

When designing your raingarden, a holistic approach to plant selection is essential. While a primary function of stormwater biofiltration raingardens is to improve stormwater quality, they should also enhance biodiversity and amenity values for our homes, streetscapes and parks.

This fact sheet provides information on the wide variety of plant species suitable for use in raingardens, plant placement and tips on general planning to ensure the long-term success of your raingarden.

The indigenous flora of the Adelaide Plains and Mount Lofty Ranges are well adapted to wetting and drying cycles. This provides us with several species appropriate for use in biofiltration raingardens



Image credits: Atlas of Living Australia

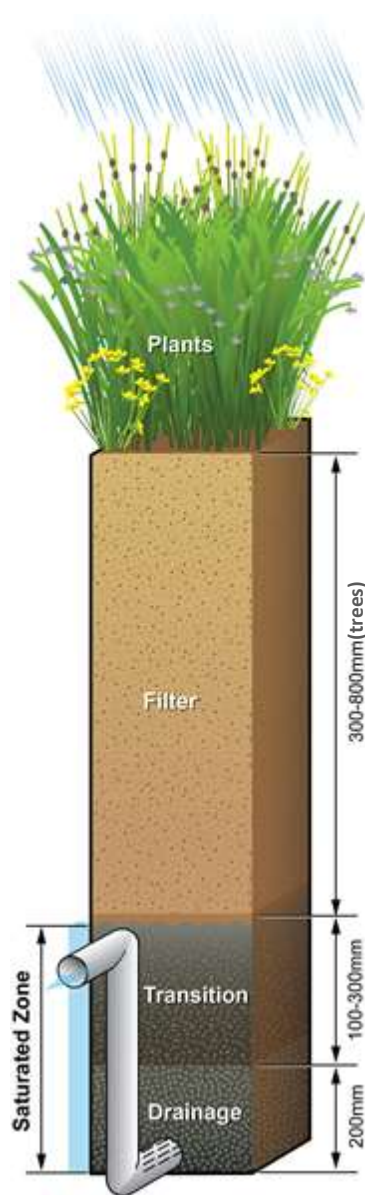


Figure 1 – Raingarden cross section

Raingarden elements

Plants - assist in pollutant removal and maintain the hydraulic conductivity of the filter media through the voids created by the growth and decay of their root system throughout the wetting and drying cycles of the raingarden.

Use our *Raingarden plant guide*, pages 3-7, to find a variety of species that can add colour and texture to your raingarden.

Filter media - selection is critical to the success of your raingarden as the composition seeks to create a balance between promoting infiltration and retaining sufficient moisture to support plants

Transition layer - conveys water to the drainage layer while preventing the finer particles migrating from the filter media and clogging the drainage layer.

Drainage layer - Conveys water to the perforated pipe.

Saturated zone = transition + drainage layers

The saturated zone has an impervious lining on the sides and base, and store water between rainfall events. It is essential to sustain raingarden vegetation in South Australian conditions.

With a nominal overall depth of 500-600mm, the drainage layer should be kept to 200mm and increase the transition layer to form the saturated zone.

DO	DON'T
<ul style="list-style-type: none"> ✓ Treat the soil for weeds prior to planting in accordance with EPA Guidelines ✓ make use of self-propagating plants like <i>Carex bichenoviana</i> and <i>Chorizandra enodis</i>, which replicate themselves via an underground stem (rhizome) ✓ plant a range of forms and species to create a healthy, resilient raingarden ✓ plan your design early and order plants before building or calling for quotations ✓ use mat-forming and spreading plants at high densities to out-compete weeds ✓ use plants with a variety of root depths ✓ plant at the beginning of winter, to minimise the need for supplementary watering during plant establishment. 	<ul style="list-style-type: none"> ✗ skimp on high-density planting – it is a crucial element of your raingardens' ability to deliver biofiltration outcomes and control weed ingress. 10 plants/m² is ideal ✗ use any mulch (including organic mulch) as it floats during inundation and particles may float away, creating problems elsewhere ✗ use rock mulch as it provides a hot environment that affects plant growth and prevents lateral plant growth ✗ wait until the last stage to buy plants – some species aren't available on demand ✗ select just a few species – raingardens with minimal variety are less able to tolerate changing conditions and generally have lower visual appeal.

