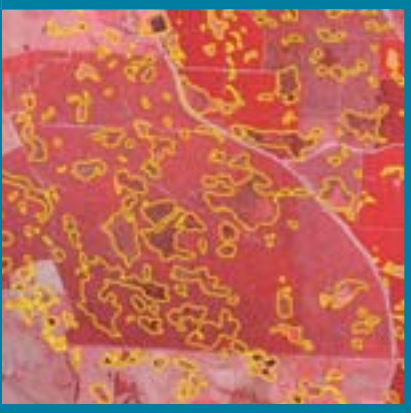
Department for Environment and Heritage

Wetland Inventory

Lower South East



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Author, Cartography, Photography and Design

Ben Taylor, Wetlands Project Officer, South East Region, DEH
Claire Harding, Wetland Ecologist, South East Region, DEH
Darren Herpich, Regional GIS Co-ordinator, South East Region, DEH
Felicity Smith, GIS Team Leader, Environmental Information, DEH
Regional Conservation, Department for Environment and Heritage

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Commonly Used Acronyms

BDBSA	Biological Database of South Australia
CAMBA	China – Australia Migratory Bird Agreement
DEH	South Australian Government Department for Environment and Heritage
DIWA	Directory of Important Wetlands in Australia
EPBC Act	Environmental Protection and Biodiversity Conservation Act (Federal)
JAMBA	Japan – Australia Migratory Bird Agreement
LSE	Lower South East
LSEWI	Lower South East Wetland Inventory
NPW Act	National Parks and Wildlife Act (State)
SAWID	South Australian Wetland Inventory Database
SENRMB	South East Natural Resources Management Board
SEWCDB	South East Water Conservation and Drainage Board

Front Cover

Clockwise from top left: Banded stilt at Lake George February 2005 (photo Iain Stewart), front page of The Border Watch 29August 2006, Bool Lagoon 1 October 2004, thrombolites at Lake Hawdon South 2 January 2005, wetland mapping of Honan Native Forest Reserve.

Inside Cover

Tina Fowler and Dan Harley surveying waterfowl at Broadlands (S0108578) 7 February 2005.

Acknowledgements

Field surveys for the LSEWI were undertaken with the generous volunteer help of Serina Lattanzio. Many thanks to all the LSE landholders for access to their properties. Thank you to my colleagues at DEH for all your help and support, particularly Darren Herpich, Claire Harding and Felicity Smith.

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Wetland Inventory

Lower South East

South Australia 2006

This report is dedicated to the Bunganditj, Meintangk and Marditjali peoples who, for thousands of years, sustainably utilised and greatly valued

EXECUTIVE SUMMARY

In the South Australian context, the Lower South East (LSE) is a region of high rainfall, high biodiversity and high endemism, with a high proportion of native species being wetland dependent. Prior to European colonisation wetland ecosystems are believed to have covered approximately 50 % of the region. Work undertaken for this report indicates that the figure today is closer to 10 %, but much of what remains is degraded and fragmented. Despite their protection under legislation including the *Native Vegetation Act (1991)* and the *Natural Resources Management Act (2004)*, the conservation of many wetlands is not assured. Wetlands of the LSE face ever increasing competition for water resources from expanding plantation forestry, industrial and agricultural groundwater extraction and surface water drainage. Providing for the environmental water requirements of wetlands in the face of these intensifying threats is a difficult but central challenge of natural resource management in the Lower South East.

Work undertaken for the Lower South East Wetland Inventory has enhanced the capacity for wetland conservation and management in the LSE in three ways. Firstly, mapping undertaken has vastly improved knowledge of the contemporary extent of wetlands in the region. Secondly, biophysical wetland data has been strategically collected and collated and stored within a single purpose built database (the South Australian Wetland Inventory Database (SAWID)). Thirdly, the available information has been interpreted to identify those wetlands of significance at the international, national, state and regional levels, providing focus for future wetland conservation efforts in the region. This report provides a transparent account of each of the above stages. Priority recommendations regarding policy and planning, on-ground works and future research are made based upon the findings.

