Appendix A **Suggested plant species for WSUD treatment elements**

A.1 Introduction

Appendix A provides a list of plants that are suitable for different Water Sensitive Urban Design treatment elements, including:

1. **sediment basins**
2. **bioretention swales**
3. **bioretention basins**
4. **swales** and **buffer** strips
5. **wetlands**
6. ponds.

Tables A.1 and A.2 (located at the end of this Appendix) are to be used as a guide to select appropriate species to perform a water quality function. Once species are selected from these tables they should be checked for consistency with local recommended species. Indigenous nurseries and/or other relevant agencies (Councils, Catchment Management Authority and Melbourne Water) should be consulted as part of the plant selection process.

Table A.1 includes plants suitable for bioretention swales, bioretention basins, buffer strips and swales. Table A.2 includes plants suitable for sediment basins, wetlands and ponds. These plant species are principally categorised according to their water depth. Littoral vegetation can be planted around all of the systems. Ponds will have submerged vegetation. Wetlands that have a full depth range will include plants recommended for all of the six zones [littoral, **ephemeral** marsh, shallow marsh, marsh, deep marsh and pool (submerged marsh species)].

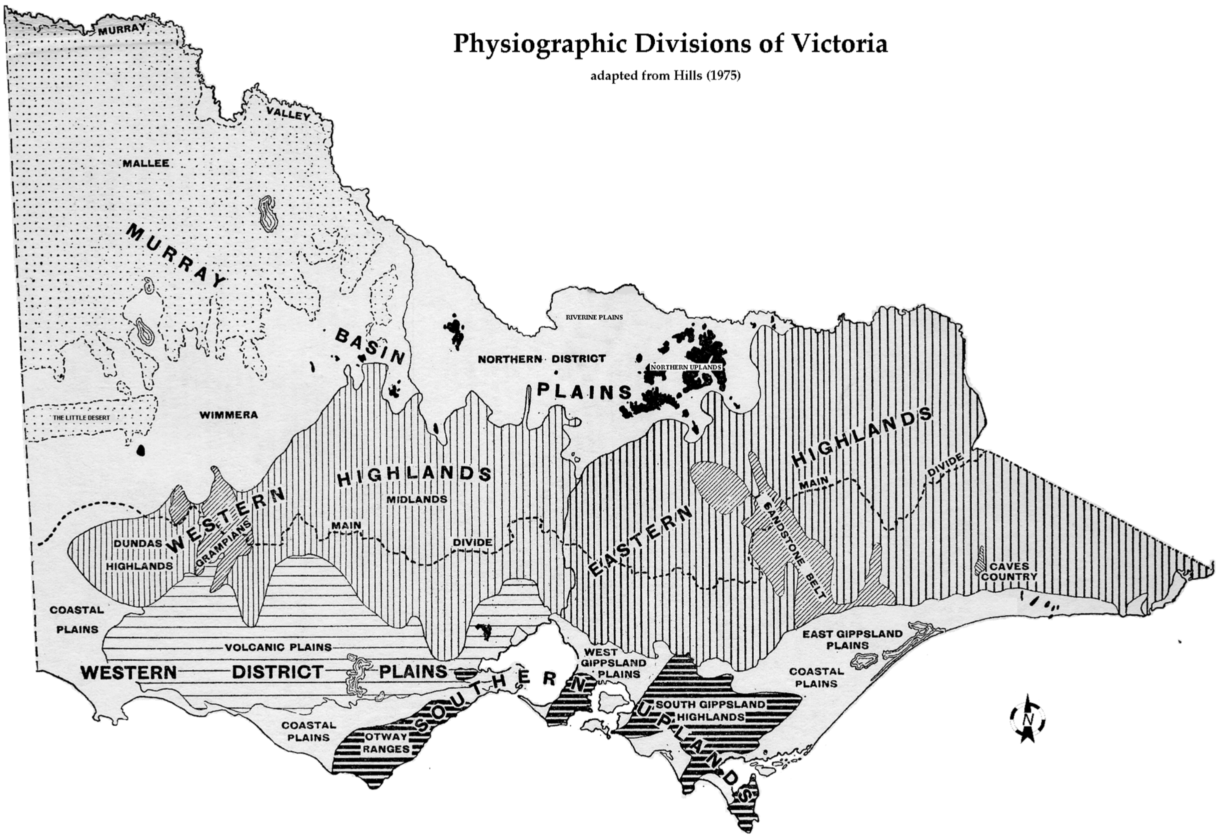

Figure A.1 Physiographic divisions of Victoria (from Hills 1975).

Most of the species listed in Tables A.1 and A.2 are widespread and occur throughout Victoria. Many species that will also be suitable for planting in WSUD elements will occur on a regional basis. Hills and Sherbon (1975) classified the physiography of Victoria into 11 regions (Figure A.1). The physiogeographic regions, or bioregions, are influenced by topography and elevation, climate, geology and edaphic (soil) characteristics (Figure A.1). The physiographic regions roughly correspond with the hydrologic regions outlined in this Manual. The hydrologic regions (Figure A.2) can be used to guide the selection of appropriate species (i.e. regionally endemic) throughout Victoria. Figure A.3 can be used as an initial guide to the soil types likely to be found in Melbourne suburbs; however, to select the most suitable plants (those from the local area) a thorough understanding of local soils is required (possibly involving laboratory testing).

Rather than solely using plants with a wide distribution, plants that are local to a particular bioregion can be used. Plants that occur in a particular bioregion will be well adapted to the local conditions and will add and enhance regional biodiversity. Use of locally occurring plants, some of which might be endemic, will encourage regional fauna.

A.2 Bioretention systems, swales and buffer strips

These WSUD elements typically treat **stormwater** close to its source (surfaces that water runs off). These elements include bioretention swales, bioretention basins, swales and buffer strips. Swales and buffer strips are typically constructed using local soils whereas soils in bioretention systems require specific hydraulic characteristics and local soils may require amendment. In some cases imported soils will be required.

Bioretention soils must meet filter media specifications (primarily a prescribed hydraulic conductivity) in addition to supporting plant growth (see Chapters 5 and 6).

Sandy loam soils are commonly used in bioretention systems because they typically have particle size distributions similar to suspended solids in urban stormwater runoff and therefore provide good retention of suspended particles. While sandy loams are typically used, other soil types can be used that suit the local vegetation, if they will support plant growth and are amended to meet the system requirements.

A.2.1 Constructing suitable soil/filter media

To ensure the soil/filter media provides for a design hydraulic conductivity and is able to support plant growth the following approach is suggested.

1 Identify if local topsoil is capable of supporting vegetation growth and if there is enough topsoil (some topsoils are very shallow) to be used as a base for the filter media (may require active collection of topsoil during the construction process). Any topsoil found to contain high levels of salt, extremely low levels of organic carbon (<<5%), or any other extremes which may be considered as a retardant to plant growth should be rejected. If the topsoil is not suitable, a sandy loam soil can be purchased from a supplier for use as a base soil.
2 Conduct laboratory tests to estimate the saturated hydraulic conductivity of the topsoil/base soil using standard testing procedures (see Appendix H in AS 4419).
3 If the soil needs to be amended to achieve the desired design saturated hydraulic conductivity, either mix in a loose non-angular sand (to increase saturated hydraulic conductivity) or a loose soft clay (to reduce saturated hydraulic conductivity).
4 The required content of sand or clay (by weight) to be mixed to the base soil will need to be established in the laboratory by incrementally increasing the content of sand or clay until the desired saturated hydraulic conductivity is achieved (within reasonable bounds). The sand or clay content (by weight) that achieves the desired hydraulic conductivity should then be adopted on-site.
5 The base soil should have sufficient organic content to establish vegetation on the surface of the bioretention system. If the proportion of base soil in the final mix is less than 50%, then it may be necessary to add in additional organic material to the mix but should not result in more than 10% organic content (measured in accordance with AS1289 4.1.1).
6 The pH of the soil mixture for the filtration layer is to be amended to between 6 and 7, before delivery to the site.