Water quality improvement

Raingardens improve stormwater water quality through sedimentation, mechanical straining, chemical and biological processes, removing pollutants such as sediments, metals and nutrients (nitrogen and phosphorus). The raingarden vegetation serves multiple functions including supporting the removal of nitrogen via the proliferation of biofilms on plant roots and stems, promoting evapo-transpiration and maintaining soil hydraulic conductivity (the rate at which water drains through the soil).

Periods of extreme dryness may decrease the nitrogen-removing capabilities of the system. **Some summer watering may be needed to maintain the biofiltration capacity of your raingarden.**

Increased nutrient-removal capacity is made possible when there is diversity within the microbial community. As different plants support different species of bacteria, it is recommended that a broad range of plants effective at nitrogen removal make up 50% of your raingarden. The balance of the plant selection, referred to as “companion plants” can be selected to add amenity, biodiversity value and resilience to the system. Use our raingarden plant guide for information on the form, suitable planting zone, height and preferred location of a broad range of nutrient removing and companion plant species

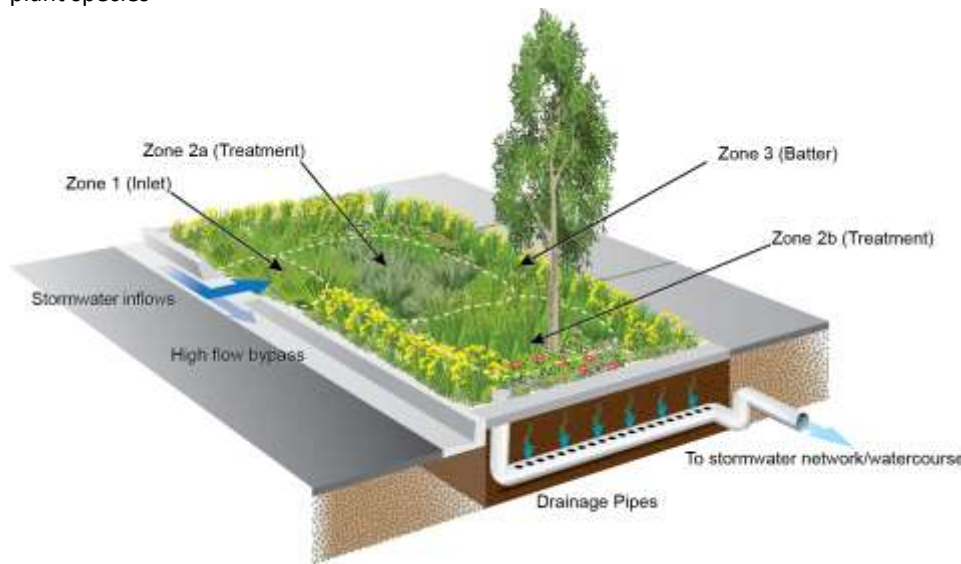


Figure 2 – Raingarden zones for plant selection



Angas Street, Adelaide raingarden (i) showing arrangement of filter media and (ii) once established.

Planting in zones

Positions of plants should reflect the type of purpose they serve in the system. Raingardens can be divided into zones to guide planting and media arrangement. The major zones within the system are shown in Figure 2 and described as follows:

Inlet

Where water enters the system. Inflows can be strong so plants in this area should be deep-rooted sedge and rush species. Densely-stemmed species in the inlet zone catch rubbish and slow the flow, which allows settling of entrained coarse sediment, protecting the treatment zone(s).

Treatment Zone 2A

This is the crucial point of treatment, so ensure 50% of plants in this zone possess nitrogen-removal capabilities. Choose a range of different species for system resilience. Ensure mat forming species are included to out-compete weeds.

Treatment Zone 2B

Similar plants to Treatment Zone A are appropriate here, but be mindful that in larger raingardens, this zone may have an extended dry period. Choose plants able to tolerate this, rather than more aquatic species. Some tree species are suitable for use in raingardens in combination with a filter media of minimum depth 800mm.


Batters

The edges of the system, above and around the treatment zone. Here is your opportunity to plant species from your local area, and plants that suit the aesthetic of the raingarden location.



