

APPENDIX 1. DESCRIPTION OF FLEURIEU PENINSULA SWAMPS

Fleurieu Peninsula Swamps are localised areas of dense native vegetation occurring on waterlogged soils. They occur in high rainfall areas (450 – 950mm p.a) and comprise freshwater and occasionally brackish systems (Croft 1999; Duffield *et al.* 2000).

Whilst the community comprises typical plant and animal species, Fleurieu Peninsula swamps vary considerably in their composition, structural diversity, soil types and landform elements. As such, the community may be defined as encompassing some or all of the descriptions mentioned below. These descriptions are not necessarily considered definitive and will require verification and/or revision (MLRSEW Recovery Team, in prep a).

Descriptive information was sourced from the current Recovery Plan for Fleurieu Peninsula Swamp 2004-2008 (MLRSEW Recovery Team, in prep a). This plan recommends specific actions to better define Fleurieu Peninsula swamps in the future.

Distribution

The following distribution is not necessarily considered definitive and will require verification and/or revision:

The Fleurieu Peninsula swamps are found within the IBRA regions of Kanmantoo and Flinders Lofty (formerly Lofty Block) and Murray Darling Depressions (Duffield *et al.* 2000). They occur in the following water catchments:

- Tookayerta and Currency Creeks, Finnis River;
- Hindmarsh and Inman Rivers;
- Myponga River and Yankalilla (including the catchments of the Anacotilla and Congeratinga Rivers and Carrickalinga Creek);
- Those of the Parawa area including the catchments of Boat Harbour, Bollaparudda, Callawonga, Coolawang, Deep Creek, First, Tapanappa, Tunkalilla and Waitpinga Creeks.

Landform and water regime

Fleurieu Peninsula swamps comprise communities occurring on waterlogged and/or peat soils;

- In narrow, open depressions, typically dissecting the lateritic plateaus of the spine of the southern Mt Lofty Ranges (Fleurieu uplands);
- In broader, open depressions, typical of the rolling hills of the spine of the southern Mt Lofty Ranges (Fleurieu basins); and/or
- On the plains adjacent to the southern Mt Lofty Ranges fringing the lacustrine systems of Lake Alexandrina (Alexandrina plains).

Swamps on the Fleurieu Peninsula drain to Gulf St Vincent and the Southern Ocean as well as to Lake Alexandrina. Swamps rely on a combination of surface and groundwater, including springs (Littlely 1998).

Floristic characteristics

Fleurieu Peninsula Swamps are floristically and structurally diverse. They are characterised by dense reedy or heathy vegetation, often in several distinct layers. Tree life forms are mostly absent. The highest stratum is commonly a medium-tall shrub layer, the medium stratum is a tall sedge and/or fern layer and the ground layer stratum is a variety of herbaceous plants, grasses or low-lying sedges (Duffield *et al.* 2000).

At least eleven structurally diverse floristic associations have been formally identified (Duffield *et al.* 2000), namely:

- *Leptospermum lanigerum* shrubland with sedge understorey *Leptospermum lanigerum* shrubland with sedge and fern understorey;
- *Leptospermum continentale* shrubland with sedge understorey;
- *Leptospermum continentale* shrubland with sedge and fern understorey;
- *Leptospermum continentale/Sprengelia incarnata* shrubland with sedge understorey;
- Mixed *Leptospermum* shrubland with emergent *Viminaria juncea* or *Acacia retinodes* and sedge understorey;
- *Melaleuca decussata* shrubland with sedge understorey;
- *Leptospermum continentale/Viminaria juncea* shrubland with sedge understorey;
- *Leptospermum continentale/Melaleuca squamea* shrubland with sedge understorey;
- Mixed sedgeland (e.g. Lignum – *Muehlenbeckia florulenta*); and
- *Phragmites* and/or *Typha* grassland with emergent *Viminaria juncea*, *Acacia retinodes* and sedge understorey.

In addition to the above, other shrub, reed and fern associations could constitute a Fleurieu Peninsula Swamp. The Mixed Sedgeland community is ambiguous and inadequately defined in the available formal description of Fleurieu Peninsula swamp (Pickett 2003).

APPENDIX 2. THREATENED FLORA AND FAUNA RECORDED IN WETLAND HABITATS OF THE FLEURIEU PENINSULA

Threatened Flora Species				
SPECIES	COMMON NAME	Regional Status	NPW Act Status	EPBC Act
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass	rare	Rare	
<i>Anogramma leptophylla</i>	Annual Fern	rare	Rare	
<i>Bauera rubioides</i>	Wiry Bauera	rare	Rare	
<i>Baumea acuta</i>	Pale Twig-rush	rare	Rare	
<i>Baumea articulata</i>	Jointed Twig-rush	uncommon		
<i>Baumea gunnii</i>	Slender Twig-rush	rare	Rare	
<i>Baumea laxa</i>	Lax Twig-rush	rare	Rare	
<i>Baumea rubiginosa</i>	Soft Twig-rush	uncommon		
<i>Baumea tetragona</i>	Square Twig-rush	uncommon		
<i>Billardiera bignoniacea</i>	Orange Bell-climber	uncommon		
<i>Blechnum minus</i>	Soft Water-fern	uncommon		
<i>Blechnum nudum</i>	Fishbone Water-fern	rare	Rare	
<i>Blechnum wattsii</i>	Hard Water-fern	rare	Rare	
<i>Boronia parviflora</i>	Swamp Boronia	rare	Rare	
<i>Caladenia argocalla</i>	White Beauty Spider-orchid	endangered	Endangered	Endangered
<i>Caleana major</i>	Large Duck-orchid	vulnerable	Vulnerable	
<i>Callistemon sieberi</i>	River Bottlebrush	uncommon		
<i>Calystegia sepium</i>	Large Bindweed	uncertain		
<i>Carex fascicularis</i>	Tassel Sedge	uncommon		
<i>Carex gaudichaudiana</i>	Fen Sedge	uncommon		
<i>Carex gunniana</i>	Mountain Sedge	rare		
<i>Centella cordifolia</i> s.str.	Native Centella	uncommon		
<i>Centrolepis fascicularis</i>	Tufted Centrolepis	uncommon		
<i>Cladium procerum</i>	Leafy Twig-rush	rare	Rare	
<i>Correa aemula</i> s. str.	Hairy Correa	rare	Rare	
<i>Correa calycina</i>	Hindmarsh Correa	vulnerable		Vulnerable
<i>Correa eburnea</i>		vulnerable	Vulnerable	
<i>Cryptandra hispidula</i>	Rough Cryptandra	uncommon		
<i>Cryptostylis subulata</i>	Moose Orchid	vulnerable	Vulnerable	
<i>Cyperus gunnii</i> ssp. <i>gunnii</i>	Flecked Flat-sedge	uncommon		
<i>Danthonia pilosa</i> var. <i>pilosa</i>	Velvet Wallaby-grass	not assessed		
<i>Danthonia semiannularis</i>	Wetland Wallaby-grass	uncommon		
<i>Danthonia tenuior</i>	Short-awn Wallaby-grass	rare	Rare	
<i>Daviesia arenaria</i>	Sand Bitter-pea	uncommon		
<i>Deyeuxia densa</i>	Heath Bent-grass	rare	Rare	
<i>Deyeuxia minor</i>	Small Bent-grass	uncertain		
<i>Dichelachne micrantha</i>	Short-hair Plume-grass	not assessed		
<i>Diuris brevifolia</i>	Short-leaf Donkey-orchid	rare	Rare	
<i>Drosera binata</i>	Forked Sundew	rare	Rare	
<i>Eleocharis gracilis</i>	Slender Spike-rush	uncommon		
<i>Eleocharis pusilla</i>	Small Spike-rush	uncommon		
<i>Eleocharis sphacelata</i>	Tall Spike-rush	rare		
<i>Empodisma minus</i>	Tangled Rope-rush	uncommon		
<i>Epilobium pallidiflorum</i>	Showy Willow-herb	uncommon		
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil	uncommon	Rare	
<i>Eucalyptus rubida</i> ssp. <i>rubida</i>	Candlebark Gum	rare	Rare	
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	endangered	Endangered	Endangered
<i>Gahnia ancistrophylla</i>	Curled Saw-sedge	uncommon		
<i>Gahnia clarkei</i>	Tall Saw-sedge	rare	Rare	
<i>Gahnia sieberiana</i>	Red-fruit Cutting-grass	uncommon		
<i>Gastrodia sesamoides</i>	Potato Orchid	rare	Rare	
<i>Gleichenia microphylla</i>	Coral Fern	rare	Rare	
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort	rare	Rare	
<i>Gratiola pedunculata</i>	Stalked Brooklime	rare		
<i>Grevillea lavandulacea</i> var. <i>sericea</i>	Spider-flower	uncommon		
<i>Haloragis brownii</i>	Swamp Raspwort	rare	Rare	
<i>Hydrilla verticillata</i>	Waterthyme	rare	Rare	
<i>Hydrocotyle hirta</i>	Hairy Pennywort	uncommon		
<i>Hydrocotyle verticillata</i>	Shield Pennywort	not assessed		
<i>Hypericum japonicum</i>	Matted St John's Wort	uncertain	Rare	
<i>Hypolepis rugosula</i>	Ruddy Ground-fern	rare	Rare	
<i>Isolepis fluitans</i>	Floating Club-rush	uncommon		
<i>Isolepis stellata</i>	Star Club-rush	rare		
<i>Juncus australis</i>	Austral Rush	uncertain	Rare	
<i>Juncus prismatocarpus</i>	Branching Rush	endangered	Endangered	
<i>Lepidosperma laterale</i> s.str.	Tall Sword-sedge	uncommon		
<i>Leucopogon hirsutus</i>	Hairy Beard-heath	rare	Rare	
<i>Leucopogon lanceolatus</i>	Lance Beard-heath	uncommon		

<i>Leucopogon rufus</i>	Ruddy Beard-heath	uncommon		
<i>Lilaeopsis polyantha</i>	Australian Lilaeopsis	not assessed		
<i>Lindsaea linearis</i>	Screw Fern	uncommon		
<i>Logania recurva</i>	Recurved Logania	uncommon		
<i>Lomandra sororia</i>	Sword Mat-rush	uncommon		
<i>Lycopodiella lateralis</i>	Slender Clubmoss	rare	Rare	
<i>Lycopodiella serpentina</i>	Bog Clubmoss	endangered	Endangered	
<i>Lycopus australis</i>	Australian Gipsywort	rare		
<i>Lythrum salicaria</i>	Purple Loosestrife	rare	Rare	
<i>Melaleuca squamea</i>	Swamp Honey-myrtle	rare	Rare	
<i>Microtis atrata</i>	Yellow Onion-orchid	rare	Rare	
<i>Microtis parviflora</i>	Slender Onion-orchid	uncommon		
<i>Microtis rara</i>	Sweet Onion-orchid	rare	Rare	
<i>Montia australasica</i>	White Purslane	rare		
<i>Montia fontana</i> ssp. <i>chondros</i>	Waterblinks	vulnerable	Vulnerable	
<i>Myoporum viscosum</i>	Sticky Boobialla	uncommon		
<i>Myriophyllum amphibium</i>	Broad Milfoil	rare	Rare	
<i>Myriophyllum</i>	Lake Milfoil	not assessed		
<i>Myriophyllum simulans</i>	Amphibious Milfoil	not assessed		
<i>Olearia glandulosa</i>	Swamp Daisy-bush	vulnerable	Vulnerable	
<i>Olearia grandiflora</i>	Mount Lofty Daisy-bush	uncommon		
<i>Olearia teretifolia</i>	Cypress Daisy-bush	uncommon		
<i>Orthoceras strictum</i>	Horned Orchid	uncommon		
<i>Ottelia ovalifolia</i>	Swamp Lily	rare	Rare	
<i>Paracaleana minor</i>	Small Duck-orchid	vulnerable	Vulnerable	
<i>Patersonia fragilis</i>	Short Purple-flag	uncommon		
<i>Patersonia occidentalis</i>	Long Purple-flag	uncommon		
<i>Phylloglossum drummondii</i>	Pigmy Clubmoss	rare	Rare	
<i>Poa tenera</i>	Slender Tussock-grass	not assessed		
<i>Poa umbricola</i>	Shade Tussock-grass	rare	Rare	
<i>Prasophyllum australe</i>	Austral Leek-orchid	rare	Rare	
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	endangered	Endangered	Endangered
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	vulnerable	Vulnerable	Vulnerable
<i>Pratia pedunculata</i>	Matted Pratia	uncommon		
<i>Pteris tremula</i>	Tender Brake	rare	Rare	
<i>Pterostylis uliginosa</i>		endangered	Endangered	
<i>Pultenaea canaliculata</i> var.	Soft Bush-pea	uncommon		
<i>Pultenaea dentata</i>	Clustered Bush-pea	rare	Rare	
<i>Pultenaea involucrata</i>	Mount Lofty Bush-pea	uncommon		
<i>Pultenaea scabra</i>	Rough Bush-pea	rare	Rare	
<i>Ranunculus amphitrichus</i>	Small River Buttercup	uncommon		
<i>Ranunculus pachycarpus</i>	Thick-fruit Buttercup	uncommon		
<i>Rubus parvifolius</i>	Native Raspberry	uncommon		
<i>Schizaea bifida</i>	Forked Comb-fern	vulnerable	Vulnerable	
<i>Schizaea fistulosa</i>	Narrow Comb-fern	vulnerable	Vulnerable	
<i>Schoenus carsei</i>	Wiry Bog-rush	uncommon		
<i>Schoenus discifer</i>	Tiny Bog-rush	rare	Rare	
<i>Schoenus laevigatus</i>		rare	Rare	
<i>Schoenus latelaminatus</i>	Medusa Bog-rush	uncertain		
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush	rare	Rare	
<i>Schoenus maschalinus</i>	Leafy Bog-rush	uncommon		
<i>Schoenus tesquorum</i>	Grassy Bog-rush	rare	Rare	
<i>Senecio hispidulus</i> var. <i>hispidulus</i>	Rough Groundsel	uncommon		
<i>Sigesbeckia orientalis</i> ssp. <i>orientalis</i>	Oriental Sigesbeckia	not assessed		
<i>Sphaerolobium minus</i>	Leafless Globe-pea	rare		
<i>Sphagnum novo-zealandicum</i>	Sphagnum moss	Vulnerable	Vulnerable	
<i>Spiranthes sinensis</i> ssp. <i>australis</i>	Austral Lady's Tresses	rare	Rare	
<i>Spirodela punctata</i>	Thin Duckweed	not assessed		
<i>Sprengelia incarnata</i>	Pink Swamp-heath	rare	Rare	
<i>Spyridium coactilifolium</i>	Butterfly Spyridium	vulnerable	Vulnerable	Vulnerable
<i>Spyridium spathulatum</i>	Spoon-leaf Spyridium	rare	Rare	
<i>Stipa muelleri</i>	Tangled Spear-grass	rare		
<i>Thelymitra canaliculata</i>	Azure Sun-orchid	uncommon		
<i>Thelymitra holmesii</i>	Blue Star Sun-orchid	vulnerable	Vulnerable	
<i>Thelymitra mucida</i>	Plum Sun-orchid	rare	Rare	
<i>Thelymitra venosa</i>	Veined Sun-orchid	endangered		
<i>Utricularia dichotoma</i>	Purple Bladderwort	uncommon		
<i>Utricularia lateriflora</i>	Small Bladderwort	vulnerable		
<i>Villarsia umbricola</i> var. <i>umbricola</i>	Lax Marsh-flower	uncommon		
<i>Viminaria juncea</i>	Native Broom	rare	Rare	
<i>Viola cleistogamoides</i>	Shy Violet	uncommon		
<i>Xanthosia tasmanica</i>	Southern Xanthosia	rare	Rare	
<i>Xyris operculata</i>	Tall Yellow-eye	rare	Rare	

Threatened Fauna Species

SPECIES	COMMON NAME	NPW Act Status	EPBC Act	Treaty
<i>Ardea alba</i>	Great Egret (White Egret)			JAMBA/CAMBA
<i>Calamanthus pyrrhopygius</i>	Chestnut-rumped Heathwren	vulnerable		
<i>Calyptrorhynchus funereus</i>	Yellow-tailed Black-cockatoo	vulnerable		

<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo	rare		
<i>Cisticola exilis</i>	Golden-headed Cisticola	rare		
<i>Craterocephalus stercusmuscarum</i>	Fly-speckled Hardyhead	uncertain		
<i>Eulamprus heatwolei</i>	Yellow-bellied Water Skink	rare		
<i>Falco peregrinus</i>	Peregrine Falcon	rare		
<i>Gadopsis marmoratus</i>	River Blackfish	uncertain		
<i>Galaxias brevipinnis</i>	Climbing Galaxias	uncertain		
<i>Gallinago hardwickii</i>	Latham's Snipe	vulnerable		JAMBA / CAMBA
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	vulnerable		CAMBA
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	vulnerable	Vulnerable	
<i>Nannoperca australis</i>	Southern Pygmy Perch	uncertain		
<i>Nannoperca obscura</i>	Yarra Pygmy Perch	vulnerable	Vulnerable	
<i>Pandion haliaetus</i>	Osprey	rare		
<i>Philypnodon</i> sp. 2 (undescribed)	Dwarf Flathead Gudgeon	uncertain		
<i>Rallus pectoralis</i>	Lewin's Rail	vulnerable		
<i>Stagonopleura bella</i>	Beautiful Firetail	rare		
<i>Stipiturus malachurus</i>	Southern Emu-wren	rare		
<i>Stipiturus malachurus intermedius</i>	Mount Lofty Ranges Southern Emu-wren	endangered	Endangered	
<i>Turnix varia</i>	Painted Button-quail	vulnerable		
Source: South Australia Wetland Inventory Database (SAWID); query generated June 2004.				