A.2.2 Importance of vegetation

Vegetation is an integral component of the treatment systems. The vegetation needs to fulfil several functions such as the following.

1 Provide a surface area to trap suspended solids and other pollutants as the water flows horizontally through the treatment systems.
2 Produce a biologically active root zone to help the removal of pollutants as water infiltrates vertically. This function is crucial for bioretention systems.
3 Reduce soil compaction and maintain infiltration rate.
4 Decrease flow velocities and bind and stabilise the substrate, thereby limiting erosion.
5 Create a prominent and diverse landscape element in the development and enhance local biodiversity.

A.2.3 Required plant characteristics

The species outlined in Table A.1 have been specifically selected, based on their life histories, physiological and structural characteristics to meet the functional requirements of swale/bioretention systems. Other species can be used as long as they can fulfil the functional roles described below.

In general, plant species that satisfy these functional roles have the following general features:

1 are able to tolerate short periods of inundation punctuated by longer dry periods – these dry periods may be reasonably severe due to the free-draining nature (relatively low water-holding capacity) of bioretention filter media
2 have either a prostrate or erect habit.
3 if prostrate, would be typically low mat-forming stoloniferous or rhizomatous plants (e.g. Couch Grass, *Cynodon dactylon*; *Phyla nodiflora, Dichondra repens*)

4 if erect, would be typically rhizomatous with simple vertical leaves (e.g. Rush, *Juncus* spp.; *Carex* spp.)
5 preferably would have spreading rather than clumped growth forms
6 would be perennial rather than annual
7 would have deep, fibrous root systems
8 would form the understorey if also grown with shrubs and trees..

Well-established uniform vegetation is crucial to the successful operation of drainage swale and bioretention systems. As a result, both the aesthetic and functional requirements of the systems need to be considered when the species are selected.

Swale/bioretention system vegetation can be either single or mixed species designs. Herbaceous groundcover species (e.g. *Phyla nodiflora, Brachyscome multifida;* Kidney Weed, *Dichondra repens*) are nearly always best planted as mixtures. Grasses, rushes, sedges and lilies can typically be planted as single (e.g. Tall Sedge, *Carex appressa*) or mixed species (e.g. *Pennisetum alopecurioides, Dichelachne crinata*; and Weeping Grass, *Microlaena stipoides*) stands depending on the landscaping requirements. Some of the prostrate shrubs that form scrambling thickets may be better suited to single species planting (e.g. *Hibbertia scandens,* and *Hardenbergia violacea*) in isolated areas for aesthetic impact. These species may also require pruning to ensure even plant cover and to maintain an even root distribution below ground.

Planting density generally varies depending on the species and the type of stock specified. Some lawn and turf species could be established from seed, hydroseeding or established as rolled on turf. Native grasses, rushes, sedges and lilies are typically supplied in small tubes (35–60 mm). In drainage swale/bioretention systems this stock should be planted at high densities (12–16 plants/m^2). Dicotyledon species (e.g. *Goodenia hederacea,* and *Hibbertia scandens*) are typically supplied in pots (50 mm). In drainage swale/bioretention systems this stock should also be planted at high densities (8–10 plants/m^2). These high densities are required to ensure runoff does not establish preferential flow paths around the plants and erode the swale surface. High density planting is also required to ensure a uniform root zone in the bioretention systems.

A.2.4 Plant species selection

Plant species suitable for use in bioretention systems, buffer strips and swales are listed in Table A.1.1. The suggested species occur in Victoria. Most of the species are widespread but some only occur in specific regions or in certain conditions (e.g. substrate type or salinity). Species' ranges should therefore be checked before they are recommended for a particular site.

The plant list in Table A.1 is not exhaustive. A diverse and wide-range of plants can be used for WSUD elements (subject to the characteristics described in Section A.2.3). Table A.1 includes only plants indigenous to Victoria. Non-indigenous natives and exotics should only be considered when there is a specific landscape need and the species has the appropriate growth form, habit and patterns of wetting and drying.

If non-indigenous natives and exotics are chosen, careful consideration should be given to the potential effects on downstream drainage systems. For example, Japanese Sacred Bamboo (*Nandina domestica*) and Carpet Weed (*Phyla nodiflora*) are both suitable for use in onsite WSUD elements. Similarly, species that are endemic to particular regions within Victoria (i.e. indigenous but not widespread) can be used.

Plant species should be selected based on several factors:

1 objectives, besides treatment function, of the WSUD element (e.g. landscape, aesthetics, biodiversity, conservation and ecological value)
2 region, climate, soil type and other abiotic factors
3 roughness of the channel (if a conveyance system)
4 extended detention depth.

Species that have the potential to become invasive weeds should be avoided.

The typical heights of the plant species (listed in Table A.1) will help with the selection process. Low-growing and lawn species are suitable for conveyance systems that require low roughness coefficients. The treatment performance of bioretention systems, in particular, requires dense vegetation to a height equal to that of the extended detention depth. Therefore, a system with a 300 mm extended detention should have vegetation at least 300 mm high. All of the selected plant species are able to tolerate periods of both wetting and drying.

Included in Table A.1 is the recommended planting density for each of the species. The planting densities recommended should ensure that 70–80% cover is achieved after two growing seasons (two years).

Although low-growing plants (e.g. grasses, sedges and rushes) are usually used, trees and shrubs can be incorporated into WSUD elements. If using trees and shrubs in bioretention systems, they should be planted in the local soil adjacent to the filter medium, so that the roots do not interfere with the perforated pipes. Shrubs listed provide a wide range of sizes from small to large. Geotechnical advice may be required if using trees in some systems.

A.2.5 Vegetation establishment and maintenance

Conventional surface mulching of swale/bioretention systems with organic material such as tanbark should not be undertaken. Most organic mulch floats and runoff typically causes this material to be washed away with a risk of causing drain blockage.

New plantings need to be maintained for a minimum of 26 weeks. Maintenance includes regular watering, weed control, replacement of dead plants, pest monitoring and control, and rubbish removal. Once established, lawn, grass and groundcover plantings will need to be mown to maintain the design vegetation height.

A.3 Sediment basins, wetlands and ponds

The WSUD elements sediment basins, wetlands and ponds typically treat stormwater away from its source. Stormwater may be transported through a conventional drainage system or it may be transported via WSUD elements, so would receive some pretreatment.

A.3.1 Importance of vegetation

Sediment basins are designed to trap coarse particles (>125 µm) before the stormwater enters a wetland. Aquatic vegetation is therefore not specified for the sediment basins except in the littoral zone around the edge of the basin. The littoral vegetation is not part of the water quality treatment process in sediment basins so it is not essential. However, plants can stabilise banks, so vegetation should be prescribed if erosion is a potential problem. Dense planting of the littoral berm zone also inhibits public access to the treatment elements, minimising the safety risks posed by water bodies. It can also improve the aesthetic appeal of the landscape and screen basins, which are typically turbid.

Ponds are principally designed to be open water features providing landscape value. Unless the ponds have hard edges, littoral vegetation should be planted along the edges. These plants will provide habitat for local fauna, will help to stabilise the banks against erosion, and will inhibit weed invasion. Littoral vegetation also plays a treatment role when the water is above normal water level. Dense planting of the littoral zone will also inhibit public access to ponds, minimising the safety risks posed by water bodies.

