bolboschoenus caldwellii</i>	4	0.5	<i>Amphibromus nervosus</i>	10	0.2	<i>Poa labillardierei</i>	4	0.5
			<i>Bolboschoenus medianus</i>	4	0.5	<i>Carex appressa</i>	4	0.5	<i>Lomandra longifolia</i>	4	0.5
			<i>Centipeda cunninghamii</i>	10	0.2	<i>Carex fascicularis</i>	4	0.5	<i>Carex appressa</i>	4	0.5
			<i>Eleocharis acuta</i>	4	0.5	<i>Carex tereticaulis</i>	4	0.5	<i>Carex inversa</i>	10	0.2
			<i>Eleocharis sphacelata</i>	1	1	<i>Crassula helmsii</i>	4	0.5	<i>Juncus pallidus</i>	0.25 #	2
			<i>Lycopus australis</i>	4	0.5	<i>Juncus pallidus</i>	0.25 #	2			
			<i>Myriophyllum crispatum</i>	4	0.5	<i>Juncus pauciflorus</i>	4	0.5			
			<i>Phragmites australis</i>	1	1	<i>Juncus sarophorus</i>	4	0.5			
			<i>Rumex bidens</i>	1	1	<i>Juncus subsecundus</i>	0.5 #	1.5			
			<i>Schoenoplectus validus</i>	4	0.5	<i>Marsilea drummondii</i>	2	0.7			
			<i>Triglochin procera</i>	0.5	1.5	<i>Alisma plantago-aquatica</i>	1	1			
			<i>Typha spp.</i>	0.5	1.5	<i>Eleocharis acuta</i>	4	0.5			
						<i>Myriophyllum crispatum</i>	1	1			
						<i>Phragmites australis</i>	1	1			



## 8.8 Shallow, seasonal wetland profile



### Notes

# low density planting

Plant names in bold are those species that should form the main planting framework.

Ψ Only plant large trees near large wetlands

Depression	Density Per m <sup>2</sup>	Spacing m	Depression	Density Per m <sup>2</sup>	Spacing m	Flood Plain	Density Per m <sup>2</sup>	Spacing m	Riparian Slope	Density Per m <sup>2</sup>	Spacing m
<b>TREES</b>			<b>SMALL PLANTS (CONT.)</b>			<b>TREES</b>			<b>TREES</b>		
<i>Eucalyptus ovata</i> Ψ	0.0025 #	20	<i>Eleocharis pallens</i>	4	0.5	<i>Eucalyptus ovata</i> Ψ	0.0025 #	20	<i>Acacia mearnsii</i>	0.25	2
<b>SHRUBS</b>			<i>Isolepis nodosus</i>	4	0.5	<b>SHRUBS</b>			<i>Acacia melanoxylon</i>	0.25	2
<i>Acacia retinoides</i>	1	1	<i>Juncus sarophorus</i>	0.5 #	1.5	<i>Hymenanthera dentata</i>	0.5	1.5	<i>Eucalyptus ovata</i> Ψ	0.0025	20
<i>Viminaria juncea</i>	0.5	1.5	<i>Juncus subsecundus</i>	2	0.7	<b>SMALL PLANTS</b>			<b>SHRUBS</b>		
<b>SMALL PLANTS</b>			<i>Marsilea drummondii</i>	4	0.5	<i>Dichondra repens</i>	1	1	<i>Acacia retinoides</i>	1	1
<i>Calocephalus lacteus</i>	4	0.5	<i>Pratia concolor</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4	<i>Hymenanthera detata</i>	0.5	1.5
<i>Centipeda cunninghamii</i>	10	0.2	<i>Eleocharis acuta</i>	4	0.5	<i>Austrodanthonia duttoniana</i>	10	0.2	<b>SMALL PLANTS</b>		
<i>Dichondra repens</i>	1	1	<i>Myriophyllum crispatum</i>	4	0.5	<i>Poa labillardierei</i>	4	0.5	<i>Dichondra repens</i>	1	1
<i>Veronica gracilis</i>	6	0.4				<i>Alternanthera denticulata</i>	4	0.5	<i>Veronica gracilis</i>	6	0.4
<i>Austrodanthonia duttoniana</i>	10	0.2				<i>Amphibromus nervosus</i>	10	0.2	<i>Austrodanthonia racemosa</i>	10	0.2
<i>Poa labillardierei</i>	6	0.4				<i>Carex appressa</i>	4	0.5	<i>Microlaena stipoides</i>	10	0.2
<i>Lomandra filiformis</i>	4	0.5				<i>Carex inversa</i>	10	0.2	<i>Poa labillardierei</i>	4	0.5
<i>Acaena echinata</i>	4	0.5				<i>Carex tereticaulis</i>	4	0.5	<i>Lomandra filiformis</i>	6	0.4
<i>Alternanthera denticulata</i>	6	0.4				<i>Crassula helmsii</i>	4	0.5	<i>Acaena echinata</i>	4	0.5
<i>Bossiaea prostrata</i>	6	0.4				<i>Isolepis nodosa</i>	4	0.5	<i>Carex appressa</i>	4	0.5
<i>Brachycombe basaltica</i>	6	0.4				<i>Juncus sarophorus</i>	4	0.5	<i>Carex inversa</i>	10	0.2
<i>Craspedia variabilis</i>	6	0.4				<i>Juncus subsecundus</i>	0.5 #	1.5			
<i>Helichrysum aff. rutidolepis</i>	6	0.4				<i>Marsilea drummondii</i>	2	0.7			
<i>Microseris lanceolata</i>	10	0.2				<i>Eleocharis acuta</i>	4	0.5			
<i>Pycnosorus chrysanthes</i>	6	0.4				<i>Myriophyllum crispatum</i>	4	0.5			
<i>Amphibromus nervosus</i>	10	0.2									
<i>Carex appressa</i>	4	0.5									
<i>Carex bichenoviana</i>	4	0.5									
<i>Carex inversa</i>	10	0.2									
<i>Carex tereticaulis</i>	4	0.5									
<i>Carex helmsii</i>	4	0.5									