APPENDIX 3. SURVEY SHEETS

[illegible]

WATER CHEMISTRY & SUBSTRATE TYPE																															
pH			Conductivity		uS/cm			Temperature		°C			Water Depth		m																
Turbidity	NTU		Dissolved O ²		ppm			Water Flow		Standing	Slow flow	Rapid flow	Reading Depth		m																
%Cover (area of water relative to full)			%		Duration of inundation				Months			Sediment size		Coarse		Fine															
Bottom sediment (circle)			Sand	Loam	Clay	Silt	Peat	Ooze	Pebbles/rocks	Surface Strew (circle)		2%	10%	20%	50%	90%															
THREATENING PROCESSES																															
Disturbance / Management Issue (circle where applicable)												Current extent of disturbance (tick where applicable)																			
												Min	Mod	High	Severe	Potential															
Altered water regime		Complete drainage		Decreased		Increased		Flooded		Water extraction																					
Changed soil character		Pugging		OTHER																											
Dams		Upstream		Downstream		Within wetland		OTHER																							
Dumping		Fill				Garden refuse		Household refuse		OTHER																					
Fragmentation		Roads		Clearing		Fenceline		Powerline		Isolation		OTHER																			
Over-grazing		Stock		Native		OTHER																									
Nutrient enrichment		Agricultural		Dairy effluent		Urban runoff		Lead shot		Stormwater discharge		OTHER																			
Vermin		Cats		Foxes		Rabbits		Introduced birds		Introduced fish		Deer		OTHER																	
Tracks		Vehicle		Bicycle		Motorbike		Walking		OTHER																					
Weeds		Woody		Pasture		Noxious		Garden		Pine forest encroachment		OTHER																			
Vegetation Destruction		Herbicide		Ploughing		Slashing		Blasting		Grading		OTHER																			
Recreational		Over-fishing				Camp-sites		Visitor disturbance		OTHER																					
Increased salinity		Increased from natural state				Decreased from natural state				OTHER																					
Water Obstruction		Silt		Dense reedbed		OTHER																									
Degraded Buffer		Absent		Degraded		OTHER																									
Pathogen		Phytophthora cinamomi infection				OTHER																									
Water extraction		drains		Pump station		Forestry		OTHER																							
Erosion		Channel		Bank		Flood		OTHER																							
Other (specify)																															
Conservation measures (tick where applicable & describe)		Action				Current		Suggested		Notes on conservation measures																					
		Fencing																													
		Re-vegetation																													
		Pest control (weed)																													
		Pest control (animal)																													
		Restoration of water regime																													
		Management Plan – in prep / implemented																													
		Environmental burning / slashing / grazing																													
		Listed Nationally Important																													
		Privately managed for conservation																													
		Within formal reserve system																													
		Other (specify)																													
WETLAND FAUNA												GENERAL COMMENTS ON SURVEY																			
Fauna Survey intensity (tick methods used for fauna survey)		Noteworthy fauna (list)				No.	B	Noteworthy fauna (list)				No.	B																		
OP Sighting																															
Call ID																															
Trace ID																															
None																															
Microhabitats (circle)		Algae mat		Banks with hollows		Burrows		Detritus		Freshwater soak		Tree hollows		Hummocks		Dense shrubs		Molluscs		Mud flat		Pooling									
		Nesting area		Open water		Perches		Undercut banks		Rocky areas		Roosting areas		Sandy areas		Sheltered areas		Structural diversity													
		Undulations		Moss mat		Dense reeds		Surface aquatics		Dense sedges		OTHER																			
WETLAND VEGETATION – SUMMARY																															
Total Veg. Cover		%		US Cover		%		OS Cover		%		Veg. Age (circle)		Juv		Mat		Sen													
Av. Buffer Width		m		% Buffer		%		Attached Algae (circle)		Little		Medium		Abundant																	
Weediness (C/A)		N	T	1	2	3	4	5	Structural Formation																						
SUBJECTIVE ASSESSMENT (circle)								Vegetation Height				Zone (tick)						Layers Present (tick)													
Wetland dependent fauna		Aquatic invertebrates		None	Low	Mod	High	Tallest stratum		m		bufferBankShoreEmergentAquatic submerged & emergentAquaticOpen waterTreesShrubsReeds/rushes/sedgHerbs/grassesFree-floatingFloatingSubmergedEmergent																			
		Fish		None	Low	Mod	High	Dominant O/S		m																					
		Birds		None	Low	Mod	High	Dominant U/S		m																					
		Amphibians		None	Low	Mod	High																								
		Reptiles		None	Low	Mod	High																								
		Mammals		None	Low	Mod	High																								
Aquatic vegetation		None	Degraded	Mod	Intact																										
Riparian vegetation		None	Degraded	Mod	Intact																										
Wetland condition		Completely degraded				Severely degraded				Degraded				Moderate				Intact		Pristine											

FLORA SPECIES RECORD – Wetland Inventory SA – SHEET 2						Biol Survey No		Survey 169 : WETLANDS INVENTORY - FLEURIEU									
Underline species present						Wetland ID		S	2	N	N	N	Survey		N	N	N
A (Braun-Blanquet cover abundance)			N (not many)		T (sparse, <5%)		1 (many, <5%)		2 (5 – 25%%)		3 ((25-50%)		4 (50-75%)		5 (>75%)		
Indicate Veg Association			O – Dominant / Codominant overstorey (max 3)				E - Emergent (max 3)		U – Dominant / Codominant understorey (max 5)					S – Submergent dominant (max 3)			
Species	Z	A	Species	Z	A	Species	Z	A	Species	Z	A	Species	Z	A			
Acacia cyclops			*Briza maxima			Correa eburnea[V]			Eucalyptus fasciculosa								
*Acacia longifolia var. longifolia			*Briza minor			Corybas diemenicus(NC)			Eucalyptus leucoxyllon ssp.								
Acacia longifolia var. sophorae			*Bromus diandrus			*Cotula coronopifolia			Eucalyptus leucoxyllon(NC)								
Acacia melanoxylon			Bromus sp.			Cotula vulgaris var. australasica			Eucalyptus obliqua								
Acacia myrtifolia var. myrtifolia			Brunonia australis			Craspedia glauca			Eucalyptus obliqua var. obliqua(NC)								
Acacia myrtifolia(NC)			Burchardia umbellata			Crassula helmsii			Eucalyptus obliqua var.(NC)								
Acacia paradoxa			Bursaria spinosa			Crassula sp.			Eucalyptus ovata								
Acacia pycnantha			Caesia calliantha			*Critesion murinum			Eucalyptus rubida ssp. rubida[R]								
Acacia retinodes var.			Banksia marginata			Cryptandra hispidula[U]			Eucalyptus viminalis ssp. cygnetensis								
Acacia retinodes var. retinodes (swamp form)			Banksia ornata			Cryptostylis subulata[V]			Euchiton gymnocephalus(NC)								
Acacia retinodes var. retinodes(NC)			Baumea acuta[R]			*Cynodon dactylon			Euchiton involucratus								
Acacia spinescens			Baumea arthrophylla			*Cynosurus echinatus			Exocarpos cupressiformis								
Acacia verticillata			Baumea articulata[U]			Cyperaceae sp.			*Festuca arundinacea								
Acaena echinata var.			Baumea gunnii[R]			Cyperus gunnii ssp. gunnii[U]			Frankenia pauciflora var.								
Acaena novae-zelandiae			Baumea juncea			Cyperus gymnocaulos			*Fumaria muralis								
Acaena sp.			Baumea laxa[R]			Cyperus tenellus			Gahnia ancistrophylla[U]								
*Acetosella vulgaris			Baumea rubiginosa[U]			Cyperus vaginatus			Gahnia filum								
Acianthus caudatus var.			Baumea tetragona[U]			Cyrtostylis reniformis			Gahnia sieberiana[U]								
Acrotiche serrulata			Billardiera bignoniacea[U]			*Dactylis glomerata			Gahnia trifida								
Adenanthos terminalis			Billardiera cymosa			Danthonia geniculata			*Galium murale								
Adiantum aethiopicum			Billardiera sp.			Danthonia pilosa var. pilosa[Q]			*Genista monspessulana								
Agrostis avenacea var.			Blechnum minus[U]			Danthonia semiannularis[U]			Geraniaceae sp.								
Agrostis avenacea var. avenacea			Blechnum nudum[R]			Danthonia setacea var. setacea			Geranium potentilloides var. potentilloides								
*Agrostis capillaris var. capillaris			Blechnum sp.			Danthonia sp.			Geranium solanderi var. solanderi								
*Aira cupaniana			Blechnum watsii[R]			Daucus glochidiatus			Geranium sp.								
*Aira sp.			Boronia parviflora[R]			Daviesia arenaria[U]			Gleichenia microphylla[R]								
Allocasuarina mackliniana ssp. mackliniana			Bossiaea prostrata			Daviesia brevifolia			Glossodia major								
Allocasuarina muelleriana ssp.			Brachyloma ericoides ssp.			Daviesia leptophylla			Glyceria australis								
Allocasuarina muelleriana ssp. muelleriana			Bracteantha bracteata			Daviesia ulicifolia(NC)			Gnaphalium indutum								
Allocasuarina pusilla			*Briza maxima			Deyeuxia densa[R]			Gnaphalium sp.(NC)								
Allocasuarina striata			*Briza minor			Deyeuxia quadriseta			Gompholobium ecostatum								
Allocasuarina verticillata			*Bromus diandrus			Dianella brevicaulis			Gonocarpus mezianus								
Amphipogon caricinus var. caricinus			Bromus sp.			Dianella brevicaulis/revoluta var.			Gonocarpus micranthus ssp. micranthus[R]								
Amphipogon strictus var. setifer			Brunonia australis			Dianella revoluta var. revoluta			Gonocarpus tetragynus								
Amyema miquelii			Burchardia umbellata			Dianella revoluta(NC)			Goodenia blackiana								
Amyema preissii			Bursaria spinosa			Dichelachne crinita			Goodenia geniculata								
*Anagallis arvensis			Caesia calliantha			Dichondra repens			Goodenia ovata								
Anogramma leptophylla[R]			Caladenia dilatata(NC)			Dillwynia hispida			Gratiola peruviana								
*Anthoxanthum odoratum			Callistemon sieberi[U]			Dillwynia sericea			Grevillea lavandulacea var. lavandulacea								
Apium prostratum ssp. prostratum var.			*Callitriche stagnalis			Dipodium punctatum(NC)			Hakea carinata								
*Arctotheca calendula			Calytrix tetragona			Disphyma crassifolium ssp. clavellatum			Hakea rostrata								
Arthropodium strictum			*Carduus tenuiflorus			Distichlis distichophylla			Hakea rugosa								
Asplenium flabellifolium			Carex appressa			Diuris brevifolia[R]			Hakea sp.								
*Aster subulatus			Carex bichenoviana			Diuris longifolia(NC)			Haloragis brownii[R]								
Astroloma conostephioides			Carex fascicularis[U]			Dodonaea viscosa ssp.			Halosarcia halocnemoides ssp. halocnemoides								
Astroloma humifusum			Carex gaudichaudiana[U]			Dodonaea viscosa ssp. spatulata			Halosarcia pergranulata ssp. pergranulata								
Atriplex paludosa ssp.			Carex gunniana[R]			Drosera auriculata			Helichrysum scorpioides								
*Avena barbata			Carex sp.			Drosera binata[R]			Hibbertia aspera(NC)								
*Avena sp.			Carex tereticaulis			Drosera macrantha ssp. planchonii			Hibbertia exutiacies								
Azolla filiculoides			Carpobrotus rossii			Drosera peltata			Hibbertia riparia								
Baeckea ramosissima ssp. ramosissima			Cassytha glabella forma dispar			Drosera pygmaea			Hibbertia riparia (glabriuscula)								
Banksia marginata			Cassytha melantha			Drosera sp.			Hibbertia sericea								
Banksia ornata			Cassytha pubescens			Drosera whittakeri(NC)			Hibbertia sp. B								
Baumea acuta[R]			*Centaurium erythraea			*Ehrharta calycina			Hibbertia stricta var. stricta								
Baumea arthrophylla			Centella cordifolia s.str.[U]			*Ehrharta longiflora			*Holcus lanatus								
Baumea articulata[U]			Centella cordifolia(NC)			Eleocharis acuta			*Homeria flaccida								
Baumea gunnii[R]			Centipeda minima			Eleocharis gracilis[U]			Hybanthus floribundus ssp. floribundus								
Baumea juncea			Centrolepis aristata			Eleocharis pusilla[U]			Hydrilla verticillata[R]								
Baumea laxa[R]			Centrolepis fascicularis[U]			Eleocharis sphacelata[R]			Hydrocotyle callicarpa								
Baumea rubiginosa[U]			Centrolepis strigosa			Empodisma minus[U]			Hydrocotyle hirta[U]								
Baumea tetragona[U]			*Ceratium glomeratum			Enchylaena tomentosa var.			Hydrocotyle pterocarpa								
Billardiera bignoniacea[U]			Chamaesclilla corymbosa var. corymbosa			Epacris impressa			Hydrocotyle sp.								
Billardiera cymosa			Cheilanthes austrotenuifolia			Epilobium billardierianum ssp.			Hydrocotyle verticillata[Q]								
Billardiera sp.			Choretum glomeratum var. glomeratum			Epilobium billardierianum ssp. billardierianum			Hypericum gramineum								
Blechnum minus[U]			Chorizandra enodis			Epilobium billardierianum ssp. x intermedium			Hypericum japonicum[K]								
Blechnum nudum[R]			*Chrysanthemoides monilifera			Epilobium hirtigerum			*Hypochaeris glabra								
Blechnum sp.			Chrysocephalum baxteri			Epilobium pallidiflorum[U]			*Hypochaeris radicata								
Blechnum watsii[R]			*Cirsium vulgare			Eragrostis benthamii			Hypolaena fastigiata								
Boronia parviflora[R]			Comesperma calymega			Eryngium vesiculosum[R]			Hypolepis rugosula[R]								
Bossiaea prostrata			*Conyza alba			Eucalyptus baxteri			Imperata cylindrica								
Brachyloma ericoides ssp.			*Conyza sp.			Eucalyptus camaldulensis var. camaldulensis			Indigofera australis var. australis								
Bracteantha bracteata			Correa aemula(NC)			Eucalyptus cosmophylla			Isachne globosa								
Z Zone number	1 buffer	2 bank – high water mark to buffer	3 shore – low water to high water	4 emergent – damp to <0.2m	5 aquatic submerged / emergent - 0.2 – 1m	6 aquatic >1m	7 open water										

A (Braun-Blanquet cover abundance)		N (not many)		T (sparse, <5%)		1 (many, <5%)		2 (5 – 25%%)		3 ((25-50%)		4 (50-75%)		5 (>75%)	
Indicate Veg Association			O – Dominant / Codominant overstorey (max 3)			E - Emergent (max 3)			U – Dominant / Codominant understorey (max 5)			S – Submergent dominant (max 3)			
Species	Z	A	Species	Z	A	Species	Z	A	Species	Z	A	Species	Z	A	
Isolepis cernua			Lythrum hyssopifolia			Pterostylis sp.			Suaeda australis						
Isolepis congrua			Lythrum salicaria[R]			Pterostylis sp.(NC)			Tetralia capillaris						
Isolepis fluitans[U]			Maireana oppositifolia			Pultenaea acerosa			Tetralthea pilosa ssp. pilosa						
Isolepis inundata			Melaleuca decussata			Pultenaea daphnoides			Thelymitra holmesii[V]						
Isolepis inundata(NC)			Melaleuca halmaturorum ssp. halmaturorum			Pultenaea dentata[R]			Thelymitra ixioides						
Isolepis marginata			Melaleuca squamea[R]			Pultenaea involucrata[U]			Thelymitra mucida[R]						
Isolepis nodosa			*Melilotus indica			Pultenaea largiflorens			Thelymitra nuda						
Isolepis platycarpa			*Mentha x piperita var. x piperita			Pultenaea laxiflora			Thelymitra pauciflora						
Iso pogon ceratophyllus			Micrantheum demissum			Pultenaea trinervis			Thelymitra sp.						
Ixodia achillaeoides ssp.			Microlaena stipoides var. stipoides			Pultenaea viscidula			Thelymitra venosa[E]						
Ixodia achillaeoides ssp. achillaeoides			Microtis atrata[R]			Ranunculus amphitrichus[U]			Themeda triandra						
Ixodia achillaeoides ssp. alata			Microtis parviflora[U]			Ranunculus lappaceus			Thysanotus juncifolius						
Juncaceae sp.			Montia australasica			Ranunculus pachycarpus[U]			Thysanotus patersonii						
*Juncus acutus			Moss sp.			Ranunculus sessiliflorus var.			Tricoryne elatior(NC)						
*Juncus articulatus			Muehlenbeckia cunninghamii			*Rhamnus alaternus			Tricoryne tenella						
Juncus australis[K]			Muehlenbeckia florulenta			*Romulea sp.			*Trifolium dubium						
Juncus bufonius			Muehlenbeckia gunnii			*Rorippa nasturtium-aquaticum			*Trifolium glomeratum						
Juncus caespiticius			Myoporum insulare			*Rosa canina			*Trifolium repens						
Juncus continuus			Myoporum viscosum[U]			*Rosa rubiginosa			*Trifolium sp.						
*Juncus effusus			Myriophyllum amphibium[R]			*Rosa sp.			*Trifolium subterraneum						
Juncus holoschoenus			*Myrsiphyllum asparagoides			*Rubus fruticosus(NC)			Triglochin procerum						
Juncus kraussii			Neurachne alopecuroides			Rubus parvifolius[U]			Triglochin procerum var. procerum(NC)						
Juncus pallidus			Olearia glandulosa[V]			*Rubus sp.			Triglochin striatum						
Juncus pauciflorus			Olearia grandiflora[U]			*Rubus ulmifolius cv. inermis			Typha domingensis						
Juncus planifolius			Olearia ramulosa			*Rubus ulmifolius var. ulmifolius			Typha sp.						
Juncus prismatocarpus[E]			Olearia sp.			*Rumex conglomeratus			*Ulex europaeus						
Juncus sarophorus			Olearia teretifolia[U]			*Rumex crispus			Utricularia dichotoma[U]						
Juncus sp.			Opercularia sp.			Rumex sp.			Utricularia dichotoma(NC)						
Juncus subsecundus			Opercularia varia			Rutidosis multiflora			Utricularia lateriflora[V]						
Kennedia prostrata			*Oxalis comiculata ssp. comiculata			Samolus repens			*Vellereophyton dealbatum						
Lagenifera huegelii			Oxalis perennans			Sarcocornia blackiana			*Vicia sativa ssp.						
*Lagurus ovatus			*Parapholis incurvus			Sarcocornia quinqueflora			*Vicia sativa ssp. sativa						
Lawrenzia squamata			*Paspalum dilatatum			Scaevola albida var. (NC)			Villarsia umbricola var.						
Laxmannia sessiliflora(NC)			*Paspalum distichum			Schizaea bifida[V]			Villarsia umbricola var. umbricola[U]						
*Leontodon taraxacoides ssp. taraxacoides			*Paspalum vaginatum			Schizaea fistulosa[V]			Viminaria juncea[R]						
Lepidobolus drapetocoleus			Patersonia fragilis[U]			Schoenus apogon			Viola hederacea						
Lepidosperma canescens			Patersonia occidentalis[U]			Schoenus breviculmis			Viola sieberiana						
Lepidosperma carphoides			Pelargonium littorale			Schoenus carsei[U]			*Vulpia bromoides						
Lepidosperma concavum			Persicaria decipiens			Schoenus discifer[R]			*Vulpia myuros forma myuros						
Lepidosperma laterale(NC)			Persicaria lapathifolia			Schoenus laevigatus[R]			*Vulpia sp.						
Lepidosperma longitudinale			Persicaria strigosa			Schoenus lepidosperma ssp. lepidosperma[R]			Wahlenbergia gracilentia						
Lepidosperma semiteres			Persoonia juniperina			Schoenus maschalinus[U]			Wahlenbergia multicaulis						
Lepidosperma viscidum			*Phalaris aquatica			Schoenus nitens			Wahlenbergia sp.						
Leptocarpus brownii			*Phalaris canariensis			Sclerostegia arbuscula			Wilsonia humilis var. humilis						
Leptocarpus tenax			*Phalaris minor			Senecio glomeratus			Wolffia australiana						
Leptoceras menziesii			*Phalaris sp.			Senecio hispidulus var. hispidulus[U]			Xanthorrhoea semiplana ssp. semiplana						
Leptospermum continentale			Phragmites australis			Senecio lautus			Xanthorrhoea semiplana ssp. tateana						
Leptospermum lanigerum			*Physalis peruviana			Senecio odoratus var.			Xanthosia pusilla						
Leptospermum myrsinoides			Pimelea flava ssp.			Senecio odoratus var. odoratus			Xanthosia tasmanica[R]						
Leptospermum sp.			Pimelea humilis			Senecio picridioides			Xyris operculata[R]						
Leucopogon concurrens			Pimelea linifolia ssp. linifolia			*Senecio pterophorus var. pterophorus			*Zantedeschia aethiopica						
Leucopogon hirsutus[R]			Pimelea octophylla			Senecio quadridentatus			LIST ADDITIONAL SPECIMENS						
Leucopogon lanceolatus[U]			Pimelea phyllicoides			Senecio sp.									
Leucopogon lanceolatus(NC)			Pimelea sp.			Senecio tenuiflorus									
Leucopogon parviflorus			Pimelea stricta			*Sherardia arvensis									
Leucopogon rufus[U]			*Pinus radiata			Sigesbeckia orientalis ssp. orientalis[Q]									
Leucopogon virgatus			*Plantago coronopus ssp.			*Silene gallica var. gallica(NC)									
Levenhookia pusilla			*Plantago coronopus ssp. coronopus			*Solanum nigrum									
Lichen sp.			*Plantago lanceolata var. lanceolata			*Sonchus asper ssp. asper									
Lindsaea linearis[U]			Platylobium obtusangulum			Sonchus hydrophilus									
Linum marginale			Platysace heterophylla var.			*Sonchus oleraceus									
Lobelia alata			Platysace heterophylla var. heterophylla			Spinifex sericeus									
Lobelia sp.			Poa clelandii			Spiranthes sinensis ssp. australis[R]									
Logania recurva[U]			Poa labillardieri var. labillardieri			Spirodela punctata[Q]									
*Lolium rigidum			Poa poiformis			Sprengelia incarnata[R]									
Lomandra fibrata			Poa sp.			Spyridium coactilifolium[V]									
Lomandra micrantha ssp.			*Polypogon monspeliensis			Spyridium parvifolium									
Lomandra micrantha ssp. micrantha			Poranthera microphylla			Spyridium thymifolium									
Lomandra micrantha ssp. tuberculata			Prasophyllum australe[R]			Stackhousia aspericocca ssp. "One-sided infloresce									
Lomandra multiflora ssp. dura			Prasophyllum frenchii[E]			Stackhousia aspericocca(NC)									
Lomandra sororia[U]			Pratia pedunculata[U]			Stackhousia sp.									
*Lotus angustissimus			Prunella vulgaris			*Stellaria media									
*Lotus suaveolens			Pseudognaphalium luteoalbum			*Stellaria palustris var. palustris									
*Lotus uliginosus			Pteridium esculentum			Stipa mollis									
Luzula meridionalis			Pteris tremula[R]			Stipa muelleri[R]									
Lycopodiella lateralis[R]			Pterostylis nana			Stipa sp.									
Lycopodiella serpentina[E]			Pterostylis nutans			Stipa stipoides									
Lycopus australis[R]			Pterostylis pedunculata			Styidium graminifolium									
Lysiana exocarpi ssp. exocarpi						Styidium inundatum									
Z Zone number			2 bank – high water mark to buffer			3 shore – low water to high water			4 emergent – damp to <0.2m			5 aquatic submerged / emergent - 0.2 – 1m			
												6 aquatic >1m			
													7 open water		