CONTENTS

1.0 INTRODUCTION

1.1 Project Scope

The internationally recognised Ramsar Convention on Wetlands defines wetlands as:

> *"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters."*

The above definition was adopted for the Lower South East Wetland Inventory (LSEWI). However, although the extensive network of artificial drains in the Lower South East (LSE) meet the Ramsar definition and provide habitat important for the conservation of aquatic biota in the region (Hammer 2002), for simplicity drains were not included in the LSEWI. Natural streams (rare in the LSE) and marine waters were also excluded.

A comprehensive, state-wide catalogue of wetland extent, biophysical character and condition is required to ensure that wetland conservation is given appropriate consideration in natural resource management decisions throughout South Australia. Additionally, a standardised approach to the prioritisation of wetlands according to their biodiversity conservation value is required to further inform the NRM process. To this end, the Wetlands Strategy for South Australia (Department for Environment and Heritage and Department of Water Land and Biodiversity Conservation 2003) lists as objectives:

> *"To identify those wetlands which are important at the regional, state, national and international levels, and ensure appropriate recognition, management and protection of these sites; and*
>
> *To develop, maintain, and make readily accessible to all, a comprehensive inventory of South Australia's wetlands and their resources."*

Consequently, wetland inventories for several regions within the state have been completed and others are in progress. The LSEWI was undertaken to collate and refine knowledge of wetland extent, biophysical character, condition and threats and to thereby provide direction for wetland conservation in the region.

1.2 Study Area

For the purposes of the LSEWI the Lower South East was defined as the 996 700 ha area bound by the (disused) Kingston to Naracoorte railway line, an east-west line between Naracoorte and the SA/Victoria border, the SA/Victoria border and the coastline (Fig. 1).

Detailed information on the physical and biological environment of the Lower South East is provided by several authors (Laut 1977; Tyler *et al.* 1983; Croft *et al.* 1999; Foulkes and Heard 2003) and only a very concise account is provided here. Average annual rainfall in the region is high in the South Australian context, 775.4 mm at Mount Gambier decreasing to 581.1 mm at Naracoorte (Hopton 2003). Average monthly rainfall is highest in July and lowest in February across most of the region. The major geological features of the lower South East are a regular series of low ranges,

calcareous sand ridges, aligned parallel with the coast, the legacy of rapid sea level fluctuations and gradual uplift during the Quaternary (Benbow 2003). Additionally, evidence of recent volcanic activity exists in the Mount Gambier region and of more ancient volcanic activity in the Mount Burr region.

