A guide to water regime, salinity ranges and bioregional conservation status of Victorian wetland Ecological Vegetation Classes

D. Frood and P. Papas

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A guide to water regime, salinity ranges and bioregional conservation status of Victorian wetland Ecological Vegetation Classes

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Front cover photo: Reedy Lagoon (Adrian Martins, North Central Catchment Management Authority)

Reedy Lagoon is considered one of the most floristically diverse and intact wetlands that remains in the region. It is also a culturally important site for the Barapa Barapa indigenous people of the region rich in archaeological sites including middens, scar trees and burial grounds. These attributes makes the wetland highly significant in the landscape, not only for its natural and cultural values, but for its importance as a contributing seed and propagule source for re-colonisation of other wetlands. Reedy Lagoon is also recognised for its significant habitat value, being surrounded by mature river red gums, and including well vegetated shallow margins as well as areas of deep water during flood events. Together these attributes support a variety of flora and fauna, with the deeper pools forming valuable refuge during drier times. During the environmental watering of Gunbower Forest in 2014 and 2015, Reedy Lagoon was observed to have vast swards of the nationally vulnerable EPBC listed River Swamp Wallaby-grass *Amphibromus fluitans*, was abundant with the State threatened Wavy Marshwort *Nymphoides crenata* and supported habitat for FFG listed Australian Little Bittern *Ixobrychus dubius* and Baillon's Crake *Porzana pusilla palustris*.

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Contents

Acknowledgements i

Section 1: About the guide 1

Information included in the guide 1
Who is the guide for and how can the information be used? 1
Source of information used in the guide 2
Interpretation of categories used in the guide 2
Interpretation of patterning within wetland vegetation 2
Notes about wetland EVC complexes, mosaics and aggregates 3
Application of water regimes to the range of EVCs occurring at a wetland 3
Comments on the water regime and salinity attributes 4

Section 2: Quick-reference table of water regime and salinity ranges for all Victorian wetland EVCs 6

Section 3: Water regime and salinity ranges for Victorian wetland Ecological Vegetation Classes – detailed information 14

Alkaline Basaltic Wetland Aggregate EVC 1111 15
Alluvial Plains Semi-arid Grassland EVC 806 16
Alpine Creekline Herbland EVC 239 17
Alpine Fen EVC 171 18
Alpine Heath Peatland EVC 288 19
Alpine Hummock Peatland EVC 1011 20
Alpine Short Herbland EVC 905 21
Aquatic Grassy Wetland EVC 306 22
Aquatic Herbland EVC 653 23
Aquatic Sedgeland EVC 308 24
Billabong Wetland Aggregate EVC 334 25
Black Box Wetland EVC 369 27
Blocked Coastal Stream Swamp EVC 875 28
Brackish Aquatic Herbland EVC 537 29
Brackish Grassland EVC 934 30
Brackish Herbland EVC 538 31
Brackish Lake Aggregate EVC 636 32
Brackish Lake Bed Herbland EVC 539 33
Brackish Lignum Swamp EVC 947 35
Brackish Sedgeland EVC 13 37
Brackish Sedgy Shrubland EVC 1114 39
Brackish Shrubland EVC 973 40
Brackish Wetland Aggregate EVC 656 41
Calcareous Sedgy Shrubland EVC A106 43
Calcareous Wet Herbland EVC 591 44
Cane Grass Wetland EVC 291 45
Cane Grass Wetland/Aquatic Herbland Complex EVC 602 46

Cane Grass Wetland/Brackish Herbland Complex EVC 606 47
Cane Grass Wetland/Lignum Shrubland Complex EVC A117 48
Claypan Ephemeral Wetland EVC 284 49
Coastal Dry Saltmarsh EVC A110 50
Coastal Ephemeral Wetland EVC 976 51
Coastal Hypersaline Saltmarsh EVC A111 52
Coastal Lagoon Wetland Aggregate EVC 11 53
Coastal Saline Grassland EVC A109 54
Coastal Saltmarsh Aggregate EVC 9 55
Coastal Tussock Saltmarsh EVC A112 57
Dune Soak Woodland EVC 673 58
Dwarf Floating Aquatic Herbland EVC 949 59
Ephemeral Drainage-line Grassy Wetland EVC 678 60
Estuarine Flats Grassland EVC 914 61
Estuarine Reedbed EVC 952 62
Estuarine Scrub EVC 953 64
Estuarine Wetland EVC10 65
Fern Swamp EVC 721 67
Floodplain Grassy Wetland EVC 809 68
Floodplain Riparian Woodland EVC 56 70
Floodplain Thicket EVC 280 72
Floodplain Wetland Aggregate EVC 172 73
Floodway Pond Herbland EVC 810 75
Floodway Pond Herbland/Riverine Swamp Forest Complex EVC 945 76
Forest Bog EVC 723 78
Forest Creekline Sedge Swamp EVC 728 79
Freshwater Lake Aggregate EVC 718 80
Freshwater Lignum - Cane Grass Swamp EVC 954 81
Freshwater Lignum Shrubland EVC 657 82
Gahnia Sedgeland EVC 968 83
Granite Rock-pool Wetland EVC 1112 84
Grassy Riverine Forest EVC 106 85
Grassy Riverine Forest/Floodway Pond Herbland Complex EVC 811 86
Grassy Riverine Forest/Riverine Swamp Forest Complex EVC 812 87
Grey Clay Drainage-line Aggregate EVC 124 88
Herb-rich Gilgai Wetland EVC 956 89
Hypersaline Inland Saltmarsh Aggregate EVC 708 90
Intermittent Swampy Woodland EVC 813 91
Intermittent Swampy Woodland/Lake Bed Herbland Complex EVC A119 93
Intermittent Swampy Woodland/Riverine Grassy Woodland Complex EVC 822 95
Lake Bed Herbland EVC 107 96
Lava Plain Ephemeral Wetland EVC 974 97
Lignum Shrubland EVC 808 98
Lignum Swamp EVC 104 100
Lignum Swampy Woodland EVC 823 101
Mangrove Shrubland EVC 140 102

Montane Bog EVC 966 103
Montane Riparian Thicket EVC 41 104
Montane Riparian Woodland EVC 40 105
Montane Sedgeland EVC 148 106
Montane Swamp EVC 318 107
Perched Boggy Shrubland Aggregate EVC 185 108
Plains Grassy Wetland EVC 125 109
Plains Grassy Wetland/Aquatic Herbland Complex EVC 755 110
Plains Grassy Wetland/Brackish Herbland Complex EVC 767 111
Plains Grassy Wetland/Calcareous Wet Herbland Complex EVC 958 112
Plains Grassy Wetland/Lignum Swamp Complex EVC A101 113
Plains Grassy Wetland/Sedge-rich Wetland Complex EVC 959 114
Plains Grassy Wetland/Spike-sedge Wetland Complex EVC 960 115
Plains Rushy Wetland EVC 961 116
Plains Saltmarsh Aggregate EVC 888 117
Plains Sedgy Wetland EVC 647 118
Plains Sedgy Wetland/Sedge Wetland Complex EVC 1010 119
Plains Sedgy Woodland EVC 283 120
Plains Swampy Woodland EVC 651 121
Plains Swampy Woodland/Lignum Swamp Complex EVC 784 122
Red Gum Swamp EVC 292 123
Red Gum Swamp/Cane Grass Wetland Complex EVC A114 124
Red Gum Swamp/Plains Rushy Wetland Complex EVC A115 125
Riparian Fern Scrub EVC A120 126
Riparian Scrub EVC 191 127
Riparian Thicket EVC 59 128
Riverine Chenopod Woodland EVC 103 129
Riverine Ephemeral Wetland EVC 975 130
Riverine Swamp Forest EVC 814 131
Riverine Swampy Woodland EVC 815 133
Rushy Riverine Swamp Aggregate EVC 804 135
Saline Aquatic Meadow EVC 842 136
Saline Lake Aggregate EVC 717 138
Saline Lake-verge Aggregate EVC 648 139
Saltmarsh-grass Swamp EVC A113 140
Salt Paperbark Woodland EVC 676 141
Samphire Shrubland EVC 101 142
Sea-grass Meadow EVC 845 144
Seasonally Inundated Shrubby Woodland EVC 195 145
Seasonally Inundated Sub-saline Herbland EVC 196 146
Sedge-rich Wetland EVC 281 147
Sedge Wetland EVC 136 148
Sedge Wetland/Aquatic Herbland Complex EVC A102 149
Sedge Wetland/Aquatic Sedgeland Complex EVC 963 150
Sedge Wetland/Brackish Herbland Complex EVC 1113 151
Sedge Wetland/Calcareous Wet Herbland Complex EVC 883 152

Sedgy Riverine Forest EVC 816 153
Sedgy Riverine Forest/Riverine Swamp Forest Complex EVC 817 155
Sedgy Swamp Woodland EVC 707 156
Shell Beach Herbland EVC 964 157
Sink-hole Wetland Aggregate EVC 908 158
Spike-sedge Wetland EVC 819 160
Spring Soak Woodland Aggregate EVC 80 162
Stony Rises Pond Aggregate EVC 857 163
Sub-alpine Wet Heathland EVC 210 164
Sub-alpine Wet Sedgeland EVC 917 165
Submerged Aquatic Herbland EVC 918 166
Sub-saline Depression Shrubland EVC 820 168
Swamp Heathland Aggregate EVC 49 169
Swamp Scrub EVC 53 170
Swamp Scrub / Gahnia Sedgeland Complex EVC 2004 172
Swampy Riparian Woodland EVC 83 173
Swampy Woodland EVC 937 174
Sweet Grass Wetland EVC 920 176
Tall Marsh EVC 821 177
Unvegetated (open water / bare soil / mud) EVC 990 179
Wet Heathland EVC 8 180
Wet Heathland/Plains Grassy Wetland Complex EVC A104 182
Wet Heathland/Plains Sedgy Wetland Complex EVC A105 183
Wet Heathland/Sedge Wetland Complex EVC 931 184
Wet Saltmarsh Herbland EVC A107 185
Wet Saltmarsh Shrubland EVC A108 186
Wet Sedgy Herbland EVC A116 187
Wet Swale Herbland EVC 12 189
Wet Verge Herbland EVC A118 190
Wet Verge Sedgeland EVC 932 192

Section 4: Bioregional Conservation Status of wetland EVCs 194

Background to EVC Bioregional Conservation Status and categories 194
Bioregional Conservation Status of Victorian wetland EVCs 196

References 205

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Section 1: About the guide

Information included in the guide

The guide presents water regime and salinity ranges for the wetland Ecological Vegetation Classes (EVCs) that are presently described in Victoria[1]. Water regime information includes the frequency of inundation, the maximum range of duration of waterlogging and inundation, and the maximum depth usually experienced by the EVC. Ranges are expressed using categories from the Victorian wetland classification (DELWP 2016a) where available in addition to those developed for the purpose of the guide. The guide also includes the conservation status of the wetland EVCs in each Victorian bioregion. This is referred to as the Bioregional Conservation Status of the EVC (EVC BCS). This information is maintained in a DELWP unpublished database and has not previously been available in a published form.

The information in the guide is presented in four sections as follows:

Section 1 An overview of the information and attributes included in the guide.

Section 2 A quick-reference key and table of the water regime and salinity ranges for wetland EVCs.

Section 3 Detailed information for each wetland EVC including:
- an ecological overview describing the natural variation in the water regime and salinity that the EVC may experience
- the EVCs water regime and salinity ranges
- considerations for management of the hydrology (including environmental watering) that may apply to the EVC

Section 4 Background to wetland EVC BCSs and a quick-reference table of the EVC BCS classification for wetland EVCs.

Who is the guide for and how can the information be used?

This guide is designed for use by natural resource management (NRM) practitioners, environmental consultants, and researchers with expertise in NRM to inform wetland management on private and public land. Users should have an understanding of Victorian wetland EVC typology and wetland EVCs. As well as outlining the natural water regimes of Victorian wetland EVCs as currently understood, the document is intended to be informative in relation to decision making and implementation of delivery of water as an ecological intervention.

Landowners or land managers who do not have specialist knowledge of wetlands, or do not have an understanding of the Victorian EVC typology and wetland EVCs, should seek assistance from their local Catchment Management Authority (CMA) wetland officer before using the guide.

In conjunction with other sources of information, this guide can be used to help inform:
- decision making around and implementation of delivery of water as an ecological intervention
- wetland vegetation rehabilitation
- the expected response of wetland vegetation to a change in water regime and/or salinity regime
- the water regime of a wetland
- the salinity status of a wetland
- the significance score in the Wetland Tender metric[2]

[1] The guide includes information on provisional Ecological Vegetation Classes (A101, A102, A104-A106, and A107-A120) that have yet to be formally approved by DELWP. For more information on Victoria's wetland EVC typology and EVCs, please refer to the *Index of Wetland Condition assessment of wetland vegetation – June 2016* (DELWP 2016a) and *Benchmarks for wetland ecological vegetation classes in Victoria – June 2016* (DELWP 2016b).

[2] The Wetland Tender method is one of a number of methods applied in projects that use an auction-based approach aimed at providing cost-effective investment for protection and improved management of natural habitat on private land (DELWP 2015). The EVC BCS contributes to the significance variable in the metric.

For each EVC profile, it is recommended that the management consideration is read in conjunction with the ecological overview.

Source of information used in the guide

Attribution of water regime, salinity ranges and BCS to wetland EVCs was done by Doug Frood (Pathways Bushland and Environment) and reviewed by Damien Cook (Rakali Ecological Consulting). This is based on their many years' experience in the identification and assessment of wetland plants and wetland EVCs in Victoria. It is important to note that the data for these attributes may be subject to modification with increased understanding of the relevant EVCs.

The information contained in this guide is specifically developed for the wetland EVCs. For a deeper understanding of the ecology of particular plants, the reader should consider other sources of information on water regime, depth or salinity requirements and tolerances – e.g. Roberts and Marston (2011).

Interpretation of categories used in the guide

Designation of a category for components of water regime or salinity to a particular wetland EVC does not imply that the EVC is naturally subject to the entire range covered by this category. Frequently only a portion of the range of the category is relevant. This also applies if a particular attribute spans more than one category. Notes are added to provide additional resolution of which part of the category range is relevant or to otherwise interpret the allocation of categories to the individual EVCs. While some wetlands (e.g. sphagnum bogs or intertidal saltmarshes) may have relatively stable water or salinity regimes, others can be highly variable, especially in semi-arid areas, and uniformity of water-delivery could be counter-productive to maintaining biodiversity values.

In Section 2 (Table 2), the use of brackets around a code means that the relevant value for an attribute is exhibited unusually or is on the edge of the range of natural variation for the EVC. In Section 3, this is expressed as 'occasional' under the heading EVC preference.

Please note the following with respect to the assignment of water regime categories to the wetland EVCs:

- They do not necessarily accurately define the limits of the optimum water regime for the EVC – but indicate only that these limits occur within the category or categories indicated for the EVC.
- The regimes are based on an assumption of average climatic conditions and are not necessarily sustained during periods of protracted drought.
- A water regime classification applied to an entire wetland (e.g. permanent or seasonal) does not necessarily apply to each of the EVCs present, and is dependent on their position in the hydrological profile.

Interpretation of patterning within wetland vegetation

The vegetation of an individual wetland can display substantial variation, both spatially (e.g. with zones supporting different floristic assemblages or vegetation structures) and across time (with different species expressing through various wetting and drying cycles). Ecological Vegetation Classes (EVCs) are a means of attempting to resolve this range of variation in the vegetation into one or more recognizable components.

Characterisations of water regimes for an EVC are required to be applicable to the range of temporal and spatial variation covered by the respective EVC, hence there is not necessarily a unique narrowly defined ideal water regime that applies to all examples of a given EVC. Applying a unique narrowly defined environmental watering regime potentially runs the risk of ecological simplifications, including loss of diversity and habitat complexity, through repeatedly favouring individual species.

EVCs provide some framework by which to evaluate species assemblages rather than individual taxa. A regime that maintains diversity may be within the tolerance range of a number of species but is not necessarily optimal for any particular one. Attempting to optimise water regimes for individual species potentially has risks. For example, River Red Gum (*Eucalyptus camaldulensis*) occurs across a wide range of environmental conditions, extending from fully terrestrial to regularly flooded areas for prolonged periods.

This variation in habitat is recognised as being representative of a range of EVCs. Therefore it makes no sense to evaluate an optimal water regime for this species without considering the ecological context in which it occurs and considering the range of species which are associated with that particular context.

Notes about wetland EVC complexes, mosaics and aggregates

Wetland EVC complex

The term complex is applied to an EVC name where the vegetation includes characteristics intermediate between the two EVCs identified in the descriptor (e.g. Sedgy Riverine Forest/Riverine Swamp Forest Complex). This may be indicative of habitat conditions intermediate between those of each of the respective EVCs, or where ecological conditions fluctuate between those favouring each of the respective EVCs, allowing components of each to co-exist within the vegetation.

Wetland EVC mosaic

The term mosaic refers to vegetation which includes patches of more than one EVC. Unlike a complex, components of the mosaic can be distinguished at a larger spatial scale than that occupied by (shoots or tufts of) individual plants which may be found within a complex. Clonal patches in wetlands can cover extensive areas and may constitute a component within a mosaic.

Wetland EVC aggregate

The term aggregate applies to an EVC name where the EVC represents a generalised wetland vegetation occurring within a given ecological context (e.g. saline, brackish or freshwater lakes; billabongs; mineralised drainage-lines on grey-clay basalt derived soils) or vegetation potentially including two or more components associated with a specific habitat (e.g. Sink-hole Wetland, Spring-soak Woodland). In these situations, the range of EVCs (which can be variously expressed) can usually be determined. However the complexity of expression can be prohibitive to resolving the component EVCs, especially for the purpose of broad-scale mapping. An aggregate may represent a range of EVCs occurring in a vegetation mosaic or as complexes, or in both contexts.

Application of water regimes to the range of EVCs occurring at a wetland

Spatial patterning in the vegetation at a wetland can occur in any combination of an interspersed mosaic, as concentric zones reflecting depth of potential inundation, or in gradients along an axis of a wetland (e.g. away from a water input point).

Variation through wetting and drying cycles can represent as temporal mosaics of EVCs, where a range of EVCs can express in the same location under different phases of inundation. For example, Aquatic Herbland may express during a wet phase, whereas Floodway Pond Herbland may occupy the same location during a drying phase. The outlined water regime applies across the wetting and drying cycle of the habitat that may support the respective EVC. In some cases, other EVCs may be represented at different times during these cycles. The overall watering regime should be equally applicable to all EVCs which may occur at the location. For each EVC profile notes indicate whether the EVC expresses continuously through the wetting and drying cycles, or only during the wet or drying phase.

Where wetland vegetation occurs in a spatially-zoned arrangement (including various types of mosaic), appropriate watering regimes can be evaluated by considering how the tolerances of each zone can be collectively met. This approach can help determine a suitable water regime where variants of particular EVCs occur across a relatively wide hydrological range, and an EVC with more narrowly defined requirements is also present. In many cases, an appropriate hydrology for the EVC at the uppermost level of potential inundation will naturally deliver suitable outcomes for the wetland as a whole. In the case of temporal mosaics which have been identified from a given wetland, an appropriate hydrological regime should allow for the potential expression of all the components.

Water regimes are supplied for a range of identified EVC complexes. However, in some instances, vegetation which is intermediate or ecotonal between two EVCs and is not covered by existing EVC descriptions will be encountered in the field. In such cases, it will be appropriate to consider water regimes that lie in between the requirements and tolerances of the respective EVCs.

In the case of aggregate EVCs, it will be necessary to assess suitable water regimes based on identification of components and adopt the approach as for mosaics or complexes (see above). While a range of water regimes may be allocated to describe the hydrological range occupied by an aggregate EVC, this does not mean that this range is necessarily suitable for all of the components. For example shallows or fringing zones and deeper water will have different water regimes.

Comments on the water regime and salinity attributes

In the guide, water regime parameters are allocated to categories covering a range of variation in frequency, depth and duration of inundation. Timing and variability of inundation are also important components of water regime. Variation in annual conditions associated with less regular inundation regimes is an important aspect, however it is difficult to characterise other aspects of variability. In some instances, additional comments about variability and/or seasonality of the water regime are supplied for the individual EVCs. Notes on the relevance and practicality of delivering environmental water to the EVCs are also provided. In general, it is easier to outline (and avoid) what is outside of the tolerance range of a particular EVC than attempt to accurately specify a required water regime, particularly since the ideal regime typically includes elements of variability. Ongoing monitoring, evaluation of ecological impacts and, where necessary, refinements of approach, are clearly vital components of implementing any regime of water delivery for environmental purposes.

Water regime variability and seasonality

Outside of what is implied by the categories for frequency of inundation, no quantification of variability is attempted. Comments on general variability and/or seasonality are provided for some individual EVC profiles. In general, these attributes are best considered through reference to tolerance range (i.e. parameters not to exceed or actions to avoid). Uniformity within a regime of water delivery should generally be avoided unless this matches the natural ecology of the respective habitat.

From the perspective of biodiversity conservation, natural events do not always have desirable effects and on occasions can be quite destructive (e.g. tree death following prolonged summer floods). While these types of extreme events can occur as part of longer term processes, it is assumed that environmental watering will attempt to avoid duplicating such highly disruptive events. An exception may be where there is an evidence-based reason for generating a particular outcome (i.e. what is being done and why).

Interpreting water regime information in the context of wetland phase

Water regime and depth information for any wetland EVC should be interpreted in the context of the relevant habitat rather than just the inundation phases during which the EVC is represented. An EVC may be continuously present or expressed as a component within a temporal mosaic (i.e. expressing in all inundation phases, only when the wetland is inundated, or only when the wetland is in the drying phase). It is important to note that EVCs which are continuously expressed may exhibit greater diversity during wet or dry phases. Wetland phase context is indicated for each EVC (see Section 2, Table 1 for context categories).

Water regime: frequency of inundation

This attribute refers to the usual frequency of inundation that the wetland EVC experiences. Each EVC is assigned to categories predetermined by the Victorian wetland classification (semidiurnal tide, king tide, permanent, seasonal, intermittent, episodic)[3] with the addition of two categories not in the classification

[3] For more information on the Victorian wetland classification, its attributes and their categories, please refer to the Victorian wetland classification framework (DELWP 2016c).

but developed for the purpose of this guide (bog, fringing). Category descriptions are presented in Section 2, Table 1.

Water regime: maximum duration of waterlogging and inundation

This attribute represents the usual maximum duration of waterlogging and inundation events that the wetland EVC can tolerate. For wetlands at higher elevations, the duration of the event may include periods where the water in the wetland is frozen. Duration of waterlogging and inundation requirements for each EVC was assigned to one or several of eight categories that represent paired combinations of waterlogging and inundation characteristics experienced at the habitat supporting the EVC. These categories are presented in the attribute summary table (Section 2, Table 1). Relatively few natural wetlands in Victoria are truly permanent – the term 'permanent' should be interpreted as also including semi-permanent systems.

Water regime: depth

Each EVC is assigned to one or more water depth categories (very shallow, shallow to medium, medium to deep, deep). These represent the maximum depth of sustained or regular inundation experienced (and often tolerated) by the range of species represented in the wetland EVC. Not all of an EVC (or wetland) will be subject to the upper limits of an inundation event. For example, outer edges may be shallower even when the wetland is full, especially in the cases of aggregate EVCs. Depth can be interpreted as an upper limit which is defined here from the deepest part of the range of the EVC.

In the narratives that accompany the attribute information in Section 3, the term 'seepage' is sometimes used in the EVC habitat description. This is as a general term applying to either groundwater or localised, seasonally high water-tables, which either originate from beneath the wetland or occur at the adjacent or included break of slope. While inundation is usually brief in the 'fringing' category of duration, these habitats may nevertheless sometimes remain moist or waterlogged for long periods due to seepage.

If delivering environmental water to support biodiversity values in relatively deep wetlands (e.g. around one metre depth or more) it is better to prime with a shallow inundation during autumn to spring prior to topping up. This is particularly the case for deep wetlands which have been subject to prolonged dry periods prior to watering. Examples of this type of EVCs include the following: Lignum Swamp, Intermittent Swampy Woodland, Red Gum Swamp, Riverine Swamp Forest, Floodplain Grassy Wetland, Billabong Wetland, Aquatic Herbland, Submerged Aquatic Herbland, Brackish Aquatic Herbland, Saline Aquatic Meadow, and in general all vegetation with a component of submerged aquatic species.

Salinity

The salinity range of the wetland EVC is represented using categories predetermined by the Victorian wetland classification (fresh, hyposaline, mesosaline, hypersaline) with the addition of a 'calcareous' category applied for the purpose of this guide. Salinity ranges for these categories are presented in Section 2, Table 1.

Some salinised wetlands are quite stable in relation to expression of the relevant vegetation types, whereas others can support a succession of several EVCs over the transition between full and dry. The nominated salinity range applies to the general growing conditions of the respective EVC but it does not necessarily apply to conditions when the EVC is no longer expressing (for example when the respective wetland is full or under very dry conditions). Calcareous conditions which lack salinity due to sodium chloride are referred to as both 'fresh' and 'calcareous' (e.g. Calcareous Wet Herbland). In a number of EVCs, the habitat may be saline to some extent, but is not substantially calcareous, while in other mineralised habitats, salinity can include a calcareous component (e.g. Grey Clay Drainage-line Aggregate). In these cases both attributes of 'calcareous' and a salinity category are indicated for the EVC.

Section 2: Quick-reference table of water regime and salinity ranges for all Victorian wetland EVCs

Table 1. Key to codes used in Table 2.

Phase context of EVC representation	**Phase context category**	**Phase context category description**	**Category code**
	Continuous	EVC always expressed	C1
	Inundated	EVC expressed when the wetland is inundated	C2
	Drying	EVC expressed during or extending into the drying phase	C3
Frequency of inundation	**Frequency of inundation category**	**Frequency of inundation category description**	
	Semidiurnal tide	Twice daily	F1
	King tide	Several times per year	F2
	Permanent	Constant, annual or less frequently but before wetland dries	F3
	Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	F4
	Intermittent	Inundated 3–7 years in every 10	F5
	Episodic	Inundated less than 3 years in every 10	F6
	Bog	Constant waterlogging, inundation mostly superficial	F7
	Fringing	Inundation periodic but brief	F8
Duration of waterlogging and inundation	**Waterlogging maximum**	**Inundation maximum**	
	Variable (fringing wetland)	Variable, usually brief	D1
	1–6 months	<1 month	D2
	>6 months	<1 month	D3
	1–6 months	1–6 months	D4
	>6 months	1–6 months	D5
		>6 months (but not permanent)	D6
		Permanent	D7
		Twice daily	D8
Maximum depth of regular or sustained inundation	**Category**	**Depth range (cm)**	
	Very shallow	<30	WD1
	Shallow to medium	30–100	WD2
	Medium to deep	>100–200	WD3
	Deep	>200	WD4
Salinity	**Category**	**Salinity range (mg/L)**	
	Fresh	0–3,000	F
	Hyposaline	>3,000–10,000	B
	Mesosaline	>10,000–50,000	S
	Hypersaline	>50,000–350,000	H
	Calcareous	N/A	C

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges. Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
1111	Alkaline Basaltic Wetland Aggregate	C1	F4	D5, D6	WD2	F, C
806	Alluvial Plains Semi-arid Grassland	C1	F6	D2, D4	WD1, WD2	F, (B)
293	Alpine Creekline Herbland	C1	F7	D3	WD1	F
171	Alpine Fen	C1	F3, F7	D5, D6, D7	WD1, (WD2)	F
288	Alpine Heath Peatland	C1	F7	D2	WD1	F
1011	Alpine Hummock Peatland	C1	F7	D3	WD1	F
905	Alpine Short Herbland	C1	F7	D5, D6	WD1	F
306	Aquatic Grassy Wetland	C1	F4, F5	D4, (D5, D6)	WD1, WD2, (WD3)	F
653	Aquatic Herbland	C2, (C3)	F3, F4, (F5)	D5, D6, D7	(WD2), WD3, (WD4)	F, (B)
308	Aquatic Sedgeland	C1	F3, F4	D5, D6, D7	WD1, WD2, (WD3)	F, (B)
334	Billabong Wetland Aggregate	C1, C2, C3	F3, F4, F5	D5, D6, D7	WD3, WD4	F
369	Black Box Wetland	C1, C2	(F4), F5, F6	D4	WD1	F
875	Blocked Coastal Stream Swamp	C1	F3	D7	WD2, WD3	F, (B), C
537	Brackish Aquatic HeArbland	C2	F3, F4	D6, D7	WD3, WD4	B
934	Brackish Grassland	C1	F8	D1, D2	WD1	B
538	Brackish Herbland	C3	F2, F4, F5, F6	D3, D4, D5	WD1, WD2, (WD3)	B, (S)
636	Brackish Lake Aggregate	C1, C2, C3	F3, F4, F5	(D5), D6, D7	(WD2), WD3, WD4	B
539	Brackish Lake Bed Herbland	C3	F5, F6	(D5), D6	(WD2), WD3	B
947	Brackish Lignum Swamp	C1	F5, F6	D4, D5	WD1, WD2	B, (S)
13	Brackish Sedgeland	C1	F4, F5, F6, F8	D1, D3, D4, D5, D6	WD1, WD2	B
1114	Brackish Sedgy Shrubland	C1	F6	D2	WD1	(F), B
973	Brackish Shrubland	C1	F8	D1	WD1	(F), B

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
656	Brackish Wetland Aggregate	C1	(F2), F4, F5, F6, F8	D3, D4, D5, D6	WD1, WD2	B, (S)
A106	Calcareous Sedgy Shrubland	C1	F6, F8	D1, D2	WD1	F, C
591	Calcareous Wet Herbland	C1	F4	D5	WD2, (WD3)	F, C
291	Cane Grass Wetland	C1	F4, F5	D5, D6	WD2, (WD3)	F
602	Cane Grass Wetland / Aquatic Herbland Complex	(C1), C2	F4	D6	WD2, (WD3)	F
606	Cane Grass Wetland / Brackish Herbland Complex	C1	F4, F5	D5, D6	WD2, (WD3)	B
A117	Cane Grass Wetland / Lignum Shrubland Complex	C1	F5, F6	D4	WD1, WD2	F, (B)
284	Claypan Ephemeral Wetland	(C1), C3	F4	D4	WD1	F
A110	Coastal Dry Saltmarsh	C1	F2, F8	D1, D2	WD1	S, (H)
976	Coastal Ephemeral Wetland	C1	F4	D4	WD1	F
A111	Coastal Hypersaline Saltmarsh	C1	F2, F8	D1, D2	WD1	H
11	Coastal Lagoon Wetland Aggregate	C1	F3	D7	WD3, WD4	F, (B)
A109	Coastal Saline Grassland	C1	F2, F8	D1, D2, D3	WD1	S
9	Coastal Saltmarsh Aggregate	C1	F1, F2, F8, (F4, F5)	D1, D3, D8, (D2 ,D4, D5)	WD1, WD2	S, (H)
A112	Coastal Tussock Saltmarsh	C1	F1, F2, F8	D1, D2, D3, D8	WD1	S
673	Dune-soak Woodland	C1	F6, F8	D1, D2	WD1	F
949	Dwarf Floating Aquatic Herbland	C2	F3, F4, F5, F6	D4, D5, D6, D7	WD2, WD3, (WD4)	F
678	Ephemeral Drainage-line Grassy Wetland	C1	F4	D2, D4	WD1	F
914	Estuarine Flats Grassland	C1	F5, F6, F8	D1, D2	WD1	B
952	Estuarine Reedbed	C1	(F1), F2, F3 , F4	D5, D6, (D8)	WD1, WD2	B, (S)
953	Estuarine Scrub	C1	F2, F8	D1, D3	WD1	B, (S)
10	Estuarine Wetland	C1	(F1), F2, F4	D3, D5, D8	WD1, (WD2)	B, (S)
721	Fern Swamp	C1	F7	D3, D5, D6	WD1	F
809	Floodplain Grassy Wetland	C1	F4, F5	D4, D5, D6	(WD2), WD3	F