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## Appendix 1 Species, References and Reference sites

Species	Common Name	Reference <sup>1</sup>	Reference Site <sup>2</sup>
<b>Trees</b>			
<i>Acacia dealbata</i>	Silver Wattle	106	Bird Habitat Area, Rushwood, St Georges Lake
<i>Acacia mearnsii</i>	Black Wattle	107	Bartrop, Cooper
<i>Acacia melanoxylon</i>	Blackwood	107	Acheson, Central, Clara, Coburg, Cooper, Galada
<i>Acacia retinodes</i>	Wirrilda	105	Pomonal
<i>Allocasuarina verticillata</i>	Drooping Sheoak	108	O'Herns
<i>Eucalyptus camaldulensis</i>	River Red Gum	111	Acheson, Bird Habitat area, C'burn-Cooper, Coburg, Merri, Rushwood
<i>Eucalyptus ovata</i>	Swamp Gum	110	O'Herns, Rushwood, St Georges Lake, Strettle
<i>Eucalyptus viminalis</i>	Manna Gum	111	Plenty-Janefield
<b>Shrubs</b>			
<i>Acacia verticillata</i>	Prickly Moses	97	Acheson, Coburg, Plenty-Janefield
<i>Bursaria spinosa</i>	Sweet Bursaria	97	Bartrop, Bird Habitat Area, Coburg, O'Herns, Queens, Rushwood
<i>Callistemon sieberi</i>	River Bottlebrush	98	Galada
<i>Cassinia aculeata</i>	Dogwood	98	Plenty-G'borough
<i>Cassinia longifolia</i>	Shiny Cassinia	99	Plenty-G'borough, Plenty-Janefield
<i>Correa glabra</i>	Rock Correa	93	Acheson, Bartrop
<i>Dodonea viscosa</i>	Wedge Leaf Hop Bush	94	Galada, Hatty
<i>Goodenia ovata</i>	Hop Bush	94	Bird Habitat area, Plenty-G'borough
<i>Gynatrix pulchella</i>	Hemp Bush	100	Galada, Hatty
<i>Hymenanchera dentata</i>	Tree Violet	100	Bird Habitat Area, C'burn-Cooper, Coburg, Galada, Merri, O'Herns, Rushwood
<i>Leptospermum lanigerum</i>	River Teatree	101	Bird Habitat Area, Coburg, Cooper, Galada, O'Herns
<i>Melaleuca ericifolia</i>	Swamp Paperbark	105	Coburg, Edgars-Kodak, Strettle
<i>Olearia lirata</i>	Snowy Daisy-bush	102	Plenty-Janefield
<i>Ozothamnus ferrugineus</i>	Tree Everlasting	102	Plenty-Janefield
<i>Pomaderris aspera</i>	Hazel Pomaderris	103	Plenty-Janefield
<i>Pomaderris racemosa</i>	Slender Pomaderris	103	Plenty-Booyan
<i>Solanum laciniatum</i>	Kangaroo Apple	104	Coburg, O'Herns, Rushwood
<i>Rapaenea howittiana</i>	Muttonwood		Galada, Lorne
<i>Viminaria juncea</i>	Golden Spray	106	Cooper-Rex, Lalor GC
<b>Groundcovers</b>			
<i>Calocephalus lacteus</i>	Milky Beauty Heads	71	Central, Curly Sedge Ck, Rushwood
<i>Centipeda cunninghamii</i>	Common Sneezeweed	86	Strettle, O'Herns
<i>Dichondra repens</i>	Kidney Weed	73	Central, Coburg, O'Herns, Rushwood
<i>Glycine clandestina</i>	Twining glycine	fom 112	O'Herns
<i>Glycine tabacina</i>	Variable Glycine	73	Cooper
<i>Rhagodia candolleana</i>	Seaberry saltbush	fom 174	Galada