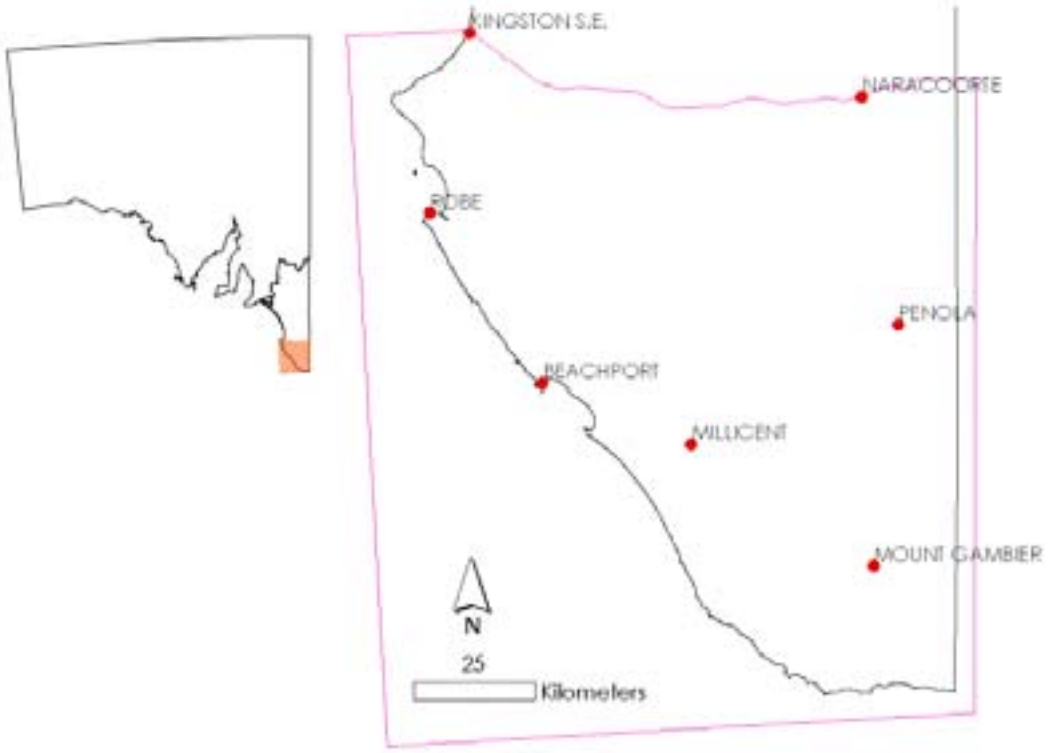


Fig. 1. The study area for the Lower South East Wetland Inventory.

The native vegetation of the South East consists predominantly of heathy woodlands and mallee shrublands on the ridges, wet heaths and swamps in the interdunal flats and damp sclerophyll forests, woodlands and grasslands in the Lower South East (Department of the Environment and Heritage 2005). Historically, large areas of wetland vegetation were present in the interdunal flats, a consequence of the accumulation of surface water during the winter. Prior to European colonisation, intermittent, seasonal and permanent wetlands covered approximately 55% of the Lower South East (Foulkes and Heard 2003). A shallow water table is a feature of much of the Lower South East. Depth to the Tertiary Limestone Aquifer, generally referred to as the unconfined aquifer, is less than 2 m over large areas of the region (Holmes and Waterhouse 1983). Many LSE wetlands are likely to intersect the water table intermittently, seasonally or permanently. Thus many LSE wetlands depend upon groundwater inputs to a greater or lesser degree and can therefore be described as groundwater dependent ecosystems (GDEs).

Despite being only 2% of South Australia by area, prior to European colonisation the region supported high proportions of the State's biota; 77% of bird, 53% of mammal, 42% of plant and 42% of frog species native to South Australia occurred in the region (Croft *et al.* 1999). A large proportion of these species are wetland dependent to various degrees. The Australian Government's Threatened Species Scientific Committee has identified the South East as one of Australia's 15 biodiversity hotspots (AGDEH 2006). This listing implies the South East has a high number of endemic species and the current or predicted future level of threat to biodiversity is high. Pre-European wetland extent in the LSE has been massively reduced (Department for Environment Heritage and Aboriginal Affairs 1998; Bachmann 2002), and much of

what remains is degraded. Land clearance and drainage for agriculture have been the primary causes of wetland loss. Although 977 km^2 (9.8 %) of native vegetation remains in the Lower South East, a lower proportion of wetlands have been retained because the fertile, interdunal flats have been preferentially cleared and drained for agriculture. Drainage works began in 1863 (Jolly *et al.* 1985) and continue today. Drains have diverted water more directly and rapidly to the sea and greatly reduced the duration of inundation across much of the landscape. Additionally, drainage and plantation forestry are likely to have reduced groundwater recharge throughout the region. Reduced recharge and groundwater extraction are almost certainly contributing to water table decline in the LSE. Depth to the unconfined aquifer is increasing by an average of approximately 0.1 m per year throughout much of the LSE, and as rapidly as 0.3 m per year in some areas (Brown *et al.* 2006). Given the high biodiversity, high endemism, degree of loss and intensity of current threat, the South East, and the Lower South East in particular, is arguably the most important region in the state for wetland conservation.

1.3 Pre-existing Information

1.3.1 Wetland Extent

Pre-existing information regarding wetland extent for the LSE consisted of the GIS layer LANDSCAPE_Wetlands held by DEH. This layer consisted of 545 polygons (i.e. 545 distinct wetlands) covering a total area of 38 688 ha and appears to have been derived primarily from the work of Jolly *et al.* (1985). Additionally the layer TOPO_Waterbodies_50k consists of 5778 polygons covering a total area of 63 706 ha. All mapped waterbodies are wetlands according to the Ramsar definition; therefore this second layer provided additional information regarding wetland extent. Another DEH layer, VEG_SthEast, is a map of remnant native vegetation of the region. The selection of only wetland vegetation types in the LSE from this shapefile consists of 1973 polygons covering a total area of 22 690 ha.