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
56	Floodplain Riparian Woodland	C1	(F5, F6), F8	D1	WD1	F
280	Floodplain Thicket	C1	F4	D2, D4	WD1	F
172	Floodplain Wetland Aggregate	C1, C2, C3	F4, F5, F6	D2, D3, D4, D5, D6	WD1, WD2, WD3	F
810	Floodway Pond Herbland	C3	F4, F5	D5, D6	WD2, WD3, WD4	F
945	Floodway Pond Herbland / Riverine Swamp Forest Complex	(C1), C3	F4, F5	D5, (D6)	WD2, WD3	F
723	Forest Bog	C1	F3, F7	D5, D6	WD1, WD2	F
728	Forest Creekline Sedge Swamp	C1	F3	D5, D6	WD1, (WD2)	F
718	Freshwater Lake Aggregate	C1, C2, C3	F3, F4, F5, F6	(D5), D6, D7	(WD2), WD3, WD4	F
954	Freshwater Lignum - Cane Grass Swamp	C1	F5	D5, D6	WD2	F
657	Freshwater Lignum Shrubland	C1	F8	D1	WD1	F
968	Gahnia Sedgeland	C1	F4, F7	D3, D5	WD1	F, C
1112	Granite Rock-pool Wetland	(C1), C3	F4	D4	WD1, (WD2)	F
106	Grassy Riverine Forest	C1	F4, F5	D4	WD2	F
811	Grassy Riverine Forest / Floodway Pond Herbland Complex	C1	F5	D4	WD2, WD3	F
812	Grassy Riverine Forest / Riverine Swamp Forest Complex	C1	F4, F5	D4	WD3	F
124	Grey Clay Drainage-line Aggregate	C1	F4, F5	D4	WD1, (WD2)	F, B, (C)
956	Herb-rich Gilgai Wetland	C1	F4, F5	D4	WD1, (WD2)	F
708	Hypersaline Inland Saltmarsh Aggregate	C1	F5, F6	D5, D6	WD1, WD2	H
813	Intermittent Swampy Woodland	C1	F5, F6	D4, (D6)	WD2, (WD3)	F, (B)
A119	Intermittent Swampy Woodland / Lake Bed Herbland Complex	C3	F5, F6	D4, D6	WD2, WD3	F, (B)
822	Intermittent Swampy Woodland / Riverine Grassy Woodland Complex	C1	F5, F6	D4	WD2	F
107	Lake Bed Herbland	C3	F5, F6	D6	WD2, WD3, WD4	F, (B)
974	Lava Plain Ephemeral Wetland	C1	F4, F5	D2, D4	WD1	F
808	Lignum Shrubland	C1	F6	D2, D4	WD1, (WD2)	F, (B)

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
104	Lignum Swamp	C1	F5	D4, D6	WD2, WD3	F, (B)
823	Lignum Swampy Woodland	C1	F5, F6	D4	WD2	F, (B)
140	Mangrove Shrubland	C1	F1	D8	WD2	S
966	Montane Bog	C1	F7	D5	WD1	F
41	Montane Riparian Thicket	C1	F3, F7	D3, D5	WD1	F
40	Montane Riparian Woodland	C1	F8	D1	WD1	F
148	Montane Sedgeland	C1	F3, F7	D5	WD1	F
318	Montane Swamp	C1	F3, F7	D6, D7	WD2	F
185	Perched Boggy Shrubland Aggregate	C1	F3, F7	D3, D5	WD1	F
125	Plains Grassy Wetland	C1	F4, F5	D4	WD1, WD2	F
755	Plains Grassy Wetland / Aquatic Herbland Complex	C1	F4	D4, D5	WD1, WD2	F
767	Plains Grassy Wetland / Brackish Herbland Complex	C1	F4, F5	D4	WD1, WD2	F, B, C
958	Plains Grassy Wetland / Calcareous Wet Herbland Complex	C1	F4	D4	WD1	F, C
A101	Plains Grassy Wetland / Lignum Swamp Complex	C1	F5, F6	D4	WD1, WD2	F, (B)
959	Plains Grassy Wetland / Sedge-rich Wetland Complex	C1	F4, F5	D4	WD1	F
960	Plains Grassy Wetland / Spike-sedge Wetland Complex	C1	F4, F5	D4	WD1, WD2	F
961	Plains Rushy Wetland	C1	F4, F5	D4	WD1, WD2	F
888	Plains Saltmarsh Aggregate	C1	F4, F5	D3, D5	WD1	S, (H)
647	Plains Sedgy Wetland	C1	F4	D5	WD1, WD2	F
1010	Plains Sedgy Wetland / Sedge Wetland Complex	C1	F4	D5	WD1, WD2	F
283	Plains Sedgy Woodland	C1	F4, F8	D2, D4	WD1	F

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
651	Plains Swampy Woodland	C1	F4, F8	D2, D4	WD1	F
784	Plains Swampy Woodland / Lignum Swamp Complex	C1	F4, F5	D4	WD1, WD2	F
292	Red Gum Swamp	C1	F4, F5, (F6)	D5, D6	WD2	F
A114	Red Gum Swamp / Cane Grass Wetland Complex	C1	F4, F5	D5, D6	WD2	F
A115	Red Gum Swamp /Plains Rushy Wetland Complex	C1	F4, F5	D5	WD1, WD2	F
A120	Riparian Fern Scrub	C1	F3, F7	D3, D5	WD1	F
191	Riparian Scrub	C1	F3, F7	D3, D5	WD1	F
59	Riparian Thicket	C1	F3, F7	D3	WD1	F
103	Riverine Chenopod Woodland	C1	F6	D1, D2	WD1	F (B)
975	Riverine Ephemeral Wetland	C1	F6	D2	WD1, WD2	F
814	Riverine Swamp Forest	C1	F4, F5	D4, (D6)	WD2, WD3	F
815	Riverine Swampy Woodland	C1	F5, F6	D2, D4	WD1	F
804	Rushy Riverine Swamp Aggregate	C1	F4	D5, D6	WD2, WD3	F
842	Saline Aquatic Meadow	C2	F2, F3, F4, F5	D5, D6, D7	(WD 1), WD2, WD3	(B), S, (H)
717	Saline Lake Aggregate	C1, C2, C3	F3, F5, F6	D6, D7	WD2, WD3, WD4	S, (H)
648	Saline Lake-verge Aggregate	C1, (C3)	F5, F6, F8	D1, D5	WD1, WD2	S, (H)
A113	Saltmarsh-grass Swamp	C1, (C3)	F4, F5, F6	D5	WD1, WD2	S, (H)
676	Salt Paperbark Woodland	C1	F6, F8	D1, D2, D3	WD1	S, (H)
101	Samphire Shrubland	C1	F5, F6, F8	D1, D2, D3, (D5)	WD1	S, H, C
845	Sea-grass Meadow	C1	F1, F3	D7, D8	WD2, WD3, WD4	S
195	Seasonally Inundated Shrubby Woodland	C1	F4, F8	D2, D4, D5	WD1	F
196	Seasonally Inundated Sub-saline Herbland	(C1), C3	(F2), F4	D4, D5	WD1, WD2	B, (S)
281	Sedge-rich Wetland	C1	F4	D4, D5	WD1	F
136	Sedge Wetland	C1	F4	D4, D5	WD1	F
A102	Sedge Wetland / Aquatic Herbland Complex	(C1), C2	(F3), F4	D5, D6	WD1, WD2	F

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
963	Sedge Wetland / Aquatic Sedgeland Complex	C1	(F3), F4	D5, D6	WD1, WD2	F
1113	Sedge Wetland / Brackish Herbland Complex	C1	F4	D5	WD1, WD2	B
883	Sedge Wetland / Calcareous Wet Herbland Complex	C1	F4	D5	WD1, WD2	F, C
816	Sedgy Riverine Forest	C1	F5, F6	D2, D4	WD1, WD2	F
817	Sedgy Riverine Forest / Riverine Swamp Forest Complex	C1	F4, F5	D4	WD1, WD2	F
707	Sedgy Swamp Woodland	C1	F4, F8	D4, D5	WD1	F
964	Shell-beach Herbland	(C1), C3	F6, F8	D1	WD1	F, (B)
908	Sink-hole Wetland Aggregate	C1	F3, (F4)	(D5, D6), D7	(WD1, WD2), WD4	F, C
819	Spike-sedge Wetland	C1	F4, F5, F6	D4, D6	WD1, WD2, (WD3)	F, (B)
80	Spring-soak Woodland Aggregate	C1	F4, F7	D2, D3, D5	WD1	F
857	Stony Rises Pond Aggregate	C1	F3, F4	D6, D7	(WD2) WD3	F
210	Sub-alpine Wet Heathland	C1	F7, F8	D1, D3	WD1	F
917	Sub-alpine Wet Sedgeland	C1	F4, (F7)	D5	WD1	F
918	Submerged Aquatic Herbland	C2	F3, F5, F6	D5, D6, D7	WD2, WD3, WD4	F, (B), (C)
820	Sub-saline Depression Shrubland	C1	F6	D2	WD1	B
49	Swamp Heathland Aggregate	C1	F4, F7	D3, D5	WD1	F
53	Swamp Scrub	C1	F4, F7	D3, D5, D6	WD1	F, (B), C
2004	Swamp Scrub / Gahnia Sedgeland Complex	C1	F4, F7	D3, D5	WD1	F, C
83	Swampy Riparian Woodland	C1	F4	D1, D3, D5	WD1	F
937	Swampy Woodland	C1	F4, F8	D1, D3, D4, D5	WD1	F
920	Sweet Grass Wetland	C1	F4	D4, D5, (D6)	WD1, WD2	F
821	Tall Marsh	C1	F3, F4	D6, D7	WD2, (WD3)	F, (B)
990	Unvegetated (open water / bare soil /mud)	C1, C2, C3	F1, F3, F5, F6	D3, D6, D7, D8	WD2, WD3, WD4	F, B, S, H
8	Wet Heathland	C1	F4, F7, F8	D1, D2, D3, (D4, D5)	WD1, (WD2)	F

Table 2. Phase context of EVC representation, frequency of inundation, duration of waterlogging and/or inundation, water depth and salinity ranges (continued). Refer to Table 1 for an explanation of the category codes. Codes in brackets indicate the EVC occasionally enters this range.

Wetland EVC number	Wetland EVC name	Wetland attribute				
		Phase context of EVC representation	Frequency of inundation	Duration of waterlogging and/or inundation	Water depth	Salinity
A104	Wet Heathland / Plains Grassy Wetland Complex	C1	F4, F7	D4, D5	WD1	F
A105	Wet Heathland / Plains Sedgy Wetland Complex	C1	F4, F7	D5	WD1	F
931	Wet Heathland / Sedge Wetland Complex	C1	F4	D4, D5	WD1	F
A107	Wet Saltmarsh Herbland	C1	F1, F2	D3, D4, D8	WD1, WD2	S
A108	Wet Saltmarsh Shrubland	C1	F1	D8	WD1, WD2	S
A116	Wet Sedgy Herbland	C1, C3	F4, F5	D2, D3, D4, D5	WD1	F, B
12	Wet Swale Herbland	C1	F4	D5, D6	WD2	F
A118	Wet Verge Herbland	C1	F4, (F5)	D4, D5	WD1, WD2	F, (B)
932	Wet Verge Sedgeland	C1	F3, F4, F5	D4, D5	WD1, WD2	F

Section 3: Water regime and salinity ranges for Victorian wetland Ecological Vegetation Classes – detailed information

Alkaline Basaltic Wetland Aggregate EVC 1111

EVC description

Defining characteristics: Structurally and floristically diverse wetlands, with the following main component elements: Aquatic Herbland (EVC 653), Wet Verge Sedgeland (EVC 932), Plains Grassy Wetland / Aquatic Herbland Complex (EVC 755), Tall Marsh (EVC 821) and Sedge Wetland / Calcareous Wet Herbland Complex (EVC 883). Highly localised, on heavy alkaline soils of relatively recent basalt flows in the vicinity of Portland.

Indicator Species: Component species variously include *Carex appressa*, *Juncus procerus*, *Phragmites australis*, *Glyceria australis*, *Amphibromus neesii*, *Amphibromus sinuatus*, *Lachnagrostis filiformis* s.l., *Eleocharis acuta*, *Carex gaudichaudiana*, *Triglochin alcockiae*, *Villarsia reniformis*, *Crassula helmsii*, *Lilaeopsis polyantha*, *Ranunculus amphitrichus*, *Neopaxia australasica*, *Rumex bidens*, *Stellaria angustifolia*, *Myriophyllum simulans*, *Isolepis fluitans*, *Asperula subsimplex*, *Potamogeton cheesemanii*, *Urtica incisa*, *Hydrocotyle tripartita*, *Hydrocotyle sibthorpioides*, *Lobelia beaugleholei*, *Senecio psilocarpus*, *Persicaria decipiens*, *Leptinella reptans* s.s. and *Senecio pinnatifolius* var. *pinnatifolius.*

Ecological overview

Inundation of this EVC is seasonal, with depth and duration varying according to local bathymetry and seasonal rainfall across the described ranges. While salinity levels are typically very low, the calcareous component of the substrate influences the water chemistry.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

Environmental water delivery is presumably not relevant to the wetlands that support this EVC. Instead, catchment protection should be a focus.

Alluvial Plains Semi-arid Grassland EVC 806

EVC description

Defining characteristics: Turf grassland (to herbland) of low-lying areas within relatively elevated riverine terraces. Shrubs incidental if present. Flood-promoted flora that potentially includes a wide range of opportunistic ephemeral/annual species. Localised to riverine areas in north-western Victoria.

Indicator species: *Sporobolus mitchellii*, *Calocephalus sonderi*, *Sclerochlamys brachyptera*, *Plantago cunninghamii* and *Brachyscome* spp.

Ecological overview

Inundation of habitat containing this EVC varies, with shallow depressions on higher terraces of the floodplain generally experiencing brief shallow flooding, which may be to some extent supported by winter waterlogging. Variants around lake margins may be more deeply inundated and remain wetter for longer, but are prone to drying out on subsequent drawdown. Generally sustained inundation does not greatly exceed 30 cm.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

If subject to delivery of environmental water (e.g. around lake verges), allow natural drawdown and avoid frequent inundation.

Alpine Creekline Herbland EVC 239

EVC description

Defining Characteristics: Dense herbland vegetation, dominated by *Celmisia sericophylla*, occurring along heads of alpine drainage-lines. Rare, mostly confined to Bogong High Plains.

Indicator Species: *Celmisia sericophylla*, variously with *Luzula atrata*, *Luzula modesta*, *Juncus falcatus*, *Carpha* spp., *Myriophyllum pedunculatum*, *Epacris* spp., *Schoenus* spp., *Poa* spp., *Chaerophyllum* spp., *Psychrophila introloba* and *Plantago* spp. in gaps or more open stands.

Ecological overview

Habitat containing this EVC is prone to brief flooding following rainfall and during snow-melt, but soils remain damp due to seepage. Salinity is negligible.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to the wetlands that support this EVC, as they are dependent the local catchment and seepage.

Alpine Fen EVC 171

EVC description

Defining characteristics: Sedgeland vegetation of high elevation wetland basins subject to cold-air ponding, often in shallow ponds occurring in association with *Sphagnum* dominated bogs. Localised within higher mountain areas.

Indicator species: *Carex gaudichaudiana*, *Myriophyllum pedunculatum* and *Isolepis crassiuscula.*

Ecological overview

Constantly waterlogged, habitat containing this EVC varies from sites subject to shallow and brief inundation following rain, to shallow long-term pools within larger bog complexes. If depth exceeds 30 cm it is at the lower end of the relevant depth range. Salinity is negligible.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to the wetlands that support this EVC, as they are dependent on the local catchment and seepage.

Alpine Heath Peatland EVC 288

EVC description

Defining Characteristics: Dwarf heathland of high altitude valley floors. Typically dominated by *Epacris glacialis* and growing on remnant peatland on the margins of alpine wetlands, streams and bogs. Rare, only on Bogong High Plains.

Indicator Species: *Epacris glacialis*, *Empodisma minus*, *Poa costiniana*, also variously *Carex breviculmis*, *Ranunculus gunnianus*, *Astelia alpina* var. *novae-hollandiae* and *Oreobolus distichus.*

Ecological overview

Inundation of this EVC is rare, but if it occurs it is neither sustained nor deep. Soils often remain damp from local seepage. Salinity is negligible.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to the wetlands that support this EVC, as they are dependent on the local catchment and seepage.

Alpine Hummock Peatland EVC 1011

EVC description

Defining characteristics: The vegetation (at least in relatively intact sites) is characterised by elevated hummocks of *Sphagnum* moss in association with peat soils. A small range of low ericoid shrubs are typically immersed within the moss bed. Where mounds are less developed, floristic richness can be higher, potentially including a diverse range of small herbs and sedges. Localised to alpine and sub-alpine zones within higher mountains. Can grade into Sub-alpine Wet Heathland (EVC 210) at lower elevations.

Indicator species: *Sphagnum* spp., *Richea continentis*, *Baeckea* spp., *Epacris* spp., *Callistemon pityoides*, *Empodisma minus*, *Carex* spp., *Astelia alpina*, *Carpha* spp. and *Ranunculus* spp. (notably *R. pimpinellifolius* and *R. gunnianus*).

Ecological overview

Apart from shallow inundation due to rain events and snow-melt, inundation of habitat containing this EVC is generally confined to included channels, however waterlogging is constant. Salinity is negligible.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering not relevant to the wetlands that support this EVC, as they are dependent on the local catchment and seepage.

Alpine Short Herbland EVC 905

EVC description

Defining characteristics: Dwarf herbland of wet alpine soils, in sites with a short growing season. Typically found in seepage zones associated with areas of late-lying snow. Rare and localised, on higher mountains.

Indicator species: *Psychrophila introloba*, *Oreobolus pumilio* subsp. *pumilio*, *Juncus antarcticus*, *Isolepis* spp., *Myriophyllum pedunculatum*, less commonly *Chaerophyllum pulvinificum*, *Deyeuxia affinis*, *Parantennaria uniceps* and *Plantago muelleri*.

Ecological overview

This EVC is prone to periodic brief shallow inundation due to rainfall and snow melt, but soils remain saturated. Salinity is negligible.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to the wetlands that support this EVC, as they are dependent on the local catchment and seepage.

Aquatic Grassy Wetland EVC 306

EVC description

Defining characteristics: Seasonal wetland on plains, dominated by rhizomatous to stoloniferous floating grasses, in association with mainly aquatic species. Turf grassland under drier conditions. Treeless or with scattered River Red-gum *Eucalyptus camaldulensis* present. Scattered, mainly in central southern to north-central areas.

Indicator species: Turf-forming species of *Lachnagrostis* (with affinities to *L. filiformis* s.l.) or *Amphibromus* spp. of similar growth-form (*A. sinuatus and A. fluitans*); with *Pseudoraphis paradoxa* very localised in East Gippsland as a component of Wet Swale Herbland. Associated species include *Crassula helmsii*, *Myriophyllum* spp. and *Eleocharis acuta*.

Ecological overview

Inundation events are potentially shallow and erratic, but total time of inundation in a given season generally exceeds several months. If frequency of inundation is intermittent, then it is characteristically towards the upper end of range.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Occasional
	>6 months (but not permanent)	Occasional

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In general, environmental watering appears unlikely to be relevant to this EVC. If water is delivered, this should be done during the cooler months and care should be taken to avoid overwatering.

Aquatic Herbland EVC 653

EVC description

Defining characteristics: Semi-permanent to seasonal wetland vegetation, lacking woody species (or nearly so), dominated by herbaceous aquatic species (often with at least rootstocks tolerant of dry periods). Widespread, but rare in mountains and north-west.

Indicator species: *Myriophyllum* spp., *Cycnogeton procerum* s.l., variously with *Villarsia reniformis*, *Ludwigia peploides* subsp. *montevidensis*, *Nymphoides* spp. and *Ranunculus inundatus* (or related aquatic species). Often occurs in mosaic or complex with other wetland EVCs.

Ecological overview

Communities in hyposaline situations are transitional towards Brackish Aquatic Herbland (EVC 537), or when otherwise subject to increasing salinity during evaporation. Inundation events when this EVC expresses are generally at least several months in duration and are generally closer to six months or more. Inundation rarely exceeds greater than 2 m depth, but is possible in some protected situations with very clear water such as in sink holes.

Phase context of EVC representation

Inundated (with expression persisting to some extent during earlier parts of drying phase).

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0-3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

If supplying environmental water, it is best to prime first with a smaller event before filling.

Aquatic Sedgeland EVC 308

EVC description

Defining characteristics: Very species-poor vegetation dominated by one to several species of robust inundation-tolerant rhizomatous sedges, typically with culms septate or otherwise including large air-spaces, with vegetative growth extending into virtually permanent water. Widespread, but rare in mountains and drier north.

Indicator species: Various combinations of one or more of *Eleocharis sphacelata*, *Chorizandra australis* (or sometimes *Chorizandra cymbaria* s.l.), *Baumea articulata* and robust forms of *Baumea rubiginosa* s.l. Often occurs in association with Aquatic Herbland (EVC 653).

Ecological overview

If inundation is less than six months duration, it is generally towards the higher end of the category range (i.e. average events are not much less than six months duration. This EVC is generally relatively resilient over drier periods. If entering the hyposaline range, then it is towards the lower end. *Baumea articulata* is probably more salt tolerant than other structurally dominant species.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

Delivery of environmental water is generally unlikely to be particularly relevant to this EVC, with most communities being more dependent on catchment and groundwater protection, apart from relatively durable variants dominated by *Eleocharis sphacelata*.

Billabong Wetland Aggregate EVC 334

EVC description

Defining Characteristics: Collective label for the various zones of vegetation associated with lagoons/billabongs on floodplains. Relevant EVCs are Floodplain Wetland Aggregate (EVC 172) and wetter versions of the primarily terrestrial Floodplain Riparian Woodland (EVC 56). Other relevant EVC mapping units include Floodplain Riparian Woodland/Floodplain Wetland Mosaic and Floodplain Riparian Woodland/Billabong Wetland Mosaic. Recognisable wetland components of Billabong Wetland Aggregate include Aquatic Herbland (EVC 653), Aquatic Sedgeland (EVC 308), Tall Marsh (EVC 821), Dwarf Floating Aquatic Herbland (EVC 949) and Floodway Pond Herbland (EVC 810). Major river systems, principally cooler areas.

Indicator species: See descriptions of component wetland EVCs.

Ecological overview

Water regime is highly variable across the topographical profile of wetlands supporting this EVC, but base levels can be sustained by a combination of groundwater and local runoff. Due to seasonal variability in rainfall and flooding and the characteristics of floodplain connectivity (i.e. how readily flooded by various sized increases in stream flow), the frequency and extent of filling is potentially highly variable.

Phase context of EVC representation

Drying, Inundated, Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
Shallow inundation, especially during warmer weather, can lead to dense regeneration of River Red-gum on the wetland floor. Artificially sustained inundation also can have undesirable impacts. In urban contexts, run-off and delivery of storm-water into wetlands can be highly damaging to the vegetation.

Black Box Wetland EVC 369

EVC description

Defining characteristics: Black Box *Eucalyptus largiflorens* with a sedgy-herbaceous understorey including species indicative of wetland habitats. Seasonal to episodic swampy woodland, with aquatic and semi-aquatic species present within Black Box dominated vegetation. Rare, lower Loddon - Avoca area and Wimmera.

Indicator species: *E. largiflorens*, (open) *Duma florulenta*, *Amphibromus* spp. (mainly *A. nervosus*), *Lachnagrostis filiformis* s.s., *Eleocharis acuta*, *Marsilea drummondii*, *Lobelia concolor*, *Ranunculus inundatus* and *Potamogeton tricarinatus* s.l.

Ecological overview

This EVC occurs in highly variable environments and expresses following shallow seasonal inundation, occasionally from local runoff and especially during wet decades. The EVC may tolerate longer breaks in flooding.

Phase context of EVC representation

Inundated, Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Occasional
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Major flood events can deleteriously impact tree health and species diversity, and upper limits of potential duration or frequency of inundation of wetlands are not a desired management goal. Any delivery of environmental water should take place from winter to spring and short inundation periods are desirable (e.g. generally less than three months).

Blocked Coastal Stream Swamp EVC 875

EVC description

Defining characteristics: Dense sedgeland, dominated by *Cladium procerum*, associated with blocked streams of calcareous coastal habitats. Rare in Victoria - Wilson's Promontory and south-western Victoria.

Indicator species: *Cladium procerum*, *variously* with *Typha domingensis* and scattered *Leptospermum lanigerum*.

Ecological overview

If the habitat containing this EVC enters the hyposaline category, this is at lower end of the range. Inundation of channels is effectively permanent (stable for substantial periods), but not so for an overbank condition, which will generally only be maintained for brief periods following substantial rainfall events. Growth of the structural dominants tapers off rapidly in sustained deeper water (from adjacent shallows / banks).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
No waterlogging	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional
Calcareous	N/A	Common

Management considerations

Delivery of environmental water is generally unlikely to be relevant to this EVC.

Brackish Aquatic Herbland EVC 537

EVC description

Defining characteristics: Submerged (to weakly emergent) herbland, including more salt-tolerant aquatic species in semi-attached floating mats. Scattered in inland and near-coastal areas.

Indicator species: *Myriophyllum* spp. (*M. verrucosum* and *M. muelleri*), *Ruppia polycarpa*, *Lepilaena* spp. and *Lilaeopsis polyantha*, Stoneworts (Family Characeae), *Mimulus repens*, *Stuckenia pectinata* and *Triglochin striata*.

Ecological overview

This EVC can temporarily express in suitable habitat during sustained wet phases (i.e. during sequences of wetter years) as part of a temporal mosaic, or be more consistently present as a component during filling and drawdown cycles. Longer term water regimes are not well known and it is less commonly encountered due to suppression by recent drought years. Salinity will vary according to the amount of water in the wetland and may concentrate to higher levels as part of temporal variation (with this EVC replaced by more salt tolerant vegetation).

Phase context of EVC representation

Inundated

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

If supplying environmental water, it is best to prime first with a smaller event before filling.

Brackish Grassland EVC 934

EVC description

Defining characteristics: Grassland on sub-saline heavy soils, including dominants of Plains Grassland (and a portion of associated herbaceous species) in association with herbaceous species indicative of saline soils. Sometimes occurring as a fringing community on the verges of saline lakes. Scattered in southern lowland and plains areas, including coastal sites, most communities critically endangered.

Indicator species: *Poa labillardierei* (*Poa poiformis* some coastal sites) and / or *Themeda triandra* and *Rytidosperma* spp., with e.g. *Distichlis distichophylla*, *Calocephalus lacteus*, *Selliera radicans*, *Disphyma crassifolium* subsp. *clavellatum*, *Sebaea* spp., *Wilsonia rotundifolia* and *Lobelia irrigua*.

Ecological overview

Habitat supporting this EVC is generally not considered to be truly wetland, however wetter versions can occur as a marginal fringe to a wetland and can remain damp for extended periods due to seepage. Inundation is restricted to very brief events if occurring at all.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

Supply of environmental water not required for this EVC. Avoiding alteration to groundwater depth and salinity is a more important management consideration. Where this EVC occurs as fringing vegetation it may be damaged by excessive watering of the relevant wetland, though due to bathymetry, this is usually unlikely to constitute a substantial risk.

Brackish Herbland EVC 538

EVC description

Defining characteristics: Low herbland dominated by species tolerant of mildly saline conditions and intermittent inundation. Scattered in inland and near-coastal areas, including estuarine sites.

Indicator species: Variously *Lobelia irrigua*, *Sebaea* spp., *Ranunculus diminutus* or *R. amphitrichus*, *Apium annuum*, *Lachnagrostis* spp., *Isolepis cernua*, *Schoenus nitens*, *Wilsonia rotundifolia*, *Selliera radicans*, *Distichlis distichophylla* and *Samolus repens*.

Ecological overview

Quite variable hydrology, ranging from driest end of Brackish Aquatic Herbland (EVC 537) to infrequently inundated, more or less seepage maintained habitats on wetland margins or plains normally lacking inundation. Habitat containing this EVC can also occur in estuarine sites. In more inundation-prone contexts, expression generally occurs after drawdown (i.e. in gaps between inundation events). While the habitat is maintained by periodic inundation, the vegetation largely comprises species which are flood-tolerant rather than true aquatics. If mesosaline conditions occur at the relevant wetland, then this is primarily during near dry phases.

Phase context of EVC representation

Drying

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional

Management considerations

Manage water regime to not exceed the tolerance ranges.

Brackish Lake Aggregate EVC 636

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the floors and verges of brackish lakes. Identifiable components of the aggregate variously include Brackish Aquatic Herbland (EVC 537), Brackish Lake Bed Herbland (EVC 539), Brackish Herbland (EVC 538), Brackish Sedgeland (EVC 13) and Brackish Wetland Aggregate (EVC 656). Mainly drier west and north of State.

Indicator species: See descriptions of component EVCs.

Ecological overview

As an aggregate, the context for this EVC is quite variable. The lake may be more or less permanent, but with edges having drawdown. Salinity can increase to high levels during drying phases. The depth categories provided for this EVC are the maxima which can occur. Clearly the outer edges may be shallower even when a wetland is full, particularly with respect to aggregate EVCs.

Phase context of EVC representation

While some components of the aggregate are continuously represented, representation of others can be restricted to the either the inundated or drying phases.

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Occasional
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Occasional
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

When watering, consider the hydrological requirements and tolerances of the component EVCs if these can be resolved (i.e. variation in the topographic profile can result in a range of associated hydrologies within a single wetland). Allow natural drawdown events and avoid maintaining water level at a constant depth or repeated filling to the same depth.

Brackish Lake Bed Herbland EVC 539

EVC description

Defining characteristics: Low herbland of salt-tolerant species developing on drying lake beds. Floristics can vary seasonally and can be in temporal phase with the unvegetated unit (open water/bare soil/mud). Localized in north and west, very rare in near coastal sites (e.g. Bellarine Peninsula, Lower Latrobe wetlands).

Indicator species: Variously *Cressa australis*, *Heliotropium curassavicum*, *Glycyrrhiza acanthocarpa*, *Mimulus repens*, *Chenopodium glaucum*, *Sporobolus* spp. (*S. mitchellii and S. virginicus*), *Atriplex australasica*, *Atriplex suberecta* and *Myriophyllum verrucosum*. Scattered living veteran trees *of Eucalyptus camaldulensis* can be present around outer fringes, and dead stags may be extensive through the vegetation reflecting an altered hydrology.

Ecological overview

This EVC expresses on the exposed mud of the wetland floor as it dries out. While some occurrences are clearly independent of anthropogenic factors, the presence of this EVC can be due to modification of the hydrology and salinity influences within the relevant wetland. The hydrological tolerances of the component species are poorly known, but appear to have substantial dormancy of seed during longer periods of inundation. Some drawdown is important to at least maintain some opportunities for species to express and produce seed. The salinity category hyposaline applies only during the growth phase of the relevant species. Salinities fresher than hyposaline can occur during wetter phases, when the EVC is not expressing. Salinities higher than hyposaline can occur during the drying out phase, if salt is concentrated at the soil surface due to evaporation. In comparison to this EVC, Brackish Herbland (EVC 538) includes more perennial species, has more frequent expression, and a lower requirement for prolonged dormancy of seed of the component species.

Phase context of EVC representation

Drying

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Occasional
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Occasional
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations
If supplying environmental water, allow natural drawdown events and avoid maintaining water level at a constant depth or repeated filling to the same depth.

Brackish Lignum Swamp EVC 947

EVC description

Defining characteristics: Wetland dominated by *Duma florulenta* (variously with *Eragrostis infecunda*), with a component or patches of salt-tolerant herbs (at least at low to moderate levels of salinity) and usually also with some species shared with freshwater habitats. Can be very species-poor apart from introduced annuals. Sites with a higher diversity of salt-tolerant native species, at least around the drier outer verges, are generally presumed to have been somewhat saline prior to European settlement. However, species-poor character does not necessarily imply that the site is degraded or highly modified. Rare, lower rainfall plains in north and west and localized in coastal areas west of Melbourne.

Indicator species: *Duma florulenta*, variously with *Eragrostis infecunda*, *Samolus repens*, *Isolepis cernua*, *Triglochin striata*, *Chenopodium glaucum*, *Myriophyllum verrucosum*, *Selliera radicans*, *Mimulus repens*, *Distichlis distichophylla*, *Lobelia irrigua*, *Wilsonia rotundifolia*, *Lachnagrostis* spp. and *Gahnia filum*.

Ecological overview

Hydrological requirements are not well known. The composition of the ground layer is quite variable, potentially reflecting variation between the respective salinities of the surface water and ground-water/seepage. Effectively represents Tangled Lignum growing within its range of tolerance of saline conditions, growing with ground–layer vegetation varying from species characteristic of Brackish Wetland (EVC 656) to species compositions similar to some variants of Coastal Saltmarsh (EVC 9). Salinity ranges/values may be considerably lower during maximum inundation, in contrast to dryer phases, where salt may concentrate near the surface due to evaporation. If the soils are waterlogged for periods greater than six months, then this is mostly at the shorter end of this range (e.g. for less than eight months), especially in inland situations. If inundation depth is in the shallow to medium range, then it only briefly, if it all, extends into the upper part of this depth category.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional

Management considerations
This EVC is primarily dependent on protection of the local catchment and groundwater. In general the provision of environmental water is unlikely to be relevant, except possibly in suburban/peri-urban contexts where the local catchment has been excised. The use of storm-water in remnant wetlands is potentially highly destructive to diversity and wetland condition.

Brackish Sedgeland EVC 13

EVC description

Defining characteristics: Medium to tall sedgeland, dominated by salt-tolerant sedges in association with low grassy / herbaceous ground-layer with a halophytic component. Scattered in near-coastal and western inland areas.

Indicator species: *Gahnia trifida* (less commonly *Gahnia filum*) or *Baumea juncea*; with *Bolboschoenus caldwellii* and/or *Schoenoplectus pungens* in some wetter versions (but also note Brackish Wetland Aggregate [EVC 656]).