<i>Veronica gracilis</i>	Slender Speedwell	76	Central, Rushwood
<b>Climbers</b>			
<i>Clematis microphylla</i>	Small Leaf Clematis	77	Rushwood
<b>Grasses</b>			
<i>Danthonia caespitosa</i>	Common Wallaby Grass	38	Rushwood
<i>Danthonia duttoniana</i>	Brown-back Wallaby Grass	39	Galada
<i>Danthonia racemosa</i>	Clustered Wallaby Grass	fom 260	Coburg, Galada, Merri, O'Herns, Rushwood, Strettle
<i>Microlaena stipoides</i>	Weeping Grass	41	Coburg, Merri, O'Herns, Rushwood, Strettle
<i>Poa labillardieri</i>	Common Tussock Grass	42	Central, Coburg, O'Herns, Rushwood, Strettle
<b>Tussock plants</b>			
<i>Lomandra filiformis</i>	Wattle Wat Rush	56	Central, Rushwood
<i>Lomandra longifolia</i>	Spiky Headed Mat Rush	68	Acheson, Coburg, Rushwood, Strettle
<b>Small plants</b>			
<i>Acaena echinata</i>	Sheeps Burr	fom 57	O'Herns, Central, Rushwood
<i>Alternanthera denticulata</i>	Lesser Joy Weed	fom 60	Acheson, O'Herns, Lenister
<i>Bossiaea prostrata</i>	Creeping Bossiaea	47	Cooper
<i>Brachyscome basaltica</i>	Basalt Daisy	47	Galada-T'town
<i>Bracteantha palustris</i>	Swamp Everlasting		Beveridge
<i>Craspedia variabilis</i>	Common Billy Buttons	66	Beveridge
<i>Helichrysum rutidolepis</i>	Pale Everlasting	55	Galada-T'town
<i>Mentha australis</i>	Native Mint	68	Bartrop, O'Herns, Rushwood
<i>Microseris lanceolata</i>	Murnong	57	Cooper
<i>Pycnosorus chrysanthes</i>	Golden Billy Buttons	60	FOM
<b>Semi-aquatics</b>			
<i>Amphibromus nervosus</i>	Swamp Wallaby Grass	fom 246	Central
<i>Baumea juncea</i>	Bare Twig-rush	fom 248	Galada
<i>Carex appressa</i>	Tall Sedge	fom 249	Beveridge, Lenister, Plenty-Janefield
<i>Carex bichenoviana</i>	Sedge	fom 250	Lalor GC
<i>Carex fascicularis</i>	Tassel Sedge	78	Bird Habitat Area, Darebin, Lenister
<i>Carex gaudichaudiana</i>	Tufted Sedge	fom 250	C'burn-Cooper, O'Herns
<i>Carex inversa</i>	Knob Sedge	fom 251	Central, O'Herns, Rushwood
<i>Carex tasmanica</i>	Curly Sedge	fom 251	O'Herns
<i>Carex tereticaulis</i>	Common Sedge	79	Central, Lenister, O'Herns
<i>Crassula helmsii</i>	Swamp Stonecrop	79	C'burn-Cooper, Coburg, Galada, Lenister, Lorne, O'Herns
<i>Eleocharis pallens</i>	Pale Spike Rush	fom265	Plenty-Mill Park
<i>Isolepis nodosa</i>	Knobby Clubrush	79	Cooper, O'Herns
<i>Juncus krausii</i>	Sea Rush	fom 275	Galada, O'Herns
<i>Juncus pallidus</i>	Pale Rush	fom 275	Lenister, Plenty-Janefield
<i>Juncus pauciflorus</i>	Loose-flower Rush	fom 275	Lorne
<i>Juncus sarophorus</i>	Rush	fom 276	C'field Ck
<i>Juncus subsecundus</i>	Finger Rush	fom 276	C'field Ck