Raingarden plant guide - Nitrogen removal

Raingarden plant species native to the Greater Adelaide region, proven to be effective at Nitrogen removal, must make up 50% of plantings in the treatment zone(s).

Image	Form ¹	Zone				Species	Common name ²	Height (mm)	Preferred location	Description
		1	2a	2b	3					
		✓	✓			<i>Carex bichenoviana</i>	Bichenov's Sedge	400	All	Species recommended for Zone 1 due to spreading habit low to ground
		✓	✓			<i>Carex tereticaulis</i>	Rush Sedge	600-1200	Adelaide Hills	Spiky
				✓	✓	<i>Goodenia ovata</i>	Hop Goodenia	1000-2500	All	Spreading shrub, formative pruning recommended to achieve compact form
		✓	✓	✓	✓	<i>Ficinia nodosa</i>	Knobby Club-rush	500-1500	All	Formerly <i>Isolepis nodosa</i>
		✓	✓			<i>Juncus amabilis</i>	Gentle Rush	600-1200	All	Less common juncus species in Adelaide region
		✓	✓	✓		<i>Juncus flavidus</i>	Juncus	350-1500	All	Less common juncus species in Adelaide region
		✓	✓			<i>Juncus palidus</i>	Pale Rush	500-2000	All	Quite drought tolerant
		✓	✓	✓		<i>Juncus subsecundus</i>	Finger Rush	300-1000	All	Attractive foliage, tolerates some dryness
		✓	✓			<i>Juncus kraussii</i>	Sea Rush	400-1400	All	Effective in wet, poorer in dry conds. High salt tolerance
		✓	✓			<i>Baumea juncea</i>	Bare Twig-rush	200-1200	All but coast	Wet dependent species
		✓	✓			<i>Baumea ribiginosa</i>	Soft Twig-rush	200-1100	All	Wet dependent species
		✓	✓			<i>Baumea articulata</i>	Jointed Rush	1500-2500	All	Wet dependent species
				✓	✓	<i>Poa poiformis</i>	Blue Tussock Grass	1000	All	Effective in dry, poorer in wet conds for nitrogen-fixing
		✓	✓	✓		<i>Cyperus gymnocaulus</i>	Spiny Sedge	700	All	Effective in wet, poorer in dry conds for nitrogen-fixing

Notes:

1. The silhouettes indicate the shape of the plant at maturity
2. There might be two or three common names in use for any one species, so always cross-check with the scientific name



Raingarden plant guide - Companion Plants

Raingarden plant species native to the Greater Adelaide region, suitable for companion planting.


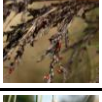
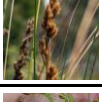





Image	Form ¹	Zone				Species	Common name ²	Height (mm)	Preferred location	Description
		1	2a	2b	3					
		✓	✓			<i>Bolboschoenus caldwellii</i>	Marsh Club Rush	300-1200	Often coastal	Spreading sedge
		✓	✓	✓	✓	<i>Carex inversa</i>	Knob Sedge	200	All	Low sedge
		✓	✓	✓		<i>Chorizandra enodis</i>	Black Bristle Rush	550	All	Spreading sedge
		✓	✓			<i>Eleocharis acuta</i>	Common Spike Rush	250-400	All	Spreading sedge
		✓	✓	✓		<i>Gahnia filum</i>	Chaffy Saw-sedge	600-1100	Coastal	Coastal
		✓	✓	✓		<i>Gahnia sieberiana</i>	Red Fruit Saw-sedge	1500-2000	Adelaide Hills	Sharp, drought tolerant
		✓	✓	✓		<i>Gahnia trifida</i>	Coast Saw-sedge	1000-1500	Coastal	Tall sedge
		✓	✓	✓	✓	<i>Juncus pauciflorus</i>	Loose Flower Rush	300-1000	All	Medium Sedge
		✓	✓	✓	✓	<i>Lepidosperma gladiatum</i>	Coast Sword-sedge	500-1500	Coastal	Propagation is slow, by division only
			✓	✓	✓	<i>Lepidosperma laterale</i>	Variable Sword-sedge	300-1000	Adelaide Hills	Propagation is slow, by division only
				✓	✓	<i>Calocephalus citreus</i>	Lemon Beauty-heads	300	All	Flowering, tolerates occasional inundation
					✓	<i>Chrysocephalum apiculatum</i>	Common Everlasting	600	All	Flowering
					✓	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	150-600	All	Flowering, spreading
				✓	✓	<i>Cotula australis</i>	Waterbuttons	120	All	Spreading riparian herb
		✓	✓	✓		<i>Crassula helmsii</i>	Swamp Crassula	50	All	Spreading riparian herb, ground cover