Ecological overview

This EVC can occur on the outer fringes of wetlands where the lower-lying zones are inundated at a greater frequency, and in estuarine contexts where the inundation regime is quite variable. Salinity is likely to exceed hyposaline levels for periods, albeit under conditions of dormancy of sedges (i.e. dieback to rootstocks).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	<1 month	Common
1-6 months	1-6 months	Common
>6 months	1-6 months	Common
	>6 months (but not permanent)	Occasional

Water depth

Category	Range (cm)	EVC preference
Shallow	<30	Common
Shallow to medium	30-100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations
The main consideration for water management appears to be allowing sufficient periods of suitable hydrological conditions for growth between times of less suitable conditions. The vegetation may not tolerate repeated extreme events (either sustained flood or prolonged drought). *Bolboschoenus caldwellii* rootstocks can have sustained dormancy during unfavourable conditions.

Brackish Sedgy Shrubland EVC 1114

EVC description

Defining characteristics: Sedgy shrubland vegetation with minor component of halophytic species, occurring on faintly brackish coastal swales and flats with grey peaty sand subject to occasional shallow inundation. Rare, recorded with certainty only from far East Gippsland.

Indicator species: *Melaleuca armillaris* with *Apodasmia brownii*, *Baumea juncea*, *Gonocarpus micranthus* and *Linum marginale*. A diverse range of species at lower covers includes *Lachnagrostis filiformis* s.s., *Paquerina graminea*, *Centella cordifolia*, *Rytidosperma semiannulare*, *Deyeuxia densa*, *Drosera pygmaea*, *Hemarthria uncinata* var. *uncinata*, *Imperata cylindrica*, *Lobelia anceps*, *Samolus repens*, *Schoenus apogon*, *Schoenus nitens*, *Selaginella uliginosa*, *Senecio glomeratus* and *Viminaria juncea.*

Ecological overview

Very marginal wetland, occurring in very restricted habitat which receives occasional shallow inundation from high rainfall events.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Occasional
Hyposaline	>3,000–10,000	Common

Management considerations

Environmental watering is neither required nor practically feasible.

Brackish Shrubland EVC 973

EVC description

Defining characteristics: Shrubland vegetation fringing claypans and shallow salt lakes, with dominant species tolerant of lower levels of salinity, but ground-layer with sparse grassy - herbaceous ground-layer with few if any halophytic species. Ephemerals are prevalent and indicative of seasonal waterlogging. Rare, Little Desert and nearby far south-west.

Indicator species: *Melaleuca brevifolia*, variously with *Acacia farinosa*, *Rytidosperma* spp. (*R. geniculatum*, *R. setaceum*, *R. semiannulare*), *Austrostipa scabra*, *Gahnia filum*, *Lepidosperma viscidum*, *Dichelachne crinita*, *Hypolaena fastigiata and Baumea juncea*, *Centrolepis* spp. (*C. polygyna* and *C. strigosa* subsp. *strigosa*), *Daucus glochidiatus*, *Millotia muelleri*, *Pogonolepis muelleriana*, *Sebaea ovata* and *Wahlenbergia gracilenta* s.l.

Ecological overview

Very marginal wetland type, restricted to verges only. Natural salinities of the groundwater appear to be in the range of the lower end of hyposaline towards the upper part of the range of fresh.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Occasional
Hyposaline	3,000-10,000	Common

Management considerations

Environmental watering is neither required nor practically feasible. Sustained reduction in groundwater levels could potentially threaten occurrences of this EVC.

Brackish Wetland Aggregate EVC 656

EVC description

Defining characteristics: Collective label for the various zones of sedgy-herbaceous vegetation associated with sub-saline wetlands. Components variously include wetter versions of Brackish Sedgeland (EVC13), Brackish Herbland (EVC 538) and Saline Aquatic Meadow (EVC 842). Mainly western and northern areas, but also scattered sites on coastal plains.

Indicator species: See descriptions of component EVCs above; in addition *Juncus kraussii* subsp. *australiensis* can be conspicuous in some variants.

Ecological overview

See notes for Brackish Sedgeland (EVC 13), Brackish Herbland (EVC 538) and Brackish Aquatic Herbland (EVC 537). Salinity may concentrate to the mesosaline range during drying phases, but not when the wetland is at full capacity.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Occasional
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30-100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	10,000-50,000	Occasional

Management considerations
In situations where delivery of environmental water may be potentially relevant, it would be ideal to attempt to identify the main component EVCs in the aggregate and set the water regime accordingly. If this is too difficult, then a suitable watering regime may be best estimated by setting the outer edges (drawdown zone) to the minimum depth and duration of the inundation range provided for the EVC, and allowing natural drawdown.

Calcareous Sedgy Shrubland EVC A106

EVC description

Defining characteristics: Stunted shrubland with a conspicuous sedge component, occurring in coastal barrier swamps on calcareous soils. The activities of yabbies are a conspicuous influence on the soils. Very localised, apparently confined to the far south-west of the State.

Indicator species: Component species include *Leptospermum lanigerum*, *Gahnia trifida*, *Logania ovata*, *Lepidosperma neesii*, *Schoenus nitens*, *Euphrasia collina* subsp. *collina*, *Prasophyllum frenchii*, *Selliera radicans*, *Cassytha glabella*, *Lobelia anceps*, *Hydrocotyle pterocarpa*, *Comesperma volubile* and *Thysanotus patersonii*. While herbs are generally sparse, some variants can be species-rich.

Ecological overview

Ephemeral wetland of coastal barrier swamp habitat.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

Environmental watering of this EVC is neither required nor practically feasible.

Calcareous Wet Herbland EVC 591

EVC description

Defining characteristics: Low wetland vegetation dominated by inundation tolerant herbs. The floristics are indicative of calcareous conditions. Rare, southern lowland areas, mostly in the south-west.

Indicator species: *Hydrocotyle* spp. (*H. sibthorpioides*, *H. muscosa*, *H. pterocarpa*), *Lilaeopsis polyantha*, *Ranunculus* spp., *Isolepis fluitans*, *Asperula subsimplex*, *Villarsia* spp., *Amphibromus recurvatus* and *Goodenia humilis*. Sparse emergent *Baumea arthrophylla* and/or *Juncus procerus* are sometimes present.

Ecological overview

Inundation of this EVC is generally towards the shallower end of the range. Greater depths only occur in 'leaky' systems which temporarily fill and drain relatively quickly. The habitat is always calcareous but not saline due to sodium chloride.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

Environmental watering of wetlands that contain this EVC is generally not likely to be feasible. This EVC is vulnerable to changes in groundwater levels and potentially the impacts of small dams in minor catchments.

Cane Grass Wetland EVC 291

EVC description

Defining characteristics: Species-poor vegetation dominated by Southern Cane-grass *Eragrostis infecunda* occurring in association with seasonal wetlands of low rainfall plains areas, typically on extremely heavy, grey clay soils. Scattered in drier plains areas in the west and north of the State.

Indicator species: *Eragrostis infecunda*, species-poor, variously with *Eleocharis acuta*, *Potamogeton tricarinatus* s.l. and *Lachnagrostis filiformis* s.s.

Ecological overview

Seasonal inundation is likely during periods of relatively high rainfall. It is presumed this EVC is quite resilient to longer intervals between inundation events. Inundation can exceed six months, but this may not be desirable without substantial natural draw down. Generally, inundation is presumably not sustained or remaining stable at deeper levels into summer.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental water is supplied to wetlands that contain this EVC, priming with smaller inputs some period prior to filling wetlands to capacity is desirable. See notes under ecological overview.

Cane Grass Wetland/Aquatic Herbland Complex EVC 602

EVC description

Defining characteristics: Wetland vegetation with open stands of Southern Cane-grass in association with freshwater aquatic herbs. Rare, scattered localities in the west and north of the State.

Indicator species: *Eragrostis infecunda*, *Myriophyllum* spp., *Rumex bidens*, *Potamogeton tricarinatus* s.l., *Cycnogeton procerum*, *Lilaeopsis polyantha*, variously including *Lachnagrostis filiformis* s.s., *Lachnagrostis filiformis* s.l., *Crassula helmsii*, *Ranunculus* spp., *Stellaria angustifolia*, *Amphibromus nervosus*, *Glyceria australis* and *Juncus holoschoenus*.

Ecological overview

The aquatic herbland component may persist to some extent through less extreme drier phases (e.g. including as dormant rootstocks), or expression of the complex may potentially be restricted to wetter climatic periods (i.e. the system may tolerate less frequent inundation including sustained periods without expressing the aquatic component). The complex may occur within the deeper core of the wetland, surrounded by vegetation referable to EVCs which are less frequently inundated or inundated over less sustained periods. In general, the EVC presumably dries out at least annually.

Phase context of EVC representation

The cane-grass component is continuously present, with the aquatic herbland component represented when the wetland is inundated and during the earlier parts of the drying phase.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental water is supplied to wetlands that contain this EVC, priming with smaller flows some period prior to filling wetlands to capacity is desirable. This approach is important to optimise the response of the vegetation.

Cane Grass Wetland/Brackish Herbland Complex EVC 606

EVC description

Defining characteristics: Wetland dominated by open stands of Southern Cane-grass in association with herbaceous species characteristic of inundation-prone brackish sites. Scattered in western areas.

Indicator species: *Eragrostis infecunda* variously with *Lilaeopsis polyantha*, *Triglochin striata*, *Samolus repens*, *Lobelia irrigua*, *Puccinellia perlaxa*, *Mimulus repens*, *Sebaea albidiflora*, *Selliera radicans*, *Wilsonia rotundifolia*, *Myriophyllum verrucosum* and *Lachnagrostis* spp., with *Sporobolus virginicus*, *Stellaria angustifolia* and *Calocephalus lacteus* in marginal sites.

Ecological overview

This EVC occurs in wetlands with an inherently variable water regime influenced by climatic conditions. The EVC is rarely subject to inundation much in excess of either one metre depth or six months duration of inundation, and dries out at least annually. Wetlands with this EVC may be fresh at full level of inundation and become more saline when the water level is very low.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

If environmental water is supplied to wetlands that contain this EVC, priming with smaller flows some period prior to filling wetlands to capacity is desirable. This approach is important to optimise the response of the vegetation. Inundation typically should not be in excess of six months duration (generally a maximum of eight months). If inundation exceeds one metre depth, then it should not be by very much or be for a sustained period.

Cane Grass Wetland/Lignum Shrubland Complex EVC A117

EVC description

Defining characteristics: Wetland vegetation dominated by a mixture of Southern Cane-grass and shrub or shrub-like species indicative of Lignum Shrubland (EVC 808), notably Cane Grass, with a minor component of Tangled Lignum and/or Nitre Goosefoot. It occurs on heavy soils in low-rainfall habitat that is prone to shallow intermittent inundation. Apparently very rare and localised, known only from the riverine plain south-west of Echuca.

Indicator species: Co-dominated by the cane grasses *Eragrostis australasica* and *Eragrostis infecunda*, with the shrubs *Duma florulenta* and *Chenopodium nitrariaceum* variously present in low numbers. The vegetation is relatively species-poor, with additional species including *Lachnagrostis filiformis* s.s., *Eleocharis acuta*, *Calocephalus sonderi*, *Cressa australis*, *Ranunculus pumilio*, *Rumex tenax* and *Senecio runcinifolius*.

Ecological overview

The water regime of this EVC is poorly known. It is tolerant of prolonged dry periods. The frequency of inundation of wetlands that contain this EVC will vary with annual/seasonal rainfall. The relative dominance of the two major structural elements (both Cane grasses) apparently varies according to inundation patterns, with the more robust *Eragrostis australasica* increasing over dry periods. The maximum depth of inundation is presumably not much in excess of 30 cm

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

It is important that natural drawdown is allowed in wetlands that contain this EVC.

Claypan Ephemeral Wetland EVC 284

EVC description

Defining characteristics: Herb dominated vegetation in shallow, seasonally-inundated habitat on cracking silty clays (within Alluvial Terraces Herb-rich Woodland), with a range of small herbs indicative of wetness, in particular ephemeral monocots. Localised in further west in vicinity of the Grampians.

Indicator species: *Eucalyptus camaldulensis* (marginal), *Leptospermum scoparium* (sparse), *Goodenia humilis*, *Myriocephalus rhizocephalus*, *Brachyscome perpusilla*, *Centrolepis* spp., *Aphelia* spp., *Stylidium* spp., *Rytidosperma geniculatum* and *Eragrostis brownii*.

Ecological overview

This EVC is determined by local topography and rainfall accumulation.

Phase context of EVC representation

Maximum representation of the floristics of this EVC occurs during the drying phase, with some species continuously evident.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC does not occur in a context where environmental watering is either required or feasible.

Coastal Dry Saltmarsh EVC A110

EVC description

Defining characteristics: Herbland to low shrubland of upper coastal saltmarsh in lower rainfall areas, subject to relatively infrequent tidal inundation or sometimes in remnant near coastal lacustrine sites which no longer have direct access to tidal inundation events. Localised and severely depleted, Bellarine Peninsula, Western Port Phillip Bay, head of Western Port and Lake Reeve.

Indicator species: Variously dominated by *Sarcocornia blackiana*, *Frankenia pauciflora*, *Disphyma crassifolium* subsp. *clavellatum*, *Angianthus preissianus* or very rarely *Sebaea albidiflora*. Associated species variously include *Sarcocornia quinqueflora*, *Samolus repens*, *Hemichroa pentandra*, *Triglochin striata*, *Suaeda australis* and *Distichlis distichophylla*.

Ecological overview

Hypersaline conditions can be reached during dry periods rather than during inundation events, when the salinity is mostly towards the upper end of the mesosaline range, consistent with sea-water. The vegetation can also be influenced by groundwater discharge. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

Environmental watering is not relevant other than potentially removing obstructions to tidal inputs. This EVC is potentially vulnerable to freshwater inputs/run-off from adjacent land uses.

Coastal Ephemeral Wetland EVC 976

EVC description

Defining characteristics: Range of moisture requiring herbs in association with species of moister dryland grassy vegetation. Extremely rare, known only from Mornington Peninsula and possibly Phillip Island. Could also be regarded as a variant of Swampy Woodland (EVC 937).

Indicator species: *Eucalyptus ovata*, *Acacia melanoxylon*, *Leptospermum continentale*, *Ozothamnus ferrugineus*, *Acaena novae-zelandiae*, *Rytidosperma semiannulare*, *Deyeuxia quadriseta*, *Eragrostis brownii*, *Poa clelandii*, *Poa labillardierei*, *Schoenus apogon*, *Amphibromus archeri*, *Centella cordifolia*, *Elatine gratioloides*, *Gratiola peruviana*, *Haloragis heterophylla*, *Hemarthria uncinata* var. *uncinata*, *Isolepis cernua* var. *platycarpa*, *Isotoma axillaris*, *Juncus holoschoenus* and *Mazus pumilio*.

Ecological overview

This EVC is generally subject to durations of inundation towards the lower end of the category range. Waterlogging and inundation do not necessarily occur as continuous seasonal events but may come and go with larger rainfall events and vary according to annual climatic conditions.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC occurs in situations where the management issues relate to catchment protection rather than the supply of environmental water. These issues include avoiding potential groundwater depletion, urban run-off including contaminated storm-water, and depletion of water inputs due to dams in local catchment – unless these dams represent part of an integrated water treatment strategy.

Coastal Hypersaline Saltmarsh EVC A111

EVC description

Defining characteristics: Low shrubland dominated by succulent chenopods (or rarely Salt Lawrencia), occurring in highly hypersaline coastal saltmarsh habitat above the zone of regular tides. Extremely localised in Western Port Phillip Bay and on the Bellarine Peninsula, with a community dominated by *Tecticornia pergranulata* also occurring at Lake Reeve in Gippsland.

Indicator species: Dominated by *Tecticornia pergranulata*, *T. halocnemoides*, or very locally *Lawrencia squamata*. Can be very species poor, with most consistent associated species including *Sarcocornia quinqueflora* and to a lesser extent *Frankenia pauciflora*, and less frequently *Disphyma crassifolium* subsp. *clavellatum*, *Samolus repens* and *Suaeda australis*. A range of indigenous annuals can be present in relatively intact sites (e.g. on low mounds associated with *T. halocnemoides*).

Ecological overview

Hypersaline conditions occur when habitat is dry or nearly so rather than during inundation events. This vegetation can also be influenced by groundwater discharge. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Hypersaline	>50,000–350,000	Common

Management considerations

Environmental watering is not relevant to this EVC. Removing barriers to natural tidal inputs may be relevant in some wetlands that support this EVC. This EVC is potentially vulnerable to freshwater inputs and run-off from adjacent land uses.

Coastal Lagoon Wetland Aggregate EVC 11

EVC description

Defining characteristics: An aggregate EVC which includes the various zones of vegetation associated with sedge-fringed aquatic vegetation of near coastal lagoons. Components include Aquatic Sedgeland (EVC 308), Aquatic Herbland (EVC 653) and Swamp Scrub (EVC 53). Rare, further eastern Victoria, but possibly elsewhere along coast.

Indicator species: *Baumea rubiginosa* s.l., *Eleocharis sphacelata*, *Cycnogeton procerum* s.l., *Melaleuca squarrosa* and *Gahnia clarkei*.

Ecological overview

This is an aggregate EVC that includes a range of components with different hydrological regimes, including fringes which are shallower/more temporally inundated. If this EVC occurs in hyposaline habitat it generally occupies the lower end of this category range. The overall depth may vary less than for inland systems.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

It is generally unlikely that environmental watering will be required for this EVC or even feasible for wetlands which support this EVC. In the event of any delivery of environmental water, it may be simplest to determine the appropriate hydrology using component EVCs (e.g. Swamp Scrub [EVC 53], Aquatic Sedgeland [EVC 308]). Protection of local groundwater levels can be important to maintain the condition of the wetland vegetation.

Coastal Saline Grassland EVC A109

EVC description

Defining characteristics: Grassland dominated by rhizomatous grasses (at best development forming mounds), occurring towards upper zones of coastal saltmarsh. Restricted extent along the Victorian coastline, with scattered distribution but mostly between the Bellarine Peninsula and Western Port Bay.

Indicator species: Frequently very species poor, especially at maximum development. Typically dominated by either *Distichlis distichophylla* (particularly on heavier soils) or *Sporobolus virginicus* (particularly on sandier soils). *Sarcocornia quinqueflora* and *Triglochin striata* are the most frequent associated species recorded with *D. distichophylla*. *S. virginicus* occurs at the boundary between Coastal Saltmarsh and Estuarine Flats Grassland, and stands may include a component of *Ficinia nodosa*.

Ecological overview

This vegetation is influenced by groundwater discharge. Waterlogging may be intermittent according to major rainfall events or sometimes flooding in estuarine locations, even if the habitat is frequently damp from seepage. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common

Management considerations

Environmental watering is not relevant to this EVC. Removing barriers to natural tidal inputs may be relevant in some wetlands that support this EVC. This EVC is potentially vulnerable to freshwater inputs/run-off from adjacent land uses.

Coastal Saltmarsh Aggregate EVC 9

EVC description

Defining characteristics: Variously low shrubby or herbaceous (to grassy or sedgy) vegetation of salinised coastal soils, in or adjacent to tidally influenced wetland. Coastal Saltmarsh Aggregate can include a number of zones of varying structure and floristics, reflecting the regimen of tidal inundation and substrate character. Refer to EVCs A107-A113 for resolution of potential components of Coastal Saltmarsh Aggregate. Scattered distribution in sheltered embayments and estuaries along Victorian coast.

Indicator species: Variously *Tecticornia* (*Sclerostegia*) *arbuscula*, *Sarcocornia quinqueflora*, *Suaeda australis* and *Samolus repens*, sometimes with *Frankenia pauciflora* and/or *Triglochin striata* locally conspicuous. *Gahnia filum*, *Austrostipa stipoides*, *Disphyma crassifolium* subsp. *clavellatum* and *Distichlis distichophylla* can variously be locally prominent in more peripheral zones.

Ecological overview

This EVC represents an aggregate vegetation with a variable range of hydrology and exposure to tidal influences. While largely occurring in the intertidal zone, it also potentially occurs in wetlands which are not directly linked to tidal influences – for example former embayments with salinity derived from inputs via wind spray or saline groundwater. Inundation is mostly towards the shallower end of the category range. For further comments see notes under the component provisional EVCs: Wet Saltmarsh Herbland (EVC A107), Wet Saltmarsh Shrubland (EVC A108), Coastal Saline Grassland (EVCA109), Coastal Dry Saltmarsh (EVC A110, Coastal Hypersaline Saltmarsh (EVC A111), Coastal Tussock Saltmarsh (EVC A112) and Saltmarsh-grass Swamp (EVC A113).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common
King tide	Several times per year	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Occasional
Intermittent	Inundated 3–7 years in every 10	Occasional
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Occasional
>6 months	<1 month	Common
>6 months	1–6 months	Occasional
1–6 months	1–6 months	Occasional
	Twice daily	Common

Water depth		
Category	**Range (cm)**	**EVC preference**
Very shallow	<30	Common
Shallow to medium	30–100	Common
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional
Management considerations		
Environmental watering is not relevant to this EVC. Removing barriers to natural tidal inputs may be relevant in some wetlands that support this EVC. This EVC is potentially vulnerable to freshwater inputs/run-off from adjacent land uses. Protection from alterations to drainage (including storm water inputs) is an important management consideration.		

Coastal Tussock Saltmarsh EVC A112

EVC description

Defining characteristics: Upper coastal saltmarsh zones dominated by robust tussocks. Scattered distribution along the Victorian coast.

Indicator species: Dominated by either *Gahnia filum* or *Austrostipa stipoides* with a range of halophytic species at lower covers. *Sarcocornia quinqueflora* is typically present, with *Samolus repens*, *Suaeda australis* and *Distichlis distichophylla* also relatively frequent associates.

Ecological overview

This EVC ranges from occurring above the reach of the daily tides to being subject to regular shallow inundation and its habitat is not always tidally connected (e.g. it can occur in wetlands of prior embayments where it is maintained by ground water). At some drier sites, it is likely that hypersaline conditions can be reached in the upper layers of the soil during low rainfall periods. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common
King tide	Several times per year	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
>6 months	<1 month	Common
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common

Management considerations

Environmental watering is not relevant to this EVC. Removing barriers to natural tidal inputs may be relevant in some wetlands that support this EVC. This EVC can be severely damaged by alterations to drainage from changes to adjacent land-use (e.g. receiving storm-water run-off).

Dune Soak Woodland EVC 673

EVC description		
Defining characteristics: Low diversity shrubby-sedgy woodland, lacking obligate aquatic flora, occurring on damp soils associated with dune swales, mostly at the interface between Quaternary aeolian and paludal deposits. Rare, localised in sandy areas south of the Little Desert. **Indicator species:** *Eucalyptus ovata*, *Leptospermum continentale* and *Lepidosperma longitudinale*.		
Ecological overview		
This EVC is subject to seasonal and annual variation in wetness according to climatic conditions. It occurs very much at the shallow end of the depth category and the lower end of the range of waterlogging duration.		
Phase context of EVC representation		
Continuous		
Frequency of inundation		
Category	**Description**	**EVC preference**
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common
Maximum event duration		
Duration of waterlogging	**Duration of inundation**	**EVC preference**
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
Water depth		
Category	**Range (cm)**	**EVC preference**
Very shallow	<30	Common
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Management considerations		
The EVC is rainfall and seepage dependent. Environmental watering is neither relevant nor feasible.		

Dwarf Floating Aquatic Herbland EVC 949

EVC description

Defining characteristics: Surface layer of dwarf free-floating plants, usually as component of more diverse aquatic systems, but sometimes comprising the only life-form present, and potentially expanding over broad areas during inundation. Widespread in lowland areas, but rarely as sole component of wetland.

Indicator species: *Lemna* spp., *Landoltia punctata*, *Wolffia* spp., *Azolla* spp. and the liverwort *Ricciocarpus natans*.

Ecological overview

This EVC is often opportunistic and potentially of transitory occupation.

Phase context of EVC representation

Inundated

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In general, it is not useful to manage specifically for this EVC but instead to use any associated EVCs as a guide to optimal hydrological regimes.

Ephemeral Drainage-line Grassy Wetland EVC 678

EVC description

Defining characteristics: Ephemeral wetlands in gilgai systems along poorly defined drainage lines within native grassland, with patchy local variation of the balance between wetland and dryland elements of flora. Localised and endangered, low rainfall volcanic plains to near west of Melbourne and possibly also Cressy and Skipton areas.

Indicator species: Relatively open *Themeda triandra* and/or *Rytidosperma duttonianum* grassland with *Eryngium vesiculosum*, *Coronidium gunnianum*, *Eleocharis acuta*, *Marsilea drummondii*, *Amphibromus nervosus* and *Lachnagrostis filiformis* var. 2, *Eleocharis pusilla and Haloragis heterophylla*, *Calotis* spp., *Calocephalus citreus*, *Eryngium ovinum*, *Minuria leptophylla*, *Walwhalleya proluta* and *Chloris truncata*.

Ecological overview

While the EVC is continuously represented the floristics can be at least partly obscured during drought conditions. Typically the EVC occurs at the fresher end of the salinity range. Inundation is mostly at the briefer end of the range if over one month, and is not necessarily continuous through the cooler and wetter seasons. Frequency of inundation and extent of wetness will vary according to annual climatic conditions.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Protection of the local catchment (e.g. from diversion of drainage, development, inputs of stormwater) is a more important management consideration for this EVC than delivery of environmental water.

Estuarine Flats Grassland — EVC 914

EVC description

Defining characteristics: Tussock grassland to sedgeland of low-lying coastal sites, beyond zone of normal tidal inundation but sometimes subject to seasonal waterlogging or rarely brief intermittent inundation (e.g. at the rear of salt marshes and around drainage-line swamps behind barrier dunes).

Indicator species: *Poa poiformis* and *Ficinia nodosa*, sometimes with *Austrostipa stipoides* in marginal sites in Gippsland (but see EVC 9, Coastal Saltmarsh Aggregate); also variously *Senecio pinnatifolius*, *Clematis microphylla s.l.*, *Distichlis distichophylla*, *Acaena novae-zelandiae* and *Apium prostratum*.

Ecological overview

Only some variants of this EVC are subject to inundation under normal conditions. Wetter examples of this EVC, such as those that occur on the outer fringes of more inundation-prone wetland vegetation types, can be subject to seepage and potentially to brief inundation following filling events, e.g. high rainfall events.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

In general, supply of environmental water will not be relevant to this EVC.

Estuarine Reedbed EVC 952

EVC description

Defining characteristics: Vegetation dominated by reeds (usually c. 1.5 - 3 m in height), in association with a sparse ground-layer of salt tolerant herbs. Distinguished from Estuarine Wetland (EVC 10) by the vigour and total dominance of the reeds, as well as the absence or low abundance of samphires in the ground layer. Sub-saline situations of coastal estuaries (sometimes periodically blocked by sand bars), localised in scattered near coastal sites between Nelson and East Gippsland.

Indicator species: *Phragmites australis*, with associated species variously including *Samolus repens*, *Juncus kraussii* subsp. *australiensis*, *Triglochin striata*, *Bolboschoenus caldwellii*, *Suaeda australis*, *Gahnia filum* and *Crassula helmsii.*

Ecological overview

This EVC generally occurs at the lower end of the depth categories (i.e. generally not greatly exceeding 30 cm except potentially during floods). *Phragmites australis* can straddle the edges of deeper water from more elevated ground, but is not extensively subject to sustained deeper inundation across stands. This species can also be inhibited by wave action, especially at higher salinities. It extends into the lower part of the mesosaline range, but apparently is always well below seawater salinity concentrations when inundated. The EVC generally occurs as a fringing vegetation, in relatively variable habitats where groundwater may be as influential as inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Semidiurnal tide	Twice daily	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Twice daily	Occasional

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional

Management considerations
Considerations around releases of environmental water may be applicable in some cases, but estuary management (whether or not to open barriers) is more likely to be an issue for consideration.

Estuarine Scrub EVC 953

EVC description

Defining characteristics: Shrubland to scrub of myrtaceous shrub species of sub-saline habitat, occurring in association with a ground-layer dominated by halophytic herbs, notably on the verges of Estuarine Wetland (EVC 10), where peripheral or further upstream, or at the rear of Coastal Saltmarsh Aggregate (EVC 9). Scattered in suitable habitat along the coast, but rare in western Victoria and of restricted total extent, reduced by clearing.

Indicator species: *Melaleuca ericifolia* (in eastern Victoria), sometimes with *Myoporum insulare*, with other *Melaleuca* spp. (e.g. *M. lanceolata*, rarely *M. gibbosa* or *M. halmaturorum*) or *Leptospermum lanigerum* in western Victoria. The major species of the ground-layer include *Samolus repens*, *Triglochin striata* and *Selliera radicans*, variously with *Sarcocornia quinqueflora*, *Gahnia filum*, *Poa poiformis*, *Juncus kraussii* subsp. *australiensis*, *Disphyma crassifolium* subsp. *clavellatum* and *Distichlis distichophylla*. Species such as *Ficinia nodosa*, *Tetragonia implexicoma*, *and Rhagodia candolleana* can occur on the drier verges, but are less typical of the vegetation. While the vegetation is frequently relatively species-poor, some sites can be rich in small herbs.

Ecological overview

If mesosaline conditions occur in habitat supporting relatively intact occurrences of this EVC, then the salinity is generally within the lower part of the range. The vegetation may be supported by less saline groundwater seepage, or at least intermittent flushing by fresher water or rainfall. Inundation of this EVC is generally sporadic, but soils are frequently damp to waterlogged.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional

Management considerations

In general, this EVC does not require substantial inundation and delivery of environmental water is largely not relevant. However management of environmental flows through estuaries and decisions in relation to breaching of sand bars at entrances may be relevant considerations.

Estuarine Wetland EVC10

EVC description

Defining characteristics: Rushland / sedgeland vegetation, variously with a component of small halophytic herbs, occurring in regularly-inundated wetlands of estuarine flats. Distinguished from Estuarine Reedbed (EVC 952) by the smaller stature and reduced dominance of *Phragmites australis* (and greater diversity), from Coastal Saltmarsh Aggregate (EVC 9) by the dominance of medium-sized graminoids (other than *Austrostipa stipoides* in the latter), and from Estuarine Scrub (EVC 953) by the general absence of woody species. Scattered along the coast in estuarine situations, also at rear of saltmarshes where there is seepage, but most extensive in association with larger estuarine floodplains.

Indicator species: *Juncus kraussii* subsp. *australiensis*, sometimes with *Bolboschoenus caldwellii*, *Schoenoplectus pungens* and/or (stunted and sub-dominant) *Phragmites australis*; variously with *Samolus repens*, *Ranunculus amphitrichus*, *Distichlis distichophylla*, *Isolepis cernua*, *Selliera radicans*, *Apium prostratum*, *Triglochin striata*, *Leptinella* spp., *Mimulus repens*, *Sarcocornia quinqueflora* and *Suaeda australis*. Woody species are generally absent, but scattered stunted shrubs (variously including *Leptospermum lanigerum*, *Melaleuca ericifolia* or *Myoporum insulare*) can occasionally be present on drier margins.

Ecological overview

If this EVC occurs in the mesosaline category, then it is generally at the lower end of the range. It has a variable composition according to local site factors. Drier versions can resemble Coastal Saltmarsh (EVC 9) with a substantial component of *Juncus kraussii* (Sea Rush) and are less dependent on regular inundation. Groundwater can be at least as important as flooding, and the extent of flooding can be highly variable with annual conditions. While inundation can be deeper during flooding, this is not sustained and generally remains within the lower end of the depth range (i.e. rarely much in 30 cm).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Semidiurnal tide	Twice daily	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity		
Category	**Range (mg/L)**	**EVC preference**
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional
Management considerations		
In relation to environmental water and estuary opening/management, comments apply as for Estuarine Scrub (EVC 953).		

Fern Swamp EVC 721

EVC description

Defining characteristics: Ferny (to sedgy-ferny) vegetation of swampy drainage lines in high-rainfall areas (mostly occurring along drainage systems which support Riparian Thicket or Cool Temperate Rainforest in more free-draining areas). Woody species are generally confined to sparse emergent tall shrubs /small trees, but sparse emergent *Eucalyptus ovata* are sometimes present. Rare, higher rainfall areas (Central Highlands, South Gippsland, Otways).

Indicator species: Sparse *Melaleuca squarrosa*, *Leptospermum lanigerum/Leptospermum grandifolium*, *Atherosperma moschatum* and/or *Acacia melanoxylon*; variously with *Todea barbara*, *Blechnum nudum*, *Blechnum minus*, *Blechnum wattsii*, *Dicksonia antarctica*, *Gleichenia microphylla*, *Carex appressa*, *Isolepis inundata*, *Persicaria hydropiper*, *Parsonsia brownii* and *Coprosma quadrifida*. On the drier edges, conspicuous species variously include *Tetrarrhena juncea*, *Austrocynoglossum latifolium*, *Lepidosperma elatius*, *Cyathea australis*, *Hydrocotyle hirta*, *Histiopteris incisa* and *Stellaria flaccida*. *Astelia australiana* can be an extremely localised component species (near Powelltown).