Submerged plants should be planted in the deep areas of ponds. Submerged plants will be seen occasionally, such as after a long dry period, when they surface to flower and seed, or when birds rip up plant fragments. However, they will mostly be totally submerged and will provide an open water perspective. Submerged plants are crucial for maintaining high water quality and minimising the chance of an algal bloom. They also inhibit weed invasion.

Wetlands are dominated by emergent **macrophytes** (aquatic plants). **Constructed wetlands** are designed to trap the fine polluted particles (<125 µm) where they can be safely stored for long periods (15–20 years). Wetland plants extract nutrients and other dissolved substances, and provide a framework for microbial **biofilms**. Wetlands, therefore, clean water through biotic absorption, ingestion and decomposition of pollutants, as well as other chemical transformations resulting from the range of oxidation states.

Vegetation should also be planted along the edges of wetlands. Littoral vegetation will help to filter and treat water during times when the water is above normal water level. Dense planting of the littoral zone will also inhibit public access to the treatment elements, minimising potential damage to the plants and the safety risks posed by water bodies.

A.3.2 Required plant characteristics

The species outlined in Table A.2 have been specifically selected, based on their life histories, physiological and structural characteristics, to meet the functional requirements of wetland systems. This includes consideration of the wetland zone/depth range and the typical extended **detention time** (48–72 h) and depth (0.5 m). Other species may be used to supplement these core species, although they must be selected to suit the particular depth range of the wetland zone and have the structural characteristics to perform particular treatment processes (e.g. distribute flows, enhance **sedimentation**, maximise surface area for the adhesion of particles and/or provide a substratum for algal epiphytes and biofilms). In general, species that perform these functions have the following general features:

1. grow in water as emergent macrophytes (e.g. marsh species) or tolerate periods of inundation (e.g. ephemeral marsh species), typically sedges, rushes or reeds.
2. generally have rhizomatous growth forms
3. should be perennial rather than annual
4. are generally erect with simple vertical leaves (e.g. Twig-rushes, *Baumea* spp.; and Rushes, *Juncus* spp.)
5. have spreading rather than clumped growth forms
6. should have a fibrous root system
7. would form an understorey if grown with shrubs and trees (which are generally only planted in the littoral or ephemeral zones).

The locations within a wetland that are best suited to specific wetland plants are determined by the interaction between basin **bathymetry**, outlet hydraulics and **catchment** hydrology – the hydrologic regime (Wong et al., 1998). Individual species have evolved preferences for particular conditions for the length of water depth-inundation periods and this must be checked (e.g. with wetland plant suppliers/nurseries) prior to recommending them for a particular wetland zone planting.

A.3.3 Plant species selection

The plant species listed in Table A.2 have suitable life histories, physiological and structural characteristics for sediment basins, wetlands and ponds. The distribution of the species within the wetland relates to their structure and function. Plants recommended for shallow marsh should be used in shallow marsh and not deep marsh, for example. The planting densities recommended should ensure that 70–80 % cover is achieved after two growing seasons (two years).

Suitable plant species have also been recommended for the littoral zone that will surround the wetlands, ponds and sediment basins. The littoral zone (berms or batters) refers to the perimeter of the treatment elements and extends over a depth range of 0–0.5 m. Plants that have a drier habit should be planted towards the top of batters, whereas those that are adapted to more moist conditions should be planted closer to the water line.

When selecting plants for wetlands, wetlands should be divided into a series of zones based on their water depth [pools (or submerged marsh), deep marsh, marsh, shallow marsh, ephemeral marsh and littoral zones]. The relative size of the zones is determined by the wetland bathymetry. Table A.3 shows the typical permanent depth ranges of the six zones commonly found in wetlands. The zones referred to in Table A.2 correspond with the depth ranges shown in Table A.3. Some plant species can be used in more than one zone, but plant species are generally categorised into one zone based on their preferred water range.

Like the plants in Table A.1, Table A.2 provides examples of the plants that can be used in Victorian wetlands. The plant species listed in Table A.2 are recommended as the core species for the zones, but several other plants could be used. The species recommended are all thought to satisfy the functional treatment requirements of the zone, and are adapted to the hydrologic conditions of the zone. Indigenous species are generally recommended as they provide habitat for native wetland fauna.

Table A.3 Depth ranges of wetland macrophyte zones
Depths refer to the mean water depth at Normal Water Level (NWL) for the summer permanent pool. Natural variation below the NWL is expected to regularly expose the shallow marsh section and much of the marsh section. During events water will temporarily be stored above the NWL and inundate the ephemeral section.

Zone	Macrophyte zone type	Depth (m)
P	Pool – submerged marsh	0.5– ~ 1
DM	Deep marsh	0.35–0.5
M	Marsh	0.2–0.35
SM	Shallow marsh	0–0.2
EM	Ephemeral marsh	+0.2–0
L	Littoral	+0.5–0

A.3.4 Wetland vegetation establishment

To maximise the success of plant establishment in wetland macrophyte zones the following vegetation establishment program is recommended. The program outlines procedures involved in site preparation, vegetation preparation, planting and maintenance.

Plant growth medium

After establishing a bathymetry of the wetland, a layer of topsoil is required as a substrate for aquatic vegetation. Although there are a few plants that can grow in subsoils such as heavy clays (e.g. Phragmites), growth is slow and the system would have low species richness, which is deemed undesirable. Wetlands should therefore have a layer of topsoil not less than 200 mm deep (deeper if possible). Topsoil removed from a site during excavation should be stockpiled for subsequent use as a growth medium for wetland macrophytes. If the topsoil is unsuitable (i.e. will not support plant growth, wetland plants typically prefer silty to sandy loams), it is advisable to purchase appropriate soils from a supplier. If stockpiled topsoil is to be used, it is recommended that it be screened to remove any coarse organic mater prior to placement in a wetland. Other topsoil treatment requirements are listed below.

Soil treatment

The topsoil covering the bed of a system (macrophyte zone and open water zones) should be treated with gypsum or lime (standard on most construction sites). By facilitating flocculation, gypsum will reduce the turbidity of the water column, which will be particularly valuable in the early stages of establishment of the wetland system. With lower turbidity, higher levels of light will be able to reach the plants, thereby facilitating their growth and establishment. It is important that the gypsum not be added too far in advance of the vegetation planting; with clear water and no aquatic plants competing for resources, conditions will be favourable for algal growth, thus increasing the threat of an algal bloom. The gypsum should be applied about one week prior to planting at a rate of 0.4 kg/m^2. Subsequent application may be required at intervals depending on **pond** condition and the amount of exchangeable sodium. Fertilisers should not be applied to the topsoil or to terrestrial areas in or around the wetland system, particularly in the early stages of plant establishment, due to the threat posed by algal blooms, particularly cyanobacteria (blue-green algae). The inadvertent addition of nutrients to the wetland system could facilitate the growth of cyanobacteria, particularly when the competing macrophytes and submerged plants are in their early developmental stages, thus raising the likelihood of algal blooms.

Plant propagation

Plants should be ordered from a vegetation supplier prior to the time of planting to enable the supplier sufficient time to grow the required number of plants and species types and for the plants to grow to a suitable size (maturity) to ensure low mortality rates. The supplier should be made aware of the planned planting layout and schedule.

To ensure successful establishment of wetland plants, particularly in deeper marsh zones, it is strongly recommended more mature tube stock be used (i.e. at least 0.5 m in height). For shallower zones of a wetland, younger tube stock or seedlings may suffice.

As a minimum a nursery should provide the following plant stock for deep marsh and marsh zone planting:

1 50 mm tube stock
2 3–4 shoots or leaves
3 500–600 mm height.