<i>Juncus usitatus</i>	Rush	fom 277	Acheson, C'field Ck, Galada, Lorne, Merri
<i>Marsilea drummondii</i>	Nardoo	81	Barmah, Crematorium, Lenister
<i>Mimulus repens</i>	Creeping Monkey Flower	81	Summerhill
<i>Persicaria decipiens</i>	Slender Knotweed	82	Acheson, Coburg, Lenister, Merri, O'Herns
<i>Persicaria hydropiper</i>	Waterpepper	fom 155	Acheson, Edgars-Kodak, Lenister
<i>Pratia concolor</i>	Poison Pratia	fom 164	Central, Galada-T'town
<i>Samolus repens</i>	Creeping Brookweed	fom 177	Galada, O'Herns
<i>Selleria radicans</i>	Swampweed	75	Galada, O'Herns
<i>Triglochin striata</i>	Streaked arrow-grass	fom 300	Galada, O'Herns
<b>Aquatics</b>			
<i>Alisma plantago-aquatica</i>	Water Plantain	83	Acheson, C'field Ck, Lenister, Merri
<i>Bolboschoenus caldwellii</i>	Sea Club Rush	fom 249	Galada, Merri, O'Herns, Strettle
<i>Bolboschoenus medianus</i>	Marsh Club Rush	83	Acheson, Coburg, Lenister, Merri
<i>Eleocharis acuta</i>	Common Spike Rush	84	Acheson, Galada-T'town, Lenister, Newlands
<i>Eleocharis sphacelata</i>	Tall Spike Rush	fom 265	Strettle
<i>Lycopus australis</i>	Austral Wolfbane	fom 137	Lenister, Sumner
<i>Myriophyllum crispatum</i>	Water Milfoil	84	Crematorium, Lenister
<i>Phragmites australis</i>	Common Reed	fom 285	Coburg, Merri, Strettle
<i>Potamogeton crispus</i>	Curly Pondweed	fom 288	Coburg, Edgar-Caravan, Queens, Strettle
<i>Potamogeton ochreatus</i>	Blunt Pondweed	fom 288	Coburg, Edgar-Caravan, Strettle
<i>Potamogeton pectinatus</i>	Fennel Pondweed	fom 288	Coburg, Edgars-Tilley, Sumner
<i>Rumex bidens</i>	Mud Dock	fom 176	Acheson, Coburg
<i>Schoenoplectus pungens</i>	Sharp Leaf-rush	fom 290	MPC-Outlook
<i>Schoenoplectus validus</i>	River Club Rush	fom 290	Merri, Coburg, Strettle
<i>Triglochin procera</i>	Water Ribbon	85	Galada, O'Herns, Rushwood, Strettle
<i>Typha spp</i>	Cumbungii	fom 301	Coburg, Merri, Strettle

1. 'References' refer to page numbers in Wigney (1994) or, where the number is prefixed by 'FOM' in Society for Growing Australian Plants Maroondah Inc (1993). The species *Bracteantha palustris* was newly described in 1998.
2. Reference sites refer to sites with remnants or established revegetation where the species grows in the equivalent environment or in a place which suggests its capacity to survive in that environment.