Ecological overview

This EVC occurs in high rainfall forest situations and can occupy peat or organic silts overlying an elevated water-table. Inundation varies with rainfall flushes and is mostly shallow, but the habitat largely remains more or less persistently waterlogged (except possibly during drought conditions). .

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is generally not likely to be subject to environmental watering. Catchment management issues are important. Some examples of this EVC are potentially vulnerable to alterations to water supply caused by dams or diversions, and the impacts of disturbances in the catchment, including land clearance and hot fires.

Floodplain Grassy Wetland EVC 809

EVC description

Defining characteristics: Wetland dominated by floating aquatic grasses (which persist to some extent as turf during drier periods), occurring in the most flood-prone riverine areas. Typically treeless, but sometimes with thickets of saplings or scattered more mature specimens of River Red-gum *Eucalyptus camaldulensis*. Restricted, Murray River floodplain, primarily within Barmah Forest.

Indicator species: *Pseudoraphis spinescens* and/or sometimes *Amphibromus fluitans or Cynodon dactylon* var. *pulchellus*, with associated species variously including *Azolla filiculoides*, *Myriophyllum crispatum*, *Eleocharis acuta*, *Persicaria prostrata*, *Lachnagrostis filiformis* s.s., *Ludwigia peploides* subsp. *montevidensis*, *Nymphoides crenata*, *Stellaria caespitosa*, *Juncus ingens* and *Centipeda* spp. (and in drier north-western Victoria, *Sporobolus mitchellii* in association with *P. spinescens*).

Ecological overview

Inundation of this EVC is generally not sustained at depths in excess of 1.5 m and its frequency of inundation varies with annual/seasonal rainfall. The vegetation is reasonably tolerant of gaps between inundation events provided they are not particularly sustained. The duration of inundation for this EVC is usually not much more than six months, and it can be very damaging if inundation is sustained into late summer. The relevant vegetation types generally drain and dry soon after flood recession (i.e. inundation is not held up by groundwater). The salinity of the habitat typically remains very low.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Occasional
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
If supplying environmental water to a dry wetland, this EVC is better primed to a shallow depth first. Wetlands supporting this EVC are largely stressed as a consequence of the sequence of prolonged drought followed by the excessive flooding of 2010-2012. This resulted in the broad-scale loss of *Pseudoraphis spinescens* (Spiny Mud-grass).

Floodplain Riparian Woodland EVC 56

EVC description

Defining characteristics: Eucalypt dominated woodland of well developed floodplains of less arid areas, often including treeless wetland areas (referable to Floodplain Wetland Aggregate [EVC 172]). At maximum development, Floodplain Riparian Woodland represents the vegetation of a mosaic of terraces, active floodways and former channels and consequently a number of communities indicative of a range of hydrological conditions. Parts of the floodplain which typically lack obligate wetland species (e.g. levees which are only intermittently and briefly subject to flooding if at all) may support vegetation referable to the non-wetland EVC Riparian Woodland. This internal variation within the EVC has led to the additional mapping labels Floodplain Riparian Woodland/Billabong Wetland Mosaic and Floodplain Riparian Woodland/Floodplain Wetland Mosaic. It is rare that the more distinctive wetland components within Floodplain Riparian Woodland are at a sufficient scale to allow comprehensive separation during vegetation mapping exercises. In functional terms all three potential labels are usually equivalent, though in instances it may be possible to distinguish the larger areas of better developed wetland within the relevant area of floodplain. Floodplains of less arid southern and eastern parts.

Indicator species: *Eucalyptus camaldulensis*, *Eucalyptus viminalis* (sometimes with *Eucalyptus ovata* and/or *Eucalyptus radiata*), *Acacia mearnsii*, *Acacia dealbata*, *Acacia melanoxylon. Poa labillardierei* and *Carex* spp.

Ecological overview

At maximum, the majority of the extent of this EVC is subject to only intermittent and brief inundation during floods and does not constitute wetlands in the stricter sense. However, the wooded zone around the outer edge of billabongs or other wetlands on floodplains can represent the wetter extremes of this EVC. On low-lying parts of floodplains, Floodplain Riparian Woodland can be represented within transitions into Tall Marsh (EVC 821) or Swamp Scrub (EVC 53) that can constitute marginal wetland. Within Floodplain Riparian Woodland, flooding is usually irregular and mostly free-draining, with areas prone to more prolonged inundation generally determined by the bathymetry of the associated wetlands. The general habitat may include substantial dry periods and can also be influenced by groundwater.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Fringing	Inundation periodic but brief	Common
Intermittent	Inundated 3–7 years in every 10	Occasional
Episodic	Inundated less than 3 years in every 10	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Management considerations		
The water requirements of the portions of the EVC that represent marginal wetland habitat (including zones transitional to wetter EVCs) are best established by setting inundation regimes for the adjacent wetter habitats.		

Floodplain Thicket EVC 280

EVC description

Defining characteristics: Dense shrubby vegetation of braided channel systems of poorly-drained broad alluvial flats associated with floodplain habitats. Characterised by the diversity of *Melaleuca* and *Leptospermum* spp. present. Floodplain Thicket has floristic affinities with forms of Riparian Scrub (EVC 191) and Swamp Scrub (EVC 53). As well as indicator species (listed), aquatics are present in channels. Localised to the vicinity of the Grampians.

Indicator species: Mixtures of *Melaleuca* spp. (*M. squarrosa*, *M. squamea*, *M. gibbosa*, *M. decussata*) and *Leptospermum* spp. (*L. continentale*, *L. scoparium*, *L. obovatum*, *L. lanigerum*), variously with *Hakea nodosa*, *Acacia provincialis*, *Acacia verticillata*, *Callistemon rugulosus*, *Gahnia sieberiana*, *Baumea tetragona*, *Empodisma minus* and aquatics in channels.

Ecological overview

The extent of inundation for this EVC is highly variable according to seasonal/annual rainfall, and is not necessarily continuous over wetter periods of the year. The local topography of the EVC is variable and includes low-lying, wetter areas. Small depressions included within the extent of the EVC may retain water longer, however inundation of the broader area is usually relatively brief and in lower part of the range of duration. Salinity is in the lower part of the category range of fresh.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The extent to which environmental watering may be relevant to this EVC is unclear. Environmental flows for streams with upstream impoundments may potentially influence this EVC. If releases are relevant, these should occur during cooler months.

Floodplain Wetland Aggregate EVC 172

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with wetlands of riparian floodplains, best developed in association with Floodplain Riparian Woodland. Potentially includes mosaics of scrub/shrubland, reedbed, sedgeland, rushland, grassland and/or herbland zones. The following components are variously recognisable within Floodplain Wetland Aggregate: Aquatic Herbland (EVC 653), Aquatic Sedgeland (EVC 308), Tall Marsh (EVC 821), Swamp Scrub (EVC 53), Wet Verge Sedgeland (EVC 932), Floodway Pond Herbland (EVC 810) and Dwarf Floating Aquatic Herbland (EVC 849). Billabong Wetland Aggregate (EVC 334) is also an aggregate EVC including many of these components. Floodplains of major streams, principally in less arid areas.

Indicator species: See descriptions of component EVCs.

Ecological overview

This aggregate EVC represents a range of wetland habitats present on floodplains, and is highly variable according to position on the floodplain, likelihood of inundation and local topography. These wetlands can be maintained by combinations of runoff, flooding and groundwater.

Phase context of EVC representation

While the aggregate EVC is effectively continuously represented, some of the component EVCs may express only during the inundated or drying phases.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
>6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
If environmental water is delivered, the inundation regime would ideally be set according to the component EVCs, where possible, and would best occur during the cooler seasons. While summer floods occur, these do not necessarily promote maintenance of diversity. If restoring an original flooding regime, some caution (and perhaps a staged approach) is important. This would require some assessment to determine if the vegetation patterns have changed under reduced flow regimes, and whether the proposed new regime poses any threats to the residual biodiversity values.

Floodway Pond Herbland EVC 810

EVC description

Defining characteristics: Low herbland on the drying mud of floors of ponds on floodway systems (mainly riverine floodplains). The floristics (and diversity) can be quite variable (both spatially and temporally), according to the traits of the relevant individual pond. The floristics also vary in temporal cycles with the unvegetated unit (EVC 990) and probably between seasons at some locations. Widely dispersed along major riparian floodplains, especially of Murray River and tributaries.

Indicator species: *Centipeda* spp., *Stellaria caespitosa*, *Dysphania glomulifera* subsp. *glomulifera*, *Fimbristylis* spp., *Polygonum plebeium*, *Glinus* spp., *Persicaria* spp., *Alternanthera* spp., *Lachnagrostis filiformis* s.s.; sometimes with narrow fringes of *Pseudoraphis spinescens*, *Eleocharis acuta* and/or *Carex gaudichaudiana*. Semi-arid versions can include an increased component of species shared with the lacustrine habitat (notably *Glycyrrhiza acanthocarpa*, *Heliotropium* spp. *and Glossostigma elatinoides*).

Ecological overview

The habitat of this EVC occurs in highly variable systems, which can remain inundated well into summer, with frequency of inundation variable between and at sites. In general, seed reserves of at least most species appear to be able to tolerate sequences of dry years (e.g. intermittent conditions) as well as prolonged flooding.

Phase context of EVC representation

Drying

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Water should not be retained artificially, particularly for protracted periods, as expression of species during the natural drawdown process is considered critical.

Floodway Pond Herbland/Riverine Swamp Forest Complex EVC 945

EVC description

Defining characteristics: River Red-gum with a ground-layer dominated by herbaceous species largely shared with Floodway Pond Herbland (EVC 810) and/or Aquatic Herbland (EVC 653), or with the ground-layer virtually absent (due to thick accumulations of forest litter or persistence of black water, or sometimes excluded by dense thickets of young River Red-gum *Eucalyptus camaldulensis* regeneration). The abundance of annual species can be highly variable between seasons (and equivalent seasons in different years). Dispersed on floodplains of the Murray River and major tributaries, also some lake verges in the Wimmera.

Indicator species:

Murray Mallee - *Eucalyptus camaldulensis with Lachnagrostis filiformis* s.s., *Centipeda cunninghamii*, *Alternanthera* spp., *Persicaria* spp. - especially *Persicaria prostrata*, and sparse *Eleocharis acuta* or *Pseudoraphis spinescens*; also variously *Gnaphalium polycaulon*, *Cynodon dactylon* var. *pulchellus*, *Centipeda minima* s.l. and *Eclipta platyglossa*.

Mid-Murray (e.g. Barmah) - *Eucalyptus camaldulensis* with *Lachnagrostis filiformis* s.s., *Lachnagrostis filiformis* s.l., *Stellaria caespitosa*, *Centipeda* spp., especially *C. cunninghamii*, *Alternanthera denticulata s.s.*, *Persicaria* spp. (*P. prostrata*, *P. decipiens*, *P. hydropiper*), *Myriophyllum crispatum* and *Eleocharis acuta*, sometimes with a component of *Juncus ingens*, *Cyperus gunnii* or *Typha* spp.

Ecological overview

Subject to later inundation events (i.e. mid to late summer), the EVC represents a combination of occurrence of *Eucalyptus camaldulensis* (River Red-gum), suitable habitat for herbs occupying drying mud and the more or less exclusion of *Pseudoraphis spinescens* (Spiny Mud-grass) and *Eleocharis acuta* (Common Spike-sedge). Inundation can occasionally include periods over six months, does generally not exceed eight months and is infrequent at this upper limit. Can be discontinuous, receiving water for minor flood events.

Phase context of EVC representation

While at least the overstorey is continuously evident, expression of the herbaceous ground-layer is largely restricted to the drying phase.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Occasional

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common

Management considerations

In some cases, management will aim to maintain the River Red-gum (see notes under Riverine Swamp Forest [EVC 814]). In other cases, such as where the tree component may have colonized previously treeless floodway pond habitats, its presence may not be desired. In the latter case, an applied watering regime may be aimed at drowning at least a component of the red gums, especially in the case of dense growth of young trees.

Forest Bog EVC 723

EVC description

Defining characteristics: Wetland comprising an open, frequently pedestalled shrubland with open clumps of large graminoids (notably restiads), and with the lower strata dominated by semi-aquatic herbs or *Sphagnum* moss. Very rare, localised variants occurring within forest communities of South Gippsland and the south-west of the State.

Indicator species:

South Gippsland - *Melaleuca squarrosa*, *Baloskion tetraphyllum*, *Sphagnum* spp., *Isolepis fluitans*, with *Goodenia humilis*, *Amphibromus recurvatus*, *Myriophyllum simulans*, *Carex appressa*, *Eleocharis acuta* and *Cycnogeton procerum* s.l.

South-west Victoria - *Melaleuca squarrosa*, *Baloskion tetraphyllum*, *Juncus procerus* and *Lepidosperma longitudinale*, with *Villarsia exaltata*, *Myriophyllum simulans*, *Isolepis fluitans* and *Baumea tetragona*.

Ecological overview

The habitat of this EVC occurs in groundwater fed systems within forest areas. Tolerance of drier periods is very poorly known for this EVC.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This habitat is dependent on protection of the catchment and groundwater levels rather than the delivery of environmental water, which would presumably not be feasible. Potential threats to this EVC include the impacts of dams, groundwater extraction, adjacent pine plantations and fire burning into peat soils when the wetland is dry.

Forest Creekline Sedge Swamp EVC 728

EVC description

Defining characteristics: Sedge dominated wetlands of drainage line terraces within moist to wet forest areas. Very restricted occurrences in Southern Victoria, mainly in highlands.

Indicator species: *Carex appressa*, *Carex fascicularis*, *Cyperus lucidus* and *Phragmites australis*, with herbs such as *Epilobium pallidiflorum*, *Gratiola* spp. and *Lythrum salicaria*, and other associated species variously including *Acacia melanoxylon*, *Kunzea ericoides s.l.*, *Rubus parviflorus*, *Stellaria flaccida*, *Gleichenia microphylla*, *Hypolepis rugosula*, *Blechnum minus*, *Juncus gregiflorus* and *Persicaria decipiens*. *Lepidosperma elatius* can be dominant on the drier verges.

Ecological overview

This EVC is fed by rainfall events in association with a high water-table. Waterlogging of the habitat is generally more or less permanent. While prolonged inundation is mostly shallow (not much over 30 cm), this EVC can remain inundated for much of the time during wet years, although not necessarily continuously so.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC typically occurs in habitats outside of the capacity or requirement to supply environmental water. Potential issues are bathymetric modification (e.g. dams above or below the wetland) that alter the stream flow and/or influence water retention with the wetland.

Freshwater Lake Aggregate EVC 718

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the floors and verges of freshwater lakes. Central deeper areas can support Aquatic Herbland (EVC 153), Submerged Aquatic Herbland (EVC 918) or open water (and bare earth or Lake Bed Herbland [EVC 107] when dry). A range of communities can occur on the fringes (see landscape profile key). Variants of Tall Marsh (EVC 821) are often present in more sheltered verges. Scattered, mainly western areas.

Indicator species: See descriptions of component EVCs.

Ecological overview

In general this aggregate is too complex and variable (in relation to the components represented) to determine specific hydrological requirements.

Phase context of EVC representation

While some components of the aggregate are continuously represented, representation of others can be restricted to the either the inundated or drying phases.

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Occasional
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Occasional
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If delivering environmental water, hydrological requirements can be evaluated by consideration of the component EVCs, ideally using the outer zone of the wetland as a reference if possible.

Freshwater Lignum - Cane Grass Swamp EVC 954

EVC description

Defining characteristics: Open grassy shrubland of wetland dominated by *Eragrostis infecunda* with *Duma florulenta*, usually very species-poor in central deeper areas, but potentially diverse and herb-rich on the outer fringes. Scattered on drier plains of the north and west of the State.

Indicator species: *Duma florulenta*, *Eragrostis infecunda*, *Eleocharis acuta*, *Lachnagrostis filiformis* s.s., *Marsilea drummondii*, *Potamogeton tricarinatus* s.l. and *Rumex* spp. Additional species from the richer outer verges include *Rytidosperma duttonianum*, *Amphibromus nervosus*, *Carex tereticaulis*, *Centipeda cunninghamii*, *Eryngium vesiculosum*, *Eclipta platyglossa*, *Asperula conferta*, *Goodenia heteromera*, *Haloragis aspera*, *Juncus flavidus*, *Lobelia concolor*, *Teucrium racemosum* s.l. and *Senecio* spp.

Ecological overview

The IWC has a narrower circumscription of this wetland EVC than its original use in state based vegetation mapping or modelling. This EVC is poorly known, with data available only from during a period of wet years. It is wetter than Lignum Swamp (EVC 104), featuring *Eragrostis infecunda* (Southern Cane-grass) in association with scattered plants of *Duma florulenta* (Tangled Lignum) and aquatic herbs. While it is likely that inundation of this EVC may sometimes exceed six months by a short period, it is presumed that the relevant wetlands dry out at least annually. These wetlands can show substantial variation in microtopography, including development of a patchwork of small but deep, gilgai-like depressions. The longer inundation period is relevant only to the deeper parts of the wetland. It is presumed that the vegetation is tolerant of gaps of several years without inundation and is possibly vulnerable to damage from the activities of carp if subject to excessively frequent and sustained inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

It is presumed that the maximum depth of inundation will be limited by the bathymetry of wetland. It is important not to artificially impound water to prolong inundation.

Freshwater Lignum Shrubland EVC 657

EVC description

Defining characteristics: Open shrubland on fringes of wetlands (typically shallow lakes) on basalt, potentially in intermittently damp sites but above normal inundation levels and lacking obligate wetland flora. Highly restricted, scattered remnants in lower-rainfall areas of the western volcanic plain.

Indicator species: *Duma florulenta*, with associated species including *Rytidosperma duttonianum*, *Poa labillardierei*, *Haloragis aspera*, *Epilobium billardierianum*, *Juncus flavidus*, *Oxalis exilis* and *Rumex brownii.*

Ecological overview

The IWC has a narrower circumscription of this wetland EVC than its original use in state based vegetation mapping or modelling. This EVC occurs as a fringe to wetlands, notably on stony basaltic terrain. It is presumably tolerant of long dry periods within the wetlands which it fringes.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In the IWC circumscription, this EVC is dependent on protection of the local catchment (e.g. from diversion of drainage, development, inputs of stormwater) rather than the supply of environmental water to the adjacent wetland. It may also be vulnerable to sustained changes to groundwater levels.

Gahnia Sedgeland EVC 968

EVC description

Defining characteristics: Species-poor, tall and usually dense sedgeland vegetation of near-coastal soaks. Rare, south-west Victoria and Gippsland.

Indicator species: *Gahnia trifida* and/or *Gahnia clarkei*, variously with *Schoenus carsei*, *Baumea juncea* and robust forms of *Triglochin striata.*

Ecological overview

Inundation events at this EVC are likely to be interrupted/discontinuous, dependent on annual conditions and variable according to climatic conditions.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

This EVC is dependent on the maintenance of groundwater levels and protection of local catchments. It occurs in situations unlikely to have the potential or requirement for supply of environmental water.

Granite Rock-pool Wetland EVC 1112

EVC description

Defining characteristics: Herbland of seasonal ponds on granite exposures, generally dominated by annual species. Extremely restricted extent, in scattered locations on outcropping granite in northern Victoria.

Indicator species: Variously including *Myriophyllum striatum*, *Myriophyllum porcatum*, *Isoetes muelleri*, *Glossostigma cleistanthum*, *Myriocephalus rhizocephalus*, *Crassula closiana*, *Limosella australis*, *Montia fontana*, *Isolepis* spp., *Aphelia gracilis*, *Lythrum hyssopifolium* and *Callitriche umbonata*, largest and deepest examples with *Eleocharis acuta* and *Amphibromus nervosus*; *Crassula decumbens* on margins.

Ecological overview

This EVC is maintained by extremely local runoff following rainfall.

Phase context of EVC representation

Maximum expression of the floristics of this EVC occurs during the drying phase, with some species continuously evident.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water to this EVC is neither relevant nor practically feasible.

Grassy Riverine Forest EVC 106

EVC description

Defining characteristics: Open eucalypt dominated forest (to woodland) with a grassy understorey, dominated by species indicative of reasonably regular flooding (notably *Paspalidium jubiflorum*), but also tolerant of sustained dry periods. Murray River system downstream from Hume Weir.

Indicator species: *Eucalyptus camaldulensis* with *Paspalidium jubiflorum* dominant in the ground-layer, associated species include *Centipeda cunninghamii*, *Brachyscome basaltica* var. *gracilis*, *Wahlenbergia fluminalis*, *Chamaesyce drummondii*, *Senecio quadridentatus*, *Rumex brownii* and *Cynodon dactylon* var. *pulchellus*; with *Eleocharis acuta* relatively minor if present.

Ecological overview

The ecological context of this EVC is sometimes misunderstood, and it has been at times incorrectly grouped with less flood-prone vegetation types. It typically occurs in highly flood-prone situations, though these may drain quickly following flood recession due to a high sand component in the relevant soils. It occurs further down the elevation profile than Sedgy Riverine Forest (EVC 816) but is further down the elevation profile where these two EVCs occur in proximity. Grassy Riverine Forest generally occurs in habitats subject to inundation persisting up to and around the middle of the range of duration (e.g. three to four months maximum under normal conditions). It is typically drained by early summer, which allows growth of *Paspalidium jubiflorum* (Warrego Summer-grass), even if it is sometimes subject to repeated shallow flooding later in the season. While inundation is potentially deeper during major flooding events, it is not sustained at these depths for long periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental watering is undertaken, it is important to follow a winter-spring flooding regime, allowing for natural delays in arrival of water at locations further downstream along the Murray River. This is consistent with the natural patterns of high flows that occur following rainfall and snow-melt in the upper catchment.

Grassy Riverine Forest/Floodway Pond Herbland Complex EVC 811

EVC description

Defining characteristics: Eucalypt dominated forest or woodland of flood-prone areas, where herbaceous species characteristic of drying mud within wetlands (Floodway Pond Herbland [EVC 810] or in part Lake Bed Herbland [EVC 107]) are conspicuous in association or fine-scale mosaic with *Paspalidium jubiflorum* and other species characteristic of Grassy Riverine Forest (EVC 106). Restricted extent, Murray River system mainly in far north-west, but upstream at least as far as Barmah Forest.

Indicator species: *Eucalyptus camaldulensis,* with *Paspalidium jubiflorum* conspicuous in association or mosaic with *Persicaria* spp. (in particular *P. decipiens*), *Centipeda cunninghamii* and/or *Glycyrrhiza acanthocarpa*. Other conspicuous species variously include *Senecio* spp., *Stemodia florulenta*, *Eclipta platyglossa*, *Chamaesyce drummondii*, *Lachnagrostis filiformis*, *Alternanthera denticulata* s.l., *Cynodon dactylon* var. *pulchellus*, *Euchiton sphaericus*, *Poa fordeana* and *Cardamine moirensis*.

Ecological overview

This EVC is a wetter variant of the riverine forests of the further downstream portion of the Murray River floodplain. Relative to Grassy Riverine Forest/Riverine Swamp Forest Complex (EVC 812) it is either subject to longer gaps between inundation events, or occurs where water persisting into summer in lower lying portions (including networks of very minor floodways) inhibits the species which characterize the ground-layer of Riverine Swamp Forest (EVC 814). If Grassy Riverine Forest/Floodway Pond Herbland Complex is inundated to over one metre depth (e.g. in floodways), then this is not by very much, but may be briefly at greater depths during flood peaks.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

As for Grassy Riverine Forest (EVC 106), environmental watering of this EVC should attempt to mimic timing of natural flow events, allowing natural drawdown to occur and avoiding artificial retention of water,.

Grassy Riverine Forest/Riverine Swamp Forest Complex EVC 812

EVC description

Defining characteristics: Eucalypt dominated forest of flood-prone areas, where the understorey dominants (e.g. *Eleocharis acuta* and/or *Pseudoraphis spinescens*) of Riverine Swamp Forest (EVC 814) are conspicuous in association or fine-scale mosaic with the larger tussock species (principally *Paspalidium jubiflorum*) characteristic of Grassy Riverine Forest (EVC 106). Murray River system, very restricted outside of Barmah Forest.

Indicator species: *Eucalyptus camaldulensis*, with *Paspalidium jubiflorum*, in association or mosaic with *Eleocharis acuta* and/or *Pseudoraphis spinescens.* Other conspicuous species variously include *Persicaria* spp. (in particular *P. prostrata*), *Cynodon dactylon* var. *pulchellus*, *Centipeda cunninghamii*, *Eclipta platyglossa*, *Cardamine moirensis*, *Alternanthera denticulata* s.l., *Lachnagrostis filiformis* s.s., *Centipeda minima* s.l. and *Wahlenbergia fluminalis*.

Ecological overview

This EVC occurs in areas receiving reasonably reliable winter-spring flooding. Relative to Grassy Riverine Forest (EVC 106), this EVC occurs in less freely draining sites that typically dry out by early summer, such as along floodways and around swampy basins. It generally clearly occurs at a lower elevation in the topographical profile than vegetation including Basket Sedge or Poong'ort (*Carex tereticaulis*), which is more easily drowned than Warrego Summer-grass (*Paspalidium jubiflorum*). However, this EVC sometimes occurs in a fine-scale mosaic with the Basket Sedge - Spiny Mud-grass (*Pseudoraphis spinescens*) dominated understorey of Sedgy Riverine Forest/Riverine Swamp Forest Complex (EVC 817), occupying shallow sand lenses overlying heavy soils which are subject to shallower but sustained inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Timing of the inundation period is important. As for Grassy Riverine Forest (EVC 106).

Grey Clay Drainage-line Aggregate EVC 124

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the inundation-prone habitat of slightly mineralised drainage lines in more elevated parts of the basalt plains. The EVC is rare and localised, identified from very few locations, and includes habitat of the extremely localised *Carex tasmanica*. The vegetation of associated grassy terraces, subject to occasional inundation, has affinities with the non-wetland EVC Creekline Tussock Grassland. The components of Brackish Herbland (EVC 538) and Brackish Aquatic Herbland (EVC 537) are also variously recognisable within the vegetation aggregate. Rare, western Volcanic Plains.

Indicator species: Various associations *of Carex tasmanica*, *Lachnagrostis adamsonii* s.l., *Isolepis cernua*, *Ranunculus diminutus*, *Lobelia irrigua*, *Eleocharis acuta*, *Distichlis distichophylla*, *Juncus kraussii* subsp. *australiensis*, *Apium* spp., *Poa labillardierei*, *Calocephalus lacteus*, *Samolus repens* and forms of *Asperula conferta.*

Ecological overview

This aggregate EVC incorporates sites with a range of associated hydrology, including ponds and flood-prone flats associated with low gradient drainage lines as well as shallow seasonal wetlands. Water depth rarely exceeds 30 cm for any duration, except potentially to some extent in ponds within drainage lines. The wetlands are maintained by a combination of local run-off and mineralized sub-saline ground water which appears to also include a calcareous component.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very Shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Common
Calcareous	N/A	Common (to some extent)

Management considerations

In general, the supply of environmental water is not relevant. This EVC is dependent on the maintenance of the groundwater conditions and protection of the local catchment.

Herb-rich Gilgai Wetland EVC 956

EVC description

Defining characteristics: Herbland of very small, seasonally wet gilgai depressions on heavy soil plains, occurring as part of a mosaic within drier woodland and grassland formations. Where present, surrounding trees can include *Eucalyptus camaldulensis*, *Eucalyptus largiflorens*, *Eucalyptus microcarpa* and/or *Allocasuarina luehmannii*. Formerly widespread in lowland plains areas of northern and western Victoria, but now very rare as a consequence of agricultural practices.

Indicator species: Herbs are conspicuous, generally in association with Nardoo and Spike-rushes. Grasses are typically a minor component where present. Component species variously include *Lobelia pratioides*, *Lobelia concolor*, *Goodenia* spp., *Marsilea drummondii*, *Rumex tenax*, *Haloragis* spp., *Eleocharis acuta*, *Eleocharis pusilla*, *Eleocharis pallens* and *Amphibromus* spp.

Ecological overview

While the EVC is continuously present, the floristics can be at least partly obscured during drought conditions. The extent and duration of wetness varies according to annual/seasonal rainfall, and the vegetation is reasonably tolerant of dry periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is primarily dependent on protection of the local catchment. In general the provision of environmental water is unlikely to be relevant, except possibly in suburban/peri-urban contexts where the local catchment has been excised. The use of storm-water in remnant wetlands is potentially highly destructive to diversity and wetland condition.

Hypersaline Inland Saltmarsh Aggregate EVC 708

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the floors and verges of hypersaline lakes. Typically comprising salt pan areas (sometimes occupied by aquatic halophytic monocots during wet phases), fringed by a monospecific (or nearly so) low shrubland of stunted succulent chenopods. Drier western and north-western Victoria.

Indicator species: *Tecticornia* spp. and *Lepilaena/Ruppia* spp.

Ecological overview

This aggregate EVC is largely maintained by saline groundwater, is generally tolerant of shallow inundation but is easily damaged by excessive inundation (e.g. disposal of agricultural run-off). The deeper portions of the wetland (e.g. saltpans) are potentially inundated for longer periods, but these are often lacking vascular vegetation or support Saline Aquatic Meadow (EVC 842). See notes under Samphire Shrubland (EVC 101) for additional comment. Flooding towards the upper limit of the wetland may occur but is generally damaging if sustained within the samphire zone. Salinity within the water body may be temporarily lower during inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hypersaline	>50,000–350,000	Common

Management considerations

Careful consideration of ecological values and potential risks is required if delivery of environmental water is under consideration.

Intermittent Swampy Woodland EVC 813

EVC description

Defining characteristics: Eucalypt (+/- Acacia) dominated woodland with (variously shrubby) rhizomatous sedgy - turf grass understorey, at best development dominated by flood-stimulated species in association with flora tolerant of inundation. The floristics are variable and often appear modified as a consequence of disturbance. Riverine floodplains of north-west and lake verges of Wimmera and southern Mallee.

Indicator species: *Eucalyptus camaldulensis* with *Acacia stenophylla* (+/- *Eucalyptus largiflorens* and relatively open *Duma florulenta*). Major species include *Sporobolus mitchellii*, *Cyperus gymnocaulos*, *Cressa australis*, *Haloragis aspera*, *Centipeda cunninghamii*, *Sphaeromorphaea australis*, *Stemodia florulenta*, *Lachnagrostis filiformis* s.s., *Wahlenbergia fluminalis* and *Calocephalus sonderi*, with *Paspalidium jubiflorum* typically a very minor species if present. In an extremely localised variant of flood-prone sandy terraces connected to the river or major floodway creeks, *Eragrostis* spp. and *Cynodon dactylon* var. *pulchellus* can be locally dominant - this variant is considered transitional towards Riverine Swamp Forest.

Ecological overview

Composition and hydrology of this EVC vary according to context (e.g. on riverine flats versus lake verges). Depth of inundation can occasionally just exceed one metre, especially in transitions towards Lake Bed Herbland (EVC 743) in lacustrine situations. If hyposaline conditions occur, then they are only at the lower end of the range (e.g. during drawdown in lacustrine situations). The *Eucalyptus camaldulensis* (River Red-gum) trees associated with this EVC have frequently been drowned by excessive watering of wetlands (e.g. to attract ducks or through linkage to the irrigation system), and relatively intact examples with living trees are very rare over much of the former range of this EVC. If the EVC is flooded for periods longer than six months (e.g. where this EVC occurs in shallow lakes, where it can be transitional to other EVCs, e.g. Lake Bed Herbland [EVC 743] and Alluvial Plains Semi-arid Grassland [EVC 806]), adequate dry periods are important to provide recovery time. On riverine floodplains (primarily along the Murray River), it would probably be difficult to supply excessive watering just from river flows. On floodplains, several months of inundation during the cooler months are beneficial for the relevant version of the EVC, but only marginal for true aquatics which occur at the wet end of tolerance for this EVC. In zones subject to deeper and more prolonged inundation (e.g. with components of Aquatic Herbland [EVC 653] or Lake Bed Herbland (EVC 107]), trees are sparser, and inundation can potentially last up to nine months as an absolute maximum. In these habitats, it is desirable to have a break of a year or more from inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
	>6 months (but not permanent)	Occasional

Water depth		
Category	**Range (cm)**	**EVC preference**
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional
Management considerations		
If environmental watering of this EVC occurs, it is advantageous to prime the wetland, e.g. to a level of one third full first. If the water is supplied in autumn or after drought a longer break is required prior to topping up. It is important that environmental water is not artificially retained in the wetland and that natural drawdown is allowed. In deeper wetlands, inundation up to eight months may be acceptable if events are spaced, but the vegetation can be compromised by subsequent natural flooding if this occurs before the wetland dries out adequately. This situation can result in a period of inundation exceeding the tolerance of the structural dominant of this EVC.		

Intermittent Swampy Woodland/Lake Bed Herbland Complex EVC A119

EVC description

Defining characteristics: Open eucalypt dominated woodland with a ground-layer including a substantial component of herbaceous (to semi-shrub) species adapted to drying mud within lake beds. Some of these evade periods of prolonged inundation as seed, while others persist as dormant tuberous rootstocks. Occurs on the beds of less saline, relatively shallow lakes of the Wimmera and southern Mallee/western Riverina, with the herbaceous component expressing following drawdown.