As a minimum a nursery should provide the following plant stock for shallow marsh and ephemeral marsh zone planting:

1 preferably 50 mm tube stock but 25 mm container stock should suffice
2 4–5 shoots or leaves
3 300–400 mm height.

Smaller (20 mm) seedling pots should be avoided as these seedlings are considered to be relatively immature and will result in high loss rates and patchy growth.

Planting water level manipulation

To maximise the chances of successful establishment of the vegetation, water levels within a wetland system should be manipulated in the early stages of vegetation growth. When first planted, vegetation in the deep marsh and pool zones may be too small to exist in their prescribed water depths (depending on the maturity of the plant stock provided). Seedlings intended for the deep marsh sections will need to have at least one-third of their form above the water level. This may not be possible if initially planted at their intended depth. Similarly, if planted too deeply, the young submerged plants will not be able to access sufficient light in the open water zones. Without adequate competition from submerged plants, phytoplankton (algae) may proliferate.

Water depth should, therefore, be controlled in the early establishment phase. Deep marsh zones should have a water depth of about 0.2 m for the first 6–8 weeks. This will ensure that deep marsh and marsh zones are inundated at shallow depths and the shallow marsh zone remains moist (muddy) which is suitable for plant establishment. After this period, water levels can be raised to normal operating levels.

Planting

Planting in all zones of a wetland should occur at the same time. With water levels controlled as described in the previous section, deep marsh and marsh zones will be inundated with water and the shallow marsh zone will be moist to allow appropriate growth (however, some water over shallow marsh zones may be required). Planting of ephemeral zones will require irrigation at a similar rate as terrestrial landscaping surrounding the wetland.

Establish operating wetland water level

After six to eight weeks of growth at a controlled water level, wetland plants should be of sufficient stature to endure deeper conditions so the wetland can be filled to its normal operating water level. Therefore, after eight weeks, the connection between the inlet pond and the macrophyte zone should be temporarily opened to allow slow filling of the wetland to normal operating water level. Once filled to normal water level, the connection between inlet pond and macrophyte zone should again be closed to allow further plant establishment without exposure to significant water level variations.

Connecting the inlet pond to the macrophyte zone

The temporary blockage located on the connection between the inlet pond and the macrophyte zone can be removed once the building construction within the wetland catchment has been completed. At this time it will be necessary to desilt the inlet pond which will have been operating as a sediment basin during the building phase. Planting of the zones disturbed during desilting will be required.

Vegetation assessment

Ensure the wetland is operating at the end of the construction landscape period and the planted macrophytes are established and healthy at the operating water level. If successful, the wetland should have a 70–80% even macrophyte cover after two growing seasons (two years).

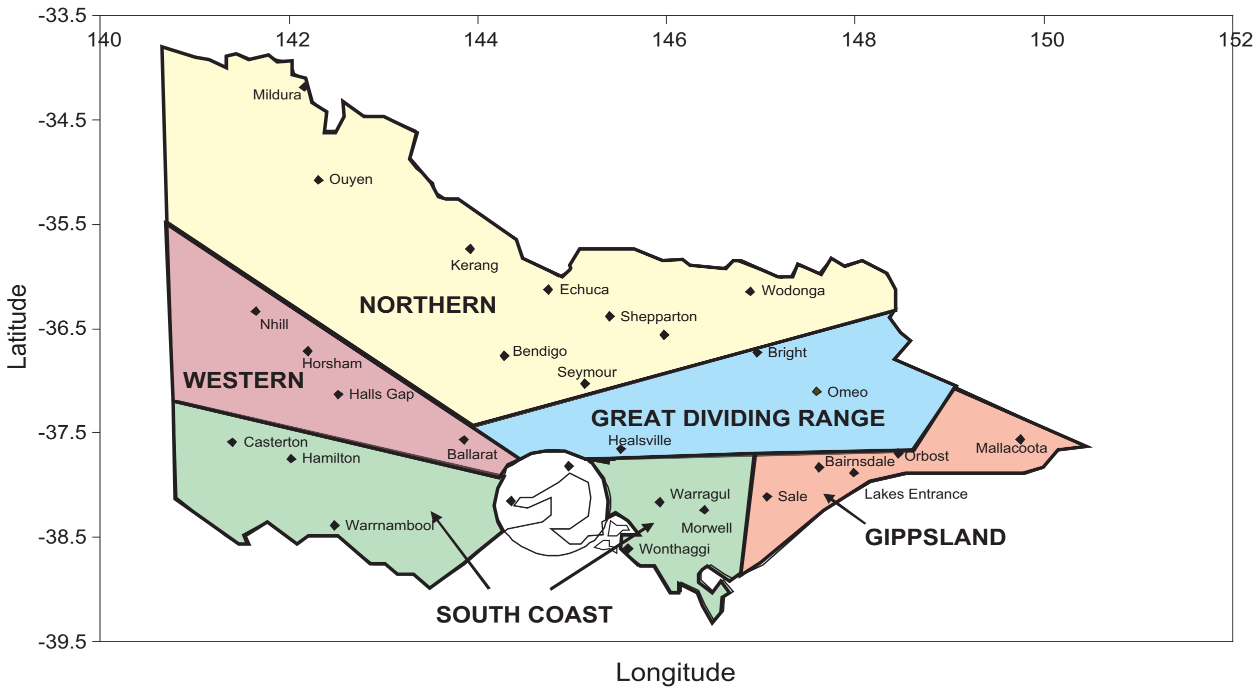

Figure A.2 Map of Victoria indicating statewide recommended vegetation regions.

A.4 Steps to choosing appropriate vegetation

The following steps should be followed when selecting vegetation for WSUD treatment elements.

1. Determine what soil type is in the local area and if it requires amendment to meet the prescribed hydraulic conductivity (for bioretention systems) and/or amendment to support plant establishment.
2. Refer to Tables to select appropriate species for each macrophyte zone (Table A.2) or swale/bioretention system (Table A.1).
3. Ensure species selection is consistent with the local hydrologic regions (listed in Tables A.1 and A.2) (see Figure A.1).
4. Consult local indigenous nurseries and/or other relevant agencies (e.g. councils, CMA and Melbourne Water) to ensure consistency with local vegetation strategies, avoiding locally invasive or exotic species and selecting for locally indigenous species.
5. Where species listed in the Tables do not comply with local vegetation strategies seek advice from relevant agencies regarding alternative species with similar characteristics.

A.4.1 Additional notes on the tables

1. The **planting stock** of the different species recommended will require differing degrees of maturity at planting. For example, even though water level management is recommended at planting times, deep marsh species will need to be more advanced stock suitable for planting in deeper water than the species recommended for the shallow marsh zone.
2. **Planting density** indicates the mean number of plants per square metre for the species spatial distribution within the zone. The planting densities recommended are suggested minimums. While planting density can be either increased or decreased depending on budget, any reduction in planting density has the potential to reduce the rate of vegetation establishment, increase the risk of weed invasion and increase maintenance costs.
3. The **total number of plants** required for each zone can be calculated as follows.