Fieldwork and aerial reconnaissance during the early stages of the project revealed that the available wetland mapping, i.e. the combined extent of the above three layers, was inaccurate and inadequate for much of the LSE. Creating an accurate and comprehensive digital map of the contemporary extent of LSE wetlands thereby become a high priority for the LSEWI.

1.3.2 Wetland Biophysical Character, Condition and Conservation Value

Jones (1978) documented the wetlands of the Lower South East for the purpose of assessing their conservation value. Jones described 34 wetlands or wetland complexes within the geographic area of the LSEWI. Jones collected and collated information, much of it qualitative, on wetland biota, type, size and condition and thereby made assessments of conservation value. A primary objective of Jones was to prioritise recommendations for addition to the State reserve system. Jones recommendations, in order of priority, were that the following wetland complexes should be proclaimed as conservation reserves under the National Parks and Wildlife Act (1972): Lake Frome/Mullins Swamp, The Marshes, Lake Hawdon South, Honans Scrub and Deadmans Swamp. To date Lake Frome is the only one of this list to have been so proclaimed. However, the outlook for wetland areas managed by the then Woods and Forest Department (now ForestrySA), namely The Marshes, Honans Scrub and Deadmans Swamp, improved markedly with the introduction of the Native Vegetation Act (1991).

A similar but more detailed and extensive approach was employed by Jolly *et al.* (1985), who described 56 wetlands or wetland complexes within the LSEWI study area. Jolly *et al*. made a considerable number of recommendations regarding wetland management and future research, many of which were acted upon. The wetland mapping of Jolly *et al.* had not been updated until the LSEWI and has formed the basis for much wetland and policy and management in the LSE for 20 years, despite its obvious limitations. Notably, several wetlands identified by Jolly *et al.* as worthy of protection have since become highly degraded. Such wetlands include Island Swamp (S0120532) and Sawpit Swamp (S0109194).

The aim of Lloyd and Balla (1986) was to summarise the wetland resources of South Australia and to highlight environmentally important areas. Environmental importance was assigned according to a score derived by quantifying features of wetland fauna, vegetation, condition and special features. Wetlands were then grouped by score into five categories of conservation significance. Lloyd and Balla documented seventy wetlands or wetland complexes in the LSEWI study area, 60 of which were assigned a score.

Howe *et al.* (2005) quantified the conservation value of all 786 mapped (at that time) wetlands of the South East. Conservation value was considered to consist of four, equally weighted parameters, each having a potential score of 1 to 4. The wetland parameters were (1) conservation significance - the recognition of conservation values under existing frameworks (eg. Ramsar, DIWA), (2) conservation status - the conservation values implied by the degree to which they are protected and managed (eg. via heritage agreements, National Parks etc.), (3) conservation status of flora reported from within 500 m, and (4) conservation status of fauna reported from within 500 m. Parameters (3) and (4) utilised the biological survey records of the DEH Biological Database of South Australia (BDBSA) available at that time. Likelihood of groundwater dependence and threat to groundwater were also quantified to determine the GDEs in greatest need of protection from groundwater affecting activities. The resultant ranking of wetlands has been used by the SENRMB to develop an Environmental Protection Zone (EPZ) Policy for wetlands, to be incorporated into the Water Allocation Plans for the South East.

In addition to the broad scale wetland studies mentioned above, there is an extensive literature pertaining to specific wetlands and/or biophysical features in the LSE. An inventory of this literature is provided as Appendix 9, although it is likely that some literature has been missed.

Effective conservation planning is greatly facilitated if all relevant biophysical information is compiled and stored in a single electronic database. The South Australian Wetland Inventory Database (SAWID) has been developed for this purpose (Harding 2005; Harding in prep.). All data collected for the LSEWI has been entered into SAWID. Additionally, data from other sources has been collated and entered into SAWID (see section 2.4 below).