Image	Form ¹	Zone				Species	Common name ²	Height (mm)	Preferred location	Description
		1	2a	2b	3					
			✓	✓	✓	<i>Dichondra repens</i>	Kidney weed	200	All	Spreading herb, ground cover
					✓	<i>Helichrysum leucopsidium</i>	Satin Everlasting	150-200	Coastal	Flowering
				✓	✓	<i>Coronidium gunnianum</i>	Button Everlasting	300	Adelaide Hills	Rare but easily cultivated, flowering, tolerates occasional inundation
			✓			<i>Hydrocotyl verticillata</i>	Shield Pennywort	30-100	All	Spreading riparian herb
					✓	<i>Lotus australia</i>	Austral Trefoil	300-500	All	Flowering
			✓			<i>Marselia drummondii</i>	Common Nardoo	100-500	All	Spreading riparian herb, floats, aquatic
				✓	✓	<i>Mentha australis</i>	Native Mint	500-750	All	Spreading herb rare but easily cultivated
				✓	✓	<i>Mentha diemenica</i>	Slender Mint	100-150	All	Spreading herb rare but easily cultivated
					✓	<i>Pelargonium australe</i>	Austral Stork's-bill	500	All	Spreading herb
					✓	<i>Ranunculus lappaceus</i>	Australian Buttercup	500	Adelaide Hills	Flowering herb
			✓	✓	✓	<i>Samolus repens</i>	Creeping Brookweed	150-1000	All	Spreading riparian herb
					✓	<i>Scaevola albida</i>	Small-fruit Fan Flower	100-200	All	Spreading herb, needs drainage
			✓	✓	✓	<i>Selliera radicans</i>	Shiny Swamp-mat	50	All	Spreading riparian herb, turfy
					✓	<i>Wahlenbergia luteola</i>	Bronze Bluebell	800	All	Spreading herb, tolerates occasional inundation
					✓	<i>Wahlenbergia stricta</i>	Austral Bluebell	100-900	All	Spreading herb
				✓	✓	<i>Brachyscome graminea</i>	Grass Daisy	100 -700	Adelaide Hills	Flowering herb
				✓	✓	<i>Centella asiatica</i>	Centella	100	All	Spreading leafy herb









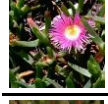

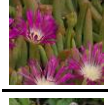























Image	Form ¹	Zone				Species	Common name ²	Height (mm)	Preferred location	Description
		1	2a	2b	3					
				✓	✓	<i>Glycine tabacina</i>	Variable Glycine	100	All	Spreading flowering herb
				✓	✓	<i>Microseris lanceolata</i>	Yam Daisy	200	All	Flowering bulb, tolerates occasional inundation
			✓			<i>Villarsia umbricola</i>	Lax Marsh Flower	300	Adelaide Hills	Spreading flowering herb
				✓	✓	<i>Xerochrysum bracteatum</i>	Golden Everlasting	700	All	Tall flowering herb, tolerates occasional inundation
					✓	<i>Carprobrotus rossii</i>	Karkalla	100	All	Spreading fruit, succulent
					✓	<i>Disphyma crassifolium</i>	Round-leaved Pig-face	20-300	All	Spreading succulent
					✓	<i>Kunzea pomifera</i>	Muntries	300	Coastal	Weed-suppressing
				✓	✓	<i>Mimulus repens</i>	Creeping Monkey Flower	200	All	Spreading riparian herb, flowering, tolerates occasional inundation
					✓	<i>Myoporum parvifolium</i>	Creeping Boobialla	500	Coastal	Spreading herb, terrestrial
					✓	<i>Dianella brevicaulis</i>	Blueberry Lily	500-1000	Coastal	Strappy, parrot-attracting, flowering
					✓	<i>Dianella revoluta</i>	Black-anther Flax-Lily	1000	All	Strappy, clumping, flowering
					✓	<i>Lomandra multiflora ssp dura</i>	Iron Grass	250-850	All	Strappy
				✓	✓	<i>Distichlis distichophylla</i>	Australian Salt-grass	300	Coastal	Spreading grass, tolerates occasional inundation
				✓	✓	<i>Microlaena stipoides</i>	Meadow Rice-grass	500	All	Shade tolerant, tufted, tolerates occasional inundation
					✓	<i>Rytidosperma auriculata</i>	Lobed Wallaby Grass	700	All	Formerly <i>Austrodanthon</i> , tall, prefer sandy soils
					✓	<i>Rytidosperma caespitosum</i>	Ringed Wallaby Grass	900	All	Tufted med grass, prefer sandy soils
					✓	<i>Rytidosperma carphoides</i>	Short Wallaby Grass	100-500	All	Low, prefer sandy soils