Number of plants = (recommended planting density × section area × proportion of section planted × cover density),

where 'the proportion of the section' planted refers to the proportion of the section area that will be planted with the identified species; and where 'cover density' refers to the proportional

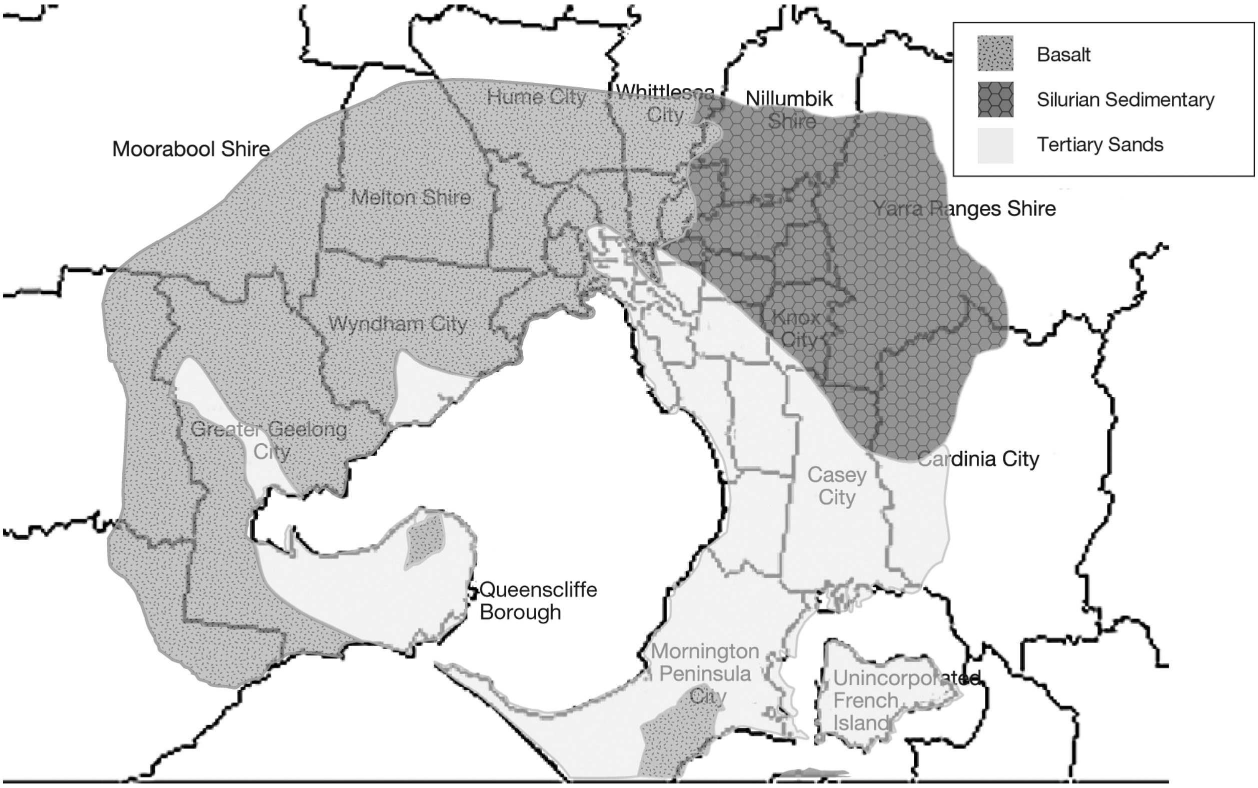

Figure A.3 Map of metropolitan recommended vegetation regions based on broad soil types (after Australian Plants Society Maroondah 2001; and Land Conservation Council 1973).

cover of that particular plant species in the designated location. The cover density of all of the plant species in a given area typically sums to 1.0.

A.4.2 Key to plant species (Tables A.1 and A.2)

Tables A.1 and A.2 outline suggested plant species for various WSUD treatment elements. The key to these tables is given below.

Type/zone		Form	
DM	Deep marsh	T	Shrubs and trees
EM	Ephemeral marsh	G	Groundcover
F	Forest		
L	Littoral	E	Erect herbs
M	Marsh	S	Submerged macrophytes
P	Pool (submerged marsh)		
SM	Shallow marsh	M	Emergent macrophytes

Recommended vegetation regions (see Figures A.2 and A.3)	
Statewide (after Walsh and Entwistle 1999)	
BA	Basalt
GDR	Great Dividing Range
GIP	Gippsland
Metro	Metropolitan (after Australian Plants Society Maroondah 2001)
N	Northern
SC	South Coast
SS	Silurian Sedimentary
TS	Tertiary Sands
W	Western

A.4.3 References

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Table A.1 Plant species for bioretention systems, swales and buffer strips (indicative)

Scientific name	Common name	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Blechnum cartilagineum	Gristle Fern	E	0.5–1.5	Upright tufting fern with short creeping stoloniferous rhizomes, forming spreading patches	2–4	Moist, well drained soils; tolerates drier conditions once established	Aesthetic; readily available	SC, GDR, GIP Metro: SS
Chrysocephalum apiculatum	Common Everlasting	E	Prostrate – 0.3	Variable, dense spreading perennial herb	2-4	Well drained soils	Aesthetic; widespread	Statewide Metro: All
Dianella longifolia var. longifolia	Pale Flax-lily	E	0.3–0.8	Tufted perennial clump with short rhizomes	8	Moist, well drained soils	Aesthetic; easy maintenance; ideal under trees	Statewide Metro: All
Epacris impressa	Common Heath	E	0.5–1.5	Open wiry shrub	2–4	Moist, well drained soils; tolerates limited dry or wet periods once established	Victoria's floral emblem	W, SC, GDR, GIP Metro: All
Hibbertia prostrata	Stalked Guinea-flower	E	0.3–0.6	Low erect subshrub	4–6	Moist, well drained sandy soils; not clay	Difficult in clay soils	W, SC, GIP Metro: TS
Pimelea linifolia ssp. linifolia	Slender Rice-flower	E	Prostrate – 1.2	Variable prostrate erect or clump-forming, depending on habitat	4–6	Well drained soils	Pruning encourages branching	Statewide Metro: BA, SS
Stypandra glauca	Nodding Blue Lily	E	0.5–1.5	Dark green leafy foliage; bright blue drooping flowers	2–4	Moist, well drained soils	Aesthetic; benefits from occasional pruning	Statewide Metro: All
Viola hederacea	Native Violet	E	Prostrate – 0.15	Stoloniferous herb forming a dense mat	2–6	Moist to wet soils	Aesthetic; rapid growth, prolific once established	W, SC, GDR, GIP Metro: All
Dichondra repens	Kidney Weed	G	Prostrate	Dense spreading herb, forms mats	6–8	Moist, well drained soils; tolerates drying once established	Alternative to grass where foot traffic is light; more vigorous when cultivated; widespread	Statewide Metro: All
Myoporum parvifolium	Creeping Boobialla	G	Prostrate	Dense matting groundcover	4–6	Well drained soils, tolerates dry periods once established	Adaptable groundcover; layering habit useful for soil binding; rare within Melbourne region	N, W, SC Metro: BA
Microlaena stipoides	Weeping Grass	G, E	0.3–0.6, stems 0.6–1.0	Highly variable in size	turf or seeds	Moist, well drained soils	Aesthetic; suitable as a lawn grass; widespread	Statewide (except far N) Metro: All

Table A.1 Plant species for bioretention systems, swales and buffer strips (indicative) (Continued)