Indicator species: *Eucalyptus camaldulensis* with ground-layer species variously including *Glycyrrhiza acanthocarpa*, *Malva* aff. *preissiana*, *Cullen cinereum*, *Trigonella suavissima*, *Glossostigma elatinoides*, *Sporobolus mitchellii*, *Cressa australis*, *Heliotropium curassavicum*, *Centipeda cunninghamii*, *Centipeda minima* s.l., *Polygonum plebeium*, *Lachnagrostis filiformis* s.s., *Senecio runcinifolius*, *Dysphania pumilio* and *Helichrysum luteoalbum*. Aquatic species including *Myriophyllum verrucosum* and *Potamogeton tricarinatus* s.l. can remain evident for a short period following drawdown.

Ecological overview

In this EVC of shallow lakes, trees are sparser than in Intermittent Swampy Woodland (EVC 813). Inundation periods of potentially up to nine months occur as an absolute maximum. Depth can exceed one metre, but not by very much. In these habitats, *Eucalyptus camaldulensis* (River Red Gum) is approaching the limits of its tolerance to inundation and trees have frequently been drowned by excessive watering of wetlands (e.g. to attract ducks or through linkage to the irrigation system). Relatively intact examples with living trees are very rare. If this EVC is flooded for longer periods (e.g. longer than six months) adequate dry periods are important as recovery time. In these situations it is desirable to have a year or so break from inundation. During drawdown the wetland can be naturally hyposaline but this is only at the lower end of the category range.

Phase context of EVC representation

Drying

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations
If environmental watering of this EVC occurs, it is best to prime first, e.g. to a level of one third full, with a longer break until topping up if the water is supplied in autumn or after drought. It is important that environmental water is not artificially retained in the wetland and that natural drawdown is allowed. In deeper wetlands, inundation up to eight months may be acceptable if events are spaced, but the vegetation can be compromised by subsequent natural flooding if this occurs before the wetland dries out adequately. This situation can result in a period of inundation exceeding the tolerance of the structural dominant of this EVC.

Intermittent Swampy Woodland/Riverine Grassy Woodland Complex EVC 822

EVC description

Defining characteristics: Eucalypt (+/- Acacia) dominated woodland with (variously shrubby) rhizomatous sedgy - turf grass understorey, including mixtures of flood stimulated species in association with species characteristic of drier riverine woodlands. Rare, riverine floodplains of further north-west.

Indicator species: *Eucalyptus camaldulensis* (+/- *Eucalyptus largiflorens*) with *Sporobolus mitchellii*, *Cyperus gymnocaulos* and species including *Rytidosperma* spp., *Lobelia concolor*, *Wahlenbergia fluminalis*, *Brachyscome basaltica* var. *gracilis*, *Brachyscome dentata*, *Vittadinia* spp. and *Cymbonotus lawsonianus*.

Ecological overview

As for Intermittent Swampy Woodland (EVC 813) in floodplain situations, but with shallower and relatively brief inundation. The depth of inundation rarely exceeds 30 cm. River regulation means this EVC is increasingly dependent on occasional, large flood events.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

It is probably difficult to deliver much environmental water to this EVC without undertaking engineering works that could potentially create additional undesirable ecological effects.

Lake Bed Herbland EVC 107

EVC description

Defining characteristics: Herbland dominated by species adapted to drying mud within lake beds. Some evade periods of prolonged inundation as seed, others as dormant tuberous rootstocks. Less saline lakes of north-western areas.

Indicator species: Variously including *Glycyrrhiza acanthocarpa*, *Malva preissiana* s.l., *Glossostigma* spp., *Solanum simile*, *Dysphania pumilio*; also localised species including *Austrobryonia micrantha*, *Nicotiana goodspeedii* and *Cullen* spp.

Ecological overview

This EVC is expressed in the wetland during and, to some extent, following drawdown. It typically includes species that are adapted to sustained periods of dormancy (as seed or in some cases persistent underground parts). This habitat can become superficially saline on drying out, through concentration of salt at the soil surface through evaporation, but is primarily fresh when the wetland is full or when rain has flushed superficial salt accumulations from the soil surface.

Phase context of EVC representation

Drying

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

If delivering environmental water, allow natural drawdown following watering.

Lava Plain Ephemeral Wetland EVC 974

EVC description

Defining characteristics: Low herbland of small ephemeral wetlands within stony swales of geologically recent lava flows, on shallow brown loamy soils. Fringing dryland vegetation typically including *Melicytus* spp. (Tree Violet/ Shrub Violet). Extremely restricted and localised, known only from near Mt Napier in the further south-west of the State and near Werribee.

Indicator species: Conspicuous species at known sites include *Persicaria prostrata*, *Oxalis* sp. aff. *exilis* (glabrescent), *Haloragis aspera*, and *Dichondra repens*, with associated species variously including *Isolepis fluitans*, *Eleocharis pusilla*, *Marsilea costulifera*, *Lachnagrostis filiformis* s.s., *Alternanthera* sp. 1 (Plains), *Carex inversa*, *Crassula peduncularis*, *Hydrocotyle sibthorpioides*, *Hypoxis vaginata*, *Lythrum hyssopifolia*, *Rumex brownii*, *Cullen parvum*, *Rytidosperma caespitosum* and *Rytidosperma duttonianum.*

Ecological overview

This EVC occurs in habitat which is typically at the fresher end of the salinity range. If inundated for over one month, it does not exceed the duration by much and inundation is not necessarily continuous through the cooler and wetter seasons. The duration, frequency and extent of wetness will vary according to annual climatic conditions.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is dependent on protection of the local catchment (e.g. from diversion of drainage, development, inputs of stormwater) rather than the delivery of environmental water.

Lignum Shrubland EVC 808

EVC description

Defining characteristics: Relatively open shrubland of species of twiggy growth-form. The ground-layer is typically herbaceous or a turf grassland, rich in annual/ephemeral herbs and small chenopods. North-western areas of Victoria, mainly in the more elevated parts of riverine floodplains.

Indicator species: *Duma florulenta* and/or *Chenopodium nitrariaceum*, or sometimes *Eragrostis australasica* or *Duma horrida* subsp. *horrida*, with a diverse ground-layer of small chenopods and annual herbs in the far north-west, more grassy-herbaceous in character in the southern Mallee. Associated species as follows -

Riverine Lignum Shrubland:
Sclerochlamys brachyptera, *Plantago cunninghamii*, *Goodenia* spp., *Bulbine semibarbata*, *Brachyscome lineariloba*, *Brachyscome ciliaris*, *Isoetopsis graminifolia*, *Rhodanthe corymbiflora*, *Senecio glossanthus*, *Tetragonia eremaea* s.l., *Atriplex leptocarpa*, *Calotis hispidula*, *Calocephalus sonderi* and *Sporobolus mitchellii*.

Tall cane grass Lignum Shrubland:
Further north-west: *Eragrostis australasica*, *Lachnagrostis filiformis* s.s., *Asperula gemella*, *Chenopodium nitrariaceum*, *Eleocharis pallens* and *Senecio runcinifolius*.

Birchip (Chirrup Swamp, where transitional towards Cane Grass dominated Lignum Swamp [EVC 104]): *Eragrostis australasica*, *Amphibromus nervosus*, *Senecio runcinifolius*, *Lachnagrostis filiformis* var. 1 and *Epilobium billardierianum*.

Ecological overview

The EVC name Lignum Shrubland can be confusing, as the relevant vegetation is potentially dominated or co-dominated by a range of species other than *Duma florulenta* (Tangled Lignum), which may not even be present. This EVC occurs in more elevated and generally less water-retentive sites than Lignum Swamp (EVC104), and is inundated by either local run-off or higher level floods. The inundation regime of this EVC varies greatly with seasonal/annual rainfall. The water requirements are poorly known, but the relevant vegetation appears reasonably tolerant of prolonged dry periods. During most years inundation will be shallow if it occurs, but occasionally more substantial flooding events can occur. The duration of inundation of drier variants (e.g. dominated by *Chenopodium nitrariaceum*) generally appears unlikely to exceed a maximum of around three months. Wetter variants dominated by *Eragrostis australasica* (Cane Grass) or *Duma horrida* (Tangled Lignum) are perhaps more prone to instances of prolonged inundation, possibly even exceeding six months, but not as a frequent or characteristic event.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth		
Category	**Range (cm)**	**EVC preference**
Very shallow	<30	Common
Shallow to medium	30–100	Occasional
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional
Management considerations		
It is unlikely that it would be feasible to artificially water most examples of this EVC. If environmental water is delivered, then it should be supplied for only a short period, during cooler months and allow for natural drawdown.		

Lignum Swamp EVC 104

EVC description

Defining characteristics: A relatively heterogeneous group of species-poor wetlands dominated by robust and often dense lignum. Scattered in lower rainfall areas of north and west, including rain-shadow areas on basalt.

Indicator species: *Duma florulenta*, with species variously including *Eleocharis acuta*, *Marsilea drummondii*, *Eragrostis infecunda*, *Lachnagrostis filiformis* s.s., *Senecio runcinifolius*, *Senecio glossanthus*, *Rytidosperma duttonianum*, *Asperula gemella* and *Scleroblitum atriplicinum*.

Ecological overview

In this EVC, if depths of one metre are exceeded then they are towards the lower end of 1-2 m inundation range and are not maintained for prolonged periods. If the habitat is hyposaline then conditions are towards the lower end of the range. If duration of inundation exceeds six months then it is not by much, and is probably damaging if too prolonged. This EVC requires drying out annually.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

This EVC can withstand prolonged dry periods. If supplying environmental water, overwatering should be avoided.

Lignum Swampy Woodland EVC 823

EVC description

Defining characteristics: Tall, mostly dense shrub layer, dominated by Tangled Lignum, in association with a eucalypt +/- acacia dominated low woodland. The ground-layer includes a component of obligate wetland flora that is able to persist (even if dormant) over dry periods. Lower rainfall northern and western areas.

Indicator species: *Duma florulenta*, with *Eucalyptus largiflorens*, *Acacia stenophylla* and sometimes stunted *Eucalyptus camaldulensis*.

Ecological overview

In this EVC, extent and frequency of inundation varies with annual rainfall. Depth is mostly at the shallow end of the inundation range, rarely exceeding 30 cm, except possibly during flood peaks. Duration of inundation, is also mostly at the lower end of the category range, rarely exceeding two months during major events. This EVC is tolerant of sustained dry periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

If environmental watering is considered, it is important to avoid too frequent or prolonged inundation. It is vital to avoid impounding water within this habitat or delivering water during the hotter months of summer.

Mangrove Shrubland EVC 140

EVC description		
Defining characteristics: Extremely species-poor shrubland vegetation of inter-tidal zone, dominated by mangroves. Sheltered embayments and tidal creeks east from Lake Connewarre to the eastern side of Nooramunga Marine Coastal Park, with most extensive development within Corner Inlet and Western Port. **Indicator species:** Characteristically occurs as monospecific stands of *Avicennia marina*. In some stands, species from adjacent Coastal Saltmarsh Aggregate or Sea-grass Meadow can also be present.		
Ecological overview		
Inundation patterns of the habitat of this EVC are determined by tides.		
Phase context of EVC representation		
Continuous		
Frequency of inundation		
Category	**Description**	**EVC preference**
Semidiurnal tide	Twice daily	Common
Maximum event duration		
Duration of waterlogging	**Duration of inundation**	**EVC preference**
	Twice daily	Common
Water depth		
Category	**Range (cm)**	**EVC preference**
Shallow to medium	30–100	Common
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Mesosaline	>10,000–50,000	Common
Management considerations		
Environmental watering is not relevant other than potentially removing obstructions to tidal inputs. It is important to avoid unnatural or contaminated freshwater inputs.		

Montane Bog EVC 966

EVC description

Defining characteristics: Low heathy shrubland with sedge and moss components in boggy montane to sub-montane valley habitats. Can be fringed by or include sparse eucalypts, variously *E. pauciflora*, *E. stellulata*, *E. dalrympleana*, *E. rubida* and *E. delegatensis*. Rare, Central Highlands and East Gippsland.

Indicator species:

East Gippsland - *Baeckea utilis* s.l. and/or *Leptospermum myrtifolium* with *Epacris microphylla* s.l., *Epacris breviflora* and *Hakea microcarpa*. The ground layer includes a diverse range of sedges, grasses, forbs and ferns. Species include *Sphagnum* spp., *Schoenus apogon*, *Empodisma minus*, *Baloskion australe*, *Baumea gunnii*, *Carex appressa*, *Isolepis subtilissima*, *Festuca asperula*, *Poa costiniana*, *Leptinella filicula*, *Asperula conferta and Blechnum penna-marina* subsp. *alpina*, *Hypericum japonicum*, *Myriophyllum pedunculatum*, *Eleocharis gracilis*, *Lobelia surrepens* and *Stylidium montanum.*

Central Highlands - *Baeckea utilis* s.l., *Epacris* spp. (notably *E. paludosa*), *Sphagnum* spp. and *Empodisma minus*, with associated species including *Richea victoriana*, *Oxalis magellanica*, *Wittsteinia vacciniacea* and *Blechnum penna-marina* subsp. *alpina*. *Nothofagus cunninghamii* and/or *Leptospermum grandifolium* can be present on the verges or scattered through the vegetation.

Ecological overview

In this EVC, inundation occurs following rainfall and snow melt. Inundation is at the lower end of the duration category and is not necessarily continuous. Waterlogging is more or less continuous, at least in wetter years.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to this EVC, which is potentially vulnerable to interference with the local hydrology (groundwater and minor catchments).

Montane Riparian Thicket EVC 41

EVC description

Defining characteristics: Closed shrubland vegetation of low-gradient drainage lines and sheltered soaks in gully-heads at montane to sub-alpine elevations, with a sparse but potentially diverse ground-layer including a range of species tolerant of shading and waterlogging. Restricted to small areas of suitable habitat on higher mountain ranges.

Indicator species: *Leptospermum grandifolium* (sometimes with stunted *Nothofagus cunninghamii* in highest rainfall areas), *Carex appressa*, *Carex alsophila*, *Isolepis subtilissima*, *Blechnum nudum*, *Blechnum minus*, *Blechnum penna-marina* subsp. *alpina*, *Tasmannia lanceolata*, *Gaultheria appressa*, *Chiloglottis* spp., *Leptinella filicula*, *Mentha laxiflora*, *Dianella tasmanica* and *Polystichum proliferum*.

Ecological overview

In this EVC, waterlogging can be more or less continuous, with inundation generally very shallow and intermittent, occurring mostly due to rainfall events and snow-melt.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to this EVC, which is potentially vulnerable to interference with the local hydrology (groundwater and minor catchments).

Montane Riparian Woodland EVC 40

EVC description

Defining characteristics: Low open woodland on peat-rich soils of stream flats at montane elevations, with ground layer comprising a dense sward of grasses, herbs and sedges. A dense riparian shrub layer can also be present. Restricted distribution in eastern Victoria, principally on tablelands of East Gippsland.

Indicator species: *Eucalyptus camphora*, *Eucalyptus stellulata* (sometimes with *Eucalyptus radiata* or *Eucalyptus rubida*), *Poa labillardierei*, *Anthosachne scabra* s.l., *Carex gaudichaudiana*, *Carex appressa*, *Hypericum japonicum*, *Deyeuxia quadriseta*, *Epilobium gunnianum*, *Gratiola peruviana*, *Ranunculus lappaceus*, *Blechnum penna-marina* subsp. *alpina*, *Blechnum minus*, *Leptospermum grandifolium*, *Leptospermum myrtifolium*, *Rubus parvifolius*, *Geranium potentilloides* and *Veronica gracilis*.

Ecological overview

Water-tables are generally high in the habitat of this EVC. Inundation is mostly brief and associated with rainfall events and snow-melt, apart from within minor depressions or old channels on the floodplain. Soaks can be present around the margins.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is generally not likely to be relevant to this EVC. It is dependent on groundwater and protection of catchment integrity (e.g. protection from potential impacts from dams, groundwater extraction and pine plantations) is important.

Montane Sedgeland EVC 148

EVC description

Defining characteristics: Sedgy-herbaceous wetland communities around springs, soaks and low-gradient drainage-lines at montane elevations. Very localised distribution in high rainfall areas of Central Highlands and East Gippsland, occurring in association with Montane Riparian Thicket or Montane Riparian Woodland or occasionally Cool Temperate Rainforest.

Indicator species: *Carex gaudichaudiana*, *Carex appressa*, *Carex alsophila*, *Sphagnum* spp., *Epilobium* spp. and *Hydrocotyle* spp., variously in association with *Poa labillardierei*, *Poa ensiformis*, *Eleocharis gracilis*, *Veronica gracilis* s.l., *Gonocarpus micranthus*, *Hookerochloa hookeriana*, *Hydrocotyle tripartita*, *Hypericum japonicum*, *Lobelia surrepens*, *Geranium potentilloides*, *Acaena novae-zelandiae*, *Luzula modesta*, *Chaerophyllum eriopodum*, *Blechnum penna-marina* subsp. *alpina*, *Juncus alexandri*, *Hierochloe redolens* and *Deyeuxia innominata*.

Ecological overview

Waterlogging in this EVC is mostly more or less continuous. Inundation can be variable according to microtopography. Inundation follows rainfall and snow melt so is not necessarily continuous.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant, with the EVC dependent on the integrity of the local hydrology (groundwater and minor catchments).

Montane Swamp EVC 318

EVC description

Defining characteristics: Sedgy-herbaceous montane wetland communities (e.g. Morass Creek near Benambra). The relevant low, shrubby vegetation of boggy flats (as previously included within Montane Swamp) is referred to Montane Bog (EVC 966). Rare, East Gippsland.

Indicator species: *Myriophyllum* spp., *Hydrocotyle tripartita* s.l., *Carex appressa* and *Ranunculus* spp.

Ecological overview

In this EVC, waterlogging is generally more or less continuous. The habitat varies from shallow permanently wet 'morass' conditions, to wet sites which can drain. The inundation regime varies with seasonal/annual rainfall and potentially snow melt.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant, with the EVC dependent on the integrity of the local hydrology (groundwater and minor catchments).

Perched Boggy Shrubland Aggregate EVC 185

EVC description

Defining characteristics: Dense mosaic of shrubland in association with a sedgy-herbaceous ground-layer in which mosses can be abundant, occurring on reliably saturated soils associated with impeding layers, soaks and springs. Swampy Riparian Woodland (EVC 83) occurs in similar habitats to Perched Boggy Shrubland, but the former is associated with flowing water. Perched Boggy Shrubland Complex is reported as always surrounded by the terrestrial EVC Herb-rich Foothill Forest. Very restricted extent, confined to the north-east.

Indicator species: *Baeckea utilis* s.s., *Sphagnum* spp., *Epacris breviflora*, *Leptospermum continentale*, *Acacia verticillata*, *Gonocarpus micranthus*, *Eriocaulon scariosum*, *Eleocharis gracilis*, *Ranunculus* spp., *Gahnia* spp. and *Baumea* spp.

Ecological overview

The vegetation in this EVC is dependent on groundwater discharge. Waterlogging is generally more or less continuous, at least with normal rainfall. The extent of inundation varies with seasonal rainfall, and is mostly quite shallow but can be ambiguous where the substrate is very soft with a high organic or silty content.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not relevant to this EVC, which is groundwater dependent. Potential threats to this EVC include drainage, modification to farm dams, and impacts of pine plantations.

Plains Grassy Wetland EVC 125

EVC description

Defining characteristics: Grassy-herbaceous, shallow seasonal wetlands of fertile lowland plains, characteristically species-rich (at least on verges) when relatively intact. Zones interpreted as representing complexes between Plains Grassy Wetland and several other wetland EVCs are frequently present. Formerly widespread in lowland plains areas.

Indicator species: *Amphibromus* spp. (notably *A. nervosus*), *Rytidosperma duttonianum*, *Glyceria australis*, *Poa labillardierei*, *Lachnagrostis filiformis* s.l., *Eleocharis acuta*, *Eleocharis pusilla. Eragrostis infecunda* occurs as an associated (but not dominant) species in drier versions (e.g. Wimmera and rainshadow basalt plains west of Melbourne). Herbs of verge zones of relatively intact sites variously include *Eryngium vesiculosum*, *Neopaxia australasica*, *Allittia cardiocarpa*, *Craspedia paludicola*, *Microseris scapigera* s.s., *Potamogeton tricarinatus* s.l., *Coronidium gunnianum* and *Villarsia reniformis*.

Ecological overview

The extent and duration of wetness of this EVC varies according to annual/seasonal rainfall. The depth of inundation is generally less than 50 cm and usually persists for only a few months; however the central parts of the relevant wetland may remain waterlogged and retain water for longer. The vegetation is reasonably tolerant of dry periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The supply of environmental water to this EVC will rarely be relevant, except perhaps in suburban/peri-urban contexts or for species management reasons (e.g. to assist the breeding of Brolgas). The use of storm-water in remnant wetlands is potentially highly destructive to diversity and wetland condition and should be avoided. Protection of the local catchment is a more important management consideration for this EVC.

Plains Grassy Wetland/Aquatic Herbland Complex EVC 755

EVC description

Defining characteristics: Structural dominants of Plains Grassy Wetland (EVC125), with aquatic herbs also prevalent. Scattered on western basalt plains, especially in cooler areas.

Indicator species: *Glyceria australis*, variously with *Myriophyllum* spp. (notably *M. variifolium*), *Rumex bidens*, *Potamogeton tricarinatus* s.l., *Neopaxia australasica* and *Cycnogeton procerum* s.l.

Ecological overview

Similar to Plains Grassy Wetland (EVC 125), but with groundwater generally more important and potentially retaining water somewhat longer, particularly in deeper areas.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In general, environmental watering will rarely be relevant to this EVC. An exception may occur where watering is used to assist completion of breeding of Brolgas, in which case a source of high quality water is required (see notes under Plains Grassy Wetland [EVC 125]).

Plains Grassy Wetland/Brackish Herbland Complex EVC 767

EVC description

Defining characteristics: Structural dominants of Plains Grassy Wetland (EVC 125) in association with herbaceous species characteristic of Brackish Herbland (EVC 538). Very restricted and scattered occurrences on western basalt plains, with disjunct outlier at Lake Omeo.

Indicator species:

Western Volcanic Plains - *Glyceria australis*, *Poa labillardierei* and/or *Rytidosperma duttonianum*, variously with *Lobelia irrigua*, *Ranunculus diminutus*, *Isolepis cernua*, *Triglochin striata*, *Wilsonia rotundifolia*, *Samolus repens* and *Selliera radicans*.

Montane community (Lake Omeo) - *Glyceria australis*, *Lachnagrostis filiformis* s.s., *Schoenus nitens*, *Isolepis cernua* and *Ranunculus diminutus*.

Ecological overview

As for Plains Grassy Wetland (EVC 125), but influenced by seepage of mineralized groundwater which, while to some extent saline, may also be to some extent calcareous.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Common
Calcareous	N/A	Common

Management considerations

In general, environmental watering of this EVC is unlikely to be relevant.

Plains Grassy Wetland/Calcareous Wet Herbland Complex EVC 958

EVC description		
Defining characteristics: Structural dominants (and some of key indicator dicot herbs) of Plains Grassy Wetland (EVC 125) in association with a low mat of herbs indicative of wet calcareous conditions. Extremely rare, in south-west (near Casterton). **Indicator species:** *Glyceria australis*, *Hydrocotyle muscosa*, *Asperula subsimplex*, *Isolepis fluitans* and *Senecio psilocarpus*, with associated species including *Lachnagrostis filiformis* s.l., *Eleocharis acuta*, *Potamogeton tricarinatus* s.l. and *Cycnogeton procerum* s.l.		
Ecological overview		
As for Plains Grassy Wetland (EVC 125) but always calcareous.		
Phase context of EVC representation		
Continuous		
Frequency of inundation		
Category	**Description**	**EVC preference**
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Maximum event duration		
Duration of waterlogging	**Duration of inundation**	**EVC preference**
1–6 months	1–6 months	Common
Water depth		
Category	**Range (cm)**	**EVC preference**
Very shallow	<30	Common
Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Calcareous	N/A	Common
Management considerations		
In general, environmental watering of this EVC is unlikely to be relevant.		

Plains Grassy Wetland/Lignum Swamp Complex — EVC A101

EVC description

Defining characteristics: Open shrubland with a grassy ground-layer including structural and floristic components (grasses and dicot herbs) of Plains Grassy Wetland (EVC 125), occurring in association with Tangled Lignum (or sometimes Spiny Lignum or Cane Grass). Scattered sites in the Riverina, where previously more extensive along ephemeral drainage-lines, also Victorian Volcanic Plains where very restricted in extent.

Indicator species: *Duma florulenta* (and sometimes *Duma horrida* subsp. *horrida* and/or *Eragrostis australasica*), *Rytidosperma duttonianum*, *Amphibromus nervosus*, *Walwhalleya proluta*, *Eragrostis infecunda*, *Lachnagrostis filiformis* s.s., *Haloragis aspera*, *Goodenia* spp., *Juncus flavidus*, *Lobelia concolor* and *Senecio runcinifolius*. A component of grasses shared with drier sites (e.g. *Chloris truncata* and *Austrostipa* spp.) can be present.

Ecological overview

This EVC complex occurs in lower rainfall areas and is subject to a highly variable hydrology. It is prone to dry periods according to seasonal/annual rainfall. Depth of inundation is usually not much greater than 30 cm except during flood peaks. Inundation rarely lasts for more than several months and is not necessarily continuous over this period. If habitat conditions become hyposaline they are towards the lower range of this category.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

In general, this EVC seems unlikely to be considered for environmental watering. If watering, delivery should occur during the cooler months and care should be taken to avoid overwatering.

Plains Grassy Wetland/Sedge-rich Wetland Complex EVC 959

EVC description

Defining characteristics: Treeless seasonal wetland with association of Black Bristle-sedge, indicative of Sedge-rich Wetland (EVC 281), with species characteristic of Plains Grassy Wetland (EVC 125). Very rare, scattered sites on western basalt plains, also Wimmera (e.g. State Forest north of White Lake).

Indicator species: *Chorizandra enodis*, (and in high quality sites *Craspedia paludicola*) dominant, associated species include *Lachnagrostis aemula* s.l., *Lachnagrostis filiformis* s.l., *Amphibromus nervosus*, *Allittia cardiocarpa*, *Rytidosperma duttonianum*, *Eleocharis acuta*, *Eleocharis pusilla*, *Eryngium vesiculosum*, *Glyceria australis*, *Microseris scapigera* s.s., *Pentapogon quadrifidus* var. *quadrifidus*, *Potamogeton tricarinatus* s.l., *Schoenus apogon* and *Villarsia reniformis*.

Ecological overview

A poorly known EVC complex, but generally as for Plains Grassy Wetland (EVC 125).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In general, environmental watering is unlikely to be relevant to this EVC.

Plains Grassy Wetland/Spike-sedge Wetland Complex EVC 960

EVC description

Defining characteristics: Low open wetland vegetation dominated by Spike-sedge with a sparse floristic component of species characteristic of Plains Grassy Wetland (EVC 125). Scattered sites mostly in western Victoria.

Indicator species: The main species includwet Heathland / Sedge Wetland Complex

e *Glyceria australis*, *Eleocharis acuta*, *Lachnagrostis filiformis* s.s. *Lachnagrostis filiformis* s.l. and *Amphibromus nervosus*, sometimes with *Neopaxia australasica* and *Potamogeton tricarinatus s.l.*, lower rainfall variants also with *Eragrostis infecunda.*

Ecological overview

This EVC complex may occur as a wetter central zone within wetlands supporting Plains Grassy Wetland (EVC 125). It is similar to Plains Grassy Wetland, but in general probably has a slightly longer duration of inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

In general, environmental watering is unlikely to be relevant to this EVC. An exception may occur where watering is used to assist completion of breeding of Brolgas, in which case a source of high quality water is required (see notes under Plains Grassy Wetland [EVC 125]).

Plains Rushy Wetland EVC 961

EVC description

Defining characteristics: Rush dominated wetlands with floristic affinities to Plains Grassy Wetland (EVC 125). Scattered on plains of central western and north-central areas of Victoria.

Indicator species: *Juncus flavidus*, *Juncus semisolidus*, *Eleocharis acuta* and *Lachnagrostis filiformis* s.s. An ephemeral component has been noted at some locations.

Ecological overview

The ecological determinants of this EVC are poorly known. While it appears to occur in sites with relatively less regular periods of inundation, it is unclear which environmental differences give rise to this EVC rather than to Plains Grassy Wetland (EVC 125), as both can be represented within the same wetland system. This EVC occurs in habitat which is highly variable according to seasonal/annual rainfall and is apparently maintained by local runoff. It typically has partial filling only or sustained dry periods. If inundated, depth does not greatly exceed 30 cm and is generally towards the lower to mid range of the duration category, during which the habitat is not necessarily subject to continuous inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Catchment protection is more important for this EVC than potential delivery of environmental water. Potential risks to examples of this EVC include the impacts from a reduction in catchment area. In peri-urban sites, storm water and road run-off entering the wetland also poses a risk.

Plains Saltmarsh Aggregate EVC 888

EVC description

Defining characteristics: Low, primarily herbaceous (to grassy) vegetation of salinised heavy soils in seasonally or intermittently waterlogged shallow depressions on lowland plains, dominated by species of *Sarcocornia* and *Suaeda* (rather than species of *Tecticornia* and/or *Frankenia* as in Samphire Shrubland [EVC 101]). Plains Saltmarsh is frequently included (and mapped) as a component of Saline Lake Aggregate (EVC 717). Scattered in less arid western areas.

Indicator species: *Sarcocornia quinqueflora*, *Suaeda australis*, *Samolus repens* and *Puccinellia perlaxa.*

Ecological overview

This EVC is largely maintained by saline groundwater, with contributions from local run-off. Flooding is typically shallow, with inundation mostly at the lower end of the range for depth and duration, and is not necessarily continuous over this time.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

While the supply of environmental water is presumably not relevant to this EVC, it may fringe lakes where watering may be under consideration. In this case, management should avoid overwatering.

Plains Sedgy Wetland EVC 647

EVC description

Defining characteristics: Sedge dominated wetland vegetation of lowland plains, with conspicuous and potentially diverse herbaceous component, including species characteristically associated with wet sites on fertile soils. Moisture supply appears to be more reliable (e.g. associated with springs/seepage) than for sites supporting Plains Grassy Wetland (EVC 125). Scattered on plains and tablelands mostly on and south of the Divide.

Indicator species: *Carex tereticaulis* (or sometimes *Baumea arthrophylla*), *Eleocharis acuta* and *Amphibromus* spp., *Neopaxia australasica* and *Stellaria angustifolia* (and in highest quality sites, species including *Coronidium gunnianum*, *Craspedia paludicola*, *Senecio psilocarpus*, *Microseris scapigera* s.s., *Allittia cardiocarpa* and *Xerochrysum palustre*). Plains Sedgy Wetland can occur in mosaic or complex with Plains Grassy Wetland (EVC 125) and Aquatic Herbland (EVC 653). Some variants attributed to Plains Sedgy Wetland approach Sedge Wetland (EVC 136) but can be distinguished by the presence of a substantial cover of the herb-rich component shared with Plains Grassy Wetland.

Ecological overview

Soil saturation in this EVC appears more sustained than for Plains Grassy Wetland (EVC 125). Groundwater or other compensating and potentially interactive factors, such as higher annual rainfalls and cooler temperatures, appear to be important determinants. Inundation is generally not sustained at depths over 50 cm. The water in these wetlands is typically very fresh.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The supply of environmental water to this EVC is presumably not relevant. It is particularly vulnerable to damage from stormwater runoff where it occurs in peri-urban areas. The habitat depends on the protection of the local catchment and groundwater.

Plains Sedgy Wetland/Sedge Wetland Complex EVC 1010

EVC description

Defining characteristics: Sedge dominated wetland vegetation of cooler lowland plains, with structural characteristics of Sedge Wetland (EVC 136), but including herbaceous species characteristically associated with wet sites on fertile soils as for Plains Sedgy Wetland (EVC 647). Rare, disjunct sites in southern Victoria.

Indicator species: *Lepidosperma longitudinale* and/or *Baumea arthrophylla*, often with *Schoenus* spp. (*S. tesquorum*, *S. apogon*) or *Lepyrodia muelleri*; diversity variable (within wetland), with associated species variously including *Coronidium gunnianum*, *Craspedia paludicola*, *Senecio psilocarpus*, *Allittia cardiocarpa* and *Xerochrysum palustre*.

Ecological overview

As for Plains Sedgy Wetland (EVC 647), it appears that soil saturation is more sustained in this EVC complex than for Plains Grassy Wetland (EVC 125). Groundwater or other compensating and potentially interactive factors, such as higher annual rainfalls and cooler temperatures, appear to be important determinants. Inundation is typically not sustained at depths over 50 cm. The water in these wetlands is typically very fresh.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The supply of environmental water to this EVC is presumably not relevant. This EVC is particularly vulnerable to damage from stormwater runoff where it occurs in peri-urban areas. Management focus should be on the protection of the local catchment and groundwater.