APPENDIX 4. INSTRUCTIONS FOR COMPLETING WETLAND INVENTORY SURVEY PROTOCOL

General field instructions

- Data collected from the field survey of wetlands for this inventory is baseline data and is not required to be overly comprehensive or time consuming to collect. Try to keep actual time spent surveying a particular wetland (or sector) under 1.5 hours if possible.
- Use lead pencil or other water resistant ink when filling out field survey sheets and annotating field maps. Water-proof paper is also advisable.
- Staple all sheets relating to each wetland together and store in a safe dry place.

Base Wetland Data Collection – SHEET 1

Location Reference Data

Date/Time	The date of data collection should be stated (day/month/year) including the time of field survey to the nearest half hour.
Wetland ID	A code specific to the wetland being surveyed must identify each wetland. Wetlands are to be numbered using State-wide numbering protocols (see report). Specific Wetland ID's are identified from GIS wetland layers. Wetland ID includes a single character (S), followed by a 4-digit number. The first digit relates to the region the wetland occurs within. (E.g. 2 – Mt Lofty Ranges). Note that the wetland ID number is to be provided on all sheets of the survey form.
SurveyNo	Where an individual wetland is very large or has differing character, conditions and management, it may be appropriate to assess individual sectors of wetlands separately (ie, different surveys). In this instance surveys of the wetland should be numbered sequentially (sector 1, 2, 3 etc.). Note that a separate survey form should be completed for each survey. Leave <i>Survey no.</i> box blank if the wetland is not assessed in sectors.
Habitat Mapping	Indicate if habitat mapping of the wetland was performed as part of the wetland inventory survey, including the number of additional habitat assessment sheets that were completed. All sheets for an individual wetland should be stapled together following completion.
Compiler details	State the name/s of person/s undertaking data collection.
Organisation	State the organisation that is managing the data collection.
Biol Survey No	Record the Biological Survey Number assigned to the survey (DEH, Biological Survey Team), if applicable.
Location description	Provide a general description of the location of the wetland using landscape features or closest roads.
Wetland Name	The name of the wetland should be stated. Where multiple names exist use them all. Where no name for the wetland exists, use descriptive qualifiers, landmarks, or ask the landowner to provide a name.
GPS Position	(WGS 84). Geographic location of wetland survey sites should be recorded using GPS (WGS 84, Zone 54 projection). In such a system, the coordinates would be expressed as metres of Eastings and Northings. All boxes provided should contain a number if recorded correctly. GPS locations of wetlands should reflect the approximate centre of the survey area/transect.
Photo no.s	Digital photographs are to be taken where possible of wetlands surveyed. Record number/s of photo/s on data sheet to identify wetlands when downloading. Rename downloaded photos using respective Wetland ID numbers and survey numbers where appropriate.

Landholder	Record landholder information. This is for reference purposes only and is regarded as confidential. Landholder details will not be entered into databases.
Aggregation Wetlands	Indicate other wetlands (using respective wetland ID's) that are directly hydrologically related to the wetland being surveyed. Indicate the general hydrological connection of each aggregation wetland identified: Up - Upstream of the wetland being surveyed Down – Downstream of the wetland being surveyed Ann – Wetland is on a stream anabranch which relates to the wetland being surveyed.

General Hydrology & Landform

Wetland System	Indicate the major wetland system group the wetland being surveyed belongs to by circling appropriate field. (circle only one option)	
Wetland System descriptions	Estuarine (EST)	Tidal habitats with a range of fresh-brackish-marine water chemistry and daily tidal cycles. Includes salt and brackish marshes, intertidal mudflats, and mangrove swamps
	Lacustrine (LAC)	Inland waterbodies that are situated in topographic depressions, lack emergent trees and shrubs, have <30% vegetation cover. E.g. large lakes.
	Marine (MAR)	Open ocean, continental shelf, including beaches, rocky shores, lagoons, and shallow coral reefs. Minimal influence from rivers or estuaries..
	Palustrine (PAL)	All non-tidal wetlands that are substantially covered with emergent vegetation. Includes bogs, swamps, floodplains and marshes.
	Riverine (RIV)	Perennial streams and rivers. Excludes floodplains adjacent to the channel.
Landform Element	Indicate the landform element the wetland occurs within (those particularly related to wetland habitats are highlighted). Landform elements from Heard & Channon 1997. Note that only a selection of these are listed on the survey sheets. Landform elements relating to wetlands in the region being surveyed should be listed. These may need to be changed for wetland surveys in differing regions. (circle one option only)	
Landform element descriptions	Plain	Large very gently inclined or level element, of unspecified geomorphological agent or mode of activity.
	Sandy Plain	Large, very gently inclined or level element composed of fine grains of weathered rocks of quartz.
	Stony Plain	Large, very gently inclined or level element covered with stones.
	Clay Plain	Large, very gently inclined or level element of heavy non-porous soil made of fine particles of silicate.
	Limestone Plain	Large, very gently inclined or level element of hard almost horizontally bedded limestone (a class of rock which contains at least 80% of the carbonates of calcium or magnesium).
	Playa/Pan	Large, shallow, level-floored closed depression, intermittently water-filled, but mainly dry due to evaporation, bounded as a rule by flats aggraded by sheet flow and channelled stream flow.
	Lunette	Elongated, gently curved, low ridge built up by wind on the margin of a playa, typically with a moderate wave modified slope towards the playa and a gentle outer slope.
	Drainage Depression	Level to gently inclined, long, narrow, shallow open depression with smoothly concave cross-section, rising to moderately inclined side slopes, eroded or aggraded by sheet wash.
	Dune/Consolidated Dune	Moderately inclined to very steep ridge or hillock built up by the wind. This element may comprise dunecrest and duneslope. May also be consolidated due to stabilising effects or vegetation.
	Swale	i) Linear, level-floored open or closed depression excavated by wind, or left relict between ridges built up by wind or waves, or built up to a lesser height than them: ii) Long, curved open or closed depression left relict between scrolls built up by channelled stream flow.
	Interdune Corridor	Generally wide, linear, level floored open depression between parallel dunes.
	Interdune Low	Low area between parallel dunes.
	Hill Slope	Gently inclined to precipitous slope, commonly simple and maximal, eroded by sheet wash, creep, or water-aided mass movement. A typical element of mountains, hills, low hills and rises.
	Hill Footslope	Moderately to very gently inclined waning lower slope of a hill resulting from aggradation of erosion by sheet flow, earth flow or creep.
	Beach Ridge	Very long, nearly straight low ridge, built up by waves and usually modified by wind. A beach ridge is often a relict feature remote from the beach.
	Fore Dune	Very long, nearly straight, moderately inclined to very steep ridge built up by the wind from material from an adjacent beach.
	Lagoon	Closed depression filled with water that is typically salt or brackish, bounded at least in part by forms aggraded or built up by waves or reef-building organisms.
	Cone	Hillock with a circular symmetry built up by volcanism. The crest may form a ring around a crater.
	Crater	Steep to precipitous closed depression excavated by explosions due to volcanism, human action, or impact of an extraterrestrial object.
	Maar	Level floored, commonly water-filled closed depression with a nearly circular steep rim, excavated by volcanism.
	Ashplain	Large, very gently inclined or level element, or the unconsolidated fine grained material formed as a result of volcanic explosions.

Landform element continued		
	Open Depression	Landform element that extends at the same elevation, or lower, beyond the locality where it is observed.
	Closed Depression	Landform element that stands below all points in the adjacent terrain.
	Flat	Planar landform element that is neither a crest nor a depression and is level or very gently inclined.
	Doline/Sinkhole	Steep-sided closed depression eroded by solution directed towards an underground drainage way, or by collapse consequent on such solution. A typical element of a karst landform pattern.
	Cave	A natural cavity, recess, chamber or series of chambers beneath the surface of the earth, within a mountain, a ledge of rocks.
	Other	
Origin	Describe the geomorphic origin of the wetland using the codes provided. Wetland origin is separated into categories within different wetland morphologies as described below.	
Origin codes	Shallow or Deep Basin	
	AXB Oxbow	Billabong (cut-off anabranch) in floodplain.
	WHO Waterhole	Depressions within river or creek channels which retain water when the channel is otherwise dry.
	DEP Depositional basin	Broad depressions which have formed by deposition in old deflation basins, may be linked or discrete.
	PSD Prior stream depression	Generally long, sinuous depression marking an old stream bed.
	LAV Lava flow	Basins formed on the edge of or within lava flows.
	CRA Crater	Roughly circular basins with deep margins formed in the vent of a volcano.
	VOL Other volcanic basins	Basins associated with volcanic activity which are neither basins formed by lava flows or craters.
	SOL Solution	Depression formed by the solution of limestone (karst landscape).
	COL Collapse	Depression formed in karst landscape by collapse caused by solution underground. Unlike Solution depressions, collapse depressions are likely to have blocks of rock in their basins.
	TDB Terminal drainage basin	Basin which is the lowest point in an internal drainage basin.
	FAU Fault	Basin formed from tectonic movement of the earth to block water flow.
	SIN Sinkhole	Basin formed from tectonic movement of the earth causing an area to fall relative to its surroundings.
	MET Meteor impact	Crater formed by the impact of an extra terrestrial object.
	CDU Coastal interdunal	Typically linear or crescent-shaped basins formed between coastal dunes or barrier ridges.
	RDU Riverine interdunal	Typically crescent-shaped basins formed between riverine dunes.
	ODU Other interdunal	Typically linear or crescent-shaped basins formed between dunes not associated with the coast or a river.
	DEF Deflation basin	Small to very large rounded basins formed by the movement of sediment through wind action. Large deflation basins typically have a crescent dune (lunette) on their down-wind margin.
	SPR Spring	Basin fed by groundwater discharge (spring).
	Flat	
	FLP Floodplain	Alluvial plain subjected to flooding; usually also containing wetland basins e.g. oxbow.
	Slope	
	BAN Riverine bank	Slope of river bank
	HIL Hillside	Hillside supporting a wetland due to seepage from hill slopes.
	Basins of human origin	
	IMP Impoundment	Basin formed by damming of a river or creek.
	SEW Sewage pond	Basin constructed as a sewage oxidation basin.
	SEB Salt evaporation basin	Normally dry basin flooded with saline water as part of saline water removal.
	PIT Pit	Excavated basin or trench. (e.g. road gutter)
	Tidal	
	RRE Rocky reef	
	MUD Mudflat	
	Estuary	
	EST Estuary	
Water regime	Indicate the dominant water regime for the wetland. These are divided into Inland and Marine systems. (Select only one dominant water regime for the wetland)	
Water regime codes	Inland System	
	PER Permanent	Contains water throughout the year, although the level may vary.
	SMP Semi-permanent	Contains water throughout the year but dries out in dry years (eg 1 year in 10)
	SEA Seasonal	Floods and dries in most years.
	INT Intermittent	Floods irregularly but can be expected to have water at least once per decade and possibly even for several years more or less continuously. This frequency is high enough to influence the type of vegetation present.
	EPI Episodic	Only contains water at infrequent and irregular intervals (less than 1 year in 10). Such episodic events hardly influence the type of vegetation (except when water is present).
	DRY Artificially dry	Water source cut off or wetland drained.

	Marine System	
	ITF Intertidal flat	Inundated by most if not all high tides.
	STF Supratidal flat	Covered only at spring tides or less frequently.
	SFF Supratidal flat and flooding	Relatively rare tidal coverage is combined with seasonal freshwater flooding.
Water source	The source of water inflow should be recorded. (Multiple sources can be selected). Source of water is determined from on-site inspection, consideration of hydrology mapping and groundwater depth mapping. Groundwater dependency is determined by the type of vegetation present, and the position of the wetland in the landscape (ie, assessment of run-off potential, presence of vegetation communities such as peat-based swamp species, water regimes).	
Water source codes	LOC Local runoff	Fed by runoff and infiltration generated by precipitation in the vicinity plus rainfall on the wetland surface; no defined stream.
	CHA Channel fed	Fed by local runoff entering wetland in artificial channel.
	OFF Off-stream	Fed by the river only during floods.
	STR Stream-fed	Fed by river/stream with a continuous connection.
	IRR Irrigation runoff	Fed by runoff generated from irrigation isolated from its natural source. Irrigation runoff will be through a channel so this is a subset of Channel-fed.
	GRW Groundwater	Fed by groundwater from underground aquifer.
	SPR Spring	Fed by groundwater coming to surface at a spring beyond the wetland boundary.
	MAR Marine	Fed by inflows from the sea, including tides.
Av. Water Depth	Provide an estimation of the average depth of the entire wetland when full in metres. This applies to inland systems only.	
Max. Water Depth	Provide an estimation of the maximum depth of the wetland when full in metres. This applies to inland systems only.	
Watercourse Name	Provide the name of the watercourse that feeds the wetland (where relevant).	
Flow control structures	Indicate Yes or No if flow control structures are in place that effect the wetland. Describe the type of flow control structures (e.g. weir).	

Land Tenure & Use

Tenure	Indicate if the wetland (on-site and surrounding) is privately or publicly owned by ticking the appropriate box. Specify other option if private and public are not applicable (e.g. Commonwealth land). (note that more than one tenure can be indicated).
Land use	Indicate the on-site use and surrounding use of the wetland by ticking appropriate land use. Specify other land use if appropriate description is not listed. (note that more than one land use code can be indicated).
Management Authority	Indicate the appropriate management authority responsible for the management of the wetland.
Fire History	Indicate any known years of fire and the approximate area of wetland burnt. This information is usually obtained from the landholder or management authority.
Social & Cultural Values	Record any social and cultural values relevant to the wetland. This may require consultation with the landholder (where possible) or review of literature.
Recreation Facilities / uses	Record any recreational facilities present at the wetland site by circling appropriate attributes. Specify other recreation uses / facilities in the space provided.

Wetland classification

Category	Wetland classification is based on that used by Ramsar Convention in describing Wetlands of International Importance and Directory of Important Wetlands in Australia. Indicate which broad category the wetland belongs to (A – marine and coastal zone; B – inland; C – human made).
Number	Indicate which sub-category the wetland belongs to using definitions provided below.

Definition of wetland classification	A – Marine and Coastal Zone Wetlands	
	1	Marine waters – permanent shallow waters less than six metres deep at low tide; includes sea bays, straits.
	2	Subtidal aquatic beds; includes kelp beds, seagrasses, tropical marine meadows.
	3	Coral reefs
	4	Rocky marine shores; includes rocky offshore islands, sea cliffs.
	5	Sand, shingle or pebble beaches; includes sand bars, spits, sandy islets.
	6	Estuarine waters; permanent waters of estuaries and estuarine systems of deltas.
	7	Intertidal mud, sand or salt flats.
	8	Intertidal marshes; includes saltmarshes, salt meadows, saltings, raised salt marshes, tidal brackish and freshwater marshes.
	9	Intertidal forested wetlands; includes mangrove swamps, nipa swamps, tidal freshwater swamp forests.
	10	Brackish to saline lagoons and marshes with one or more relatively narrow connections with the sea.
	11	Freshwater lagoons and marshes in the coastal zone.
	12	Non-tidal freshwater forested wetlands.
	B – Inland Wetlands	
	1	Permanent rivers and streams; includes waterfalls.
	2	Seasonal and irregular rivers and streams.
	3	Inland deltas (permanent).
	4	Riverine floodplains; includes river flats, flooded river basins, seasonally flooded grassland, savanna and palm savanna.
	5	Permanent freshwater lakes (>8ha); includes large oxbow lakes.
	6	Seasonal/intermittent freshwater lakes (>8ha), floodplain lakes.
	7	Permanent saline/brackish lakes.
	8	Seasonal/intermittent saline lakes.
	9	Permanent freshwater ponds (<8ha), marshes and swamps on inorganic soils; with emergent vegetation waterlogged for at least most of the growing season.
	10	Seasonal/intermittent freshwater ponds and marshes on inorganic soils; including sloughs, potholes; seasonally flooded meadows, sedge marshes.
	11	Permanent saline/brackish marshes.
	12	Seasonal saline marshes.
	13	Shrub swamps; shrub dominated freshwater marsh, shrub carr, alder thicket on inorganic soils.
	14	Freshwater swamp forest; seasonally flooded forest, wooded swamps; on inorganic soils.
	15	Peatlands; forest, shrub or open bogs.
	16	Alpine and tundra wetlands; includes alpine meadows, tundra pools, temporary water from snow melt.
	17	Freshwater springs, oases and rock pools.
	18	Geothermal wetlands.
	19	Inland, subterranean karst wetlands.
	C – Human-made Wetlands	
	1	Water storage areas; reservoirs, barrages, hydro-electric dams, impoundments (generally >8ha).
	2	Ponds, including farm ponds, stock ponds, small tanks (generally <8ha).
	3	Aquaculture ponds, fish ponds, shrimp ponds.
	4	Salt exploitation; salt pans, salines.
	5	Excavations; gravel pits, borrow pits, mining pools.
	6	Wastewater treatment; sewage farms; settling ponds, oxidation basins.
	7	Irrigated land and irrigation channels; rice fields, canals, ditches.
	8	Seasonally flooded arable land, farm land.
	9	Canals.