## Appendix 2 Location of Reference Sites

Site Name	Location	Profile	Mel-ways	Remnant or Planted
<b>Acheson</b>	Merri Creek, North Coburg	Typical Creek Profile Shady Creek Profile Anabranched/billabong profile	17 J8	R/P
<b>Barmah</b>	Barmah Forest NSW	Anabranched/billabong profile	521 G5	R
<b>Bartrop</b>	Bartrop St Merri Ck Reservoir	Typical Creek Profile	8 B12	R/P
<b>Beveridge</b>	Beveridge-Wallan Railway Reserve	Seasonal wetland Profile	510 L11	R
<b>Bird Habitat Area</b>	Wetland Merlynston Ck Glenroy	Lake seasonal variation	7 B11	P
<b>C'field Ck</b>	Campbellfield Ck Melbourne Water Retarding Basin, Glenroy	Gully profile Seasonal wetland Profile Lake seasonal variation	7 F12	R
<b>Central Ck</b>	Central Ck Grasslands Reservoir	Gully profile Seasonal wetland Profile	8 B12	R
<b>Clara St</b>	Merri Creek Brunswick East	Typical Creek Profile	30 B5	P
<b>Coburg</b>	Coburg Lake Merri Creek Coburg	Shady Creek Profile Lake no water level variation Lake seasonal variation	17 J10	R
<b>Cooper</b>	Grasslands west of Merri Ck Campbellfield	Typical Creek Profile Gully profile Seasonal wetland Profile	7 K1	R
<b>Cooper-Rex</b>	West of John Deere Factory, Rex Rd, Campbellfield	Seasonal wetland Profile	180 H12	R
<b>C'burn - Cooper</b>	Merri Ck, Cooper St - Craigieburn	Typical Creek Profile Gully Profile	180 K10	R
<b>Crematorium</b>	Depressions in grassy woodland between Railway and Hume Hwy, Fawkner Crematorium	Seasonal wetland Profile	17 G5	R
<b>Curly Sedge Ck</b>	Curly Sedge Ck Craigieburn	Gully profile	180 G6	R
<b>Dandenong</b>	Dandenong Ck Vermont	Saline spring affected profile Anabranched/billabong profile	63 D5	R
<b>Darebin</b>	Darebin Ck Parkland Alphington	Lake no water level variation	31 C9	P
<b>Edgars-Caravan</b>	Edgars Ck Melbourne Caravan Park, Coburg North	Typical Creek Profile Shady Creek Profile Saline spring affected profile	18 B7	R
<b>Edgars-Kodak</b>	Edgars Ck and low-lying areas near Kodak factory, Coburg Nth	Typical Creek Profile Anabranched/billabong profile	18 A9	R/P
<b>Edgars-Tilley</b>	Edgars Ck near Tilley St	Saline spring affected profile	18 B8	R
<b>FOM</b>	Flora of Melbourne (no remnant sites seen by author)	Seasonal wetland Profile	----	R
<b>Galada</b>	Galada Tamboore, west of Merri Ck Campbellfield	Typical Creek Profile Shady Creek Profile Saline spring affected profile Seasonal wetland Profile	7 K6	R
<b>Galada-T'town</b>	Depressions in Grassland east of Merri Ck Thomastown	Seasonal wetland Profile	8 A5	R
<b>Hatty</b>	Merri Creek opposite Hatty Court, Campbellfield	Typical Creek Profile	7 K5	R
<b>Jukes</b>	Merri Creek below Jukes Rd Grassland Fawkner	Shady Creek Profile	18 B2	R
<b>Lalor GC</b>	Lalor Golf Course , Lalor	Seasonal wetland Profile	8 B3	R