Plains Sedgy Woodland EVC 283

EVC description

Defining characteristics: Woodland, mostly eucalypt dominated, occurring in seasonally inundated shallow depressions on broad plains, within floodplains and fringing dunes. The most similar EVCs are Seasonally Inundated Shrubby Woodland (EVC 195), or for wettest forms, Red Gum Swamp (EVC 292) or Sedge-rich Wetland (EVC 281). Typically species-rich (at least in drier sites/on verges) with many species (notably geophytes) at low frequencies. South-western areas of Victoria, principally in the vicinity of the Grampians.

Indicator species: *Eucalyptus camaldulensis* (sometimes with *E. leucoxylon*, *E. melliodora* and/or *E. microcarpa*, or occasionally *Allocasuarina luehmannii*), *Leptospermum* spp. (sparse), *Lepidosperma* spp. (variously *L. longitudinale*, *L. lineare* and *L. congestum*), *Chorizandra enodis*, *Schoenus tesquorum*, *Villarsia reniformis*, *Isolepis fluitans*, *Potamogeton tricarinatus* s.l., etc.

Ecological overview

The extent of inundation and duration of waterlogging of this EVC is variable according to annual climatic conditions and microtopography. If inundation occurs, it is mostly very shallow and towards the shorter end of the duration range (generally up to three months).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Presumably the supply or environmental water to this EVC is not relevant or feasible.

Plains Swampy Woodland EVC 651

EVC description

Defining characteristics: Woodland with tussocky (grassy/sedgy) ground-layer, which includes herbs characteristic of poorly-drained, seasonally waterlogged, dark clay soils of paludal deposits on cooler lowland plains. Context appears to have been mainly dampland, but extending into marginal wetland situations, wetland verges or as a dampland-wetland mosaic. Formerly scattered mostly on southern plains of Victoria but now much depleted.

Indicator species: *Eucalyptus ovata* (occasionally *Eucalyptus camaldulensis* or *Eucalyptus tereticornis* subsp. *mediana*), *Acacia melanoxylon*, *Poa labillardierei*, *Carex* spp., *Lachnagrostis* spp., with e.g. *Lobelia* spp., *Coronidium gunnianum*, *Eryngium vesiculosum* and *Centella cordifolia*. Shrubs (*Ozothamnus ferrugineus*, *Leptospermum continentale* and *Allocasuarina paludosa*) can be present in the highest rainfall plains areas.

Ecological overview

The seasonal extent of inundation and waterlogging of this EVC is related to rainfall, therefore is variable between years. If inundation occurs, it is typically very shallow, is generally for less than several months duration and is not necessarily continuous over this time. Groundwater can be important to this EVC.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The potential delivery of environmental water to this EVC is presumably rarely relevant. If this EVC is fringing wetlands receiving environmental water (e.g. on fringing riparian flats), it is vital to avoid overwatering or altering the bathymetry to retain water for longer.

Plains Swampy Woodland/Lignum Swamp Complex EVC 784

EVC description

Defining characteristics: Vegetation including a mixture of structural components of Plains Swampy Woodland (EVC 651) and Lignum Swamp (EVC 104), but without the floristic attributes of Red Gum Swamp (EVC 292). Extremely rare, drier volcanic plains, mainly in rainshadow area to the west of Melbourne.

Indicator species: *Eucalyptus camaldulensis*, *Duma florulenta*, *Poa labillardierei*, *Lachnagrostis filiformis* var. 1, *Ottelia ovalifolia*, *Schoenus apogon*, *Persicaria prostrata*, *Lythrum hyssopifolia*, *Amphibromus* spp., and *Rytidosperma* spp.

Ecological overview

This EVC occurs in a variable environment but with relatively low annual rainfall. It is tolerant of prolonged dry periods. If inundation depth exceeds 30 cm then it is not by much.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is unlikely to be considered for environmental watering. Protection of the site bathymetry and local catchment are important considerations for this EVC.

Red Gum Swamp EVC 292

EVC description

Defining characteristics: Woodland of swampy depressions of lowland plains, with sedgy-herbaceous understorey including aquatic species. Scattered on lowland plains, principally in the Riverina and south-west of Wimmera, extremely rare on the western volcanics.

Indicator species: *Eucalyptus camaldulensis* (or occasionally *Eucalyptus tereticornis* subsp. *mediana*), *Carex tereticaulis* (or rarely *Baumea arthrophylla* and *Lepidosperma longitudinale*), *Eleocharis acuta*, *Marsilea drummondii* and *Myriophyllum crispatum*.

Ecological overview

This EVC is relatively tolerant of long dry periods and in lower rainfall areas may be inundated as infrequently as one in five years. Inundation of deeper parts of the wetlands can exceed six months but within a year it naturally dries out. Obviously in the zones towards the outer edges of this EVC, inundation is shallower and occurs for shorter periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Care is required if supplying environmental water to this EVC. Inundation up to eight months is potentially suitable if events are spaced, but can be compromised by subsequent natural flooding if this occurs before the wetland dries out. This can result in a period of inundation exceeding the tolerance of the structural dominant of this EVC. Priming with smaller flows (e.g. to one third depth) prior to filling wetlands to capacity is desirable, especially in deeper systems. It is vital that natural drawdown is allowed and artificial impoundment of water is avoided.

Red Gum Swamp/Cane Grass Wetland Complex — EVC A114

EVC description

Defining characteristics: Species-poor wetland vegetation transitional between the component EVCs (EVCs 292 and 291 respectively), with River Red-gum occurring in association with Southern Cane-grass and a component of aquatic herbs. Rare, recorded from the Wimmera, northern Volcanic Plains and lowland north-east of the State.

Indicator species: *Eucalyptus camaldulensis* and *Eragrostis infecunda*, variously with *Potamogeton sulcatus*, *Myriophyllum crispatum*, *Eleocharis acuta*, *Limosella australis*, *Ottelia ovalifolia* subsp. *ovalifolia*, *Utricularia australis*, *Azolla* spp. and *Centipeda cunninghamii.*

Ecological overview

While the relevant wetland as a whole may retain water longer, inundation frequency in areas supporting this EVC will vary according to seasonal/annual rainfall and proximity to the wetland margin. In general, the frequency of inundation is probably more intermittent than seasonal. The duration of inundation is generally for not much more than six months. Depth of inundation is mostly towards the shallow end of the category range, any depth beyond this does not persist for long.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Comments as for Red Gum Swamp (EVC 292).

Red Gum Swamp/Plains Rushy Wetland Complex EVC A115

EVC description

Defining characteristics: Wetland vegetation transitional between the component EVCs (EVCs 292 and 961 respectively), with River Red-gum occurring in association with rushes and a variable component of rhizomatous to stoloniferous aquatic grasses and herbs. Rare, recorded from the western north-central and the lowland north-east parts of the State.

Indicator species: *Eucalyptus camaldulensis*, *Juncus semisolidus* and *Juncus flavidus*, variously with *Lachnagrostis filiformis* s.l., *Glyceria australis*, *Rumex tenax*, *Persicaria prostrata*, *Eleocharis acuta*, *Epilobium* spp., *Centipeda* spp. and *Myriophyllum* spp.

Ecological overview

The frequency of inundation in this EVC is highly variable according to seasonal conditions and is mostly more intermittent than seasonal. Duration is variable and depth rarely greatly exceeds 30 cm when in the shallow to medium category.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental water is delivered, it should be supplied during the cooler months and allowed to drawdown naturally, taking care not to water too frequently.

Riparian Fern Scrub — EVC A120

EVC description

Defining characteristics: Dense tall shrubby vegetation with a primarily ferny ground-layer, associated with waterlogged and inundation-prone soils with a substantial organic content. Distinguished from Riparian Scrub (EVC 191) and Riparian Thicket (EVC 59) by greater height and more open and diverse ferny understorey. Distinguished from Swamp Scrub by being dominated by Scented Paperbark as well as by understorey character. Localised in the Otway Ranges and probably also higher rainfall parts of the Gippsland Plain.

Indicator species: Usually dominated by *Melaleuca squarrosa*, sometimes with *Leptospermum lanigerum*, with *Eucalyptus ovata* generally a relatively minor component where present. Ferns are conspicuous, variously including *Blechnum minus*, *Blechnum nudum*, *Blechnum wattsii*, *Dicksonia antarctica*, *Gleichenia microphylla*, *Histiopteris incisa*, *Hypolepis spp.*, *Pteris tremula* and *Todea barbara.* Other species variously include *Gahnia sieberiana*, *Tetrarrhena juncea*, *Isolepis inundata*, *Cycnogeton procerum s.l.*, *Gratiola peruviana*, *Juncus* spp. (notably *J. procerus and J. gregiflorus*), *Myriophyllum pedunculatum* and *Triglochin striatum* s.l.

Ecological overview

In this EVC, the inundation period is not necessarily continuous, varying with rainfall events. Inundation is mostly relatively superficial outside of flooding events but deep waterlogging from groundwater seepage can be more or less permanent. The extent of inundation is sometimes ambiguous due to soft saturated substrates.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is unlikely to be subject to environmental watering. Protection from drainage and maintenance of groundwater levels are the main considerations relevant to the hydrological requirements of this EVC.

Riparian Scrub EVC 191

EVC description

Defining characteristics: Dense shrubby vegetation associated with waterlogged ground along poorly-defined drainage-lines, often in areas with sandy (or granite-derived) soils, in less fertile and more acidic but similarly wet sites to Swamp Scrub (EVC 53). Higher rainfall southern areas. *Leptospermum lanigerum* dominated variant on Mt Disappointment and in Strathbogie Ranges, previously referred to as Riparian Scrub is now considered better referred to as Riparian Thicket (EVC 59).

Indicator species: *Melaleuca squarrosa* (sometimes alternatively *Leptospermum lanigerum*), *Gleichenia microphylla*, *Baumea tetragona*, *Baumea gunnii*, *Gahnia sieberiana* and *Lepidosperma elatius.*

Ecological overview

In this EVC, the inundation period is not necessarily continuous, varying with rainfall events. Inundation is mostly relatively superficial outside of flooding events but deep waterlogging from groundwater seepage can be more or less permanent. The extent of inundation is sometimes ambiguous due to soft muddy substrates.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is unlikely to be subject to environmental watering. Protection from drainage and maintenance of groundwater levels are the main considerations relevant to the hydrological requirements of this EVC.

Riparian Thicket EVC 59

EVC description

Defining characteristics: Closed scrub with component of ferns and large sedges, occurring along swampy drainage lines with acidic soils, at altitudes intermediate between the habitats of Riparian Scrub (EVC 191) and Montane Riparian Thicket (EVC 41) (c. 450– 700 m). Very localised on ranges mostly north of the divide (e.g. Mt Disappointment, Murrindindi, Dandenongs and Strathbogies).

Indicator species: *Leptospermum lanigerum*, *Blechnum nudum*, *Blechnum wattsii*, *Coprosma quadrifida*, *Gleichenia microphylla*, *Tetrarrhena juncea*, *Mentha laxiflora*, *Agrostis* spp. agg. aff. *hiemalis*, *Gratiola pubescens*, *Veronica calycina* and *Carex* spp.

Ecological overview

In this EVC, the inundation period is not necessarily continuous, varying with rainfall events (stream flow and groundwater seepage). Inundation is primarily short-term, with the habitat potentially subject to periodic, repeated events across a season according to rainfall conditions. While inundation is mostly relatively superficial outside of flooding events, deep waterlogging can be more or less permanent.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	D3

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Habitat supporting this EVC is unlikely to be subject to environmental watering. Protection from drainage and maintenance of groundwater levels are the main considerations relevant to the hydrological requirements of this EVC.

Riverine Chenopod Woodland — EVC 103

EVC description

Defining characteristics: Eucalypt dominated woodland of the most elevated of the flood-prone riverine terraces, intact examples with a diverse shrubby-grassy understorey which can be rich in annual species. Prior to river regulation, at least a portion of the habitat was prone to at least irregular shallow flooding, and comprised intermittent or episodic wetland. Floodplains of the north-west of the State.

Indicator species: *Eucalyptus largiflorens*, *Duma florulenta*, *Chenopodium nitrariaceum*, *Rytidosperma setaceum*, *Eremophila* spp., *Pittosporum angustifolium*, *Exocarpos aphyllus*, *Calocephalus sonderi*, *Goodenia* spp., *Brachyscome* spp. and *Lepidium* spp. (and general diversity of annual herbs).

Ecological overview

The ecological context in which this EVC occurs is variable and not all examples are flood-prone. If *Duma florulenta* (Tangled Lignum) and *Chenopodium nitrariaceum* (Nitre Goosefoot) are present, the vegetation is potentially subject to infrequent inundation (shallow and less than two months duration) during higher level flooding events. More sustained flooding can cause serious damage to this EVC. Generally, *Eucalyptus largiflorens* (Black Box) is not flood dependent in Victoria (at least not outside the further north-west of the State) and regeneration can occur in association with wet summers.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

Critical assessment of the associated flora should precede any decision to deliver environmental water. Any requirement for associated engineering works to deliver water should raise concerns, and extreme caution is required to avoid unintended associated ecological damage. If environmental water is delivered, it should be supplied during cooler months and artificial water retention should be avoided.

Riverine Ephemeral Wetland EVC 975

EVC description

Defining characteristics: Herbland of the floor of riverine depressions on relatively free draining soils, with a mixture of species from less inundation-prone riverine forest/woodland and species of shallow ephemeral wetland. Rare, recorded from Barmah Forest.

Indicator species: Partially with scattered or overhanging *Eucalyptus camaldulensis*, but primarily without woody species. The structurally dominant species are *Isolepis fluitans*, *Geranium* spp. and *Acaena novae-zelandiae*. Species diversity is relatively low.

Ecological overview

This EVC is both extremely restricted in distribution and very poorly known. It occurs in habitat that is relatively free-draining, and presumably is rarely subject to sustained inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The delivery of environmental water is not particularly relevant to this EVC, with requirements probably largely met from local run-off and elevated water-tables near the watercourse.

EVC description

Defining characteristics: Tall open eucalypt dominated forest (to woodland), to 30–40 m or more in height with a generally species-poor understorey dominated by obligate wetland species. Opportunistic annuals can become prevalent during sustained dry periods. Murray River floodplain, restricted outside of Barmah Forest.

Indicator species: *Eucalyptus camaldulensis*, variously with *Pseudoraphis spinescens*, *Eleocharis acuta*, (locally) *Amphibromus fluitans*, or sometimes bare (leaf-litter/mud). Where present, associated species variously include *Lachnagrostis filiformis* s.s., *Cardamine moirensis*, *Ranunculus pumilio*, *Cycnogeton procerum* s.l. and *Centipeda cunninghamii.* On localised areas of flood-prone sandy terraces, connected to the river or major floodway creeks, *Eragrostis* spp. and *Cynodon dactylon* var. *pulchellus* can be locally dominant. This vegetation is transitional to Intermittent Swampy Woodland and was treated as a variant of the latter along the lower Murray.

Ecological overview

This EVC generally (and ideally) drains by early summer, after being inundated by winter-spring flooding. The depth of inundation generally does not greatly exceed one metre, at least for any sustained period. More open woodland versions with the ground-layer dominated by *Eleocharis acuta* (Common Spike-sedge), which are transitional to Red Gum Swamp (EVC 292) or Spike-sedge Wetland (EVC 819), are more tolerant of prolonged dry periods, whereas taller denser forest versions with the ground-layer dominated by mixtures of *Pseudoraphis spinescens* (Spiny Mud-grass) with *E. acuta* are much less so. The duration of inundation is generally less than six months. On rare occasions, autumn flooding can lead to more prolonged inundation.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
	>6 months (but not permanent)	Occasional

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
If environmental watering of this EVC is implemented, it should be delivered in autumn or after drought, avoiding the hotter summer months. It is best to prime first, e.g. to a level of one third full, with a longer break until topping up. Natural drawdown should be allowed and artificial retention of water in the wetland should be avoided. Excessively long periods of inundation can be damaging to the vegetation.

Riverine Swampy Woodland EVC 815

EVC description

Defining characteristics: Eucalypt dominated woodland to open woodland, ground-layer grassy to sedgy to herbaceous, with species indicative of periodic waterlogging (and with floristic affinities to Plains Grassy Wetland [EVC 125]). Depleted and rare, most extensive at Barmah Forest.

Indicator species:

Riverina Plains - *Eucalyptus microcarpa*, or sparse *E. camaldulensis* in wetter central areas. Species include *Pycnosorus globosus*, *Amphibromus nervosus*, *Rytidosperma duttonianum*, *Lachnagrostis filiformis* s.s., *Eleocharis acuta*, *Juncus* spp. (*J. flavidus*, *J. amabilis*, *J. subsecundus* and *J. pallidus*), *Walwhalleya proluta*, *Isolepis* spp., *Alternanthera denticulata* s.l., *Lythrum hyssopifolia*, *Swainsona procumbens*, *Asperula conferta*, *Haloragis aspera*, *Calotis scapigera*, *Marsilea* spp., *Lobelia concolor*, *Poa fordeana* and *Rumex* spp.

Riverine Floodplain - *E. camaldulensis* (sometimes with scattered *E. largiflorens*), with species including *Rytidosperma duttonianum*, *Amphibromus nervosus*, *Eleocharis acuta*, *Eleocharis pusilla*, *Lobelia concolor*, *Wahlenbergia fluminalis*, *Goodenia* spp., *Calotis* spp., *Marsilea* spp., *Poa fordeana* and *Brachyscome basaltica* var. *gracilis*. Sparse tussocks of *Carex tereticaulis* or *Paspalidium jubiflorum* can also be present.

Ecological overview

Some examples of this EVC are maintained only by local run-off, whereas others are more flood-prone and maintained by periodic shallow inundation from larger events on floodplains. Inundation is usually only shallow and for a couple of months, though it may persist for a short time longer during wet winters.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If this EVC is being considered for environmental watering, there should be major concerns and a cautious approach if this involves engineering works to modify floodways or local topography to create new flow paths or barriers to drainage. This vegetation is reasonably tolerant of prolonged dry periods and can be damaged by overwatering. For example, overwatering may result in a species-poor condition dominated by *Eleocharis acuta* (Common Spike-sedge) and, potentially mortality among tree species which have grown under a different hydrological regime.

Rushy Riverine Swamp Aggregate EVC 804

EVC description

Defining characteristics: Aggregate EVC describing the various zones of vegetation associated with semi-permanent wetlands with (turf/aquatic) grassy species co-dominating in mosaic or association with components of tall rushland and aquatic herbs. Concentrically zoned wetland with lawn-like grassy centres during drier periods or as a patchy structural mosaic. Variously including species-poor components of Tall Marsh (EVC 821), Floodplain Grassy Wetland (EVC 809), Aquatic Sedgeland (EVC 308), Aquatic Herbland (EVC 653) and Dwarf Floating Aquatic Herbland (EVC 949). Scattered and restricted, floodplains in less arid parts of the Riverina, upstream from Gunbower Island.

Indicator species: Dominated by *Amphibromus fluitans* and/or *Pseudoraphis spinescens*, with *Stellaria caespitosa* and/or *Myriophyllum* spp. (mostly *M. variifolium or M. crispatum*), and ringed by/in mosaic with *Juncus ingens*. *Eucalyptus camaldulensis* is present around the verges. Additional aquatics which can be present include *Azolla filiculoides*, *Eleocharis sphacelata*, *Ludwigia peploides* subsp. *montevidensis*, *Potamogeton tricarinatus* s.l., *Landoltia punctata*, *Ricciocarpus natans*, *Vallisneria americana* var. *americana* and *Stellaria caespitosa*.

Ecological overview

This EVC is typically structurally variable, with the inundation regime varying across the relevant wetland. While deeper areas may retain water longer, these generally drain/dry out annually. Depth of inundation does not greatly exceed one metre if reaching this level.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental water is delivered to this EVC, this is best done during winter and spring. In this case it is very important to allow natural drainage and drawdown (i.e. avoid artificially retaining water for any sustained period). Priming wetlands early with smaller inputs may be beneficial as late rains may provide a partial top up to the habitat.

Saline Aquatic Meadow EVC 842

EVC description

Defining characteristics: Submerged herbland of thin grass-like plants, occurring within brackish to hyper-saline waterbodies (shallow lakes and swamps and intermittent wetland ponds). The vascular vegetation is characteristically extremely species-poor, comprising one or more species of *Lepilaena* or *Ruppia.* The non-vascular stoneworts (*Lamprothamnium* spp.) can also be conspicuous and are ecologically important. Widespread in lowlands (within restricted habitat), principally in the Wimmera, western volcanics and coastal areas.

Indicator species: Variously *Ruppia megacarpa*, *Ruppia polycarpa*, *Lepilaena* spp. (e.g. *L. preissii*, *L. bilocularis*, *L. cylindrocarpa*), *Ruppia maritima* s.s. (confined to north-west of the State) and *Lamprothamnium* spp.

Ecological overview

This EVC occupies a range of highly variable environments, including within or close to the intertidal zone. Lacustrine habitats vary substantially in the frequency of inundation events. While shorter durations of inundation can occur, at least several months is required for species such as *Ruppia maritima* and *Ruppia tuberosa* to complete their life cycles. The longevity of propagules during dry phases appears to vary between the various potential component species.

Phase context of EVC representation

Inundated

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Common
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Occasional
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common

Salinity		
Category	**Range (mg/L)**	**EVC preference**
Mesosaline	>10,000–50,000	Common
Hyposaline	>3,000–10,000	Occasional
Hypersaline	>50,000–350,000	Occasional

Management considerations
The delivery of environmental water is not relevant to examples of this EVC within or close to the intertidal zone. If environmental water is supplied to non-tidal sites, it should emulate the seasons and allow for natural drawdown. In the case of *Ruppia* spp., priming with smaller amounts of water in spring can assist the plants, but care is required in case the water remains too salty.

Saline Lake Aggregate EVC 717

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the floors and verges of saline waterbodies. Components of the aggregate variously include Saline Aquatic Meadow (EVC 842), Plains Saltmarsh Aggregate (EVC 888), Brackish Herbland (EVC 538), Brackish Sedgeland (EVC 13) and, on drier verges, Brackish Grassland (EVC 934) and Brackish Shrubland (EVC 973). Mainly western and northern areas, but also scattered sites on coastal plains.

Indicator species: See descriptions of component EVCs.

Ecological overview

See comments under the component EVCs.

Phase context of EVC representation

While some components of the aggregate are continuously expressed, other components can be restricted to the inundated or drying phases.

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

If water is being delivered to wetlands relevant to this aggregate, a suitable regime will consider the component EVCs requirements, especially those of upper zones, and allow for natural drawdown.

Saline Lake-verge Aggregate EVC 648

EVC description

Defining characteristics: Collective label for the various zones of vegetation associated with the verges of saline waterbodies. Components of the aggregate variously include Plains Saltmarsh Aggregate (EVC 888), Brackish Herbland (EVC 538), Brackish Sedgeland (EVC 13) and, on drier verges, Brackish Grassland (EVC 934) and Brackish Shrubland (EVC 973). Mainly western and northern areas, but also scattered sites on coastal plains.

Indicator species: See descriptions of component EVCs.

Ecological overview

See comments under the component EVCs.

Phase context of EVC representation

While the aggregate EVC is continuously represented, the expression of some components can be restricted to the drying phase.

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

If water is being delivered to wetlands relevant to this aggregate, a suitable regime will consider the component EVCs requirements, especially those of upper zones, and allow for natural drawdown.

Saltmarsh-grass Swamp EVC A113

EVC description

Defining characteristics: Inundation-prone grassland of highly saline sites, dominated by Australian Saltmarsh-grass. Shallow intermittent saline lakes in parts of inland western Victoria, also extremely restricted occurrences in the Barwon River estuary and on wet saline flats in the Kerang area.

Indicator species: *Puccinellia perlaxa* or *Puccinellia stricta*, with associated species mostly at lower covers, variously including *Sarcocornia quinqueflora*, *Suaeda australis*, *Tecticornia pergranulata*, *Wilsonia rotundifolia*, *Senecio halophilus*, *Gahnia filum* and *Wilsonia humilis*.

Ecological overview

The environmental requirements of this EVC are poorly known. This EVC apparently occurs in sites where hydrological conditions can be highly variable according to annual and seasonal rainfall. The habitat can become hypersaline when dry or nearly so, but not when it is inundated. If it is inundated depths exceeding 30 cm, it is usually not by much and if so, then only briefly. Saline groundwater is a major determinant with the habitat subject to fresher flushes.

Phase context of EVC representation

This EVC can be at least in part more or less continuously expressed at a site, or sometimes restricted in expression to the drying phase.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

In general, the habitat is not likely to be subject to environmental watering. If this EVC occurs in a context where watering is being considered then a cautious approach is vital. If water is supplied, natural drawdown of shallow ponding should be allowed. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Salt Paperbark Woodland EVC 676

EVC description

Defining characteristics: Melaleuca dominated woodland with a halophytic understorey, occurring on seasonally waterlogged heavy clay soils on saline flats and lake verges of inland semi-arid areas. Restricted, drier northern and western areas of the State.

Indicator species: *Melaleuca halmaturorum*, with *Tecticornia* spp., *Sarcocornia quinqueflora* and halophytic herbs - e.g. variously *Triglochin striata*, *Mimulus repens* and *Selliera radicans*.

Ecological overview

The extent to which this EVC is inundated is highly variable according to seasonal/annual rainfall. Where it occurs on a lake verge, it is unlikely to be drowned due to topographical considerations. The cause of death of Salt Paperbark observed at Pink Lakes is not known. In the absence of local knowledge it appears this mortality is related to the effects of drought. Further information would be helpful in understanding the ecological context of this community and its relationships to soil salinity and moisture conditions. When this EVC is inundated, salinity may just enter the hyposaline range.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Occasional

Management considerations

In some instances, it may be possible that more inundation-prone areas adjacent to this EVC could be subject to delivery of environmental water, however this will rarely, if at all, be relevant to the habitat occupied by this EVC. Artificial retention of water in wetlands that support this EVC should be avoided.

Samphire Shrubland EVC 101

EVC description

Defining characteristics: Low halophytic shrubland of drier inland areas, dominated by succulent-stemmed chenopods (samphires). Lower rainfall western and northern areas.

Indicator species: *Tecticornia* spp., *Frankenia* spp.; potentially more diverse with a range of small annual herbs (e.g. *Brachyscome lineariloba*, *Crassula sieberiana* s.l., *Hornungia procumbens*, *Senecio glossanthus* and *Triglochin* spp.) on outer verges and mounds.

Ecological overview

This EVC is maintained by saline groundwater and the extent of waterlogging varies across the relevant wetland system. The high salinity is also frequently associated with gypseous substrates, especially in the further north-west. Most variants are tolerant of brief inundation, but sustained inundation will result in loss of diversity and the death of structural dominants. The wettest versions of this EVC (e.g. dominated by *Tecticornia flabelliformis* and *Tecticornia indica*) are more tolerant of occasional shallow inundation. Species-poor versions of this EVC can extend onto sites where salinity has been induced by land-use practices.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
>6 months	<1 month	Common
>6 months	1–6 months	Occasional

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Common
Calcareous	N/A	Common

Management considerations

Some wetlands supporting this EVC have been used as disposal sites for irrigation run-off which has led to severe and long-term damage to highly significant vegetation. If supplying water to the deeper basins of wetlands naturally fringed by this EVC, it is important to minimize exposure of this EVC to inundation and to monitor any potential impacts. Even in the wettest versions of this EVC (e.g. those dominated by *T. flabelliformis* and *T. indica*) inundation should not exceed one or two months and should at most comprise extremely shallow ponding.

Sea-grass Meadow EVC 845

EVC description

Defining characteristics: Sward-forming aquatic herbland of sheltered marine shallows, intertidal flats and lower estuarine habitats. Scattered along Victorian coast, with most extensive development within Corner Inlet and Western Port Bay.

Indicator species: *Zostera* and / or *Heterozostera* spp., often monospecific and sometimes in close proximity to stands of *Avicennia marina*. *Zostera muelleri* s.l. extends into lower estuarine habitats, with *Heterozostera* spp. conspicuous on intertidal mud flats. A localised variant of inter-tidal mud-flats of Western Port Phillip Bay includes *Lepilaena marina* and *Ruppia tuberosa*.

Ecological overview

This EVC occurs in intertidal to estuarine/marine habitats

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common
Permanent	Constant, annual or less frequently but before wetland dries	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	Permanent	Common
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common

Management considerations

Environmental watering is generally not relevant to this EVC, with the possible exception of barrier management in estuarine situations if the entrance has been modified by altered stream flows.

Seasonally Inundated Shrubby Woodland EVC 195

EVC description

Defining characteristics: Woodland of broad drainage lines and poorly-drained flats (e.g. recent Quaternary swamp deposits, seasonally-waterlogged depressions between dunes), in habitat that is occasionally inundated, or at least waterlogged for extensive periods over winter. The EVC is characteristically rich in geophytes, sedges and annual herbs, usually with a conspicuous shrubby component. Principally in south-west, but extending into north-central areas of the State and central Gippsland.

Indicator species: *Eucalyptus* spp. (notably *E. camaldulensis*, also *E. leucoxylon* and *E. melliodora*; *E. ovata* in Gippsland) with *Callistemon* spp. (*C. rugulosus* in western Victoria; *C. citrinus* in Gippsland) and *Melaleuca* spp. in wetter sites (notably *M. decussata* and *M. gibbosa*; *M. parvistaminea* in Gippsland). *Melaleuca brevifolia* dominated shrubland/heath in sub-saline sites is referred to Brackish Shrubland (EVC 973).

Ecological overview

This EVC is subject saturation from seasonally high water tables and to shallow inundation as a result of larger rainfall events. The ecological context of the EVC is variable and not all communities are particularly prone to inundation. The extent of seasonal wetness is highly variable and depends on annual conditions and site factors as reflected by the relevant structural dominant of the vegetation (e.g. ranging from being subject to winter waterlogging to experiencing regular shallow surface inundation).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Most, if not all examples of this EVC are unlikely to be subject to potential environmental watering.

Seasonally Inundated Sub-saline Herbland EVC 196

EVC description

Defining characteristics: Very species-poor low herbland of seasonal saline wetland within relicts of former tidal lagoons, dominated by *Wilsonia* spp. The habitat is not inundated tidally, but by overland flows. Extremely localised (mostly Bellarine Peninsula, small areas in the Gippsland Lakes)

Indicator species: *Wilsonia humilis* and/or *W. backhousei* and *W. rotundifolia*.

Ecological overview

This EVC occupies ponds or very shallow lakes within saline flats. It is influenced by saline groundwater and is prone to seasonal flooding with brackish water. The habitat of this EVC is presumed to remain within the lower part of the potential salinity range during active growth phases of the structural dominants.

Phase context of EVC representation

While the EVC is to some extent continuously evident, maximum expression of the structural dominants occurs during the drying phase of the wetland.

Frequency of inundation

Category	Description	EVC preference
King tide	Several times per year	Occasional
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Occasional

Management considerations

Environmental watering is presumably unlikely to be relevant to this EVC, but if so bathymetry will determine inundation levels. Any water delivery should occur in cooler months and allow for natural draw-down.

Sedge-rich Wetland EVC 281

EVC description

Defining characteristics: Treeless (or nearly so) vegetation of small swamps on seasonal drainage lines, characterised by a diversity of small sedges, the extent of bare earth and lack of shrubs. The habitat is prone to shallow seasonal inundation and extreme summer dryness. This EVC is typically species-rich, with many species seasonally apparent at very low frequencies. Restricted, south-western areas.

Indicator species: *Chorizandra enodis*, diversity of small plants (especially sedges), e.g. *Isolepis fluitans*, *Schoenus latelaminatus*, *Juncus holoschoenus*, *Juncus bufonius*, *Gratiola pumilo*, *Schoenus tesquorum*, *Lilaeopsis polyantha*, *Neopaxia australasica*, *Goodenia humilis* and *Villarsia reniformis*.

Ecological overview

This EVC is maintained by local run-off and/or seasonally elevated water-tables, and soil-type (sloppy when wet, hard-setting when dry). Inundation is shallow and highly variable in extent and duration between seasons. Consequently, this EVC is presumed to be reasonably tolerant of drought conditions.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is unlikely to be subject to environmental watering. Instead the focus should be on the protection of the local catchment and water-table levels.

Sedge Wetland EVC 136

EVC description

Defining characteristics: Seasonally-inundated, freshwater sedgeland of depressions, typically within swales amidst soils with a substantial sandy component, clearly dominated by tall sedges, lacking the diversity of broad-leaved herbs associated with relatively intact Plains Sedgy Wetland (EVC 647), and occurring within relatively less-fertile land-types than the latter. Widespread in southern and higher rainfall western areas.

Indicator species: *Lepidosperma longitudinale*, *Baumea arthrophylla* and/or *Baumea juncea*; diversity variable, with associated species variously including *Schoenus* spp. (variously *S. tesquorum*, *S. apogon*, *S. brevifolius*), *Goodenia humilis* and *Patersonia* spp.