Scientific name	Common name	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Carex appressa	Tall Sedge	M	0.5–1.2	Dense, robust and tough; hairy and sticky	4–8	Very moist soils, tolerates periods of inundation and dryness	Stabilises banks against erosion; tough; slow-growing; high surface area; dominates zones	Statewide Metro: All
Carex fasicularis	Tassel Sedge	M	0.5–1.0	Coarse, tufted plant	6-8	Moist soils	Aesthetic	Statewide Metro: SS
Carex inversa	Knob Sedge	M	0.1–0.3	Small tufted or spreading clump	10	Moist, well-drained soils	Variable species; rapid establishment	Statewide Metro: All
Ficnia nodosa	Knobby Club-rush	M	0.5–1.5	Tall, coarse, wiry and densely tufted perennial rush with creeping rhizomes	6–8	Moist soils tolerates dry periods once established	Aesthetic (upright habit); widespread in Melbourne; binds soils in moist areas	N, W, SC, GIP Metro: All
Juncus amabilis	–	M	0.2–1.2	Rhizomatous tufted perennial rush	8–10	Tolerates inundation and dry periods once established	Widespread	Statewide Metro: All
Juncus flavidus	Yellow Rush	M	0.4–1.2	Rhizomatous tufted perennial rush; yellow-green	8–10	More tolerant of dry soils than other *Juncus* spp.	Aesthetic	Statewide Metro: All
Juncus gregiflorus	–	M	0.5–1.4	Rhizomatous tufted perennial rush	8–10	Moist, well drained soils	Widespread in Melbourne and eastern Victoria	W, SC, GDR, GIP Metro: All
Juncus procerus	–	M	1.0–2.0	Rhizomatous tufted perennial rush	8–10	Moist, well-drained soils in a sheltered position	Widespread in southern Victoria	W, SC, GDR, GIP Metro: SS, TS
Lepidosperma gladiatum	Coastal Sword-sedge	M	1.0–1.5	Leaves wide and flat with dark green blades	6	Moist, well drained sandy soils	Sharp-edged leaves - could be used to manage pedestrian traffic	SC, GIP Metro: TS (coastal)
Lepidosperma laterale	Variable Sword-sedge	M	0.5–1.0	Leaves wide and flat with dark green blades	6	Moist to wet soils but tolerates dry periods	Little maintenance once established	Statewide Metro: All
Lepidosperma longitudinale	Common Sword-sedge	M	0.6–1.7	Sedge with long, flat, dark green blades	6	Moist to wet soils	Aesthetic	W, SC, GIP Metro: SS, TS
Lomandra filiformis ssp. filiformis	Wattle Mat-rush	M	0.15–0.5	Small tussock with fine blades	6–8	Moist, well-drained clay or sandy soils; tolerates dry shaded positions once established	Little maintenance	N, SC, GIP Metro: All

Table A.1 Plant species for bioretention systems, swales and buffer strips (indicative) (Continued)

Scientific name	Common name	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Lomandra longifolia var. exilis	–	M	0.5–1.0	Large tussock with broad flat leaves	4–6	Well-drained soils	Tolerates drier conditions than l. Longifolia var. Longifolia	SC, GDR, GIP Metro: All
Lomandra longifolia var. longifolia	Spiny-headed Mat-rush	M	0.5–1.0	Large tussock	4–6	Well-drained soils; tolerates dry shaded positions	Grows well under established trees	W, SC, GDR, GIP Metro: All
Patersonia occidentalis	Long Purple-flag	M	0.2–0.5	Compact clumping perennial herb	6–8	Tolerates inundation and dry periods	Aesthetic; may not persist	W, SC, GIP Metro: SS, TS
Poa labillardieri	Common Tussock Grass	M	0.3–0.8, stems to 1.2	Large, coarse densely tufted tussock	6–8	Adapts to moist or slightly dry soils	Widespread	Statewide Metro: All
Poa morrisii	Velvet Tussock Grass	M	Prostrate – 0.3	Soft, dense	6–8	Moist well drained soils	Aesthetic	Statewide Metro: All
Schoenus melanostachys	–	M	0.5–1.0	Perennial with short stout rhizome; often forms big weeping tussocks	6–8	Moist soils	Tough; spreads to form dense clumps	GIP Metro: (Does not occur)
Callistemon sieberi	River Bottlebrush	T	3–10	Open to dense weeping shrub	1	Very wet to moist conditions in heavy clay soils but tolerates dry periods once established	Aesthetic; very adaptable; widespread	GDR, GIP Metro: BA, SS
Correa alba	White Correa	T	0.5–2.0	Dense, spreading shrub, dwarfed by wind and salt spray	2–4	Well drained soils; tolerates inundation and dry periods once established	Useful for soil binding	SC, GIP Metro: TS (coastal)
Correa reflexa	Common Correa	T	0.3–2.0	Very variable – open upright to spreading shrub	2–4	Well drained soils; dry shaded position	Establishes well under trees	Statewide Metro: SS, TS
Eucalyptus camaldulensis	River Red Gum	T	12–50	Large open spreading tree	< 1	Damp alluvial soils; deep subsoils; tolerates inundation and very dry periods once established	Aesthetic; some forms can be used to combat salinity; widespread	Statewide Metro: All
Eucalyptus ovata	Swamp Gum	T	8–30		< 1	Moist soils; tolerates inundation and dry periods; lake edge	Aesthetic; widespread	W, SC, GDR, GIP Metro: All
Kunzea ericoides	Burgan	T	2–5	Dense to open weeping shrub	< 1	Adaptable, tolerates inundation and dry periods	Aesthetic; rapid growth	Statewide Metro: SS, TS

Table A.1 Plant species for bioretention systems, swales and buffer strips (indicative) (Continued)

Scientific name	Common name	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Leptospermum continentale	Prickly Tea-tree	T	1–4	Rigidly upright, dense or straggling shrub or small tree	< 1	Adaptable; tolerates moisture	Two forms exist in Melbourne; widespread	Statewide Metro: SS, TS
Leptospermum lanigerum	Woolly Tea-tree	T	2–6	Dense shrub to erect small tree	< 1	Moist soils	Aesthetic	W, SC, GDR, GIP Metro: All
Leucopogon australis	Spike Beard Heath	T	1.0–1.5	Upright shrub	2–4	Well drained damp sandy soils	Strongly perfumed flowers	SC Metro: TS
Melaleuca ericifolia	Swamp Paperbark	T	2–9	Erect, open to bushy shrub or small tree	2–4	Moist to wet soils; tolerates dry periods once established	Aesthetic; very adaptable; once established	GP, SC Metro: All
Melaleuca squarrosa	Scented Paperbark	T	2–5 (rarely to 10)	Erect, open to compact large shrub or rarely, a small tree	<1	Moist to wet soils	Aesthetic; salt tolerant; grows well in coastal areas	W, SC, GIP Metro: SS, TS
Pimelea glauca	Smooth Rice-flower	T	0.3–0.6	Erect, many-branched glabrous shrub	2–4	Well drained soils	Aesthetic	Statewide Metro: All
Pultenaea daphnoides	Large-leaf Bush-pea	T	1–3	Erect branching shrub	2–4	Moist, well drained soils; tolerates dry periods once established	Aesthetic	Statewide Metro: SS, TS