Image	Form ¹	Zone				Species	Common name ²	Height (mm)	Preferred location	Description
		1	2a	2b	3					
					✓	<i>Rytidosperma geniculatum</i>	Kneed Wallaby Grass	80-450	All	Medium, prefer sandy soils
					✓	<i>Rytidosperma racemosum</i>	Wallaby Grass	200-600	Coastal and plains	Hardy, drought tolerant, tussock grass
					✓	<i>Adriana quadripartita</i>	Coast Bitter-Brush	500-3000	Coastal	Flowering, open-branched shrub
					✓	<i>Banksia marginata</i>	Silver Banksia	2000	All	Butterfly-attracting, may require pruning
					✓	<i>Bursaria spinosa</i>	Sweet Bursaria	4000	All	Flowering, butterfly-attracting
					✓	<i>Callistemon rugulosus</i>	Scarlett Bottle-brush	3000	Adelaide Hills	Woody shrub
				✓	✓	<i>Callistemon sieberi</i>	Alpine Bottle-brush	1200-4500	Coastal	Part shade OK
					✓	<i>Goodenia varia</i>	Sticky Goodenia	1000	All	Low shrub, rare but easily cultivated
					✓	<i>Grevillea ilicifolia</i>	Holly Grevillea	2000	All	Flowering
					✓	<i>Leucophyta brownii</i>	Cushion Bush	1000	Adelaide Hills	Dwarf shrub
				✓	✓	<i>Melaleuca decussata</i>	Cross-leaf Honey Myrtle	3000	All	Flowering
					✓	<i>Melaleuca brevifolia</i>	Mallee Honey Myrtle	4000	Coastal	Hardy shade or shelter tree, tolerates periods of inundation
					✓	<i>Pomaderris paniculosa</i>	Shining Dogwood	2000	Coastal	Compact, many-branched shrub
					✓	<i>Scaevola crassifolia</i>	Thick-leaved Fan Flower	1500	Coastal, all	Spreading shrub
				✓	✓	<i>Eucalyptus cosmophylla</i>	Bog Gum	6000	Sandy, Adelaide hills	Small tree
					✓	<i>Melaleuca lanceolata</i>	Black Paperbark	10000	All	Bee-attracting
					✓	<i>Pittosporum angustifolium</i>	Weeping Pittosporum	2000-6000	All	Small tree



More information

[Atlas of living Australia](#) – plant species location, conservation status, photo gallery etc

Botanic Gardens of South Australia [Plant Selector](#) – for more detailed information on some plant species

Butterfly conservation SA Inc. [Butterfly friendly plant species](#)

Cooperative Research Centre for Water Sensitive Cities, [Adoption Guidelines for Stormwater Biofiltration systems](#) – for detailed specifications on raingarden filter media

EPA, Catchment to Coast, [Raingarden 500](#) Program – for information on grant funds for raingardens

EPA, [Safe and effective herbicide use. A handbook for near-water applications](#)

Natural Resources Adelaide and Mount Lofty Ranges, [Raingardens – how to build one – Fact sheet](#)

Natural Resources Adelaide and Mount Lofty Ranges, [Native plant nurseries list](#)

Natural Resources Adelaide and Mount Lofty Ranges, [Native grasses, A regional guide](#)

Water Sensitive SA [Biofiltration](#) webpage

Water Sensitive SA [Raingarden \(above ground\) construction - Video.](#)



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