Ecological overview

This EVC occurs in shallow wetlands dependent on annual rainfall and local catchments, typically in swales of sandy terrain. Inundation of this EVC is generally relatively shallow and rarely exceeds several months but it may occasionally remain inundated for a longer duration during wetter years.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is unlikely to be relevant to this EVC. Management of wetlands containing this EVC should focus on protection of the local catchment and integrity of the groundwater (e.g. from the impacts of drains or extraction from the groundwater).

Sedge Wetland/Aquatic Herbland Complex EVC A102

EVC description

Defining characteristics: Open sedgeland occurring in association with a well developed component of aquatic herbs. Apparently restricted distribution on the west side of the Grampians.

Indicator species: *Lepidosperma longitudinale*, *Baumea arthrophylla*, *Myriophyllum integrifolium* and *Villarsia* spp. Fringed by *Eucalyptus camaldulensis*.

Ecological overview

Wetlands supporting this EVC can retain shallow water in parts of the system on a more or less continuous basis during wetter years, but inundation is largely seasonal. Expression of the aquatic herbland component of the complex may be dependent on high rainfall years.

Phase context of EVC representation

While expression of the sedge component is continuous, the aquatic herb component is expressed during the inundated phase and declining with the drying phase.

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Occasional
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is unlikely to be relevant to this EVC. Management of wetlands within this EVC should focus on protection of the local catchment and integrity of the groundwater (e.g. from the impacts of drains or extraction from the groundwater).

Sedge Wetland/Aquatic Sedgeland Complex EVC 963

EVC description

Defining characteristics: Tall sedgeland, with a component of septate, hollow-leaved sedges and aquatic herbs. Outer fringes are typically richer, with species characteristic of Sedge Wetland (EVC 136). Restricted, principally in south-west but with disjunct outliers further east (e.g. Dereel, Brisbane Ranges).

Indicator species: *Baumea articulata*, *Chorizandra australis* (or possibly on occasions *C. cymbaria*), *Lepidosperma longitudinale*, *Baumea arthrophylla*, *Villarsia reniformis*, *Myriophyllum* spp. (*M. crispatum* and *M. simulans*), *Cycnogeton procerum* s.l. and *Isolepis fluitans*. The outer drier verges are much more species-rich (see Sedge Wetland).

Ecological overview

This EVC is dependent on groundwater/high water-tables. It may retain shallow water in part of system on a more or less continuous basis, at least during wetter years, but inundation is largely seasonal. While the Aquatic Sedgeland component may decline during drought periods, the less drought-tolerant species presumably persist in the seed bank.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Occasional
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is unlikely to be relevant to this EVC. Management of wetlands within this EVC should focus on protection of the local catchment and integrity of the groundwater/water table (e.g. from the impacts of drains or extraction from the groundwater or directly from the wetland).

Sedge Wetland/Brackish Herbland Complex EVC 1113

EVC description

Defining characteristics: Sedgeland of near coastal depressions, with the structural dominant species of Sedge Wetland (EVC 136) occurring in association with a component of halophytic herbs. Very rare, recorded from sub-saline soils with a high organic content on the Mornington Peninsula, but potentially at least previously more widespread in coastal areas.

Indicator species: *Baumea arthrophylla*, *Baumea juncea*, *Gahnia trifida* and/or *Lepidosperma longitudinale*, variously with e.g. *Lobelia irrigua*, *Isolepis cernua*, *Schoenus nitens*, *Selliera radicans*, *Distichlis distichophylla*, *Centella cordifolia* and *Samolus repens*.

Ecological overview

This EVC is poorly known but is dependent on the local catchment and groundwater (similar to Sedge Wetland [EVC 136] but with brackish inputs). During a wet year, habitat supporting this EVC could remain inundated for a short time beyond the suggested duration period, however this would be unusual. Water depths rarely exceed 30 cm, and if so, this is presumably not by much and not for long periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

Delivery of environmental water is presumably unlikely to be required or relevant to this EVC. Management of wetlands within this EVC should focus on protection of the local catchment and integrity of the groundwater/water table (e.g. from the impacts of drains or extraction from the groundwater or directly from the wetland).

Sedge Wetland/Calcareous Wet Herbland Complex EVC 883

EVC description

Defining characteristics: Open sward of sedge species characteristic of Sedge Wetland (EVC 136), in association with herbaceous species characteristic of wet calcareous habitats. Rare with variants from near-coastal Western Victoria and South Gippsland.

Indicator species:

Western Victoria: *Baumea arthrophylla*, *Lachnagrostis filiformis* s.l., *Centella cordifolia*, *Hydrocotyle muscosa*, *Isolepis fluitans*, *Myriophyllum simulans*, *Goodenia humilis*, *Schoenus tesquorum* and *Villarsia reniformis*, with a wide range of associated species at low frequencies on more species-rich outer verges.

South Gippsland: *Baumea arthrophylla*, *Baumea juncea*, *Carex appressa*, *Poa labillardierei*, *Hydrocotyle* spp. (*H. sibthorpioides* s.l., *H. pterocarpa*, *H. muscosa*) and *Mentha diemenica* s.l., with a wide range of associated species at low frequencies on more species-rich outer verges. *Gahnia trifida* appears to have been greatly reduced by grazing following burning.

Ecological overview

This poorly known EVC occurs on limestone geology or calcareous sand and is presumably groundwater dependent. Inundation does not persist at depths substantially greater than 30 cm and is generally presumed to remain quite shallow.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

While wetlands supporting this EVC can be fed by small channels, the potential delivery of environmental water is unlikely to be relevant or practical. Management should instead focus on the protection of the local catchment and integrity and quality of the groundwater/water-table.

Sedgy Riverine Forest EVC 816

EVC description

Defining characteristics: Eucalypt dominated forest (to woodland) with the understorey dominated by larger sedges (to sedgy-herbaceous or sedgy-grassy), floristics with some affinities to Red Gum Swamp (EVC 292). Floodplains of less arid Riverina and Wimmera (absent from further north-west).

Indicator species:

Murray River Floodplain: *Eucalyptus camaldulensis* with *Carex tereticaulis*, variously with *Bolboschoenus medianus*, *Paspalidium jubiflorum*, *Eleocharis acuta*, *Juncus amabilis*, *Lobelia concolor*, *Brachyscome basaltica* var. *gracilis*, *Amphibromus nervosus*, *Lachnagrostis filiformis* s.s. and *Calotis* spp., *Stellaria angustifolia*, *Phragmites australis* and *Craspedia paludicola*, with *Eleocharis pusilla* on drier margins.

Wimmera: *Eucalyptus camaldulensis* with *Carex tereticaulis* and associated species including *Cyperus* spp., *Isolepis* spp., *Juncus* spp., *Centipeda cunninghamii*, *Calotis scapigera*, *Crassula helmsii*, *Cycnogeton* spp. and *Myriophyllum* spp.

Ecological overview

This EVC occurs on heavier soils than Grassy Riverine Forest (EVC 106) and is less tolerant of deep inundation. Instead, inundation in this EVC is mostly relatively shallow, and generally does not greatly exceed 30 cm, as the structural dominant of the understorey, *Carex tereticaulis* (Poong'ort), is easily drowned by sustained total submersion. The rootstock of *C. tereticaulis* is relatively tolerant of dry periods. Inundation frequency of this EVC spans the middle of the episodic to intermittent range, with high decadal variation in the frequency of inundation events. The maximum duration of inundation is generally less than three months.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
If this EVC is being considered for delivery of environmental water, there should be major concerns and a cautious approach, especially if this involves engineering works to modify floodways or local topography to create new flow paths or barriers to drainage. It is important that any delivery of environmental water is restricted to the cooler months and that natural drawdown is allowed.

Sedgy Riverine Forest/Riverine Swamp Forest Complex EVC 817

EVC description

Defining characteristics: Eucalypt dominated forest (to woodland), with the understorey dominants of Riverine Swamp Forest (EVC 814) conspicuous in association or fine-scale mosaic with larger tussock or rhizomatous species characteristic of Sedgy Riverine Forest (EVC 816). Floodplains of less arid parts of the Riverina, but mainly within Barmah Forest.

Indicator species: *Eucalyptus camaldulensis*, with *Carex tereticaulis* and variously *Bolboschoenus medianus*, *Phragmites australis* and *Paspalidium jubiflorum* in association or mosaic with *Eleocharis acuta* and/or *Pseudoraphis spinescens*. Associated species variously include *Amphibromus nervosus*, *Persicaria* spp. (in particular *P. prostrata*), *Centipeda cunninghamii*, *Eclipta platyglossa* and *Lobelia concolor*.

Ecological overview

This EVC occurs on relatively heavy soils of low gradient sites on broad floodplains, where floodwaters tend to spread rather than deepen as river flows increase. The duration of inundation is longer than for Sedgy Riverine Forest (EVC 816), but usually persists for less than six months. By early summer the habitat is dry. The tolerable depth range is not substantially greater than that of Sedgy Riverine Forest, as the characteristic species *Carex tereticaulis* (Poong'ort) is easily drowned by sustained total submersion. Compared to Sedgy Riverine Forest, this EVC occurs in wetter conditions, however presence of *C. tereticaulis* is sparser. This EVC can also occur in situations subject to repeated shallow inundation during the normal flood season (winter-spring).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If this EVC is being considered for delivery of environmental water, there should be major concerns and a cautious approach, especially if this involves engineering works to modify floodways or local topography to create new flow paths or barriers to drainage. It is important that any delivery of environmental water is restricted to the cooler months and that natural drawdown is allowed.

Sedgy Swamp Woodland EVC 707

EVC description

Defining characteristics: Eucalypt dominated woodland with the ground layer typically dominated by *Lepidosperma longitudinale* (or rarely *Lepidosperma congestum*) with a range of herbs characteristic of seasonally wet sites. Occurs on seasonally wet flats of coastal plains, on Quaternary sandy soils over heavier sub-soils. Rare, south-west Victoria and Mornington Peninsula, possibly also central Gippsland.

Indicator species: *Eucalyptus ovata* (and possibly *Eucalyptus camaldulensis* and or *Eucalyptus tereticornis* subsp. *mediana*), *Lepidosperma longitudinale* (or rarely *Lepidosperma congestum*), *Goodenia humilis*, *Gratiola pubescens*, *Villarsia reniformis* and *Centella cordifolia*.

Ecological overview

The ecological determinants of this EVC are poorly known. High water-tables are presumed to be an important ecological factor. Inundation, which may follow rainfall events, is generally towards the lower end of the specified range and not be continuous over the wet period.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The potential supply of environmental water to this EVC is presumably not particularly relevant, with the habitat dependent on the maintenance of the integrity of the local catchment and groundwater/ water-table levels.

Shell Beach Herbland EVC 964

EVC description

Defining characteristics: Turf grassland/herbland mounds within largely unvegetated areas, occurring on *Coxiella* shell deposits on saline lake verge, over grey clay soils. Rare, Lake Corangamite.

Indicator species: *Convolvulus* spp. and *Wilsonia backhousei*, with *Cuscuta* spp., *Distichlis distichophylla*, *Geranium retrorsum* s.l. and a range of introduced annuals and biennials.

Ecological overview

This EVC is a poorly known and very localised community associated with the verge of the relevant wetlands. It is subject to inundation only at high lake levels or due to storm action, rather than requiring inundation at a specified frequency. It occurs in a particularly distinctive context as the substrate comprises accumulations of shells derived from within the adjacent lake.

Phase context of EVC representation

As a fringing community, the EVC is evident over long periods during the dryer phases of the wetland, and is virtually continuously represented outside of episodic inundation events

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

Delivery of environmental water to this EVC is neither feasible nor required.

Sink-hole Wetland Aggregate EVC 908

EVC description

Defining characteristics: Collective label for the various zones of wetland vegetation associated with near-coastal sink-holes in limestone. The central 'sink-hole' portions of the relevant wetlands are species-poor, with mats of aquatics. This inner zone is fringed by a sedgy-herbaceous verge, which is fringed by Swamp Scrub (EVC 53) at the few known sites. Rare, far south-west.

Indicator species: *Myriophyllum salsugineum* and *Nitella* spp. (Characeae), *Baumea arthrophylla*, *Baumea juncea*, *Schoenoplectus pungens*, *Typha* spp., *Cycnogeton procerum* s.l. and *Leptospermum lanigerum* (outer verges).

Ecological overview

The habitat of this EVC comprises permanent waterbodies and adjacent inundation-prone fringes. It occurs within karst landscapes and consequently the habitat is always calcareous. The depth categories relate to different components of the aggregate. For the outer fringes, seen notes under Swamp Scrub (EVC 53). The edge zones are potentially vulnerable to desiccation under drought conditions or otherwise depleted water- tables, far more so than the deeper water-body of the associated sink-hole.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Occasional
	>6 months (but not permanent)	Occasional
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Occasional
Shallow to medium	30–100	Occasional
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations
Environmental watering of wetlands supporting this aggregate EVC is presumably not relevant or practical, with habitat condition dependent on protection of the water-table and local catchment.

Spike-sedge Wetland EVC 819

EVC description

Defining characteristics: Low sedgy vegetation of seasonal or intermittent wetlands, dominated by spike-sedges and usually species-poor. Typically treeless, but sparse eucalypts (mostly *E. camaldulensis*) can be present in marginal sites. Scattered in drier lowlands, including the western volcanics, Riverina floodplains and Wimmera.

Indicator species: *Eleocharis acuta* (or rarely *E. pusilla*), monospecific or with *Lachnagrostis filiformis* s.s. and incidental opportunistic species (e.g. *Crassula helmsii*, *Cycnogeton procerum* s.l., *Lythrum hyssopifolia*, *Glyceria australis* and *Stellaria* spp). The verges can be more species-rich and grade into other EVCs, notably Plains Grassy Wetland (EVC 125).

Ecological overview

A variable suite of ecological factors appear to lead to the presence of this EVC. This EVC represents typically very species-poor vegetation occurring across a range of habitats in conditions where *Eleocharis acuta* (Common Spike-sedge) is highly competitive or where it apparently has the best tolerance to the range of prevailing environmental conditions. The vegetation can be species-poor due to an intermittent wetting regime with shallow summer inundation or due to long dry periods. *E. acuta* is very tolerant of sustained dry periods. Drawdown to less than 30 cm is required for *E. acuta* to grow, although it is tolerant of deep flooding if it has an adequate growth period to replenish the rootstocks before the onset of limiting hot and dry conditions (i.e. deeper flooding is not sustained into summer). Some examples of this EVC extend into hyposaline conditions, abutting patches of Brackish Wetland (EVC 656).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations
In many cases environmental watering of wetlands supporting this aggregate EVC will not be relevant or practical. In instances where this EVC occurs in wetlands subject to environmental watering, other EVCs present in the system may provide a better guide for a suitable hydrological regime. If delivering environmental water, it is important to allow natural drawdown, and to recognise the risks of damage to the vegetation associated with storm-water discharge into wetlands.

Spring Soak Woodland Aggregate — EVC 80

EVC description

Defining characteristics: Herbland to eucalypt dominated woodland with a shrubby-herbaceous understorey, herb-rich wetland vegetation associated with soaks and springs. Rare, north-east Victoria.

Indicator species: *Eucalyptus* spp. (variously *E. blakelyi*, *E. goniocalyx*, *E. cadens*, *E. ovata* or *E. nortonii*), *Leptospermum continentale*, with *Goodenia macbarronii*, *Schoenus apogon* and a range of associated herbs, sedges and rushes – e.g. *Aphelia gracilis*, *Glossostigma elatinoides*, *Drosera peltata* s.s., *Centrolepis strigosa* subsp. *strigosa*, *Hypericum japonicum*, *Isotoma fluviatilis* subsp. *australis*, *Eragrostis brownii* and *Juncus* spp.

Ecological overview

This EVC can comprise an aggregate vegetation, potentially including herbland areas around soaks, which can be more or less permanently wet, and woodland areas which, at least in patches and outside of drought conditions, are prone to sustained seasonal waterlogging. Inundation is related to rainfall events, and when it occurs, it is not necessarily continuous across the seasonally wet period. The water-tables generally remain relatively high for much of the year.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

This EVC is highly unlikely to be subject to environmental watering. Management should focus on protection of the local catchment and groundwater/water-tables.

Stony Rises Pond Aggregate EVC 857

EVC description

Defining characteristics: Collective label for the various zones of wetland vegetation associated with more permanent ponds of basaltic stony rises. Components include Dwarf Floating Aquatic Herbland (EVC 949) and Wet Verge Sedgeland (EVC 932) and/or Tall Marsh (EVC 821). Rare, stony rises of most recent volcanics (notably near Camperdown).

Indicator species: Various associations of *Lemna disperma*, *Lemna trisulca*, *Wolffia australiana*, *Azolla filiculoides*, *Carex appressa*, *Crassula helmsii*, *Myriophyllum* spp., *Persicaria decipiens* and *Typha domingensis*.

Ecological overview

This aggregate EVC includes ponds of variable depth and fringing seasonally wet edges (see also notes under Wet Verge Sedgeland [EVC 932]).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Occasional
Medium to deep	>100–200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Environmental watering is not likely to be relevant to this EVC as it is maintained by rainfall.

Sub-alpine Wet Heathland EVC 210

EVC description

Defining characteristics: Wet treeless heathland habitat of sub-alpine to alpine soaks or flats along streams. Some communities are difficult to interpret as a consequence of degradation of bogs arising from cattle and horse grazing. Localised within higher mountains. Often more shrubby than, but intergrades with higher elevation alpine bog systems.

Indicator species: *Baeckea* spp., *Epacris* spp. (notably *E. paludosa*), *Empodisma minus*, *Callistemon pityoides*, *Sphagnum cristatum* and *Hakea microcarpa.*

Ecological overview

This EVC is maintained by seepage and local run-off. It occurs across habitats ranging from generally damp sites to those with more or less permanent waterlogging. In wetter sites, inundation can occur with snow-melt and larger rainfall events, but it is mostly very shallow and brief.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Bog	Constant waterlogging, inundation mostly superficial	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The supply of environmental water to this EVC is not relevant. Management should focus on protection of the integrity of local catchments.

Sub-alpine Wet Sedgeland EVC 917

EVC description

Defining characteristics: Treeless tussocky (grassy-sedgy) vegetation of wet plains on sub-alpine (apparently to alpine) creek flats, with patchy inter-tussock matting of *Sphagnum* spp. (with few large *Sphagnum* hummocks, and patchy *Callistemon* shrubland, both primarily on upper margins). Relatively species-poor when tussock or sward density is moderate to high. Rare, lower elevation snowfields.

Indicator species: *Carex gaudichaudiana* and/or *Carex appressa*, *Poa* spp., *notably P. helmsii*, with *Psychrophila introloba*, *Sphagnum* spp. and (patchy) *Callistemon pityoides*.

Ecological overview

This EVC is localised on broader creek flats associated with larger streams at high elevations. Inundation occurs with snow-melt and heavy rainfall events. The habitat can retain partial shallow inundation, but this is not necessarily continuous over the inundation period. Outside of drought conditions, the habitat remains waterlogged for extensive periods due to elevated water-tables.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The supply of environmental water to this EVC is not relevant. Management should focus on protection of the integrity of local catchments.

Submerged Aquatic Herbland EVC 918

EVC description

Defining characteristics: Extensive submerged beds of Eel Grass (*Vallisneria australis*) in lakes and watercourse ponds. Restricted, mainly in west to north-west, apparently depleted by carp.

Indicator species: *Vallisneria australis* is typically dominant as a submerged sward. *Myriophyllum* spp. may also be present. Submerged Aquatic Herbland can occur in association with a range of wetland components, including Tall Marsh (EVC 821), Aquatic Herbland (EVC 653), Brackish Aquatic Herbland (EVC 537) and (rarely) Saline Aquatic Meadow (EVC 842).

Ecological overview

The ecological characteristics of this EVC are inadequately understood. Submerged aquatics appear to have declined severely during recent years. In sites subject to long-term inundation the impacts of carp potentially add a risk factor for species such as *V. australis*. However minimum inundation periods of not much less than six months are required. More or less permanent inundation may no longer be suitable for this EVC if the relevant site is accessible to carp. The deeper ranges of potential inundation (i.e. in excess of about one metre) apply only to situations with very clear water (e.g. *Myriophyllum* spp. in sinkholes), and will be unsuitable for *V. australis* which must extend its flowers to the water surface for pollination. If the water is hyposaline, then it will only be at concentrations at the lower end of this range.

Phase context of EVC representation

Inundated

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity		
Category	**Range (mg/L)**	**EVC preference**
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional
Calcareous	N/A	Occasional

Management considerations
If environmental watering is supplied to wetlands supporting this EVC, the sites should be primed first, e.g. to a level of one third full, during spring or autumn before filling. The rate of drawdown and the water clarity is important. In most cases, depth of inundation should be to less than one metre. In some situations with consistently clear water, a greater depth may be tolerable.

Sub-saline Depression Shrubland EVC 820

EVC description

Defining characteristics: Low open shrubland/herbland of the highest terraces of the former (i.e. pre-1750) Murray River floodplain in far north-west, dominated by chenopods and succulents, occupying semi-saline treeless pans within the drier, more elevated parts of the Riverine Chenopod Woodland (EVC 103) zone. Rare, far north-west of the State.

Indicator species: The major species include *Sclerolaena tricuspis*, *Malacocera tricornis* and *Disphyma crassifolium* subsp. *clavellatum*, variously with *Maireana pentagona*, *Cressa australis*, and *Frankenia* spp. or *Sarcocornia* spp.

Ecological overview

This EVC occurs in shallow depressions at the highest levels and is only inundated by major flooding or rainfall events. It is normally subject to, and tolerant of, prolonged dry periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Hyposaline	>3,000–10,000	Common

Management considerations

This EVC is presumably outside of the range of potential environmental watering and does not requiring watering.

Swamp Heathland Aggregate EVC 49

EVC description

Defining characteristics: Collective label for the various zones of densely shrubby vegetation associated with waterlogged flats on acidic soils of the Central Highlands. Considered to include three component EVCs (Riparian Scrub [EVC 191], Wet Heathland (EVC 8] and the terrestrial EVC Damp Heathy Woodland). Confined to lower elevations of central highlands east of Melbourne.

Indicator species: *Melaleuca squarrosa*, *Gleichenia* spp., *Baumea tetragona*, *Gahnia sieberiana*, *Epacris lanuginosa*, *Pultenaea weindorferi*, *Empodisma minus* and *Chorizandra cymbaria*, typically fringed by Damp Heathy Woodland dominated by *Eucalyptus cephalocarpa*.

Ecological overview

This aggregate EVC includes the vegetation of bogs occurring along low gradient drainage-lines. Subterranean water-flow can occur beneath the associated peats. Inundation of the wetter components mostly occurs following rain but is not necessarily continuous through these wet periods. However, waterlogging of soft substrates can be substantial, and effectively constitute shallow inundation. See also notes under the component EVCs Riparian Scrub (EVC 191) and Wet Heathland (EVC 8).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

The habitat of this aggregate EVC is not relevant to the delivery of environmental water, but rather is dependent on catchment protection, maintenance of groundwater and avoiding unnatural drainage.

Swamp Scrub EVC 53

EVC description

Defining characteristics: Dense (and potentially up to 10-15 m) shrubby vegetation of relatively fertile swampy flats, dominated by Myrtaceous shrubs (to small trees), ground-layer often sparse, aquatic species conspicuous, *Sphagnum* and/or ferns tolerant of waterlogging sometimes present. Formerly widespread in cooler lowland southern areas of Victoria. Note that much of the prior EVC mapping has included the drier (non wetland) EVC 948 Damp Melaleuca Scrub, and the saline EVC 953 Estuarine Scrub within a broader circumscription of Swamp Scrub. Damp Melaleuca Scrub is distinguished by a ground-layer dominated by terrestrial species (e.g. grasses and forbs with bryophytes and lichens) and Estuarine Scrub by a ground-layer dominated by salt-tolerant to halophytic species.

Indicator species: *Melaleuca ericifolia*, *Leptospermum lanigerum*, *Isolepis inundata* and *Cycnogeton procerum* s.l., *Villarsia* spp. Swamp Scrub can interface with a range of EVCs, including Riparian Forest, Swampy Woodland, Swampy Riparian Woodland, Riparian Scrub and Seasonally Inundated Shrubby Woodland, and local floristics can reflect these transitions.

Ecological overview

The degree of wetness varies within this EVC, but it is frequently waterlogged for extensive periods, occasionally to the extent of shallow inundation. The extent of elevated water-tables and groundwater seepage varies with seasonal/annual conditions and flood events. The dominant woody species can sometimes be pedestalled, with the adjacent deeper areas retaining more prolonged inundation (e.g. six to nine months). The EVC occurs in both calcareous and non calcareous sites, with conditions sometimes extending into the lower end of the hyposaline range.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional
Calcareous	N/A	Common

Management considerations
The composition of the ground-layer vegetation of this EVC should be considered in any potential delivery of environmental water. If watering, delivery should occur over the winter-spring period. Water depths should remain very shallow as sustaining elevated inundation for lengthy periods can impact plant species diversity.

Swamp Scrub / Gahnia Sedgeland Complex EVC 2004

EVC description

Defining characteristics: Dense shrubby sedgeland on swampy ground on limestone geologies, structurally and floristically intermediate between Gahnia Sedgeland (EVC 968) and Swamp Scrub (EVC 53). Very localised in the far south-west of the State.

Indicator species: *Leptospermum lanigerum*, *Melaleuca squarrosa*, *Gahnia trifida*, *Gahnia clarkei*, *Baumea juncea*, *Baumea arthrophylla*, *Hydrocotyle sibthorpioides*, *Acaena novae-zelandiae*, *Urtica incisa*, *Poa tenera*, *Lachnagrostis scabra*, *Leucopogon* sp. aff. *parviflorus*, *Pteridium esculentum*, *Blechnum* spp., *Cassytha melantha* and *Viola hederacea* sensu Entwisle (1976); outer margins with *Eucalyptus ovata* and *Ozothamnus ferrugineus*.

Ecological overview

This EVC always occurs over calcareous substrates, with a generally similar hydrology to the less inundation prone variants of Swamp Scrub (EVC 53).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Calcareous	N/A	Common

Management considerations

This EVC is presumably unlikely to be subject to environmental watering, instead being dependent on protection of the local catchment and groundwater.

Swampy Riparian Woodland EVC 83

EVC description

Defining characteristics: Eucalypt dominated woodland vegetation (in mosaic with scrub/reed-beds) associated with very low-gradient streams within areas subject to riparian processes. Typically constitutes linear wetland, but includes drier banks and levees, as for Floodplain Riparian Woodland. Scattered in moister lowland areas.

Indicator species: *Eucalyptus ovata* or *Eucalyptus camphora* subsp. *humeana*, variously *Leptospermum lanigerum*, *Melaleuca ericifolia* (southern Victoria only), *Phragmites australis*, *Persicaria decipiens*, *Calystegia sepium* subsp. *roseata*, *Acacia melanoxylon*, *Poa labillardierei* and *Poa ensiformis.*

Ecological overview

The extent and frequency of inundation of this EVC varies with seasonal/annual rainfall. More prolonged inundation is usually restricted to the lower-lying portions, such as depressions derived from prior channels. Otherwise inundation is mostly relatively brief, following rainfall events, and not necessarily continuous over the wetter months. The habitat may remain waterlogged for substantial periods.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	<1 month	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

If environmental watering is relevant to this EVC, then it will primarily be about replicating patterns of natural flooding events, in conjunction with maintaining the water-table. It is important to allow natural drainage. If inundation is too sustained, the trees can be at risk of drowning.

Swampy Woodland EVC 937

EVC description

Defining characteristics: Swampy Woodland denotes a poorly-understood range of vegetation types of poorly-drained, seasonally waterlogged heavy soils. In the strict sense the label applies to at least seasonally waterlogged vegetation of wet flats, not subject to direct flooding from major streams, but receiving water through seepage or surface run-off. In some instances Swampy Woodland can occur to the rear of levees on floodplains, receiving water via minor side streams rather than direct flooding from the main watercourse. The distinctions between Swampy Riparian Woodland (EVC 83) and Swampy Woodland become more difficult where the habitats occur in narrow bands along low gradient valleys in more dissected terrain. Swampy Woodland occurs as an outer zone to some wetland systems. Formerly widespread in cooler southern areas, mainly in the east, extending into margins of the highlands.

Indicator species: Typically dominated by *Eucalyptus ovata*, but a range of other *Eucalyptus* spp. can be present, especially in drier versions (including *E. fulgens*, *E. ignorabilis* s.l., *E. yarraensis*, *E. camphora* s.l., *E. obliqua* and *E. radiata* s.l.), variously with *Melaleuca ericifolia* (of reduced vigour relative to occurrences within Swamp Scrub (EVC 53) and Swampy Riparian Woodland), *Acacia* spp. (including *A. melanoxylon* and *A. verticillata*), *Goodenia ovata*, *Coprosma quadrifida*, *Ozothamnus ferrugineus*, *Poa* spp., *Carex* spp. and *Lepidosperma* spp.

Ecological overview

The habitat of this EVC varies from gentle slopes subject to seepage that do not experience sustained inundation, to wetter sites subject to shallow seasonal inundation. The wetness of sites varies according to seasonal/annual conditions, however if inundation occurs, it will generally not be sustained for much in excess of a month or two.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
>6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
Environmental watering is presumably relevant to this EVC only in instances where it is occurs adjacent to other more inundation dependent wetland habitats. If watering of adjacent wetland habitats extends into this EVC, it is vital that artificially sustained inundation is avoided and natural drawdown is allowed.

Sweet Grass Wetland EVC 920

EVC description

Defining characteristics: Very species-poor wetland vegetation, dominated by Sweet Grass. It is distinguished from Plains Grassy Wetland (EVC 125) by its extremely low diversity. Sweet Grass Wetland is frequently monospecific or virtually so). It can form an inner zone to Plains Grassy Wetland and in some (but not all) instances, a pragmatic approach may be to treat wetland cores dominated by Sweet Grass as a very species-poor phase of Plains Grassy Wetland. Scattered on western volcanics, also recorded from the less-arid Wimmera and south-west Victoria.

Indicator species: *Glyceria australis*, sometimes monospecific or with sparse associated species including *Eleocharis acuta*, *Rumex bidens* and *Lachnagrostis filiformis* s.l. *Poa labillardierei* and *Eryngium vesiculosum* are frequently present on drier verges. In some cases a diverse seasonal flora (with affinities to Plains Grassy Wetland) can be expressed as inundation retreats, whereas in others the vegetation remains very species-poor.

Ecological overview

This EVC mostly has an inundation regime generally similar to that of Plains Grassy Wetland (EVC 125). Inundation is generally less than for a six month period and is towards the shallower end of the depth range (i.e. rarely much in excess of 50 cm), though central areas and some atypical examples may have a more sustained duration.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common
	>6 months (but not permanent)	Occasional

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is rarely, if ever, likely to be relevant to this EVC.

EVC description

Defining characteristics: Wetland dominated by tall emergent graminoids, typically in thick, species-poor swards. The structure is variously rushland, sedgeland or reedbed, locally closed or in association or fine-scale mosaic with Aquatic Herbland (EVC 653), e.g. along floodway lagoons. The vegetation is typically treeless, but sparse *Eucalyptus camaldulensis* (or in higher rainfall areas, *Eucalyptus ovata*) are dispersed through some sites where sufficient dry periods occur to allow their survival. Scattered across lowland Victoria.

Indicator species: Variously with *Phragmites australis*, *Typha* spp., *Juncus ingens*, *Juncus procerus*, *Schoenoplectus tabernaemontani* and in more marginal sites sometimes also *Bolboschoenus* spp., *Cyperus* spp. or (locally) *Cladium procerum*. Associated species are quite variable and can include aquatics such as *Potamogeton* spp., *Myriophyllum* spp., *Rumex bidens*, *Stellaria caespitosa*, *Amphibromus fluitans*, *Pseudoraphis spinescens*, *Calystegia sepium*, *Azolla* spp., *Landoltia punctata* and *Lemna* spp. In cooler or more reliably inundated areas, frequent associated species include *Wolffia* spp. and *Urtica incisa*.

Ecological overview

Outside of during major floods, the water depth in the habitat of this EVC is rarely maintained in excess of one metre for any substantial duration. The species composition of the EVC varies with the general duration of inundation. Stabilisation of water levels for the purposes of hunting or storage of irrigation water can result in excessive growth of the structural dominants and loss of habitat values. Periodic drawdown and drying out is generally favourable, as long as problems with acid sulphate soils are not triggered.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	>6 months (but not permanent)	Common
	Permanent	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations

In planning a regime for water delivery to this EVC, it is vital to consider the environmental requirements and responses of the relevant species. Any delivery of environmental water should consider desired vegetation structure and, in general, allow summer drawdown where feasible. Shallow summer flushes can trigger potentially unwanted effects such as mass germination of *Juncus ingens* (Giant Rush).