Criteria	Criteria for determining Nationally important wetlands in Australia, and hence inclusion in the Directory of Important Wetlands in Australia. Criteria agreed to by the ANZECC Wetlands Network in 1994. Indicate if the wetland meets any of the major criteria for Nationally important wetlands.	
Definition of criteria	1	It is a good example of a wetland type occurring within a biogeographic region in Australia.
	2	It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system / complex.
	3	It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.
	4	The wetland supports 1% or more of the National populations of any native plant or animal taxa.
	5	The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the National level.
	6	The wetland is of outstanding historical or cultural significance.
General Description	Provide a general description of the wetland. This description is relevant to the project. eg. <i>Juncus</i> spp. Brackish Creekline Floodplain; Spring-fed Peat Bog etc.	
FPS Type	Fleurieu Peninsula Swamp (FPS) Type (per EPBC Act definitions). Indicate by circling appropriate numbers, which FPS communities are represented within the wetland being surveyed.	
Definition of FP Swamp habitat types	1	<i>Leptospermum lanigerum</i> shrubland with sedge understorey
	2	<i>Leptospermum lanigerum</i> shrubland with sedge and fern understorey
	3	<i>Leptospermum continentale</i> shrubland with sedge understorey
	4	<i>Leptospermum continentale</i> shrubland with sedge and fern understorey

Definition of FP Swamp habitat types continued	
5	<i>Leptospermum continentale</i> / <i>Sprengelia incarnata</i> shrubland with sedge understorey
6	Mixed <i>Leptospermum</i> shrubland with emergent <i>Viminaria juncea</i> or <i>Acacia retinodes</i> and sedge understorey
7	<i>Melaleuca decussata</i> shrubland with sedge understorey
8	<i>Leptospermum continentale</i> / <i>Viminaria juncea</i> shrubland with sedge understorey
9	<i>Leptospermum continentale</i> / <i>Melaleuca squamea</i> shrubland with sedge understorey
10	Mixed sedgeland
11	<i>Phragmites</i> and/or <i>Typha</i> grassland with emergent <i>Viminaria juncea</i> , <i>Acacia retinodes</i> and sedge understorey

General comments about the wetland as a whole

Provide any comments/sketch maps that assist in describing the wetland / wetland complex as a whole.

Water Chemistry & Substrate Type

Water chemistry readings are taken from specified equipment. More than one set of recordings are recommended in different parts of the wetlands. Complete a new survey sheet for each additional water chemistry survey. Where a wetland is dry or has insufficient water at the time of survey, no water chemistry data can be collected.

pH	Recorded using YSI Model 63 Handheld pH, Conductivity, Salinity and Temperature System. Equipment should be calibrated regularly as specified in the instruction manuals. Recommend at least weekly calibration.
Turbidity	Measured using HACH Portable Turbidimeter (Model 2100P). Equipment should be calibrated regularly as specified in the instruction manuals.
Conductivity	Recorded using YSI Model 63 Handheld pH, Conductivity, Salinity and Temperature System. Equipment should be calibrated regularly as specified in the instruction manuals.
Dissolved O₂	Recorded using Hanna Portable Waterproof Dissolved Oxygen Meter (HI 9142). Equipment should be calibrated regularly as specified in the instruction manuals.
Temperature	Recorded using YSI Model 63 Handheld pH, Conductivity, Salinity and Temperature System.
Water Flow	Record the flow of water at the site where water chemistry readings are taken. Circle appropriate description of flow: Standing / Slow flow / Rapid flow.
Water Depth	Record the total depth of water at the site where water chemistry readings are taken (value in meters).
Reading Depth	Record the depth at which the water chemistry readings were taken within the available depth (value in meters).
%Cover	Indicate the area of water present relative to full at the time of survey.
Duration of inundation	If the wetland is dry, indicate the number of months since the last inundation (if known).
Sediment size	Indicate dominant sediment size (substrate grain size) category by circling appropriate code.
Bottom sediment (substrate)	Simple visual / textural method of classifying the substrata should be applied using categories defined below.

Substrate definitions	Textural class	Texture / general appearance	Percentage composition	
			% clay	% sand
	Stony	Rough or gritty texture, evidence of small stones and pebbles.	N/A	N/A
	Coarse sand	Disintegrates readily, individual sand grains can be readily seen and felt. Shell fragments are common.	N/A	80
	Fine sand	Well packed, clean, disintegrates readily and individual sand grains hard to distinguish.	10	90
	Muddy sand	Sandy material noticeable discoloured by mud.	20	80
	Sandy mud	Muddy material with equal quantities of sand and mud.	50	50
	Silt or mud	Silty or muddy material, loose when moist, with traces of sand.	70	30
	Silty clay	Sand hardly evident. Usually grey, sometimes containing iron concretions.	90	10
	Clay	Sand not evident. Stiff and tenacious material, greasy when moist. Solid grey to blue grey in colour.	100	N/A
	Peat	Organically laden substrata containing partly decomposed plant remains. Spongy when wet.	N/A	N/A
	Ooze	Fine black, organically laden sludge, generally smelling of hydrogen sulphide.	N/A	N/A

Surface strew	Indicate the amount of surface strew (amount of rock or pebble litter) indicated by a percentage of the wetland area. Circle appropriate attribute where relevant.
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Threatening Processes

Disturbance / Management issues	Disturbances and management issues are listed on Sheet 1. A number of these have been divided into sub-categories of a particular disturbance. Circle the particular type of disturbance present at the site. More than one disturbance sub-category can be indicated where necessary. Leave blank where no disturbance exists. Specify threatening processes that are not included on the data sheet in the "other" row.										
Current extent of disturbance	Indicate the extent of disturbance caused by respective threatening process at the time of survey by indicating the level of disturbance (potential – severe). Leave boxes blank where no disturbance was evident.										
Level of disturbance descriptions	<table> <tr> <td>Potential</td><td>Indicate where it is considered that the wetland could potentially be threatened by a disturbance factor in the future, however is currently not effected.</td></tr> <tr> <td>Minimum</td><td>Minimal evidence of the disturbance factor. Disturbance has little impact on wetland values, easily rectifiable.</td></tr> <tr> <td>Moderate</td><td>Moderate evidence of disturbance. Disturbance has noticeable effect on wetland values although is rectifiable.</td></tr> <tr> <td>High</td><td>Significant disturbance to wetland values. Verging on unrectifiable damage, although some of original wetland values evident.</td></tr> <tr> <td>Severe</td><td>Disturbance at such a level that wetland values are destroyed (e.g. wetland completely drained, completely dominated by exotic species, biologically dead etc.)</td></tr> </table>	Potential	Indicate where it is considered that the wetland could potentially be threatened by a disturbance factor in the future, however is currently not effected.	Minimum	Minimal evidence of the disturbance factor. Disturbance has little impact on wetland values, easily rectifiable.	Moderate	Moderate evidence of disturbance. Disturbance has noticeable effect on wetland values although is rectifiable.	High	Significant disturbance to wetland values. Verging on unrectifiable damage, although some of original wetland values evident.	Severe	Disturbance at such a level that wetland values are destroyed (e.g. wetland completely drained, completely dominated by exotic species, biologically dead etc.)
Potential	Indicate where it is considered that the wetland could potentially be threatened by a disturbance factor in the future, however is currently not effected.										
Minimum	Minimal evidence of the disturbance factor. Disturbance has little impact on wetland values, easily rectifiable.										
Moderate	Moderate evidence of disturbance. Disturbance has noticeable effect on wetland values although is rectifiable.										
High	Significant disturbance to wetland values. Verging on unrectifiable damage, although some of original wetland values evident.										
Severe	Disturbance at such a level that wetland values are destroyed (e.g. wetland completely drained, completely dominated by exotic species, biologically dead etc.)										
Conservation measures taken	Indicate where known conservation efforts have occurred / or are suggested by ticking appropriate boxes. Complete any notes to clarify conservation measures currently in progress or those that are suggested.										

Wetland Fauna

Noteworthy fauna	List any rare or threatened fauna species that are present at the site, including species listed under JAMBA and CAMBA. Also include any species that occur in notable numbers or that are regionally significant. Provide approximate numbers of individuals of each species observed at the time of survey in the No. column. Indicate evidence of breeding (B) by ticking.
Fauna survey intensity	Indicate the amount of effort involved in fauna survey by listing methods used to locate fauna species. Due to the rapid nature of wetland inventory, this is mostly confined to casual observations. List other methods used where applicable.
Microhabitats	Indicate micro-habitats that are present within the wetland. Micro-habitats refer to habitat components that have relevance for their importance to fauna. Specify other un-listed micro-habitats where relevant.

Wetland Vegetation - Summary

Total Veg. Cover	Indicate the cover of aquatic vegetation as a percentage of the wetland area should be estimated by eye.						
US Cover	Indicate the cover of understorey species as a percentage of the wetland area. Estimated by eye. (note: the cover of understorey species should not exceed the value for Total Veg. Cover).						
OS Cover	Indicate the cover of overstorey species as a percentage of the wetland area. Estimated by eye. (note: the cover of overstorey species should not exceed the value for Total Veg. Cover).						
Age	Indicate dominant vegetation maturity within the wetland by circling appropriate category						
Vegetation age descriptions	<table> <tr> <td>Juv</td><td>Juvenile</td></tr> <tr> <td>Mat</td><td>Mature</td></tr> <tr> <td>Sen</td><td>Senescent</td></tr> </table>	Juv	Juvenile	Mat	Mature	Sen	Senescent
Juv	Juvenile						
Mat	Mature						
Sen	Senescent						
Av. Width of Buffer	Indicate the average width of fringing native vegetation based on visual estimates or GIS calculation (record in meters).						
% Buffer	Indicate the approximate percentage of the wetland body surrounded by native vegetation buffer by visual estimates of GIS calculation.						
Attached algae	An indication of the amount of macroalgae present should be recorded as little, medium or abundant.						
Attached algae descriptions	<table> <tr> <td>Little</td><td>No obvious macroalgae present.</td></tr> <tr> <td>Medium</td><td>Clumps of significant macroalgae present.</td></tr> <tr> <td>Abundant</td><td>Macroalgae present over at least one-third of water area.</td></tr> </table>	Little	No obvious macroalgae present.	Medium	Clumps of significant macroalgae present.	Abundant	Macroalgae present over at least one-third of water area.
Little	No obvious macroalgae present.						
Medium	Clumps of significant macroalgae present.						
Abundant	Macroalgae present over at least one-third of water area.						

Weediness	Indicate the presence and abundance of exotic species by circling the appropriate code for total weed cover / abundance. (note: an abbreviated key to cover abundance codes can be found at the top of Survey Sheet 2).	
Weediness cover abundance scale	N	Not many, 1 – 10 individuals, insignificant cover.
	T	Sparsely or very sparsely present; cover less than 5%.
	1	Plentiful, but of small cover: less than 5% cover.
	2	Any number of individuals, 6-25% cover.
	3	Any number of individuals, 26-50% cover.
	4	Any number of individuals, 51-75% cover.
	5	Any number of individuals, 76-100% cover.
Structural formation	Provide the Structural Formation description for the wetland using the categories listed below.	
Structural formation descriptions	Tall Closed Wet Forest	Trees >30m; Dense (70-100%) cover (wetland)
	Tall Open Wet Forest	Trees >30m; Mid-dense (30-70%) cover (wetland)
	Tall Wet Woodland	Trees >30m; Sparse (10-30%) cover (wetland)
	Tall Open Wet Woodland	Trees >30m; Very Sparse (<10%) cover (wetland)
	Closed Wet Forest	Trees 10-30m; Dense (70-100%) cover (wetland)
	Open Wet Forest	Trees 10-30m; Mid-dense (30-70%) cover (wetland)
	Wet Woodland	Trees 10-30m; Sparse (10-30%) cover (wetland)
	Open Wet Woodland	Trees 10-30m; Very Sparse (<10%) cover (wetland)
	Low Closed Wet Forest	Trees 5-10m; Dense (70-100%) cover (wetland)
	Low Open Wet Forest	Trees 5-10m; Mid-dense (30-70%) cover (wetland)
	Low Wet Woodland	Trees 5-10m; Sparse (10-30%) cover (wetland)
	Low Open Wet Woodland	Trees 5-10m; Very Sparse (<10%) cover (wetland)
	Very Low Closed Wet Forest	Trees <5m; Dense (70-100%) cover (wetland)
	Very Low Open Wet Forest	Trees <5m; Mid-dense (30-70%) cover (wetland)
	Very Low Wet Woodland	Trees <5m; Sparse (10-30%) cover (wetland)
	Very Low Open Wet Woodland	Trees <5m; Very Sparse (<10%) cover (wetland)
	Tall Closed Wet Shrubland	Shrubs >2m; Dense (70-100%) cover (wetland)
	Tall Wet Shrubland	Shrubs >2m; Mid-dense (30-70%) cover (wetland)
	Tall Open Wet Shrubland	Shrubs >2m; Sparse (10-30%) cover (wetland)
	Tall Very Open Wet Shrubland	Shrubs >2m; Very Sparse (<10%) cover (wetland)
	Closed Wet Shrubland	Shrubs 1-2m; Dense (70-100%) cover (wetland)
	Wet Shrubland	Shrubs 1-2m; Mid-dense (30-70%) cover (wetland)
	Open Wet Shrubland	Shrubs 1-2m; Sparse (10-30%) cover (wetland)
	Very Open Wet Shrubland	Shrubs 1-2m; Very Sparse (<10%) cover (wetland)
	Low Closed Wet Shrubland	Shrubs <1m; Dense (70-100%) cover (wetland)
	Low Wet Shrubland	Shrubs <1m; Mid-dense (30-70%) cover (wetland)
	Low Open Wet Shrubland	Shrubs <1m; Sparse (10-30%) cover (wetland)
	Low Very Open Wet Shrubland	Shrubs <1m; Very Sparse (<10%) cover (wetland)
	Closed Wet Grassland	Tussock grasses; Dense (70-100%) cover (wetland)
	Wet Grassland	Tussock grasses; Mid-dense (30-70%) cover (wetland)
	Open Wet Grassland	Tussock grasses; Sparse (10-30%) cover (wetland)
	Very Open Wet Grassland	Tussock grasses; Very Sparse (<10%) cover (wetland)
	Closed Wet Sedgeland	Sedges; Dense (70-100%) cover (wetland)
	Wet Sedgeland	Sedges; Mid-dense (30-70%) cover (wetland)
	Open Wet Sedgeland	Sedges; Sparse (10-30%) cover (wetland)
	Very Open Wet Sedgeland	Sedges; Very Sparse (<10%) cover (wetland)
	Closed Wet Herbland	Herbs; Dense (70-100%) cover (wetland)
	Wet Herbland	Herbs; Mid-dense (30-70%) cover (wetland)
	Open Wet Herbland	Herbs; Sparse (10-30%) cover (wetland)
	Very Open Wet Herbland	Herbs; Very Sparse (<10%) cover (wetland)
	Closed Wet Fernland	Ferns; Dense (70-100%) cover (wetland)
	Wet Fernland	Ferns; Mid-dense (30-70%) cover (wetland)
	Open Wet Fernland	Ferns; Sparse (10-30%) cover (wetland)
	Very Open Wet Fernland	Ferns; Very Sparse (<10%) cover (wetland)
	Closed Wet Reedbed	Reeds; Dense (70-100%) cover (wetland)
	Wet Reedbed	Reeds; Mid-dense (30-70%) cover (wetland)
	Open Wet Reedbed	Reeds; Sparse (10-30%) cover (wetland)
Zone	Vegetation zones present within the wetland should be indicated. Tick where vegetation zone is present. Corresponding zone numbers provided are to be used on Sheet 2 of the survey form to indicate the presence and abundance of individual species within vegetation zones.	
Zone descriptions	1 buffer	Fringing native vegetation from the top of the bank and extending between 10-100 meters.
	2 bank	High water mark to buffer.
	3 shore	Low water to high water.
	4 emergent	
	5 aquatic submerged and emergent <1m	Emergent zone to 1 meter water depth.
	6 aquatic >1m	Mostly submerged at water depth 1 meter and greater.
	7 open water	
Layers present	Indicate the presence of flora growth-forms in both the riparian and aquatic habitats.	
Growth-form descriptions	Trees	Includes emergent species. Plants in this group tend to grow in seasonally or infrequently wet habitats.

	Shrubs	Includes those emergent species that have woody stems. Plants in this group tend to grow in seasonally or infrequently wet habitats.
	Reeds / Rushes / Sedges	
	Herbs / Grasses	
	Free-floating	Includes those species that normally are unattached but float on the surface.
	Floating attached	Includes those species that are rooted in the substrate but normally have at least the mature leaves floating on the water surface.
	Submerged attached	Includes species rooted in the substrate and whose leaves are normally fully submerged. These species may produce flowers that either float on the water surface or are held above it.
	Emergent	Includes those species rooted in the substrate and whose stems, flowers and most of the mature leaves project above the water surface.
	Ferns	

Subjective Assessment

The rapid assessment component of the survey provides a snap shot of the vegetation association and condition within different riparian habitats. Scores are subjective and should provide an indication of the condition of wetlands at time of survey as determined by the surveyor. Subjective scores will be compared with condition index scores generated from data collected above and should provide an indication of the accuracy of condition index scores following data analysis.

Aquatic vegetation	Subjective score according to the abundance and diversity and relative condition of aquatic vegetation determined by observation.	
Aquatic vegetation descriptions	None	No aquatic vegetation observed.
	Degraded	Indicates no or very little aquatic vegetation present, notable presence of exotic species, with low species diversity.
	Moderate	Indicates some aquatic vegetation cover, most vegetation layers present, some exotic species present.
	Intact	High diversity of aquatic vegetation with few exotics. Most or all aquatic vegetation layers represented.
Riparian vegetation	The vegetation of each zone is subjectively scored considering the level of disturbance and vegetation cover within each zone.	
Riparian vegetation descriptions	None	No riparian vegetation present. (ie, completely removed)
	Degraded	< 30% native vegetation cover with an abundance or exotic species and evidence of a high level of disturbance.
	Moderate	Between 30-75% native vegetation cover, few exotics with little evidence of disturbance.
	Intact	>75% native vegetation cover with little or no evidence of disturbance.
Wetland condition	The overall wetland condition score should reflect the previous rapid assessment scores. The combination of these values and the interpretation of other parameters recorded during the survey (such as land degradation and water chemistry) form the basis of the wetland condition score.	
Wetland condition descriptions	Severely degraded	Very high level of disturbance evident to the extent that wetland values are destroyed or irreversibly modified (e.g. wetland drained, eutrophication). Received low rapid assessment scores.
	Degraded	High level of disturbance evident. Verging on unrectifiable damage. Received mostly low rapid assessment scores.
	Moderate	Significant level of disturbance evident although some natural values present. Most damage rectifiable. Received mostly moderate rapid assessment scores.
	Intact	Small amounts of disturbance evident, with high native species diversity. Damage easily rectifiable. Received mostly moderate - intact rapid assessment scores.
	Pristine	No obvious disturbance, with high native species diversity. Scored mostly intact rapid assessment scores. Usually formally conserved within the reserve system.