<b>Lenister</b>	Artificial wetlands on Yarra River banks at Lenister Farm Eltham	Lake seasonal variation	21 J11	P
<b>Lorne</b>	Merri Creek near Lorne St Fawkner	Typical Creek Profile Shady Creek Profile Anabranh/billabong profile	18 A5	R
<b>Merri</b>	Widespread and frequent remnants along Merri Ck in Moreland area	Typical Creek Profile	----	R
<b>MPC-Outlook</b>	Moonee Ponds Creek below Outlook Drive, Glenroy	Typical Creek Profile	16 C3	R
<b>Newlands</b>	In ditches in degraded native grassland next to Newlands Road opposite Norfolk Court, Coburg North	Gully profile	18 A7	R
<b>O'Herns</b>	North of O'Herns Rd Craigieburn, various sites along 1km stretch of Merri Ck	Typical Creek Profile Shady Creek Profile Saline spring affected profile Anabranh/billabong profile Gully profile Seasonal wetland Profile	180 H7	R
<b>Plenty-Booyan</b>	Plenty River Booyan Cres Greensborough	Typical Creek Profile	10 J10	R
<b>Plenty-Greensborough</b>	Plenty River near Greensborough shopping Centre	Shady Creek Profile Anabranh/billabong profile Gully profile	20 K1	R
<b>Plenty-Janeffield</b>	Plenty River within the former Janeffield Training Centre, Bundoora	Typical Creek Profile Shady Creek Profile Gully profile	10 F7	R
<b>Plenty-Mill Park</b>	Mill Park area (site now destroyed, described by Latrobe Wildlife Reserve staff)	Seasonal wetland Profile	----	R
<b>Pomonal</b>	Swampy sites along Mt William Ck, Pomonal - Halls Gap	Seasonal wetland Profile	526	R
<b>Queens</b>	Merri Creek below Queens Parade, Fawkner	Shady Creek Profile	17 K6	R
<b>Rushwood</b>	Merri Creek Rushwood Drive Craigieburn	Typical Creek Profile Shady Creek Profile Anabranh/billabong profile Gully profile Seasonal wetland Profile	180 E1	R
<b>St Georges Lake</b>	St Georges Lake, Creswick - Dean Road, Creswick	Lake no water level variation	509 A11	R
<b>Strettle</b>	Constructed wetland Merri Ck , north end Strettle St Thornbury	Lake seasonal variation	30 B3	P
<b>Summerhill</b>	Merri Ck Summerhill Rd Craigieburn	Saline spring affected profile	387 H2	R
<b>Sumner</b>	Merri Creek Sumner Park, below footbridge, Brunswick East	Typical Creek Profile Shady Creek Profile Anabranh/billabong profile	30 B9	R

### Appendix 3. Trees and shrubs for planting within Powerline easements

	Height	within / off e'ment	off easement only
<b>Trees</b>			
Acacia dealbata	5-15		*
Acacia mearnsii	up to 15		*
Acacia melanoxylon	5-18		*
Acacia retinoides	3-6		*
Allocasuarina verticillata	4-10		*
Eucalyptus camaldulensis	12-30		*
Eucalyptus ovata	8-25		*
Eucalyptus viminalis	15-30		*
Melaleuca ericifolia	2-5	#	
<b>Shrubs</b>			
Acacia verticillata	1-3	☐	
Bursaria spinosa	2-4	☐	
Callistemon sieberi	2-3	☐	
Cassinia aculeata	2-4	☐	
Cassinia longifolia	2-4	☐	
Correa glabra	1-2.5	☐	
Dodonea viscosa	2	☐	
Goodenia ovata	1	☐	
Gynatrix pulchella	2-3	☐	
Hymenathera dentata	2	☐	
Leptospermum lanigerum	<3	☐	
Olearia lirata	<3	☐	
Ozothamnus ferrugineus	3	☐	
Pomaderris aspera	2-4	☐	
Pomaderris racemosa	2-3	☐	
Solanum laciniatum	3	☐	
Rapaenea howittiana	1-4	#	
Viminaria juncea	2-5	#	

Groundcovers, climbers, grasses, tussock plants, small plants, semi-aquatics and aquatics may all be planted within easements and under powerlines.

☐ may be planted within easements and under powerlines

# may be used in specific circumstances within easement only with the permission of GPU PowerNet

\* must be planted so that tree at mature height could not fall within 4m of conductor