Unvegetated (open water / bare soil / mud) EVC 990

EVC description

Defining characteristics: Low lying areas which are unvegetated (or nearly so), at least in relation to vascular flora, including relevant habitat on intertidal mudflats. Widespread wetland component, which may or may not alternate across time with various vegetated EVCs.

Indicator species: Lacking vascular flora (but sometimes with sparse opportunistic species).

Ecological overview

This EVC descriptor is not relevant to emergent vegetation or maintenance of a specific EVC supporting vascular vegetation.

Phase context of EVC representation

Continuous, Inundated, Drying

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common
Permanent	Constant, annual or less frequently but before wetland dries	Common
Intermittent	Inundated 3–7 years in every 10	Common
Episodic	Inundated less than 3 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
	>6 months (but not permanent)	Common
	Permanent	Common
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common
Medium to deep	>100–200	Common
Deep	>200	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Common
Mesosaline	>10,000–50,000	Common
Hypersaline	>50,000–350,000	Common

Management considerations

The relevant wetlands should be managed according to other habitat values/requirements of any EVCs which occur in spatial or temporal mosaics with EVC 990.

Wet Heathland EVC 8

EVC description

Defining characteristics: Low shrubby (to sedgy) vegetation associated with impeded drainage on wet flats at lower (below montane) elevations. Scattered across less fertile soils of cooler southern and south-western Victoria.

Indicator species: *Melaleuca squarrosa*, *Leptospermum continentale*, *Xanthorrhoea* spp., *Gymnoschoenus sphaerocephalus*, *Lepyrodia* spp., *Leptocarpus* spp. s.l., *Empodisma minus* and including species restricted to waterlogged habitats, e.g. *Sprengelia incarnata*, *Drosera binata*, *Gonocarpus micranthus*.

Ecological overview

This EVC is largely maintained by local run-off and/or high water tables and is often transitional to wetland. While some examples of this EVC are regarded as 'dampland' or marginal to wetland habitat others clearly match the definition of wetland. The duration and extent of saturation varies with seasonal/annual rainfall. In general inundation is very shallow if it occurs, but potentially deeper and more sustained on flats dominated by *Xanthorrhoea resinosa* (Spear Grass-tree) following more substantial rain events.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common
Fringing	Inundation periodic but brief	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
Variable (fringing wetland)	Variable, usually brief	Common
1–6 months	<1 month	Common
>6 months	<1 month	Common
1–6 months	1–6 months	Occasional
>6 months	1–6 months	Occasional

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Occasional

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
The delivery of environmental water is not relevant to this EVC, with the habitat dependent on protection of the local catchment and groundwater.

Wet Heathland/Plains Grassy Wetland Complex — EVC A104

EVC description

Defining characteristics: Low shrubland dominated by sclerophyllous species, with a diverse grassy-herbaceous ground-layer including species shared with seasonal grassy wetlands of heavy soils on lowland plains. Extremely localised in far south-west Victoria.

Indicator species: *Melaleuca gibbosa*, *Leptospermum continentale*, *Amphibromus* spp., *Allittia cardiocarpa*, *Craspedia paludicola* and *Villarsia reniformis*.

Ecological overview

The ecological characteristics of this EVC are poorly known. The extent of saturation/shallow inundation varies with annual/seasonal rainfall. It is maintained by local run-off and high water tables/groundwater. The depth and duration of inundation is presumed to generally be at the lower end of the specified ranges and is not necessarily continuous over the seasonal wet period.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is presumably not relevant to this EVC, with the habitat dependent on protection of the local catchment and groundwater.

Wet Heathland/Plains Sedgy Wetland Complex EVC A105

EVC description

Defining characteristics: Low shrubland dominated by sclerophyllous species, with a sedgy ground-layer including herbaceous species shared with seasonal wetlands of heavy soils on lowland plains. Extremely localised in far south-west Victoria.

Indicator species: *Melaleuca gibbosa*, *Baumea arthrophylla*, *Villarsia reniformis*, *Allittia cardiocarpa*, *Craspedia paludicola* and *Senecio squarrosus.*

Ecological overview

The ecological characteristics of this EVC are poorly known. The habitat of this EVC is presumed to have a hydrology similar to Wet Heathland/Plains Grassy Wetland (EVC A104), but probably with a more sustained/reliable period of inundation. Inundation potentially spans much of the category range of duration and with a more reliable groundwater contribution than EVC A104.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Bog	Constant waterlogging, inundation mostly superficial	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is presumably not relevant to this EVC, with the habitat dependent on protection of the local catchment and groundwater.

Wet Heathland/Sedge Wetland Complex EVC 931

EVC description

Defining characteristics: Sedgy open heathland, transitional in structure and floristics between Wet Heathland (EVC 8) and Sedge Wetland (EVC 136). Rare, recorded with certainty only from south-west Victoria.

Indicator species: *Leptospermum continentale*, *Lepidosperma longitudinale*, *Lepyrodia* spp. and *Schoenus tesquorum*, with associated species including *Amphibromus recurvatus*, *Rytidosperma semiannulare*, *Mazus pumilio*, *Melaleuca squarrosa*, *Lobelia pedunculata* s.l., *Centella cordifolia* and *Villarsia reniformis.*

Ecological overview

The ecological characteristics of this EVC are poorly known. It is presumed to dependent on local run-off and high water-tables, with the extent of waterlogging and duration of inundation varying with seasonal and annual conditions. Inundation of the habitat of this EVC is presumed to generally be shallow and not necessarily consistent over the duration of the wet period. Duration of inundation is usually towards the shorter end of the category range.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is presumably not relevant to this EVC, with the habitat dependent on protection of the local catchment and groundwater.

Wet Saltmarsh Herbland EVC A107

EVC description

Defining characteristics: Low herbland dominated by succulent to semi-succulent halophytic herbs or semi-shrubs, occupying low-lying areas of coastal saltmarsh subject to regular inundation. Widespread but confined to restricted areas of suitable habitat in sheltered parts of the Victorian coast.

Indicator species: Often very species-poor, most frequently dominated by *Sarcocornia quinqueflora*, less commonly by *Hemichroa pentandra*, *Selliera radicans*, *Samolus repens* or *Suaeda australis*, and on rare occasions, *Triglochin striata*.

Ecological overview

This EVC mainly occurs in intertidal habitats, but can sometimes occur in depressions towards the rear of saltmarsh areas, or in prior coastal embayments now separated from tidal influence, where inundation is less frequent but potentially lasts for longer periods. In habitats remote from tidal influence, it is dependent on elevated groundwater and local run-off. The structural dominant is not tolerant of sustained total submersion. The deeper category of inundation refers to what can be experienced during tidal events rather than that tolerated during ponding. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common
King tide	Several times per year	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	<1 month	Common
>6 months	1–6 months	Common
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common

Management considerations

The supply of environmental water is presumably not relevant to this EVC. Potentially, removal of artificial barriers to tidal influence may be considered. Artificial drainage inputs should be avoided.

Wet Saltmarsh Shrubland EVC A108

EVC description

Defining characteristics: Shrubland dominated by halophytic species and subject to regular tidal inundation. Scattered along Victorian coast, but largely confined to between Breamlea and Corner Inlet.

Indicator species: Often very species-poor, most frequently dominated by *Tecticornia arbuscula*, much less commonly by *Atriplex paludosa*, and rarely by *Atriplex cinerea*. *Sarcocornia quinqueflora* is also frequent in wetter sites with *T. arbuscula*, but less abundant in the slightly more elevated communities dominated by *Atriplex* spp., where *Distichlis distichophylla* becomes more prevalent. *Suaeda australis* can also be conspicuous.

Ecological overview

This EVC is confined to intertidal habitats. See also notes under Coastal Saltmarsh Aggregate (EVC 9).

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Semidiurnal tide	Twice daily	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
	Twice daily	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Mesosaline	>10,000–50,000	Common

Management considerations

The supply of environmental water is not relevant to this EVC, other than potentially through the removal of artificial barriers to tidal influence. Artificial drainage inputs should be avoided.

Wet Sedgy Herbland EVC A116

EVC description

Defining characteristics: Species-poor vegetation dominated by herbaceous monocots other than grasses, sometimes with sparse, taller emergent rushes. It occurs on silty alluvium in coastal plain habitats prone to shallow seasonal inundation. Apparently very rare and localised, known only from restricted occurrences in west to south Gippsland, where sometimes occurring adjacent to or in mosaic with Swamp Scrub (EVC 53).

Indicator species: Dominated by *Isolepis inundata* and robust forms of *Triglochin striata*, variously with *Eleocharis acuta* and/or *Eleocharis pusilla*. Additional minor species include *Isolepis producta*, *Eleocharis sphacelata*, *Myriophyllum simulans*, *Cycnogeton procerum*, *Cycnogeton microtuberosum*, *Baumea rubiginosa*, *Selliera radicans* and *Lobelia anceps*. A sparse component of scattered *Juncus ingens* and/or *Juncus pallidus* is sometimes present, but is not characteristic.

Ecological overview

The ecological characteristics of this EVC are poorly known. The frequency of inundation would vary according to annual/seasonal rainfall and the inundation period is not necessarily continuous. The habitat is generally inundated by the extension of regular flooding filling the adjacent deeper wetland areas. This EVC is potentially a component of temporal mosaics in some situations (coming up after major floods) whereas in others it appears to be more persistent across seasons. Outside of temporary flood peaks, inundation during growth periods is at maximum very shallow.

Phase context of EVC representation

In some locations, representation of this EVC presumed to be continuous, whereas in others it is represented only during the drying phase.

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	<1 month	Common
>6 months	<1 month	Common
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Common

Management considerations
In relation to potential delivery of environmental water to this EVC, it seems likely that requirements of this vegetation will be adequately met through appropriate management of the adjacent wetland EVCS (e.g. Swamp Scrub EVC 53).

Wet Swale Herbland EVC 12

EVC description

Defining characteristics: Wetland vegetation of coastal barrier lagoons, including a mixture of aquatic grasses, sedges and herbs. Rare, East Gippsland.

Indicator species: *Pseudoraphis paradoxa*, *Eleocharis sphacelata*, *Villarsia reniformis*, *Myriophyllum simulans*, *Cycnogeton procerum* s.l., *Baumea articulata*, *Hydrocotyle sibthorpioides*, *Asperula subsimplex* and *Potamogeton tricarinatus* s.l.

Ecological overview

The ecological characteristics of this EVC are poorly known and it is potentially inconsistently interpreted. As circumscribed for the IWC, this EVC comprises seasonal wetland which remains waterlogged for long periods. Deeper areas are potentially subject to periods of inundation in excess of six months during wetter years, whereas outer zones are subject to much briefer periods of inundation. Maximum depth is generally considerably less than one metre, with drawdown occurring during warmer and dryer months.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
>6 months	1–6 months	Common
	>6 months (but not permanent)	Common

Water depth

Category	Range (cm)	EVC preference
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations

Delivery of environmental water is presumably not relevant to this EVC, with the habitat dependent on protection of local catchments.

Wet Verge Herbland EVC A118

EVC description

Defining characteristics: Low herbland dominated by amphibious/semi-aquatic species. It occupies seasonally wet habitat in the outer drawdown zone of wetlands that have a sufficiently reliable water supply and elevated watertable to support Aquatic Herbland (EVC 653). Wet Verge Herbland typically abuts Aquatic Herbland, but is much more diverse than that EVC. The soils are typically high in organic content. Apparently very restricted, scattered across southern lowland parts of the State, where often bounded by Swamp Scrub (EVC 53), Riparian Scrub (EVC 171) or sometimes the terrestrial EVC Damp Heathland (EVC 710), on peaty to sandy soils.

Indicator species: Common species include *Goodenia humilis*, *Hydrocotyle sibthorpioides*, *Centella cordifolia*, *Myriophyllum simulans*, *Isotoma fluviatilis* subsp. *australis*, *Montia australasica*, *Gratiola pubescens*, *Isolepis fluitans*, *Gonocarpus micranthus*, *Schoenus maschalinus* and *Crassula helmsii*. Additional associated species variously include *Hypericum japonicum*, *Juncus planifolius*, *Juncus holoschoenus*, *Isolepis inundata*, *Lobelia anceps*, *Lilaeopsis polyantha*, *Hydrocotyle tripartita*, robust forms of *Triglochin striata*, *Lachnagrostis filiformis* s.l., *Eleocharis acuta* and *Hemarthria uncinata*. Occasional larger sedges and rushes or incidental plants of shrubs such as *Leptospermum continentale* can also be present, but are not representative.

Ecological overview

The ecological characteristics of this EVC are poorly known. It represents the zone that is occupied by amphibious plants and is transitional to Aquatic Herbland (EVC 653). The frequency and duration of inundation of this habitat will vary with annual/seasonal rainfall. Inundation, when it occurs, is presumably not much in excess of 30 cm. Groundwater is likely to be important in maintaining this habitat.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Occasional

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common
Hyposaline	>3,000–10,000	Occasional

Management considerations
It appears likely that delivery of environmental water is not relevant to this EVC, with the habitat dependent on groundwater and protection of local catchments. In the event of any possible watering of this EVC, it is vital that natural drawdown is allowed.

Wet Verge Sedgeland EVC 932

EVC description

Defining characteristics: Tussock sedge dominated wetland component of cooler areas, occasionally occurring as the main wetland vegetation present, typically dominated by *Carex appressa*. Scattered, mostly in south but extending (as a component of aggregate EVCs) to montane elevations in East Gippsland.

Indicator species: *Carex appressa*, with associated species variously including *Carex fascicularis*, *Juncus* spp. (notably *J. amabilis*, *J. gregiflorus*, *J. holoschoenus*), *Poa labillardierei*, *Glyceria australis* (pale green less upright forms), *Amphibromus nervosus*, *Crassula helmsii* and *Persicaria* spp. (e.g. *P. decipiens*, *P. lapathifolia*, *P. praetermissa*, *P. prostrata*), *Centella cordifolia*, *Eleocharis acuta*, *Epilobium billardierianum*, *Epilobium hirtigerum*, *Goodenia humilis*, *Lobelia pratioides* and *Hemarthria uncinata* var. *uncinata*.

Ecological overview

Outside of flood conditions, the inundation depth of the habitat of this EVC is mostly shallow and does not greatly exceed 30 cm, and rarely persists above this value for long. This EVC is potentially tolerant of variation in the frequency of inundation, according to climatic conditions, and is at least in part maintained by elevated water-tables. The season of inundation due to flooding will naturally vary, but is most likely to occur from winter to spring.

Phase context of EVC representation

Continuous

Frequency of inundation

Category	Description	EVC preference
Permanent	Constant, annual or less frequently but before wetland dries	Common
Seasonal	Annual or near annual inundation (e.g. 8–10 years in every 10)	Common
Intermittent	Inundated 3–7 years in every 10	Common

Maximum event duration

Duration of waterlogging	Duration of inundation	EVC preference
1–6 months	1–6 months	Common
>6 months	1–6 months	Common

Water depth

Category	Range (cm)	EVC preference
Very shallow	<30	Common
Shallow to medium	30–100	Common

Salinity

Category	Range (mg/L)	EVC preference
Fresh	0–3,000	Common

Management considerations
This EVC occurs in a range of contexts, some of which could be potential sites for environmental watering, while others would not. If water is delivered to wetlands supporting this EVC, natural drawdown should be allowed. Artificial impoundment or change to bathymetry should be avoided as these types of modification can easily kill the structural dominants and deplete plant species diversity within the wetland.

Section 4: Bioregional Conservation Status of wetland EVCs

Background to EVC Bioregional Conservation Status and categories

The Bioregional Conservation Status (BCS) of each EVC is a measure of the current extent and quality of that EVC in a bioregion[4] compared to its original (pre-1750) extent and condition. There are 28 bioregions identified in Victoria that form part of the Interim Biogeographic Regionalisation for Australia (Figure 1).

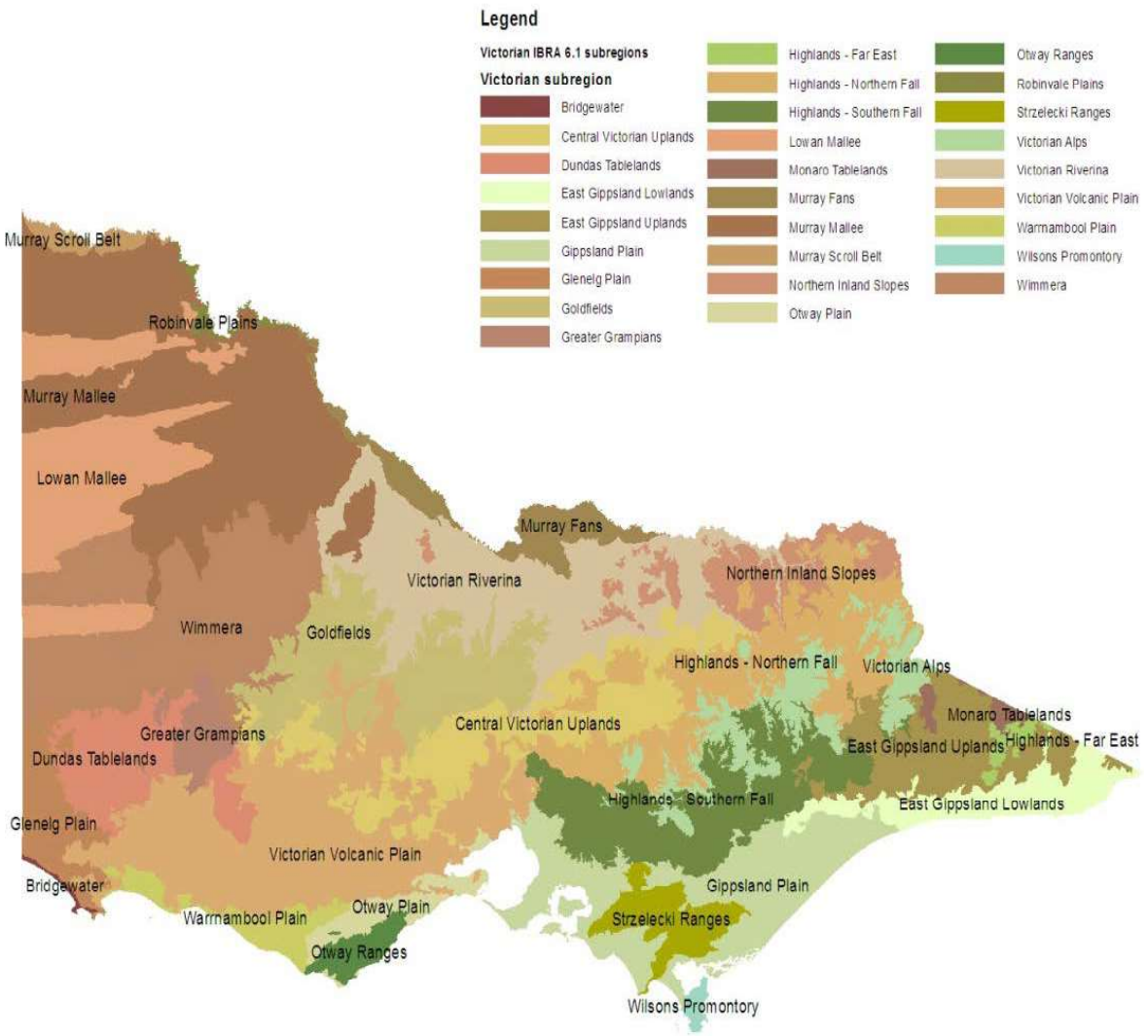

Figure 1. IBRA subregions (IBRA 6.1) in Victoria.

BCS values were initially applied to EVCs identified in Victoria's native vegetation framework[5]. A number of the wetland EVCs and their BCS are included in this framework. However, Victoria's wetland EVC typology has since been developed to a finer resolution and greater understanding than what was available during the EVC mapping that underpinned the native vegetation framework. Consequently, the EVC BCS supplied in this guide should be used in preference to those in the native vegetation framework.

[4] See the following website for further information and spatial data that delineates the Victorian bioregions: https://www.data.vic.gov.au/data/dataset/victorian-bioregions

[5] For further information on the derivation of the EVC BCS in the native vegetation framework, please refer to Appendices 2 and 4 of *Victoria's native vegetation management – a framework for action* (NRE 2005).

There are five categories for EVC BCS: 'presumed extinct', 'endangered', 'vulnerable', 'depleted', 'rare' and 'least concern'. Definitions of these categories are presented in Table 3 below. The EVC BCS for all wetland EVCs are presented in Table 4 overleaf.

Table 3. Bioregional conservation significance categories and their descriptions. The BCS category codes are used in Table 4 (EVC BCS of Victorian wetland EVCs in each Victorian bioregion).

BCS category	BCS category description	BCS code
Presumed Extinct	EVC probably no longer present in the bioregion	X
Endangered	Contracted to less than 10% of former range; or Less than 10% pre-European extent remains; or Combination of depletion, degradation, current threats and rarity is comparable overall to the above: • 10 to 30% pre-European extent remains and severely degraded over a majority of this area; or • naturally restricted EVC reduced to 30% or less of former range and moderately degraded over a majority of this area; or • rare EVC cleared and/or moderately degraded over a majority of former area.	E
Vulnerable	10 to 30% pre-European extent remains; or Combination of depletion, degradation, current threats and rarity is comparable overall to the above: • greater than 30% and up to 50% pre-European extent remains and moderately degraded over a majority of this area; or • greater than 50% pre-European extent remains and severely degraded over a majority of this area; or • naturally restricted EVC where greater than 30% pre-European extent remains and moderately degraded over a majority of this area; or • rare EVC cleared and/or moderately degraded over a minority of former area.	V
Depleted	Greater than 30% and up to 50% pre-European extent remains; or Combination of depletion, degradation and current threats is comparable overall to the above and: • greater than 50% pre-European extent remains and moderately degraded over a majority of this area.	D
Rare	Rare EVC (as defined by geographic occurrence) but neither depleted, degraded nor currently threatened to an extent that would qualify as Endangered, Vulnerable or Depleted.	R
Least Concern	Greater than 50% pre-European extent remains and subject to little to no degradation over a majority of this area.	LC

Bioregional Conservation Status of Victorian wetland EVCs

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion. Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
1111	Alkaline Basaltic Wetland Aggregate																									V			
806	Alluvial Plains Semi-arid Grassland																	V				V			E				
239	Alpine Creekline Herbland																							V					
171	Alpine Fen												V											V					
288	Alpine Heath Peatland																							E					
1011	Alpine Hummock Peatland										E	E												E					
905	Alpine Short Herbland																							V					
306	Aquatic Grassy Wetland		V		V		E		E																	E			
653	Aquatic Herbland	E		E			E	E		E						V									E	E	E		E
308	Aquatic Sedgeland				R		V	V								V				V				R		E	E		
334	Billabong Wetland Aggregate		V		E		E	E	V			V	V			D									V				
369	Black Box Wetland															E									E				E
875	Blocked Coastal Stream Swamp						R																					R	
537	Brackish Aquatic Herbland	V					V													V					V	V	V		V
934	Brackish Grassland			E			E													E						E	E		
538	Brackish Herbland			E	R		V	V												V					E	E	V		V
636	Brackish Lake Aggregate						R	D																	E	V			D
539	Brackish Lake Bed Herbland						V													V					V				V

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
947	Brackish Lignum Swamp																			V					V	E			
13	Brackish Sedgeland			E	V		V	V												V						E			E
1114	Brackish Sedgy Shrubland				E																								
973	Brackish Shrubland							V						R															
656	Brackish Wetland Aggregate			E	R		V	V	E											V					E	E	V		E
A106	Calcareous Sedgy Shrubland	E																											
591	Calcareous Wet Herbland						E	E																					
291	Cane Grass Wetland													E					V						V	V			V
602	Cane Grass Wetland / Aquatic Herbland Complex			E																					V	E			E
606	Cane Grass Wetland / Brackish Herbland Complex			E																						E			E
A117	Cane Grass Wetland / Lignum Shrubland Complex																								E				
284	Claypan Ephemeral Wetland									V																			
A110	Coastal Dry Saltmarsh				R		E													V						E		R	
976	Coastal Ephemeral Wetland						E																						
A111	Coastal Hypersaline Saltmarsh						V													V						E			
11	Coastal Lagoon Wetland Aggregate				V		V																					R	
A109	Coastal Saline Grassland				R		R													R						E	E		
9	Coastal Saltmarsh Aggregate	V			R		D													V						E	E	R	

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
A112	Coastal Tussock Saltmarsh	V			R		V													R						E	E	R	
673	Dune-soak Woodland			E																									E
949	Dwarf Floating Aquatic Herbland		LC		LC		LC		LC			LC	LC			LC		LC	LC			LC			LC	R			LC
678	Ephemeral Drainage-line Grassy Wetland																									E			
914	Estuarine Flats Grassland	E			E		E													E	E					E	E	E	
952	Estuarine Reedbed	E			V		V													E	E					E	E	V	
953	Estuarine Scrub	E			E		E													E	E						E		
10	Estuarine Wetland	E			V		D													E	E					E	D	R	
721	Fern Swamp												V								E		E						
809	Floodplain Grassy Wetland						E									E	E	E				E							
56	Floodplain Riparian Woodland		E	V			E	V	E			E	E			D			E	E					V	E			E
280	Floodplain Thicket			V						LC																			
172	Floodplain Wetland Aggregate			E			E	E				E	E			D			V	E					V	E			E
810	Floodway Pond Herbland						E		E			V	E			D	V	D				D			V				
945	Floodway Pond Herbland / Riverine Swamp Forest Complex															D		V				V			V				V
723	Forest Bog						V																			E			
728	Forest Creekline Sedge Swamp		V		R		V					V	R													V			
718	Freshwater Lake Aggregate																V								V	E			R

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
954	Freshwater Lignum - Cane Grass Swamp																								V	E			V
657	Freshwater Lignum Shrubland																									E			
968	Gahnia Sedgeland	E					E	E																			E	R	
1112	Granite Rock-pool Wetland		E						E			E							E										
106	Grassy Riverine Forest															D	D	D				D			D				
811	Grassy Riverine Forest / Floodway Pond Herbland Complex															V		D				D			D				
812	Grassy Riverine Forest / Riverine Swamp Forest Complex															D		D				D			D				
124	Grey Clay Drainage-line Aggregate																									E			
956	Herb-rich Gilgai Wetland			E												E									E	E			E
708	Hypersaline Inland Saltmarsh Aggregate																R												V
813	Intermittent Swampy Woodland													E		E	E	V				V			E				E
A119	Intermittent Swampy Woodland / Lake Bed Herbland Complex																E								E				E
822	Intermittent Swampy Woodland / Riverine Grassy Woodland Complex																					E							
107	Lake Bed Herbland													D		V	D	V				D			D				
974	Lava Plain Ephemeral Wetland																									E			

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
808	Lignum Shrubland															E	V	D				D			E				
104	Lignum Swamp								V							V	V	V		E		V			V	E			E
823	Lignum Swampy Woodland													D		V	V	D	V			D			V				V
140	Mangrove Shrubland						LC													V						V		R	
966	Montane Bog					E						E	R											E					
41	Montane Riparian Thicket					LC					LC	R	LC											LC					
40	Montane Riparian Woodland					E					V	V	E		V									LC					
148	Montane Sedgeland					E					V	V	V		E									R					
318	Montane Swamp					E						E																	
185	Perched Boggy Shrubland Aggregate											E																	
125	Plains Grassy Wetland		E	E			E	E	E							E			E	E					E	E			E
755	Plains Grassy Wetland / Aquatic Herbland Complex																									E			E
767	Plains Grassy Wetland / Brackish Herbland Complex			E								V														E			
958	Plains Grassy Wetland / Calcareous Wet Herbland Complex							E																					
A101	Plains Grassy Wetland / Lignum Swamp Complex																								E	E			E
959	Plains Grassy Wetland / Sedge-rich Wetland Complex			E																						E			E

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
960	Plains Grassy Wetland / Spike-sedge Wetland Complex						E																			E			
961	Plains Rushy Wetland		V																						V	E			
888	Plains Saltmarsh Aggregate			E																					E	E			V
647	Plains Sedgy Wetland		E	E			E	E		E										E					E	E	E		E
1010	Plains Sedgy Wetland / Sedge Wetland Complex		E				E	E																		E			
283	Plains Sedgy Woodland			D				V		V																V			D
651	Plains Swampy Woodland			E			E	E					E							E					E	E	E		E
784	Plains Swampy Woodland / Lignum Swamp Complex																									E			
292	Red Gum Swamp		E	E			E	E	E	V				E		V			E						V	E			V
A114	Red Gum Swamp / Cane Grass Wetland Complex																								E	E			E
A115	Red Gum Swamp / Plains Rushy Wetland Complex																								E	E			
A120	Riparian Fern Scrub						E														E								
191	Riparian Scrub		E	E	LC		V	D		LC		V	V										V				E	LC	E
59	Riparian Thicket						V					V	V																
103	Riverine Chenopod Woodland													D		E	D	D				D			V				E
975	Riverine Ephemeral Wetland															V													
814	Riverine Swamp Forest															D									D				
815	Riverine Swampy Woodland								E							V			E			E			V				

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																											
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Murray Fans	Monaro Tablelands	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
804	Rushy Riverine Swamp Aggregate															R									D				
842	Saline Aquatic Meadow			R			R										R			R					R	R			R
717	Saline Lake Aggregate			V													LC								E	V			V
648	Saline Lake-verge Aggregate			E													D								V	E			V
676	Salt Paperbark Woodland													V			V												V
A113	Saltmarsh-grass Swamp																			E					E	E			V
101	Samphire Shrubland													LC	V		LC		R						D				V
845	Sea-grass Meadow	V			R		D													V	V					V	V	R	
195	Seasonally Inundated Shrubby Woodland)		D	D			E	E		LC				LC												E			LC
196	Seasonally Inundated Sub-saline Herbland						R													R									
136	Sedge Wetland		V	E			V	V		E																V	E	R	E
A102	Sedge Wetland / Aquatic Herbland Complex			E						E																			
963	Sedge Wetland / Aquatic Sedgeland Complex		V	E			V	D		V																	E	R	

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																												
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
1113	Sedge Wetland / Brackish Herbland Complex						E																							
883	Sedge Wetland / Calcareous Wet Herbland Complex						E	E																		E	E			
281	Sedge-rich Wetland			V				V		V																				V
816	Sedgy Riverine Forest												X		D		V					V			V	E				
817	Sedgy Riverine Forest / Riverine Swamp Forest Complex														D										D					
707	Sedgy Swamp Woodland						E	E																						
964	Shell-beach Herbland																									E				
908	Sink-hole Wetland Aggregate	R																												
819	Spike-sedge Wetland		V				V	V	V			V	V			V	E	V	E	V		V			V	E	V		V
80	Spring-soak Woodland Aggregate		E																E						V					
857	Stony Rises Pond Aggregate																									R				
210	Sub-alpine Wet Heathland											E	E		E									E						
917	Sub-alpine Wet Sedgeland																							D						
918	Submerged Aquatic Heathland						E									E									E	D			D	
820	Sub-saline Depression Shrubland																	V				V								
49	Swamp Heathland Aggregate						D						E																	
53	Swamp Scrub	E	E	E	E		E	V	E	E			E							V	E		E			E	E	E	E	

Table 4. Bioregional Conservation Status (BCS) of Victorian wetland EVCs in each Victorian bioregion (continued). Refer to Table 3 for the EVC BCS category codes.

Wetland EVC number	Wetland EVC name	Bioregion																												
		Bridgewater	Central Victorian Uplands	Dundas Tablelands	East Gippsland Lowlands	East Gippsland Uplands	Gippsland Plain	Glenelg Plain	Goldfields	Greater Grampians	Highlands Far East	Highlands Northern Fall	Highlands Southern Fall	Lowan Mallee	Monaro Tablelands	Murray Fans	Murray Mallee	Murray Scroll Belt	Northern Inland Slopes	Otway Plain	Otway Ranges	Robinvale Plain	Strzelecki Ranges	Victorian Alps	Victorian Riverina	Victorian Volcanic Plain	Warrnambool Plain	Wilsons Promontory	Wimmera
2004	Swamp Scrub / Gahnia Sedgeland Complex	V						V																						
83	Swampy Riparian Woodland		E			E	E		E			V	V						E	E	E		E	V		E	E		
937	Swampy Woodland		E				E					E	E						E				E						
920	Sweet Grass Wetland							E																		E			E
821	Tall Marsh			V	E		E	V	V	E		V	V			LC	R			V	E	D			D	E	E		E
990	Unvegetated (open water / bare soil / mud)	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC
8	Wet Heathland			D	LC	LC	D	LC		V			D							LC	LC		V			R	E	LC	
A104	Wet Heathland / Plains Grassy Wetland Complex																									E			
A105	Wet Heathland / Plains Sedgy Wetland Complex																									E			
931	Wet Heathland / Sedge Wetland Complex							E																					
A107	Wet Saltmarsh Herbland	R			R		D													R						E	R	R	
A108	Wet Saltmarsh Shrubland				R		D													D						E	V	R	
A116	Wet Sedgy Herbland						E																						
12	Wet Swale Herbland				V		V																					R	
A118	Wet Verge Herbland			E			E	E																			E		
932	Wet Verge Sedgeland		E			E	V	V				V	V					E								E	E		

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