Data Sheet 2 Completion Instructions.

Flora species present at the site are to be identified on Sheet 2 of the survey form. Sheet 2 provides a list of commonly recorded species on wetlands within the Fleurieu Peninsula region compiled from BDBSA records. Limited flora data exists for many wetlands within the study area and so the list provided is likely not to be comprehensive. Additional species should be listed in the spaces provided. Note that detailed quadrats are **not** to be completed for this wetland inventory. However, the most dominant species should be identified in each vegetation zone, including incidentals and any rare or threatened species noted. Unknown specimens are to be collected, vouchers attached and pressed for identification by the State Herbarium. List any unidentified species voucher numbers in the blank spaces, for later identification. Identification of unknown species was conducted by Rosemary Taplin (Fleurieu Peninsula Swamp expert-Botanist at the Plant Biodiversity Centre, Hackney Rd., Adelaide).

Wetland ID	Insert the same Wetland ID number for the site as shown on Sheet 1 of the survey form.	
Sector	Insert the sector number if the wetland is being assessed in sectors as shown on Sheet 1 of the survey form. If the wetland is not being assessed in sectors leave this box blank.	
flora species present	Indicate species present at the site by underlining. Species rare or threatened status is shown in square brackets. (NC) refers to species names which are non-current. The current nomenclature needs to be sought if these are underlined. Asterisk (*) at the beginning of the species name refers to introduced species.	
Z (zone number)	Where a species is identified at a site, indicate which vegetation zone the species occurs in. A key to the zone numbers is also provided at the bottom of the species list.	
Zone descriptions	1	Buffer: Top of the bank to the buffer which can extend between 10-100 meters.
	2	Bank: High water mark to buffer.
	3	Toe of bank: Low water to high water.
	4	Emergent
	5	Aquatic submerged and emergent <1m: Emergent zone to 1meter water depth.
	6	Aquatic >1m: Mostly submerged at water depth 1 meter and greater.
	7	Open water
A (cover abundance)	Indicate cover abundance for each species present using cover abundance scale. (Note that an abbreviated version of the cover abundance scale is included at the top of the survey form (SHEET 2)).	
Braun-Blanquet cover abundance descriptions	N	Not many, 1 – 10 individuals, insignificant cover.
	T	Sparsely or very sparsely present; cover less than 5%.
	1	Plentiful, but of small cover: less than 5% cover.
	2	Any number of individuals, 6-25% cover.
	3	Any number of individuals, 26-50% cover.
	4	Any number of individuals, 51-75% cover.
	5	Any number of individuals, 76-100% cover.
Veg Association	Indicate the vegetation association by marking the dominant species in the overstorey, understorey and emergent categories. Mark species by writing in the appropriate code next to relevant species names. e.g. <i>Baumea tetragona</i> [U] ☐ Observe the maximum number of species that can be listed within each category. An abbreviated version of category descriptions are provided at the top of the survey form (SHEET 2).	
Veg Association codes	O	Dominant / Co-dominant overstorey species (max 3)
	E	Emergent species (max 3)
	U	Dominant / Co-dominant understorey species (max 5)
	S	Dominant / Co-dominant submergent species (max 3)

APPENDIX 5. GIS DATASET DESCRIPTIONS

Layer Name	Source	Relevant Fields	Description
Inner Rural Series 2	DEH (ImageMap)	N/A	Type: Raster Image (ecw image) (MapInfo Tab file) Date: 2002 Rectified and tiled aerial photography covering the Adelaide Metropolitan region, Fleurieu Peninsula, and Barossa Valley. Sections of this image were cut to fit the Fleurieu Peninsula Wetland Inventory study area.
Emuswamp	Mt Lofty Ranges Southern Emu-wren Recovery Program	EMUSWAMP_: Individual object ID given to each polygon. STATUS: Code for condition of wetland. SWAMPNO: Survey number given to wetlands that were surveyed. TYPE: General description of the type of wetland (landform/hydrology) DOM1-3: Records the three most dominant flora species. LASTFIRE: Records the year of the last known fire. TRACKS: yes/no presence of tracks within wetland. PRESGR: Present grazing pressure: light – high. EMU: yes/no presence of emu-wren.	Type: Polygon (MapInfo Tab file) Date: 1993 Data gathered by MLR Southern Emu-wren Recovery Program focussing on Fleurieu Peninsula Swamps. Contains detailed data including dominant species and the presence of Emu-wren for over 50 wetlands. Spatial accuracy poor.
Veg_SthMtLofty	DEH	MU_50: Code for detailed floristic description (see Appendix 7 for descriptions)	Type: Polygon (MapInfo Tab file) Date: last updated Dec 2002 Identifies the location (polygons), floristic and general structural classification of areas of native vegetation of the South Mount Lofty region of South Australia.
Wetlands – Statewide (Incomplete)	DEH	AUS_WETNR: identification number for SA wetlands NAME: Name of wetland COMPLEX: Name of group of wetland sharing hydrogeological properties. WATER_REGIME: type of water regime. AUSDIR_NO: official Directory of Important Wetlands identifier. WATERCOURSE: Name of feeding watercourse. SOURCE: source of original dataset the wetland boundaries were compiled from.	Type: Polygon (MapInfo Tab file) Date: last updated Feb 2002 Identifies the location and conservation rating of South Australian Wetlands. The dataset is incomplete for the State. Includes data derived from DEH 1:50 000 topographic waterbody data and swamp data from the Mt Lofty Ranges Southern Emu-wren Recovery Program 1993.

Layer Name	Source	Relevant Fields	Description
Topographic waterbodies	1:50 000 DEH		Type: Line/Polygon (MapInfo Tab file) Date: last updated Jan 1999 Waterbodies mapped at 1:50 000 extracted from topographic map layers. Includes mostly large open waterbodies, and farm dams.
Topographic contours	1:50 000 DEH	CONTOUR: gives elevation in meters above sea level.	Type: Line (MapInfo Tab file) Date: last updated Jun 2001 Contains contour lines derived from 1:50 000 topographic maps.
Topographic drainage	1:50 000 DEH		Type: Line (MapInfo Tab file) Date: last updated Jan 1999 Contains the natural drainage lines derived from 1:50 000 topographic maps.
Digital Elevation Model	DEH	N/A	Type: Raster (jpg – MapInfo Tab file) Date: Dec 2003-12-16 Layer created using Raster based GIS IDRISI and topographic contour data to create hillshade image of the study area.
Sa_dir	DEH	A: Directory of Important Wetlands unique identifier number B: Name of wetland system	Type: Point (MapInfo Tab file) Date: 1996 Identifies the approximate mid-point of wetland complexes identified in the Directory of Important Wetlands. No spatial boundaries of these wetlands were available for the Fleurieu Peninsula region.
Catch_s	DEH	CNAME: Catchment name.	Type: Polygon (MapInfo Tab file) Date: 2001 Identifies sub-catchment boundaries.
FireYear	DEH/DWLBC		Type: Polygon (MapInfo Tab file) Date: 2004 Provides extent of burn area / year data.
DCDB	DEH		Type: Polygon (MapInfo Tab file) Date: 2004 Cadastre layer, showing property and parcel boundaries / property ownership information.

APPENDIX 6. FLEURIEU WETLANDS INVENTORY GIS DATABASE – METADATA

Table name	Fleurieu Wetlands		
Produced by	Claire Harding, Department for Environment & Heritage. Fleurieu Peninsula Wetland Inventory		
Description	Identifies spatial boundaries of wetlands throughout the Fleurieu Peninsula Region. Includes floodplains, heathy and sedgy wetlands (Fleurieu Peninsula Swamps), salt marsh and coastal lagoons. The layer does not include any open water bodies of human origin such as dams and reservoirs and does not identify marine wetlands such as reefs and sea-grass beds. The dataset can be considered complete for the study area.		
DATA QUALITY			
Lineage	The Fleurieu Wetlands dataset was digitised from aerial photography with the aid of existing wetland layers including DEH 1:50 000 topographic waterbody data, swamp data from the Mount Lofty Ranges Southern Emu-wren Recovery Program (1993) and wetland vegetation associations extracted from Vegetation Mapping VEG. SthMtLofty. These layers were merged and adjusted to improve spatial accuracy. New polygons were created where data was absent. Wetlands that are listed in the Directory of Important Wetlands have been identified and coded. Coding of wetland unique identifiers follows State-wide wetland numbering systems: Southern Mount Lofty Region S2001 – S2999. Fleurieu Wetlands numbers begin at S2110, following inventory numbers from the Mt Lofty Wetland Inventory (Seaman 2002a).		
Ground-truthing	Ground-truthing of polygons has been performed for approximately 40% of all wetlands mapped – from on-ground field survey and from roadside checks. However, the accuracy of unground-truthed polygons is expected to be high (95% accuracy for wetland habitat being present – from accuracy assessment results). Polygons tend to over-estimate the area of actual wetland. Errors of commission are more common than errors of omission.		
Data capture method	Digitising from aerial photography		
Data capture scale	1:5 000 (from 1: 10 000 aerial photography)		
Completeness	The dataset can be considered complete for floodplains, Fleurieu Peninsula Swamps, salt marsh and coastal lagoons within the study area. Watercourse information is incomplete due to absence of data.		
Positional accuracy	Position of wetlands is considered very good. Data capture was from 1:5 000 aerial photography.		
Attribute accuracy	Attributes are considered the minimum required and accuracy is good.		
Consistency	MapInfo Professional Version 7.0 was used to detect flaws in the spatial data structure. This check ensured that all polygons are closed, nodes are formed at the intersection of lines and that there is only one label in each polygon.		
GEOGRAPHIC EXTENT & PRESCRIPTION			
Extent name	Fleurieu Peninsula Wetland Inventory project boundary		
Min Easting	239202.6	Min Northing	6052263.1
Max Easting	332650.7	Max Northing	6176890.2
Projection	MGA ZONE 54		
Datum	GDA94		
Date	Dec 2005		

File format	MapInfo TAB file or ESRI Shapefile
Type	Polygons
Data size	1.55MB
Number of polygons	858
POLYGON ATTRIBUTE DESCRIPTIONS	
OBJNO	Individual row ID given to each polygon (sequential 1- 858)
WetlandID	Unique identifier for labelling all South Australian wetlands. Wetland numbers follow those for South Mt Lofty Ranges and begin where the Mt Lofty Wetland Inventory ends. S2110 – S2968
AUSDIR_NO	Directory of Important Wetlands In Australia: Identification number. Identifies wetland bodies that are included in listings of Nationally important wetlands: SA030 – Lanacoona Road Swamps SA034 – Tookayerta Finnis Catchments SA035 – Upper Hindmarsh River Catchment SA036 – Upper Tunkalilla Creek Swamps
OLDWetlandID	<u>Temporary field</u> : Wetland ID numbers (WetlandID) were re-assigned during the data editing / post ground-truthing phase. The previous WetlandID numbers have been retained in this field until all other adjustments to databases have been made. DO NOT REFER TO THESE ID NUMBERS FOR FUTURE ANALYSIS
EMUSWAMPID	Individual polygon ID given to wetlands mapped in the Emuswamp layer (links with EMUSWMP_)
SWAMPNO	Individual survey number given to swamps surveyed by the Mt Lofty Ranges Southern Emu-wren Recovery Program. Links to SWAMPNO field in the Emuswamp layer.
MU_50	Detailed floristic description code (for use at 1:50 000 scale) for vegetation group in polygon (refer to Appendix 7). Links to MU_50 number in the VEG_SthMtLofty layer.
WATERCOURSE	Name of watercourse that the wetland is a part of.
COMPLEX	Code for group of wetland sharing hydrogeological/ecological properties. FPS – Fleurieu Peninsula Swamps LAF – Lake Alexandrina Foreshore FLP – Mt. Lofty Hills Floodplain CL – Coastal Lagoon SM – Salt Marsh (Coastal) BCL – Brackish Creekline Floodplain (Note: the accuracy of this field has not been finalized – further ground-truthing is required to improve accuracy of this information. See field FPS)

CONDITION	Code indicating the condition of the wetland as determined by condition indices from field survey data and aerial photograph interpretation. Accuracy is considered to be good. p – pristine i – intact m - moderate d – degraded s – severely degraded
WETNAME	Name of the wetland or wetland group
AREA_ha	Total area of polygon calculated by GIS query (hectares)
PERIMETER_km	Total perimeter of polygon calculated by GIS query (kilometers)
CENTROID_E	Easting coordinate of the center of the polygon calculated by GIS query (MGA ZONE 54, GDA94)
CENTROID_N	Northing coordinate of the center of the polygon calculated by GIS query (MGA ZONE 54, GDA94)
SOURCE	Identifies the source of the original dataset the wetland boundaries were compiled from. The source was also specified in the case of new polygon created or old polygon adjusted where it was obvious that the data was indicating the same wetland.
LGA	Local Government Authority the polygon falls within (GIS query)
MAP_SHEET	1:50 000 map sheet name the polygon falls within (GIS query)
IBRA	Biogeographic Region the polygon falls within (GIS query)
IBRASubRegion	Biogeographic Sub-region specific to SA the polygon falls within (GIS query)
ENV_ASSOC	Environmental Association the polygon falls within (GIS query)
SUB_CATCH	Sub-Catchment the polygon falls within (GIS query)
BASIN	Major drainage basin the polygon falls within (GIS query)
GEOLOGY	
RAINFALL	The average annual rainfall isohyets the wetland falls within.
ELEVATION	Elevation of the wetland from 50m contours.
CATCH_BOARD	Name of the catchment board
ParkName	Name of NPWS reserve the wetland is within
ParkCode	Specific code identifying the NPWS reserve the wetland is within
ReserveType	Code given to reserve types: CP – Conservation Park RP – Recreation Park
HeritageAgreeNo	Number given to identify specific heritage agreement properties.
AccessHyperlink	Hyperlink linking the GIS polygon layer to the Wetland Inventory Database of SA (note: this will not be activated unless you have access to the database)
Count_Surveys	Total number of survey efforts conducted within the wetland.
Count_FloraSp	Total diversity of flora (number of species) recorded within the wetland.
Priority	<u>Temporary Field:</u> Scores generated through priority setting analysis for identifying priorities for field survey. Higher scores correspond to highest priorities for field survey (see report for details).

GRTR	Ground-truthed: indicates if the polygon has been ground-truthed (wetland habitat positively identified within the polygons extent). Y – indicates that the polygon has been ground-truthed Null value – indicates that no ground-truthing has been performed (95% accuracy)
Survey	Indicates the wetlands that have been included in surveys for the Fleurieu Peninsula Wetland Inventory (FPWI) project. Y – indicates that the wetland has been surveyed as part of the FPWI project. Null value – wetland was not surveyed as part of the FPWI project.
FPWI	Fleurieu Peninsula Wetland Inventory – this field combines data from GRTR and Survey. S – wetland has been surveyed as part of FPWI project G – ground-truth only Null value – no on-ground verification (95% accuracy)
FPS	Fleurieu Peninsula Swamp: identifies wetland polygons that contain habitats identified as Fleurieu Peninsula Swamp under the EPBC Act. Y – wetland polygon definitely contains areas of FPS N – wetland polygon definitely does not contain FPS Null value – no data available / un-checked (see field – COMPLEX)
PhotoHyperLink	Hyperlink linking the GIS polygon layer to site photos (note: this will not be activated unless you have access to the database/photo files)
SigScre	<u>Temporary field</u>: Ecological significance index number: generated through analysis of available data. Higher values indicate higher significance.
SIGNIF	Provides descriptive significance levels identified from cut-off points in SigScre field. Listed in order of the highest significance: Most Significant Significant Notable
Character	Provides the character description for the wetland body as generated through analysis of available data (see Section 4.2).

* Note: The Fleurieu Wetlands layer is available in the Statewide wetland layer: Landscape_wetlands, DEH corporate GIS.

APPENDIX 7. VEGETATION ASSOCIATION DESCRIPTIONS – MU_50

MU_50	DESC1_50	DESC2_50	DESC3_50	DESC4-5_50	FORMDESC_50	No. Polygons
301	<i>Eucalyptus ovata</i> over <i>Goodenia ovata</i> ,	<i>Leptospermum continentale</i> , <i>Melaleuca decussata</i> ,	<i>Acacia retinodes</i> var. <i>retinodes</i> (swamp form)	<i>Baumea juncea</i> , <i>Gahnia sieberiana</i>	Open Forest	92
601	<i>Melaleuca halmaturorum</i> ssp. <i>halmaturorum</i> over	<i>Samolus repens</i> , <i>Sarcocornia quinqueflora</i> ,	<i>Frankenia pauciflora</i> var., <i>Juncus kraussii</i> ,	<i>Suaeda australis</i>	Low Open Forest	2
3501	<i>Muehlenbeckia florulenta</i> , +/- <i>Gahnia filum</i> over	<i>Samolus repens</i> , <i>Isolepis nodosa</i> ,	<i>Sarcocornia quinqueflora</i> , * <i>Cynodon dactylon</i>		Tall Shrubland	1
3901	<i>Leptospermum continentale</i> & / or <i>L. lanigerum</i>	+/- <i>Phragmites australis</i> over <i>Baumea rubiginosa</i> ,	<i>Lepidosperma longitudinale</i> , <i>Baumea tetragona</i>	<i>Gahnia sieberiana</i> , <i>Empodisma minus</i> , <i>Blechnum minus</i>	Shrubland	78
3902	<i>Acacia retinodes</i> var. <i>retinodes</i> (swamp form),	+/- <i>Leptospermum continentale</i> , +/- <i>L. lanigerum</i> over	<i>Baumea tetragona</i> , <i>Blechnum minus</i> ,	<i>Lepidosperma longitudinale</i> , <i>Phragmites australis</i> , <i>Viminaria juncea</i>	Tall Shrubland	22
4004	<i>Halosarcia pergranulata</i> ssp. <i>pergranulata</i> ,	<i>Sarcocornia quinqueflora</i> over	<i>Enchylaena tomentosa</i> var., <i>Frankenia pauciflora</i>		Low Shrubland	1
4901	<i>Phragmites australis</i> & / or <i>Typha domingensis</i>	over * <i>Aster subulatus</i> , * <i>Paspalum distichum</i> ,	<i>Persicaria lapathifolia</i> , <i>Muehlenbeckia florulenta</i>	<i>Suaeda australis</i>	Sedgeland	8
5001	<i>Gahnia trifida</i> , <i>Gahnia filum</i> , <i>Juncus kraussii</i> over	<i>Sarcocornia</i> sp.			Sedgeland	2
5002	<i>Juncus sarophorus</i> , * <i>Juncus effusus</i> over	* <i>Anthoxanthum odoratum</i> , <i>Eleocharis gracilis</i> ,	* <i>Lotus uliginosus</i>		Sedgeland	2

APPENDIX 8. SAWID – BASIC USER GUIDE

The database program Microsoft Access 2000® is required to run the South Australia Wetland Inventory Database (SAWID).

What's in the database?

The South Australia Wetland Inventory Database was designed as a storage and retrieval system for data generated through the wetland inventory process. The SAWID is also designed to store information gathered through literature/data review related to individual wetland bodies.

The database has been designed to enable non-database users to access information on wetlands in a user-friendly format. The design of data entry forms enables easy entry of data collected through field survey for wetland inventory, and can be entered from field-based laptops.