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Baumea articulata	Jointed Twig-rush	DM	M	1–2	Tall erect rhizomatous perennial	4	Moist soil to permanent water	Slow growth	Statewide Metro: All
Bolboschoenus fluviatalis	–	DM	M	1–2 (stems)	Semi-aquatic rhizomatous perennial rush	4	Moist soil to permanent water	Plant solo	N, GDR Metro: All
Eleocharis sphacelata	Tall Spike-rush	DM	M	0.5–2	Robust perennial herb with thick woody rhizome; clumps to big dense stands	6	Aquatic; to depth of 2 m; tolerates occasional drying	Plant solo, rhizomes can restrict growth of other plants; slow establishment	Statewide Metro: All
Juncus ingens	Giant Rush	DM	M	1.5–4	Dioecious rhizomatous perennial; in tussocks when grazed but can form uniform stands	6–10	Moist soil to seasonal inundation	Useful for bank stabilisation; slow spreading; dominant – plant solo	N Metro: (Does not occur)
Schoenoplectus tabernaemontani	River Club-rush	DM	M	Stems to 3	Robust, tufted rhizomatous herb	4	Moist soil to permanent water	Rapid establishment	Statewide Metro: All
Blechnum minus	Soft Water Fern	EM	G	0.5–1.2	Dense, erect clump forming spreading patches from underground stolons	4–6	Very moist soils; tolerates wet soils	Adaptable	W, SC, GDR, GIP Metro: SS, TS
Carex appressa	Tall Sedge	EM	M	0.5–1.2	Dense, hairy and sticky; robust; dense and tough	4–8	Very moist soils; tolerates periods of inundation and dryness	Stabilises banks against erosion, tough, slow-growing, high surface area; dominates zones	Statewide Metro: All
Carex inversa	Knob Sedge	EM	M	0.1–0.3	Small tufted or spreading clump	6–8	Moist well-drained soils	Rapid establishment	Statewide Metro: All
Cyperus gunnii	Flecked Flat Sedge	EM	M	0.6–1	Densely tufted perennial herb	6–8	Moist to boggy soils	High surface area	Statewide Metro: All
Juncus amabilis	–	EM	M	0.2–1.2	Rhizomatous tufted perennial rush	8–10	Tolerates inundation and dry periods once established	Widespread	Statewide Metro: All
Juncus flavidus	Yellow Rush	EM	M	0.4–1.2	Rhizomatous tufted perennial rush; yellow-green	8–10	More tolerant of dry soils than other *Juncus* spp.	Aesthetic	Statewide Metro: All
Juncus pallidus	Pale Rush	EM	M	0.5–2.3	Rhizomatous tufted perennial rush	8–10	Grows well with periodic inundation	Rapid growth; adaptable	Statewide Metro: All

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative) (Continued)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Lepidosperma longitudinale	Common Sword-sedge	EM	M	0.6–1.7	Rhizomatous	6	Moist or wet soils	Aesthetic	W, SC, GIP Metro: SS, TS
Melaleuca ericifolia	Swamp Paperbark	EM	T	2–9	Erect, open to bushy shrub or small tree	2–4	Moist to wet fertile soils; tolerates dry periods once established	Very adaptable	SC,GIP Metro: All
Baumea juncea	Bare Twig-rush	L	M	0.3–1	Rush-like clump with creeping rhizomes	8	Moist to boggy soils; tolerates occasional dry periods	Slow establishment	W, SC, GIP Metro: All
Brachyscome cardiocarpa	Swamp Daisy	L	G	0.1–0.3	Tufted perennial herb	2–4	Moist soils	Rapid establishment; aesthetic	W, SC, GIP Metro: SS, TS
Callistemon sieberi	River Bottlebrush	L	T	3–10	Open to dense weeping shrub	1	Very wet to moist, heavy clay soil but tolerates dry periods once established	Very adaptable; widespread; aesthetic	GDR, GIP Metro: BA, SS
Carex bichenoviana	Sedge	L	G	0.25–0.5 (stems)	Tufted grass-like sedge with long creeping rhizome	6–8	Moist depressions on heavy clay	May form dense carpets in shady situations; very rare in Melbourne	N, W, SC, GDR Metro: BA
Carex breviculmis	Short-stem sedge	L	M	0–0.15	Small but densely tufted sedge	6–8	Moist to wet soils; tolerates dry periods	Very adaptable	Statewide Metro: All
Centella cordifolia	Swamp Pennywart	L	G	Prostrate	Creeping perennial herb	2–4	Moist to wet soils	Rapid growth; may become invasive	Statewide Metro: All
Chrysocephalum apiculatum	Common Everlasting	L	G	Prostrate – 0.3	Variable, dense spreading perennial herb	2–6	Well-drained soils	Widespread	Statewide Metro: All
Dianella longifolia var. longifolia	Pale Flax-lily	L	M	0.3–0.8	Tufted perennial clump with short rhizomes	6–8	Moist, well-drained soils	Aesthetic; easy maintenance; ideal under trees	Statewide Metro: All
Dianella tasmanica	Tasman Flax-lily	L	M	0.6–1.5	Robust tufted perennial; may spread vigorously with strong rhizomes	6	Moist soils, prefers shaded position	Tolerant once established; adaptable (including snow cover); aesthetic	W, SC, GDR, GIP Metro: SS, TS
Eleocharis pusilla	Small Spike-rush	L	G	0.002–0.25	Tiny perennial herb with thread-like rhizomes and stems	6–10	Moist to wet soils	Readily grown; easily controlled	Statewide Metro: BA

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative) (Continued)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Gahnia filum	Chaffy Saw-sedge	L	M	1–1.2	Perennial leafy tussock	4–6	Moist sandy soils; salt tolerant	Aesthetic fruits	W, SC, GIP Metro: BA, TS (coastal)
Gahnia siberiana	Red-fruited Sword Sedge	L	M	1.5–3	Clumping perennial sedge	4–6	Moist soils; tolerates dry periods once established	Aesthetic; easily grown from seed	W, SC, GDR, GIP Metro: SS, TS
Goodenia humilis	Swamp Goodenia	L	M	0.05-.1	Suckering, matting plant	2–4	Moist to wet soil	Aesthetic; very adaptable	N, W, SC, GIP Metro: SS, TS
Juncus australis	Austral Rush	L	M	0.6–1.2	Rhizomatous tufted perennial rush	6–10	Moist soils; will tolerate short, dry periods	Common in south-eastern Victoria	SC, GDR, GIP Metro: BA, SS
Juncus pauciflorus	Loose-flower Rush	L	M	0.3–1	Rhizomatous perennial rush	6–10	Moist soils; tolerates dryness once established	Adaptable	W, SC, GDR, GIP Metro: All
Linum marginale	Native Flax	L	G	0.3–0.8	Slender erect perennial	4–6	Moist, well-drained soils	Widespread	Statewide Metro: All
Lomandra filiformis spp. filiformis	Wattle Mat-rush	L	M	0.15–0.5	Small tussock with fine blades	6–8	Moist, well-drained clay or sandy soils; tolerates dry, shaded positions once established	Little maintenance; grows well under trees	N, SC, GIP Metro: All
Lomandra longifolia var. longifolia	Spiny-headed Mat-rush	L	M	0.5–1	Large tussock	4–6	Well-drained soils; tolerates dry, shaded positions	Grows well under established trees	W, SC, GDR, GIP Metro: All
Melaleuca ericifolia	Swamp Paperbark	L	T	2–9	Erect, open to bushy shrub or small tree	<1	Moist or wet soils; tolerates dry periods once established	Very adaptable	SC, GIP Metro: All
Persicaria decipiens	Slender Knotweed	L	M	Prostrate – 0.6	Glabrous, erect to spreading annual herb	2–4	Semi-aquatic to aquatic	Low surface area; aesthetic	Statewide Metro: All
Poa tenera	Slender Tussock Grass	L	G	0.05–0.2	Trailing, sometimes forms open tussocks	6–8	Moist, well-drained soils	Very effective when trailing down embankments	W, SC, GDR, GIP Metro: SS, TS
Phylidrium lanuginosum	Woolly Water Lily	L	M	0.5–1	Erect aquatic perennial herb; low foliage (0.3) and then big spike flower (< 1 m)	6	Semi-aquatic to aquatic	Aesthetic; rare in Victoria	N, W, GIP Metro: TS