Wetland data can be tracked to a specific location and date, allowing comparative analysis and monitoring of wetland condition over time and therefore is a valuable tool for management of wetlands into the future. The flexible design of the database allows for the storage of a wide range of data fields and is continually growing to encompass all data collected for wetlands in South Australia.

Existing data relevant to wetlands that is entered into SAWID includes:

- All flora and fauna data stored in Biological Databases of South Australia (BDBSA) (Survey, Opportune, Reserve, Plant Population) that falls within wetlands;
- EPA Frogwatch;
- Birds Australia;
- EPA Water Quality;
- SA Museum records;
- Mount Lofty Ranges Southern Emu-wren records (MLRSEWRP, unpublished data); and
- Wetland Inventory data: Fleurieu; Lofty Ranges; Eyre Peninsula; Yorke Peninsula; Kangaroo Island.

The Fleurieu Peninsula version of SAWID comprises a total of 858 wetlands entered into SAWID for the Fleurieu Peninsula, including 1024 individual survey records.

The integration of SAWID into DEH corporate databases is currently being investigated. For access to information within SAWID, contact DEH Senior Wetlands Officer.

Wetland ID

Each individual wetland (defined by each wetland polygon within the GIS layer) is given a unique identification number. This is known as the Wetland ID and consists of a five-digit code (e.g. S2155). Refer to Section 2.2.1 for description of numbering systems in South Australia. The Wetland ID is the 'primary key' within SAWID, which links all data to a particular wetland body. The Wetland ID also provides the linking field between the GIS wetland layers and SAWID.

Links with GIS layer

Data is linked between the wetlands GIS layer and SAWID through the Wetland ID field. A hyperlink between the GIS layers and SAWID allows direct access to data entry / reporting functions from the GIS layer. Figure 1 illustrates this link. SAWID is designed to run completely separate to the GIS databases, but maintains the link through the Wetland ID.



Types of data

There are two main types of data related to wetlands that is stored within the database. Base Wetland Data is data that is collected only once for a particular wetland body. This includes location information, tenure and land use, dominant water regimes etc.

The second type of data is Survey Data. Many surveys can be stored for a singular wetland body. This type of data includes information such as, date, GPS location, species lists, vegetation structure information, water chemistry, etc. This data can be replicated for a particular wetland at many dates and at many specific locations within the wetland.

Searching the database

The database will open with the form displayed in Figure 2, which is the main search engine for the database. Several options for searching are available within this format:

1. Generate reports for a known wetland body (either by Wetland Name or Wetland ID);
2. Generate reports for particular projects relating to Wetland Surveys;
3. Perform a criteria search; and
4. Enter or edit data within the database.



Option 1 Generate reports for a known wetland body

This option allows reports on a specific wetland to be generated. For this function either the name of the wetland, or the Wetland ID of the wetland body must be known (refer Section 2.2.1 of this report). This is particularly useful when working from GIS wetland layers where the Wetland ID of a particular wetland body can be defined from each polygon. Note that not all wetlands have been given a name. In this case the Wetland ID must be determined (usually from GIS query).

Enter either a Wetland ID into the box provided (e.g. S2155) **OR** pick a Wetland Name from the drop-down list (e.g. Upper Boat Harbour Creek Wetlands). Then click on the required report button.

Types of Reports

There are three main reporting options. The Wetland Report groups information from all 'surveys' that have been conducted within the wetland and displays summarised information. The Survey Report option displays a complete report for each survey conducted in the wetland selected. This enables all data collected within the wetland to be viewed in raw format. The Flora and Fauna Report function simply generates a list of all flora and fauna species that have been recorded for the wetland body.

Wetland Report

The Wetland Report function allows a summary report to be generated for a wetland body. Appendix 9 describes some of the main features of this report. Several complicated queries within the database are used to produce this report.

Wetland Reports are particularly useful for generating comprehensive information on a wetland that can be provided to relevant landholders or parties seeking information on a given wetland. If more detailed information on a wetland is required, Survey Reports can then be generated (see below).

Note that blank fields indicate that no data has been collected for this particular wetland body.

Survey Report

The Survey Report displays all information recorded from each survey within a particular wetland. An individual Survey Report will be generated for each survey effort, where a survey is defined as a singular sampling effort (of any scale) completed on a known date, at a known location, for a singular project and conducted by the same field team.

Survey reports provide specific data for each survey, including dates, specific locations, species lists etc. Many surveys can be stored for each wetland body, therefore many Survey Reports may be generated as a result of performing this query.

Note that a blank report will be generated if no surveys have been conducted in the wetland specified in the query. Blank fields within a report indicate that no data was collected for these fields in a particular survey. For example many surveys provide only date, location, collector details, and a species list.

Flora & Fauna List

The Flora and Fauna List button generates a complete list of all flora and fauna recorded within a wetland. These records are sourced from all surveys. This report is useful for providing an instant species list for a site. A blank report will be generated if there are no flora or fauna records for the specified wetland.

Option 2 Project Report

This option allows reports on specific projects to be generated. These give details of each project including methods used, survey extent and locations, members of field survey teams etc.

Pick a Project Name from the drop-down list (e.g. Fleurieu Peninsula Wetland Inventory), then click on the Project Report button.

Option 3 Criteria Search

The criteria search button enables reports to be generated for wetlands that meet user specified criteria. Several querying functions are available within this option which allows Wetland Reports to be generated by specifying attributes within several different fields or combinations of fields. Drop-down lists, list boxes, and check boxes have been created for most search options.

A Criteria Search form is displayed by clicking the Criteria Search button on the main form. Figure 3 describes some of the main features of the search engine.

The screenshot shows the 'Search Database' window with various search criteria and annotations. The annotations are as follows:

- Specify a tenure and landuse**: Points to the 'Tenure' and 'Landuse' dropdown menus.
- Search for wetlands that have records of a particular flora or fauna species**: Points to the 'Flora species' and 'Fauna species' dropdown menus.
- Search for wetlands with records from a specific Project**: Points to the 'Project' dropdown menu.
- Select wetlands that contain threatened species**: Points to the 'Threatened Flora' and 'Threatened Fauna' checkboxes.
- Search for Nationally / Internationally important wetlands**: Points to the 'Nationally Important Wetlands' and 'Internationally Important Wetlands' checkboxes.
- Specify min & max values**: Points to the 'Specify ranges' section with 'Min' and 'Max' input fields for 'Wetland area' and 'Elevation'.
- Specify wetlands that fall within a known area**: Points to the 'Local Government Authority' and 'Sub-SEA Region' dropdown menus.
- Search for wetlands with records relating to disturbances / conservation efforts**: Points to the 'Disturbance category' and 'Conservation measures' dropdown menus.
- Select specific hydrological characteristics**: Points to the 'Hydrological characteristics' section with checkboxes for 'Wetland System', 'Water Regime', and 'Water Source'.
- Exit criteria search & return to main form**: Points to the 'Back to Home' button.
- Clear last search (always reset the search engine between searches)**: Points to the 'RESET' button.
- Run query**: Points to the 'New Reports' button.

Figure 3 Criteria Search dialogue.

Generating reports

Once the required fields have been selected (e.g. Park Name = 'Deep Creek Conservation Park' and Select wetlands that contain Threatened Flora), use the 'View Reports' button to generate reports for the query. Wetland Reports for wetlands that meet the specified criteria are generated. The number of wetlands that meet the specified criteria is shown in the 'Number of Hits' text at the top of the first report (see Appendix 9 for explanation). A blank report will be generated if the combinations of fields entered do not exist within the database. This means that no wetlands within the database have the specific combination of fields entered. Change one or more of the fields to broaden the search. The database is limited by the sources of data inputted.

Use the page selector buttons  at the bottom of the screen to browse through the reports. Close the reports using the close button  on the report window at the top of the screen. The Criteria Search dialogue for the database will now be displayed again.

Use the 'Reset' button after each query to return all search attributes to Null before performing the next query.

Printing Reports

Reports can be printed from the report window (ie, with the report/s open) using normal print procedures (using *File* on the main menu bar then *Print*) or saved as PDF files. The reports have been designed to print legibly in greyscale or colour on A4 paper.

Data Entry

Option 4 Data Entry and Edit

Data entry and editing is restricted to allow only those with authorisation to enter and change data within the database. This function is protected with a password. Contact the Wetlands Officer responsible for Wetland Inventory data for database access privileges.

Data entry training is required for users of this function. A very short overview of data entry will be provided for the purposes of this document.

Data is entered into a specific wetland body through the data entry dialogue which opens the data entry forms for a specified wetland. Figure 4 describes the basic functions of this form. There are four options available for opening a wetland for data entry (Wetland ID, Wetland Name, Wetland Complex Name and Directory of Important Wetlands ID).

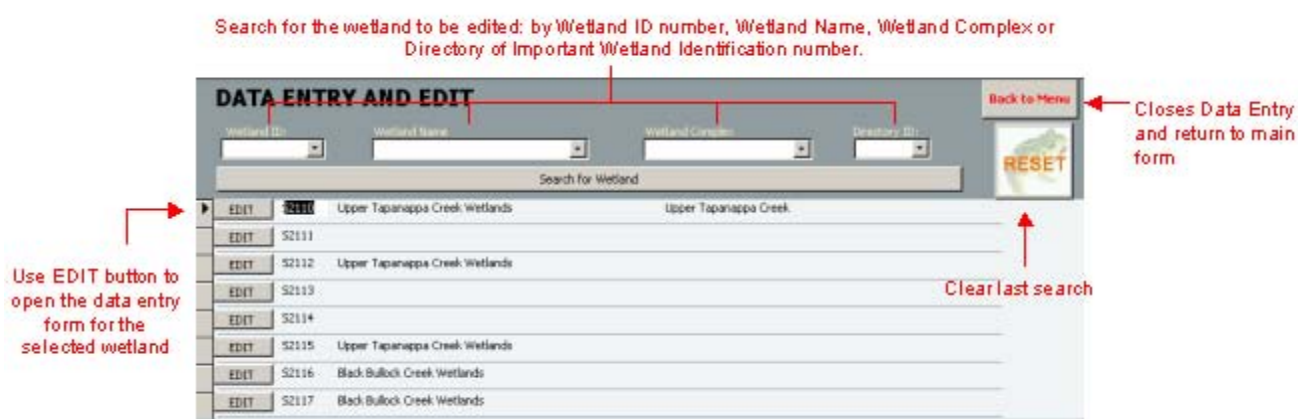


Figure 4 Data Entry and Edit dialogue

The data entry form enables entry of data in a standardised format and provides list boxes linked to lookup tables for many of the input fields. This reduces the occurrence of errors during data entry. Several fields have input masks and data entry criteria that must be met to further

reduce the chance of errors. Figure 5 shows the format of the data entry forms (both Base Data and Survey data is linked within the form). Simple training is required to ensure that data is entered in a consistent manner, and that the user correctly understands the functions of each field and the forms. Appendix 10 lists the fields available within SAWID.

Opening data entry form (Base Wetland data)

Survey related information (many surveys with one wetland body)

Example Sub-forms

The figure displays three screenshots of the SAWID data entry interface. The top screenshot shows the 'Data Entry and Edit' form for '52150', which includes fields for 'Wetland Name', 'Location', 'Survey Date', 'Survey Time', 'Survey Duration', 'Survey Area', 'Survey Method', 'Survey Notes', and 'Survey Photos'. The middle screenshot shows the 'Survey Reference' form, which includes fields for 'Survey Site', 'Survey Date', 'Survey Time', 'Survey Duration', 'Survey Area', 'Survey Method', 'Survey Notes', and 'Survey Photos'. The bottom screenshot shows the 'Example Sub-forms' form, which includes a table of survey data with columns for 'Species', 'Zone', 'Cover/Abundance', 'Veg Association', and 'Flora Species List'.

Species	Zone	Cover/Abundance	Veg Association	Flora Species List
<i>Leptodermis senilis</i>	2	2	N	
<i>Stipa muelleri</i>	2	2	N	
<i>Asplenium flabellifolium</i>	2	2	N	
<i>Daviesia ulicifolia</i> ssp. <i>incarnata</i>	2	2	N	
<i>Acrotiche serrulata</i>	2	2	N	
<i>Isopogon ceratophyllus</i>	2	2	N	
<i>Exocarpos cupressiformis</i>	3	3	N	
<i>Pteridium esculentum</i>	3	4	U	
<i>Melaleuca decussata</i>	3	1		
<i>Blechnum minus</i>	4	3	U	
<i>Gahnia sieberiana</i>	4	3	0	
<i>Platylobium obtusangulum</i>	2	2	N	
<i>Viminaria juncea</i>	3	N		

Figure 5 Example of data entry forms from SAWID

Access to tabular data

Raw data is available from the tables within the database used to store the information entered into SAWID. This data can be queried and analysed by users as required. An understanding of Microsoft Access® is required in order to manipulate raw data. A brief description of the tables and fields within SAWID is provided as Appendix 10. For further information contact the Wetlands Officer responsible.

APPENDIX 9. EXAMPLE SAWID WETLAND REPORT

Indicates number of reports generated (ie, number of wetlands that meet the search criteria)

General location information

List of other wetlands that share a direct hydrological relationship

Basic hydrological data

Tenure and landuse both onsite (within the wetland) and surrounding.

Directory of Important Wetlands Classification system

Lists threats recorded from all surveys and displays the most recent Extent value.

WETLAND REPORT

Number of hits: 1

Wetland Name: **Upper Boat Harbor Creek Wetlands** Wetland ID: **S2155**

Wetland Directory ID: ☐ Remove ID

Location (GDA84)

Easting: 25321.96 MGA Zone: 54
Northing: 605689.05

Area: 12.36 ha Perimeter: 3.73 km
Elevation: 260 m (a.s.l.) Period: 600 m (circumf.)

Local Government Authority: YARRAKULLA
State: SA
Catchment Board: NONE
IRRA: Kinnaroo
Environmental Association: Fleurieu
IRRA Sub-region: Fleurieu
Landform Element: Swamp

Other wetlands in aggregation:
S2153 Downstream
S2154 Anneland

Location Description:
Within pine forest and Deep Creek Conservation Park.

General Comments:
Fleurieu Peninsula Swamp in intact condition. The upper parts of the wetland are surrounded by pine plantation, the majority of the wetland occurs within Deep Creek Conservation Park. Good structural diversity exists.




Hydrology									
Major Catchment Basin:		FLEURIEU PENINSULA		Wetland system:		Palustrine		Water sources:	
Sub-Catchment:		Boat Harbour Creek		Wetland origin:		Spring		Local Runoff	
Watercourse:		BOAT HARBOUR CREEK		Water regime:		Permanent		Stream-fed	
Maximum water depth:		0.60 m (when full)		Inland:		Contains water throughout the year, although level may vary.		Spring	
Average water depth:		0.20 m (when full)							
Water Chemistry									
Conductivity: Min	101.2	Max	101.2	Avg	101.2	Turbidity: Min		Max	
pH: Min	5.14	Max	5.14	Avg	5.14	Dissolved O2: Min		Max	
Temperature: Min	15.5	Max	15.5	Avg	15.5				
Tenure and Landuse									
Onsite		Surrounding		Park Name: Deep Creek Conservation Park					
Tenure:	Public	Tenure:	Public	Heritage Agreement number:					
Landuse:	Vacant / Unused	Landuse:	Forestry (pine)	Management Authority:					
	Conservation Park		Conservation Park	Forestry SA					
				National Parks & Wildlife Service					
Classification and Criteria for inclusion : Wetland Directory									
Classification:	B13 Shrub swamps; shrub dominated freshwater marsh, shrub c	Criteria:	1 Wetland Type						
	B15 Peatlands; forest, shrub or open bogs.								
Wetland Type:	Creekline/floodplain	Structural Formation:	Closed Wet Shrubland						
Threats and Management Issues									
Disturbance	Extent	Conservation measures	Current	Suggested					
Nutrient enrichment - agricultural	Moderate	Formally reserved for conservation	☒	☐					
Altered Water Regime - decreased	Moderate								
Fragmentation - roads	Minimum								
Weeds - pine forest encroachment	Potential								

Identify's the wetland by unique Wetland ID.

Aerial photograph showing wetland polygon.

Location map indicating the position of the wetland within the study area.

Water chemistry readings: grouped and displayed as min, max, and average values.

Lists conservation measures from all surveys and displays the most recent status.

WETLAND FLORA AND FAUNA					
Dominant Native Species			Problem weed species		
Species	Common Name		Species	Common Name	
<i>Baumea rubiginosa</i>	Soft Twig-rush		* <i>Phalaris aquatica</i>	Phalaris	
<i>Blechnum minus</i>	Soft Water-fern				
<i>Eucalyptus ovata</i>	Swamp Gum				
<i>Gahnia sieberiana</i>	Red-fruit Cutting-grass				
<i>Lepidosperma longistylis</i>	Pithy Sword-sedge				
<i>Leptospermum lanigerum</i>	Silky Tea-tree				
<i>Leptospermum sp.</i>	Tea-tree				
<i>Pteridium esculentum</i>	Bracken Fern				
<i>Putanea daphnoides</i>	Large-leaf Bush Pea				
Threatened Flora Species					
Species	Common Name	Regional Status	NPW Act	EPBC	
<i>Baumea rubiginosa</i>	Soft Twig-rush	uncommon			
<i>Baumea tetragona</i>	Square Twig-rush	uncommon			
<i>Blechnum minus</i>	Soft Water-fern	uncommon			
<i>Centella cordifolia</i> s.str.	Native Centella	uncommon			
<i>Empodisma minus</i>	Tangled Rope-rush	uncommon			
<i>Gahnia sieberiana</i>	Red-fruit Cutting-grass	uncommon			
<i>Viminaria juncea</i>	Native Broom	rare	Rare		
Total Fauna Diversity		Threatened Fauna Species			
Fauna Group	No. species	Common Name	Breeding record	NPW Act	EPBC
AVES	3	Southern Brown Bandicoot	☐	vulnerable	Vulnerable
MAMMALIA	3				
Fauna Survey Methods		Lists all methods used for fauna survey within the wetland. Provides an indication of survey effort.			
Opportune Sighting					
Rapid Assessment (Wetland dependant biota)					
Wetland Dependant Fauna:			Wetland Flora:		
Macroinvertebrates:	Moderate	Reptiles:	Moderate	Aquatic vegetation:	Intact
Fish:	Moderate	Birds:	High	Riparian vegetation:	Intact
Amphibians:	Moderate	Mammals:	Moderate	Wetland condition: Pristine	
Studies / projects including this wetland					
Project Name	Publication produced			Number of surveys completed	
Biological Survey Database - Opportune records				1	
Fleurieu Peninsula Wetland Inventory	Harding, C. (in prep). Fleurieu Peninsula Wetland Inventory. Department for Environment & Heritage, Adelaide.			1	
Mount Lofty Southern Emu-wren Survey				1	
Spatial Data Existing			Fire History		
GIS Polygon layer	☒	Name:	Fleurieu Wetlands (MapInfo Tab)	Year	Area burnt
Habitat Mapping	☐	Name:			
Videography	☐	Video start time:	Finish time:		
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Wetland ID appears at the bottom of each page.

APPENDIX 10. DATABASE FIELDS AND DESCRIPTIONS – SAWID

Field Name	Data Type	Description	No. attributes possible / wetland	Data Storage Table Name	Lookup Table	Main linking table and field
WetlandID	Text	Wetland ID using the SA system (ie, S0000)	Single	TBL_BaseWetlandData		Primary Key
IncludeInReport	Number	Field that updates to allow reports to be generated from queries.	Single	TBL_BaseWetlandData		
WetDir	Text	Directory of Important Wetlands Reference Number	Single	TBL_BaseWetlandData		
Ramsar	Yes/No	Is site a Ramsar site?	Single	TBL_BaseWetlandData		
MGA Zone	Number	Map Grid of Australia zone Number that the mid-point of the wetland polygon falls within	Single	TBL_BaseWetlandData		
CentroidX	Number	Mid-point of the wetland polygon GDA94 (easting)	Single	TBL_BaseWetlandData		
CentroidY	Number	Mid-point of the wetland polygon GDA94 (northing)	Single	TBL_BaseWetlandData		
LocDesc	Memo	Location Description: general description of the wetland location using landscape features or closest roads etc.	Single	TBL_BaseWetlandData		
WetlandName	Text	The name of the wetland or wetland complex	Single	TBL_BaseWetlandData		
Area	Number	Total area of the wetland (hectares)	Single	TBL_BaseWetlandData		
Perimeter	Number	Total perimeter of the wetland (kilometers)	Single	TBL_BaseWetlandData		
Elevation	Number	Meters above sea level	Single	TBL_BaseWetlandData		
Map	OLE Object	Map of wetland (jpg image) including aerial photograph with wetland boundary.	Single	TBL_BaseWetlandData		
LocMap	OLE Object	Location Map: small map of study area showing wetland site as point.	Single	TBL_BaseWetlandData		
LGA	Text	Local Government Authority (Name)	Single	TBL_BaseWetlandData	LKP_LGA	
MapSheetNo	Text	1:50 000 Map Sheet number	Single	TBL_BaseWetlandData	LKP_50KMapSheet	
IBRA	Text	Name of bioregion (Interim Biogeographical Region of Australia)	Single	TBL_BaseWetlandData	LKP_IBRA	
IBRASub	Text	Name of Sub-IBRA region (South Australia)	Single	TBL_BaseWetlandData	LKP_IBRASubRegion	
EnviroAssoc	Text	Name of Environmental Association (South Australia)	Single	TBL_BaseWetlandData	LKP_EnviroAssoc	
CatchBoard	Text	Name of Catchment Board	Single	TBL_BaseWetlandData	LKP_CatchmentBoard	
Rainfall	Number	Average rainfall band	Single	TBL_BaseWetlandData		
WetlandSystem	Text	Name of type of wetland system (eg Palustrine)	Single	TBL_BaseWetlandData	LKP_WetlandSystem	
LandformElem	Number	Code for major landform element (BDBSA)	Single	TBL_BaseWetlandData	LKP_LandformElement	
Geology	Text	Name of geological formation	Single	TBL_BaseWetlandData		
Origin	Text	Code for the descriptive name for the origin of the wetland (e.g. karst)	Single	TBL_BaseWetlandData	LKP_Origin	

WaterRegime	Text	Code for dominant water regime for the wetland or wetland complex (eg. Permanent)	Single	TBL_BaseWetlandData	LKP_WaterRegime	
Watercourse	Text	Name of feeding watercourse	Single	TBL_BaseWetlandData	LKP_WaterCourse	
SubCatch	Text	Name of sub-catchment	Single	TBL_BaseWetlandData	LKP_SubCatchment	
Basin	Text	Name of major catchment basin	Single	TBL_BaseWetlandData	LKP_Basin	
DepthMax	Number	Maximum water depth when full (meters)	Single	TBL_BaseWetlandData		
DepthAv	Number	Average water depth when full (meters)	Single	TBL_BaseWetlandData		
TenureOnsite	Text	Tenure of the wetland body (private / public)	Single	TBL_BaseWetlandData	LKP_Tenure	
TenureSurrounding	Text	Tenure of the areas surrounding the wetland body (private / public)	Single	TBL_BaseWetlandData	LKP_Tenure	
ParkName	Text	Name of reserve the wetland is within / or partly within	Single	TBL_BaseWetlandData	LKP_ParkName	
HeritageAgreeNo	Text	Unique identifier for Heritage Agreement on wetland	Single	TBL_BaseWetlandData		
Type	Text	General wetland type (descriptive)	Single	TBL_BaseWetlandData	LKP_WetlandType	
HabitatMapping	Yes/No	Has habitat mapping been performed for this site?	Single	TBL_BaseWetlandData		
NameHabitatLayer	Text	Name of GIS polygon layer containing habitat mapping.	Single	TBL_BaseWetlandData		
Videography	Yes/No	Does videography exist for this wetland? (source: DWLBC)	Single	TBL_BaseWetlandData		
VRTTimeMin	Text	Start time of videography for this wetland	Single	TBL_BaseWetlandData		
VRTTimeMax	Text	End time of videography for this wetland	Single	TBL_BaseWetlandData		
GeneralComments	Memo	Provide general descriptive comments on the entire wetland system; including conservation significance	Single	TBL_BaseWetlandData		
FlowControlStructure	Yes/No	Are flow control structures present?	Single	TBL_BaseWetlandData		
FlowControlDesc	Memo	Describe flow control structures	Single	TBL_BaseWetlandData		
AggWetlandID	Text	Wetland ID for other wetlands with hydrological, ecological or biological connections.	Multiple	TBL_AggregationWetlands		TBL_BaseWetlandData WetlandID
DirectionOfFlow	Text	Direction of water flow from Wetland to each of the wetlands in aggregation (Upstream / Downstream / Flood events of the Wetland ID)	Multiple	TBL_AggregationWetlands	LKP_DirectionOfFlow	TBL_BaseWetlandData WetlandID
Criteria	Number	Nationally important criteria (Directory of Important Wetlands)	Multiple	TBL_Criteria	LKP_Criteria	TBL_BaseWetlandData WetlandID
RamsarCat	Text	Directory of Important Wetlands category code (adapted from Ramsar categories)	Multiple	TBL_RamsarClassification	LKP_RamsarClassification	TBL_BaseWetlandData WetlandID
RecFacility	Text	Recreation facilities present at the wetland site (eg. Board walk, jetty etc.)	Multiple	TBL_RecreationFacilities	LKP_RecreationFacilities	TBL_BaseWetlandData WetlandID
Type (Social & Cultural values)	Text	Indigenous or non-indigenous	Multiple	TBL_SocialCulturalValues		TBL_BaseWetlandData WetlandID
Description (Social & Cultural values)	Memo	Description of Social / Cultural use	Multiple	TBL_SocialCulturalValues		TBL_BaseWetlandData WetlandID
WaterSource	Text	Code for source of water to the wetland body (eg. Local runoff, spring etc.)	Multiple	TBL_WaterSource	LKP_WaterSource	TBL_BaseWetlandData WetlandID

LanduseOnsite	Text	Code for landuse within the wetland	Multiple	TBL_LanduseOnsite	LKP_Landuse	TBL_BaseWetlandData WetlandID
LanduseSurround	Text	Code for landuse of the area surrounding the wetland	Multiple	TBL_LanduseSurrounding	LKP_Landuse	TBL_BaseWetlandData WetlandID
ManagAuth	Text	Code for the name of management authority responsible for the management of the wetland	Multiple	TBL_ManagementAuthority	LKP_ManagementAuthority	TBL_BaseWetlandData WetlandID
FireYear	Text	Year of known fire within the wetland	Multiple	TBL_Fire		TBL_BaseWetlandData WetlandID
FireArea	Number	Approximate number of hectares of wetland burnt	Multiple	TBL_Fire		TBL_BaseWetlandData WetlandID
SurveyNo	Auto Number	Unique identifier given to each survey within the database	Single	TBL_Survey		Primary Key TBL_BaseWetlandData WetlandID
IncludeInReport	Number	Field that updates to allow reports to be generated from queries.	N/A	TBL_Survey		
Date	Date/Time	Date of data collection	Single	TBL_Survey		
Time	Date/Time	Time of survey (AM / PM)	Single	TBL_Survey		
ProjectNo	Number	ProjectID Number specifying the project the data was collected for.	Single	TBL_Survey	LKP_ProjectDetails	
SurveyEasting	Number	Location of survey site (GPS): Easting (GDA94)	Single	TBL_Survey		
SurveyNorthing	Number	Location of survey site (GPS): Northing (GDA94)	Single	TBL_Survey		
%Cover	Number	Percentage area of water relative to full (at the time of survey)	Single	TBL_Survey		
Inundation	Number	Number of weeks the wetland has been inundated at time of survey	Single	TBL_Survey		
%Buffer	Number	Percentage of total wetland perimeter surrounded by native vegetation buffer	Single	TBL_Survey		
BufferWidth	Number	Average width of native vegetation buffer around wetland (meters) (where present)	Single	TBL_Survey		
Algae	Number	Code for amount of attached algae (none / little / medium / abundant)	Single	TBL_Survey	LKP_Algae	
TallestStratumHeight	Number	Height of the tallest stratum (meters)	Single	TBL_Survey		
DomOSHeight	Number	Height of the dominant overstorey species (meters)	Single	TBL_Survey		
DomUSHeight	Number	Height of the dominant understorey species (meters)	Single	TBL_Survey		
StructuralFormation	Text	Structural formation description (Heard & Channon 1997)	Single	TBL_Survey	LKP_StructuralFormation	
CoverAbundVeg	Number	Indicate % total cover of vegetation for the survey site	Single	TBL_Survey		
Comments	Memo	General comments on wetland survey	Single	TBL_Survey		
pH	Number	Reading taken from pH meter	Single	TBL_Survey		
Conductivity	Number	US/cm reading taken from conductivity meter	Single	TBL_Survey		
Temperature	Number	Reading taken from water temperature meter (degree Celsius)	Single	TBL_Survey		
Turbidity	Number	Reading taken from turbidity meter (NTU)	Single	TBL_Survey		

O2	Number	Reading taken from dissolved oxygen meter (ppm)	Single	TBL_Survey		
WaterFlow	Text	Water movement at place water chemistry readings are taken	Single	TBL_Survey	LKP_WaterFlow	
ReadingDepth	Number	Depth at which water chemistry readings are taken (meters)	Single	TBL_Survey		
WaterDepth	Number	Total depth of water at survey site (where water chemistry readings taken)	Single	TBL_Survey		
MicroWaterRegime	Text	Code for water regime relevant at the survey site (may differ from the dominant water regime for the wetland / wetland complex)	Single	TBL_Survey	LKP_WaterRegime	
SoilType	Text	Code for soil type at the survey site	Single	TBL_Survey	LKP_SoilTypes	
RA_AquInverts	Number	Subjective assessment number: indicates wetland value for aquatic invertebrates	Single	TBL_Survey	LKP_RAFauna	
RA_AquFish	Number	Subjective assessment number: indicates wetland value as fish habitat	Single	TBL_Survey	LKP_RAFauna	
RA_AquBirds	Number	Subjective assessment number: indicates wetland value as bird habitat	Single	TBL_Survey	LKP_RAFauna	
RA_AquAmph	Number	Subjective assessment number: indicates wetland value as amphibian habitat	Single	TBL_Survey	LKP_RAFauna	
RA_AquReptiles	Number	Subjective assessment number: indicates wetland value as reptile habitat	Single	TBL_Survey	LKP_RAFauna	
RA_AquMammals	Number	Subjective assessment number: indicates wetland value as mammal habitat	Single	TBL_Survey	LKP_RAFauna	
RA_AquVeg	Number	Subjective assessment number: subjective condition of aquatic vegetation	Single	TBL_Survey	LKP_RAVeg	
RA_RipVegBuffer	Number	Subjective assessment number: condition of riparian vegetation buffer	Single	TBL_Survey	LKP_RAVeg	
RA_WetCond	Number	Subjective assessment number: subjective indication of overall wetland condition	Single	TBL_Survey	LKP_RAWetlandCondition	
WeedinessCoverAbund	Text	Overall cover abundance of exotic flora species	Single	TBL_Survey	LKP_CoverAbundanceScale	
SedimentSize	Text	Broad sediment granular size	Single	TBL_Survey	LKP_SedimentSize	
SurfaceStrew	Number	Approximate % of surface rock litter (strew)	Single	TBL_Survey	LKP_SurfaceStrew	
ConsMeasure	Text	Conservation measures taken to protect the wetland	Multiple	TBL_ConservationMeasures	LKP_ConservationMeasures	TBL_Survey . SurveyNo
Current	Yes/No	Is the conservation measure currently active?		TBL_ConservationMeasures		TBL_Survey . SurveyNo
Suggested	Yes/No	Is the conservation measure suggested?		TBL_ConservationMeasures		TBL_Survey . SurveyNo
ConsNotes	Memo	Notes on individual conservation measures		TBL_ConservationMeasures		TBL_Survey . SurveyNo
Disturbance	Text	Code for Disturbance type / Management Issue / Threatening process	Multiple	TBL_Disturbance/Threats	LKP_Disturbances	TBL_Survey . SurveyNo
Extent	Number	Extent of disturbance caused by respective threatening processes		TBL_Disturbance/Threats	LKP_DisturbanceExtent	TBL_Survey . SurveyNo
FaunaSurveyMeth	Text	Method of fauna survey	Multiple	TBL_FaunaSurveyMethod	LKP_FaunaSurveyIntensity	TBL_Survey . SurveyNo

NSXCODE (fauna)	Text	Species code for fauna species	Multiple	TBL_NoteworthyFauna	LKP_FaunaSpeciesList	TBL_Survey . SurveyNo
Number	Number	Approximate number of individual fauna species observed		TBL_NoteworthyFauna		TBL_Survey . SurveyNo
Breeding	Yes/No	Was breeding/nesting activity observed		TBL_NoteworthyFauna		TBL_Survey . SurveyNo
MicroHabitat	Text	Description of particular habitat type present (eg. Dense shrubs, open water etc.)	Multiple	TBL_MicroHabitat	LKP_MicroHabitat	TBL_Survey . SurveyNo
NSXCODE (flora)	Text	Species code for flora species	Multiple	TBL_FloraSpeciesLists	LKP_FloraSpeciesList	TBL_Survey . SurveyNo
Zone	Number	Vegetation zone (wetland zones, e.g. submerged; emergent, bank, riparian)		TBL_FloraSpeciesLists	LKP_Zone	TBL_Survey . SurveyNo
Abund	Text	Cover abundance (using Cover Abundance scale Heard & Channon 1997)		TBL_FloraSpeciesLists	LKP_CoverAbundanceScale	TBL_Survey . SurveyNo
VegAssociation	Text	Indicate dominant overstorey and understorey species		TBL_FloraSpeciesLists	LKP_VegAssociation	TBL_Survey . SurveyNo
VegLayer	Text	Vegetation layers present (e.g. trees, shrubs, sub-aquatics etc.)	Multiple	TBL_VegLayer	LKP_VegLayer	TBL_Survey . SurveyNo
ZonePresent	Text	Wetland zones present (zones defined by water depth and inundation periods)	Multiple	TBL_Zones	LKP_Zone	TBL_Survey . SurveyNo
Photo	OLE Object	Photos of survey sites	Multiple	TBL_SurveySitePhotos		TBL_Survey . SurveyNo
PhotoName	Text	Text relating to the photo / including photo credit etc.		TBL_SurveySitePhotos		TBL_Survey . SurveyNo
TDS	Number	Total Dissolved Solids (by EC) mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
SusSolids	Number	Suspended Solids mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
DisSolCalc	Number	Dissolved Solids by Calculation mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Ca	Number	Calcium mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Mg	Number	Magnesium mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Na	Number	Sodium mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
K	Number	Potassium mg/l	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
CaCO3	Number	Carbonate mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Bicarbonate	Number	Bicarbonate mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Sulphate	Number	Sulphate mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Chloride	Number	Chloride mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
AmAsNit	Number	Ammonia as Nitrogen mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
TKNAsNit	Number	TKN as Nitrogen mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
NitrateNiN	Number	Nitrate + Nitrite as N mg/L	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ReactPhosAsP	Number	Filtered Reactive Phosphorus as P (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Phosphorus	Number	Phosphorus – Total as P (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Silica	Number	Silica – reactive (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
AlMgL	Number	Aluminium (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
AlSol	Number	Aluminium soluble	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo

As	Number	Arsenic (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Cd	Number	Cadmium (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Cr	Number	Chromium (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Cu	Number	Copper (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
FeMg	Number	Iron (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
FeSol	Number	Iron soluble	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Pb	Number	Lead (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Hg	Number	Mercury (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Ni	Number	Nickel (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Se	Number	Selenium (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Ag	Number	Silver (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ZnMgL	Number	Zinc (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ZnSol	Number	Zinc soluble	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Antimony	Number	Antimony (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ChlorophyllA	Number	Chlorophyll A (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ChlorophyllB	Number	Chlorophyll B (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
TotalHardness	Number	Total hardness as CaCO3 (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
CarbHardness	Number	Carbonate Hardness as CaCO3 (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
NonCarbHardness	Number	Noncarbonate Hardness as CaCO3 (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
CaHardness	Number	Calcium Hardness as CaCO3 (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
MgHardness	Number	Magnesium Hardness as CaCO3 (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Alkalinity	Number	Alkalinity as CaCO3	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
CO2	Number	Free Carbon Dioxide (mg/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
LangelierInd	Number	Langelier Index	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
NaAdsorp	Number	Sodium adsorption Ration	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
IonBal	Number	Ion Balance (%)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
NaTotCat	Number	Sodium / Total Cations Ration (%)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
TotMetalPrep	Number	Total Metal Preparation	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Aldrin	Number	Aldrin (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Dacthal	Number	Dacthal (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Dieldrin	Number	Dieldrin (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Endosulfan	Number	Endosulfan (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
EndosulfSulphate	Number	Endosulfan Sulphate (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo

Lindane	Number	Lindane (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Heptachlor	Number	Heptachlor (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
HeptachlorEpo	Number	Heptachlor Expoxide (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Trifluralin	Number	Trifluralin (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Atrazine	Number	Atrazine (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
AzinMeth	Number	Azinphos – Methyl (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Diazinon	Number	Diazinon (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Fenitrothion	Number	Fenitrothion (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Hexazinone	Number	Hexazinone (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Malathion	Number	Malathion (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Parathion	Number	Parathion (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
ParathionMeth	Number	Parathion – Methyl (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Prometryne	Number	Prometryne (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Simazine	Number	Simazine (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo
Glyphosate	Number	Glyphosate – herbicide (ug/L)	Multiple	TBL_AdvancedWaterChem		TBL_Survey . SurveyNo