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative) (Continued)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Ranunculus inundatus	River Buttercup	L	G	0.05–0.3	Slender, stoloniferous perennial herb; often forms large mats	2–4	Semi-aquatic to aquatic	Rapid establishment	Statewide Metro: SS
Schoenus apogon	Common Bog-rush	L	G	0.05–0.3	Slender perennial tufted herb	8–10	Moist or wet soils	Variable; widespread	Statewide Metro: All
Stypandra glauca	Nodding Blue Lily	L	E	0.5–1.5	Slender tufted; bright blue drooping flowers	4–8	Moist to dry, well drained soil	Aesthetic; other *Stypandra* spp. probably just as suitable	Statewide Metro: All
Lythrum salicaria	Purple Loosestrife	L	E	1–2	Erect, hairy perennial	2–4	Moist soils or shallow water	Dies back after summer	W, SC, GDR, GIP Metro: All
Villarsia reniformis	Running Marsh Flower	L	M	0.4	Tufted; stoloniferous if growing in water	6–8	Moist to wet soils	Aesthetic	Statewide Metro: SS, TS
Marsilia drummondii	Common Nardoo	L	M	0.02–0.3	Rhizomatous aquatic with floating fronds	2–4	Wet soils subject to inundation; shallow water to depth of 0.3 m	Aesthetic; rapidly growth over large areas in ideal conditions without becoming invasive	N, W Metro: BA, SS
Viola hederacea	Native Violet	L	G	Prostrate – 0.15	Stoloniferous herb forming a dense mat	2–4	Moist to wet soil	Rapid growth; aesthetic; prolific growth once established	W, SC, GDR, GIP Metro: All
Baumea rubiginosa	Soft Twig-rush	M	M	0.3–1	Rhizomatous perennial	6–8	Moist soils to prolonged inundation	Slow establishment	SC, GDR, GIP Metro: SS, TS
Baumea tetragonia	Square Twig-rush	M	M	0.3–1	Rhizomatous perennial	6–8	Moist soils to prolonged inundation; 0.2–0.4 m depth	Slow establishment	W, SC, GIP Metro: SS, TS
Bolboschoenus medianus	Marsh Club-rush	M	M	0.7–2	Aquatic to semi-aquatic rhizomatous perennial	4–6	Moist soils to permanent water	Rapid establishment; spreading	N, W, SC, GIP Metro: All
Schoenoplectus pungens	Sharp Club-rush	M	M	0.3–0.6	Robust, tufted rhizomatous herb	4–6	Wet soils to permanent water	Become rare due to urbanisation; rapid establishment	N, W, SC, GIP Metro: BA
Triglochin procera	Water-ribbon	M	M	0.2–0.5	Aquatic or amphibious perennial herb with erect or floating leaves	4	Semi-aquatic to aquatic to depth of 1.5 m	Aesthetic; spreading	Statewide Metro: All

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative) (Continued)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Baumea arthrophylla	–	M	M	0.3–1.3 (stems)	Aquatic perennial with long rhizomes	6–8	Wet soils to permanent water	Spreads quickly	N, W, SC, GIP Metro: All
Bolboschoenus caldwellii	Sea Club-rush	M	M	0.3–0.9	Aquatic to semi-aquatic rhizomatous perennial	4–6	Fresh to brackish water on heavy clay to sandy soils	Coastal/saline; rapid establishment	N, W, SC, GIP Metro: All
Myriophyllum caput-medusae	Coarse Water-milfoil	P	S	0.3–2 (stems)	Perennial herb, sparsely branched below the waterline, profusely above; procumbent	1	Aquatic; depth to 2 m	Heterophyllic	Statewide Metro: All
Myriophyllum verrucosum	Red Water-milfoil	P	S	0.1–1.5 (stems)	Sparsely branched perennial rooting at lower nodes; procumbent	1	Deep fast-flowing water to shallow brackish or calcareous water	Heterophyllic	N, W, SC, GIP Metro: All
Nymphoides geminata	Entire Marshwort	P	S	Stems to 1	Robust native perennial with long petiole leaves and +/– floating stolons up to 2 m long	1	Aquatic; deep permanent water	Aesthetic	GDR, GIP Metro: (Does not occur)
Potamogeton crispus	Curly Pondweed	P	S	To 4.5	Perennial, rhizomatous aquatic herbs	1	Aquatic; deep permanent water	Growth can be dense	N, SC, GDR, GIP Metro: All
Potamogeton ochreatus	Blunt Pondweed	P	S	To 4.5	Annual or perennial, rhizomatous aquatic herbs; submerged floating annuals	1	Aquatic; deep permanent water	Rapid growth; aesthetic; seasonal; salt tolerant (up to 2000 ppm)	Statewide Metro: All
Potamogeton pectinatus	Fennel Pondweed	P	S	Stems to 3	Perennial, rhizomatous aquatic herbs; submerged	1	Aquatic; deep permanent water	Saline (thrive in > 5000 ppm dissolved salt); rarely recommended; not aesthetic; often invasive	N, W, SC Metro: BA
Potamogeton tricarinatus	Floating Pondweed	P	S	stems to 2.7	Perennial rhizomatous aquatic herb; submerged or attached floating	1	Aquatic; shallow semi-permanent water	Seasonal	Statewide Metro: All

Table A.2 Plant species for sediment basins, wetlands and ponds (indicative) (Continued)

Scientific name	Common name	Zone	Form	Height (m)	Description	Planting density (plants/m^2)	Requirements	Comments	Region
Vallisneria gigantea	Ribbonweed	P	S	to 3	Submerged, dioecious tufted stoloniferous perennial with floating flowers	1	Open water; depth of < 0.1–4m	Rapid growth; salt tolerant (1500 ppm)	N, W, SC, GIP Metro: SS
Cyperus lucidus	Leafy Flat-sedge	SM	M	0.6–1.5	Robust, tufted perennial herb with sharply triangular stems; large; dense	6	Wet soils	Can grow as an aquatic plant; slow spreading	W, SC, GDR, GIP Metro: SS
Eleocharis acuta	Common Spike-rush	SM	M	0.3–0.9	Perennial aquatic herb; slender rhizomes	6–8	Heavy damp soils to 0.20 m depth	High surface area; may spread rapidly in shallow water	Statewide Metro: All
Ficnia nodosa	Knobby Club-rush	SM	M	0.5–1.5	Tall; wiry; rhizomatous; densely tufted perennial rush	6–8	Moist soils; tolerates dry periods once established	Widespread in Melbourne; binds soils in moist areas; aesthetic	N, W, SC, GIP Metro: All
Juncus subsecundus	Finger Rush	SM	M	0.5–1	Rhizomatous tufted perennial rush	6–10	Heavy, wet soils	Widespread	Statewide Metro: All
Juncus usitatus		SM	M	0.3–1.2	Rhizomatous tufted perennial rush	6–10	Tolerates up to 0.2 m inundation	Rapid growth	N, GIP Metro: All
Isolepis inundata	Swamp Club-rush	SM	M	0.05–0.3	Tufted perennial rush; small; stoloniferous	6–8	Moist to wet soils; tolerates periodic inundation	Widespread; high surface area; rapid growth	N, W, SC, GDR, GIP Metro: All
Villarsia exaltata	Yellow Marsh Flower	SM	M	0.3, stems to 1.5	Tufted herb; broad basal leaves	6–8	Wet soils to 1 m depth	Leaves float if growing in water	SC, GIP Metro: SS, TS
Juncus krausii	Sea Rush	SM	M	0.6–2.3	Rhizomatous perennial rush	6–10	Brackish to saline conditions	Slow growth; saline; habitat only	W, SC, GIP Metro: All
Carex fasicularis	Tassel Sedge	SM	M	0.5–1	Coarse, tufted plant	6–8	Moist soil; tolerates periods of inundation	Aesthetic	Statewide Metro: SS
Carex gaudichadiana	Tufted sedge	SM	M	0.1–0.6	Coarse, tufted plant	6–8	Gravel or mud at water's edge	Aesthetic; tolerates drawdown	Statewide Metro: SS
Alisma plantago-aquatica	Water Plantain	SM	M	0.5–1	Erect, perennial semi-aquatic herb	6–8	Moist to wet soils; tolerates poorly drained sites	Aesthetic; little surface area; often dies off in winter	Statewide Metro: All