APPENDIX 11. MOST COMMONLY RECORDED FLORA SPECIES OF FLEURIEU PENINSULA SWAMPS

SPECIES	COMMON NAME	Total number of wetlands	% of all wetlands with flora records
<i>Lepidosperma longitudinale</i>	Pithy Sword-sedge	221	89.4737
<i>Leptospermum continentale</i>	Prickly Tea-tree	219	88.664
<i>Baumea rubiginosa</i>	Soft Twig-rush	211	85.4251
<i>Gahnia sieberiana</i>	Red-fruit Cutting-grass	191	77.3279
<i>Leptospermum lanigerum</i>	Silky Tea-tree	186	75.3036
<i>Blechnum minus</i>	Soft Water-fern	186	75.3036
<i>Pteridium esculentum</i>	Bracken Fern	179	72.4696
<i>Baumea tetragona</i>	Square Twig-rush	176	71.2551
* <i>Holcus lanatus</i>	Yorkshire Fog	173	70.0405
<i>Carex appressa</i>	Tall Sedge	140	56.6802
<i>Juncus pallidus</i>	Pale Rush	137	55.4656
<i>Juncus sarophorus</i>		136	55.0607
<i>Acacia retinodes</i> var. <i>retinodes</i> (swamp form)	Swamp Wattle	134	54.251
<i>Gratiola peruviana</i>	Austral Brooklime	129	52.2267
<i>Empodisma minus</i>	Tangled Rope-rush	125	50.6073
<i>Eucalyptus ovata</i>	Swamp Gum	124	50.2024
<i>Epilobium pallidiflorum</i>	Showy Willow-herb	113	45.749
<i>Goodenia ovata</i>	Hop Goodenia	112	45.3441
<i>Juncus planifolius</i>	Broad-leaf Rush	102	41.2955
<i>Viminaria juncea</i>	Native Broom	101	40.8907
* <i>Juncus articulatus</i>	Jointed Rush	101	40.8907
<i>Acacia verticillata</i>	Prickly Moses	100	40.4858
<i>Eleocharis gracilis</i>	Slender Spike-rush	99	40.081
* <i>Lotus uliginosus</i>	Greater Bird's-foot Trefoil	98	39.6761
<i>Phragmites australis</i>	Common Reed	97	39.2713
<i>Myriophyllum amphibium</i>	Broad Milfoil	89	36.0324
<i>Isolepis inundata</i>	Swamp Club-rush	81	32.7935
<i>Melaleuca decussata</i>	Totem-poles	79	31.9838
<i>Gleichenia microphylla</i>	Coral Fern	74	29.9595
<i>Acaena novae-zelandiae</i>	Biddy-biddy	72	29.1498
<i>Baumea juncea</i>	Bare Twig-rush	67	27.1255
<i>Persicaria decipiens</i>	Slender Knotweed	67	27.1255
<i>Isolepis cernua</i>	Nodding Club-rush	65	26.3158
<i>Gahnia trifida</i>	Cutting Grass	65	26.3158
<i>Pultenaea daphnoides</i>	Large-leaf Bush Pea	65	26.3158
<i>Patersonia occidentalis</i>	Long Purple-flag	63	25.5061
<i>Gonocarpus micranthus</i> ssp. <i>micranthus</i>	Creeping Raspwort	61	24.6964
<i>Juncus pauciflorus</i>	Loose-flower Rush	61	24.6964
* <i>Rubus</i> sp.	Blackberry	60	24.2915
<i>Hypolepis rugosula</i>	Ruddy Ground-fern	59	23.8866
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	58	23.4818
<i>Villarsia umbricola</i> var. <i>umbricola</i>	Lax Marsh-flower	57	23.0769
<i>Leptocarpus tenax</i>	Slender Twine-rush	55	22.2672
<i>Carex fascicularis</i>	Tassel Sedge	55	22.2672
<i>Eucalyptus cosmophylla</i>	Cup Gum	53	21.4575
<i>Centella cordifolia</i> s.str.	Native Centella	50	20.2429
* <i>Leontodon taraxacoides</i> ssp. <i>taraxacoides</i>	Lesser Hawkbit	49	19.8381
<i>Melaleuca squamea</i>	Swamp Honey-myrtle	48	19.4332
<i>Sprengelia incarnata</i>	Pink Swamp-heath	47	19.0283
<i>Lobelia alata</i>	Angled Lobelia	46	18.6235
* <i>Hypochaeris radicata</i>	Rough Cat's Ear	46	18.6235
* <i>Dactylis glomerata</i>	Cocksfoot	46	18.6235
<i>Triglochin procerum</i>	Water-ribbons	45	18.2186
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort	45	18.2186
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife	44	17.8138

<i>Drosera binata</i>	Forked Sundew	42	17.004
<i>Centrolepis fascicularis</i>	Tufted Centrolepis	40	16.1943
<i>Billardiera bignoniacea</i>	Orange Bell-climber	40	16.1943
<i>Isolepis nodosa</i>	Knobby Club-rush	40	16.1943
* <i>Ulex europaeus</i>	Gorse	39	15.7895
<i>Xanthorrhoea semiplana</i> ssp. <i>semiplana</i>	Yacca	38	15.3846
* <i>Rubus ulmifolius</i> var. <i>ulmifolius</i>	Blackberry	38	15.3846
<i>Xyris operculata</i>	Tall Yellow-eye	38	15.3846
<i>Typha domingensis</i>	Narrow-leaf Bulrush	37	14.9798
<i>Rumex</i> sp.	Dock	36	14.5749
* <i>Cirsium vulgare</i>	Spear Thistle	34	13.7652
<i>Cassytha glabella</i> forma <i>dispar</i>	Slender Dodder-laurel	34	13.7652
<i>Juncus caespiticius</i>	Grassy Rush	34	13.7652
<i>Hakea rostrata</i>	Beaked Hakea	34	13.7652
* <i>Trifolium</i> sp.	Clover	31	12.5506
<i>Baumea gunnii</i>	Slender Twig-rush	30	12.1457
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	29	11.7409
<i>Lindsaea linearis</i>	Screw Fern	29	11.7409
<i>Carex tereticaulis</i>	Rush Sedge	28	11.336
<i>Leucopogon hirsutus</i>	Hairy Beard-heath	28	11.336
<i>Juncus kraussii</i>	Sea Rush	28	11.336
* <i>Vellereophyton dealbatum</i>	White Cudweed	27	10.9312
* <i>Pinus radiata</i>	Radiata Pine	26	10.5263
* <i>Rubus discolor</i>	Blackberry	25	10.1215
<i>Deyeuxia quadriseta</i>	Reed Bent-grass	25	10.1215
<i>Schoenus carsei</i>	Wiry Bog-rush	25	10.1215
<i>Acacia retinodes</i> var.	Silver Wattle	25	10.1215
<i>Isopogon ceratophyllus</i>	Horny Cone-bush	24	9.7166
<i>Eleocharis acuta</i>	Common Spike-rush	23	9.31174
<i>Platylobium obtusangulum</i>	Holly Flat-pea	23	9.31174
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	22	8.90688
<i>Lepidosperma semiteres</i>	Wire Rapier-sedge	22	8.90688
<i>Schoenus maschalinus</i>	Leafy Bog-rush	22	8.90688
<i>Eucalyptus obliqua</i>	Messmate Stringybark	22	8.90688
<i>Patersonia fragilis</i>	Short Purple-flag	21	8.50202
<i>Drosera peltata</i>	Pale Sundew	21	8.50202
<i>Isolepis fluitans</i>	Floating Club-rush	20	8.09717
<i>Schoenus lepidosperma</i> ssp. <i>lepidosperma</i>	Slender Bog-rush	20	8.09717
* <i>Senecio pterophorus</i> var. <i>pterophorus</i>	African Daisy	20	8.09717
<i>Spyridium thymifolium</i>	Thyme-leaf Spyridium	20	8.09717
<i>Epilobium billardierianum</i> ssp. <i>billardierianum</i>	Robust Willow-herb	19	7.69231
<i>Epacris impressa</i>	Common Heath	19	7.69231
<i>Burchardia umbellata</i>	Milkmaids	19	7.69231
<i>Eucalyptus fasciculosa</i>	Pink Gum	19	7.69231
<i>Banksia marginata</i>	Silver Banksia	19	7.69231
<i>Eucalyptus baxteri</i>	Brown Stringybark	18	7.28745
* <i>Briza minor</i>	Lesser Quaking-grass	18	7.28745
* <i>Cotula coronopifolia</i>	Water Buttons	18	7.28745
<i>Epilobium billardierianum</i> ssp.	Robust Willow-herb	17	6.88259
<i>Juncus subsecundus</i>	Finger Rush	17	6.88259
<i>Drosera pygmaea</i>	Tiny Sundew	17	6.88259
<i>Utricularia dichotoma</i>	Purple Bladderwort	17	6.88259
* <i>Rorippa nasturtium-aquaticum</i>	Watercress	17	6.88259

APPENDIX 12. VERTEBRATE FAUNA SPECIES RECORDED WITHIN WETLANDS OF THE FLEURIEU PENINSULA

Superb Fairy-wren	<i>Malurus cyaneus</i>	84
Common Froglet	<i>Crinia signifera</i>	50
Western Grey Kangaroo	<i>Macropus fuliginosus</i>	48
Grey Fantail	<i>Rhipidura albiscapa</i>	38
Crimson Rosella	<i>Platycercus elegans</i>	37
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	33
Australian Magpie	<i>Gymnorhina tibicen</i>	30
Mount Lofty Ranges Southern Emu-wren (E)	<i>Stipiturus malachurus intermedius</i>	29
Galah	<i>Cacatua roseicapilla</i>	23
Australian Raven	<i>Corvus coronoides</i>	21
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	20
Brown Tree Frog	<i>Litoria ewingi</i>	16
White-browed Scrubwren	<i>Sericornis frontalis</i>	16
Bull Frog	<i>Limnodynastes dumerili</i>	14
Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i>	14
Pacific Black Duck	<i>Anas superciliosa</i>	12
Red Wattlebird	<i>Anthochaera carunculata</i>	12
Swamp Rat	<i>Rattus lutreolus</i>	12
Welcome Swallow	<i>Hirundo neoxena</i>	12
Australian Wood Duck, (Maned Duck)	<i>Chenonetta jubata</i>	11
Common Starling	<i>*Sturnus vulgaris</i>	11
Eurasian Blackbird	<i>*Turdus merula</i>	11
European Goldfinch	<i>*Carduelis carduelis</i>	11
Little Raven	<i>Corvus mellori</i>	11
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	10
Clamorous Reedwarbler	<i>Acrocephalus stentoreus</i>	10
House Mouse	<i>*Mus musculus</i>	10
Striated Thornbill	<i>Acanthiza lineata</i>	10
White-faced Heron	<i>Egretta novaehollandiae</i>	10
Yellow-tailed Black-cockatoo (V)	<i>Calyptorhynchus funereus</i>	10
Fox	<i>*Vulpes vulpes</i>	9
Brown Thornbill	<i>Acanthiza pusilla</i>	8
Garden Skink	<i>Lampropholis guichenoti</i>	8
Latham's Snipe (V)	<i>Gallinago hardwickii</i>	8
Magpie-lark	<i>Grallina cyanoleuca</i>	8
Red-browed Finch	<i>Neochima temporalis</i>	8
Crescent Honeyeater	<i>Phylidonyris pyrrhoptera</i>	7
Wedge-tailed Eagle	<i>Aquila audax</i>	7
Beautiful Firetail (R)	<i>Stagonopleura bella</i>	6
Golden Whistler	<i>Pachycephala pectoralis</i>	6
House Sparrow	<i>*Passer domesticus</i>	6
Three-toed Earless Skink	<i>Hemiergis decresiensis</i>	6

Tree Martin	<i>Petrochelidon nigricans</i>	6
Western Banjo Frog	<i>Limnodynastes dorsalis</i>	6
Crested Pigeon	<i>Ocyphaps lophotes</i>	5
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	5
Mountain Galaxias	<i>Galaxias olidus</i>	5
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	5
Silvereye	<i>Zosterops lateralis</i>	5
Southern Pygmy Perch (I)	<i>Nannoperca australis</i>	5
Willie Wagtail	<i>Rhipidura leucophrys</i>	5
Black-tailed Native-hen	<i>Gallinula ventralis</i>	4
Brown Toadlet	<i>Pseudophryne bibroni</i>	4
Bush Rat	<i>Rattus fuscipes</i>	4
Dusky Moorhen	<i>Gallinula tenebrosa</i>	4
Eastern Gambusia	* <i>Gambusia holbrooki</i>	4
Elegant Parrot	<i>Neophema elegans</i>	4
Eurasian Skylark	* <i>Alauda arvensis</i>	4
Grey Currawong	<i>Strepera versicolor</i>	4
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	4
Little Grassbird	<i>Megalurus gramineus</i>	4
Marbled Gecko	<i>Christinus marmoratus</i>	4
Masked Lapwing	<i>Vanellus miles</i>	4
Pied Cormorant	<i>Phalacrocorax varius</i>	4
Scarlet Robin	<i>Petroica multicolor</i>	4
Sleepy Lizard	<i>Tiliqua rugosa</i>	4
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	4
Yellow-bellied Water Skink (R)	<i>Eulamprus heatwolei</i>	4
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	4
Yellow-footed Antechinus	<i>Antechinus flavipes</i>	4
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	4
Australian White Ibis	<i>Threskiornis molucca</i>	3
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	3
Common Bronzewing	<i>Phaps chalcoptera</i>	3
Eastern Three-lined Skink	<i>Bassiana duperreyi</i>	3
Mistletoebird	<i>Dicaeum hirundinaceum</i>	3
Purple Swamphen	<i>Porphyrio porphyrio</i>	3
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>	3
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	3
Singing Honeyeater	<i>Lichenostomus virescens</i>	3
Spotted Turtle-dove	* <i>Streptopelia chinensis</i>	3
Striated Pardalote	<i>Pardalotus striatus</i>	3
Swamp Harrier	<i>Circus approximans</i>	3
White-fronted Chat	<i>Epthianura albifrons</i>	3
White-throated Treecreeper	<i>Cormobates leucophaeus</i>	3
Australian Shelduck	<i>Tadorna tadornoides</i>	2
Big-headed Gudgeon	<i>Philypnodon grandiceps</i>	2
Black-fronted Dotterel	<i>Elsayornis melanops</i>	2
Bougainville's Skink	<i>Lerista bougainvillii</i>	2
Brown Falcon	<i>Falco berigora</i>	2
Brown Goshawk	<i>Accipiter fasciatus</i>	2

Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	2
Carp Gudgeon (<i>Hypseleotris</i> sp.)	<i>Hypseleotris</i> sp.	2
Common Jollytail	<i>Galaxias maculatus</i>	2
Dusky Woodswallow	<i>Artamus cyanopterus</i>	2
Dwarf Flathead Gudgeon (I)	<i>Philypnodon</i> sp. 2 (undescribed)	2
Eastern Rosella	<i>Platycercus eximius</i>	2
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	2
Golden-headed Cisticola (R)	<i>Cisticola exilis</i>	2
Great Egret, (White Egret) (TR)	<i>Ardea alba</i>	2
Hardhead (White-eyed Duck)	<i>Aythya australis</i>	2
Hoary-headed Grebe	<i>Poliiocephalus poliocephalus</i>	2
Horsfield's Bronze-cuckoo	<i>Chrysococcyx basalis</i>	2
Little Corella	<i>Cacatua sanguinea</i>	2
Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>	2
Nankeen Kestrel	<i>Falco cenchroides</i>	2
Peregrine Falcon (R)	<i>Falco peregrinus</i>	2
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	2
Red Deer	* <i>Cervus elaphus</i>	2
Red-rumped Parrot	<i>Psephotus haematonotus</i>	2
Rufous Whistler	<i>Pachycephala rufiventris</i>	2
Silver Gull	<i>Larus novaehollandiae</i>	2
Southern Grass Skink	<i>Pseudemoia entrecasteauxii</i>	2
Starling (<i>Sturnus</i> sp.)	<i>Sturnus</i> sp.	2
Straw-necked Ibis	<i>Threskiornis spinicollis</i>	2
Swan River Goby	<i>Pseudogobius olorum</i>	2
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	2
White's Skink	<i>Egernia whitii</i>	2
Yarra Pygmy Perch (V)	<i>Nannoperca obscura</i>	2
*Domestic Goose		1
Australian Smelt	<i>Retropinna semoni</i>	1
Black Rat	* <i>Rattus rattus</i>	1
Black Swan	<i>Cygnus atratus</i>	1
Black-shouldered Kite	<i>Elanus axillaris</i>	1
Bony Bream	<i>Nematalosa erebi</i>	1
Brown Hare	* <i>Lepus capensis</i>	1
Brown Treecreeper	<i>Climacteris picumnus</i>	1
Brush Bronzewing	<i>Phaps elegans</i>	1
Callop	<i>Macquaria ambigua</i>	1
Chestnut-rumped Heathwren (V)	<i>Calamanthus pyrrhopygius</i>	1
Climbing Galaxias (I)	<i>Galaxias brevipinnis</i>	1
Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>	1
Common Long-necked Tortoise	<i>Chelodina longicollis</i>	1
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	1
Eastern Bluetongue	<i>Tiliqua scincoides</i>	1
Eastern Tiger Snake	<i>Notechis scutatus</i>	1
Echidna (<i>Tachyglossus</i> sp.)	<i>Tachyglossus</i> sp.	1
Eurasian Coot	<i>Fulica atra</i>	1
European Carp	* <i>Cyprinus carpio</i>	1
European Greenfinch	* <i>Carduelis chloris</i>	1

Fallow Deer	* <i>Cervus dama</i>	1
Fly-speckled Hardyhead (I)	<i>Craterocephalus stercusmuscarum</i>	1
Four-toed Earless Skink	<i>Hemiergis peronii</i>	1
Goldfish	* <i>Carassius auratus</i>	1
Great Cormorant	<i>Phalacrocorax carbo</i>	1
Grey Teal	<i>Anas gracilis</i>	1
Heron/Egret (<i>Ardea</i> sp.)	<i>Ardea</i> sp.	1
Hooded Robin	<i>Melanodryas cucullata</i>	1
Lewin's Rail (V)	<i>Rallus pectoralis</i>	1
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	1
Little Wattlebird	<i>Anthochaera chrysoptera</i>	1
Musk Lorikeet	<i>Glossopsitta concinna</i>	1
Noisy Miner	<i>Manorina melanoccephala</i>	1
Osprey (R)	<i>Pandion haliaetus</i>	1
Painted Button-quail (V)	<i>Turnix varia</i>	1
Parrot (<i>Neophema</i> sp.)	<i>Neophema</i> sp.	1
Penguin (<i>Eudyptes</i> sp.)	<i>Eudyptes</i> sp.	1
Peron's Tree Frog	<i>Litoria peroni</i>	1
Rabbit	* <i>Oryctolagus cuniculus</i>	1
Rainbow Bee-eater	<i>Merops ornatus</i>	1
Redfin Perch	* <i>Perca fluviatilis</i>	1
Red-kneed Dotterel	<i>Erythronyx cinctus</i>	1
Restless Flycatcher	<i>Myiagra inquieta</i>	1
Richard's Pipit	<i>Anthus novaeseelandiae</i>	1
River Blackfish (I)	<i>Gadopsis marmoratus</i>	1
Rock Dove	* <i>Columba livia</i>	1
Shining Bronze-Cuckoo (R)	<i>Chrysococcyx lucidus</i>	1
Smallmouth Hardyhead	<i>Atherinosoma microstoma</i>	1
Southern Brown Bandicoot (V)	<i>Isodon obesulus</i>	1
Southern Emu-wren (R)	<i>Stipiturus malachurus</i>	1
Spotted Pardalote	<i>Pardalotus punctatus</i>	1
Tawny-crowned Honeyeater	<i>Gliciphila melanops</i>	1
Varied Sittella	<i>Daphoenositta chrysoptera</i>	1
Water-rat	<i>Hydromys chrysogaster</i>	1
Weebill	<i>Smicrornis brevirostris</i>	1
Western Pygmy-possum	<i>Cercartetus concinnus</i>	1
White-bellied Sea-Eagle (V)	<i>Haliaeetus leucogaster</i>	1
White-browed Babbler	<i>Pomatostomus superciliosus</i>	1
White-necked Heron	<i>Ardea pacifica</i>	1
Yabby	<i>Cherax destructor</i>	1
Yellow-plumed Honeyeater	<i>Lichenostomus ornatus</i>	1
Threatened Status		
E – endangered		
V – vulnerable		
R – rare		
I – insufficient data		