1.3.3 Biodiversity Conservation Value

Ideally, comprehensive biophysical data would be catalogued for all wetlands. However, due to the extreme complexity of ecosystems cataloguing is never complete (Margules and Pressey 2000). Yet in the real world of conservation planning, where available resources are typically inadequate to conserve all features of value, it is often necessary to prioritise wetlands in terms of their biodiversity conservation value. Criteria such as species richness, rarity, naturalness (condition), representativeness and special features can be used in the prioritisation process (Kingsford *et al.* 2006). In the absence of comprehensive biological data it may be necessary to use surrogate measures, such as geomorphic and hydrological classifications, that are believed to correlate with ecosystem types (Kingsford *et al.* 2006). The prioritisation process used will be influenced by the data available. Although many biological data sets are available for the LSE wetlands, there is much inconsistency regarding the parameters measured. Past approaches to wetland prioritisation in the LSE have incorporated wetland features such as threatened biota, condition, diversity of vegetation, existing level of protection and status according to various conventions (Lloyd and Balla 1986; Howe *et al.* 2005). Size has not been considered, yet larger natural areas have been shown to have greater benefits for biodiversity conservation that smaller areas (Margules and Pressey 2000). A re-prioritisation of the biodiversity conservation value of wetlands in the LSE is warranted given the limitations of past approaches in light of the greatly improved mapping and access to data now available as a consequence of the LSEWI and the development of SAWID.

2.0 INVENTORY METHODS

2.1 Wetland Extent

Mapping standards, topology rules, attribute specifications, domains and associated metadata, which meet minimum data standards required by DEH, were defined prior to the commencement of mapping. A minimum set of attributes for each polygon were defined (Appendix 2). Each wetland polygon has been given a unique identifier which follows the South Australian wetland numbering system developed by DEH. The LANDSCAPE_Wetlands layer was updated using ArcGIS® 9 to create an accurate and comprehensive map of the contemporary extent of LSE wetlands. Several steps were involved. First, the TOPO_Waterbodies_50k layer was merged with LANDSCAPE_Wetlands. Second, all polygons in the resulting shapefile were overlaid upon orthorectified, infra-red aerial photography of the region taken in January 2003. Infra-red aerial photography taken in summer provides a relatively clear indication of wetland extent because surface water and wetland vegetation contrast strongly with other landscape features. All polygons were aligned with wetlands as indicated by the aerial photography and many additional polygons were added. The minimum scale used for mapping was 1:5000. Other layers including VEG_SthEast and TOPO_Contours_50k were also referred to for guidance. For wetlands surveyed for the LSEWI, the mapping was ground-truthed. Additionally, aerial reconnaissance of the LSE on 1 October 2004, when the extent of inundation was maximal over most of the region, informed the mapping process. An attempt was made to ensure all mapped wetland boundaries represent real ecological boundaries. For example, mapped wetlands are generally not split along land section boundaries. However, if section boundaries have ecological significance, eg. one side of the fence is intact native vegetation while the other is grazed pasture, despite hydrological connectivity between the two sections the wetland has been split into two or more polygons.

The updated wetland mapping was compared with the DEH pre-European vegetation mapping to obtain an estimate of post colonisation wetland loss. For this purpose, the pre-European vegetation types considered as wetland are listed in Table 1.

Table 1. Pre-European vegetation types considered wetland for comparison against contemporary wetland extent.

MU250 Code	Pre-European wetland vegetation type
0	No vegetation but obviously wetland (eg. lakes)
4	*Eucalyptus camaldulensis* var. *camaldulensis* Woodland
11	*Eucalyptus ovata* Woodland
15	*Melaleuca halmaturorum* ssp. *halmaturorum* or *M. brevifolia* Low open forest to Shrubland
29	*Leptospermum lanigerum* Tall closed shrubland
35	*Muehlenbeckia florulenta* Shrubland
37	*Halosarcia* spp. Low shrubland
38	*Baumea juncea, Chorizandra enodis* Sedgeland
39	*Gahnia filum* Sedgeland
40	*Gahnia trifida* Sedgteland
41	*Phragmites australis, Typha domingensis* Grassland
45	Floating water plants herbland
46	*Selliera radicans*, +/- *Wilsonia backhousei* Herbland

2.2 Field Survey

Field survey of wetlands was conducted between May 2004 and November 2005. Most wetlands were surveyed during winter and spring. The documentation of each wetland utilised the approach developed for the Fleurieu Peninsula wetland inventory

(Harding 2005), with the parameters measured or described corresponding to fields in the SAWID. The data sheets completed for each survey site are provided in Appendix 7 and detailed instructions on how each parameter was measured or described are provided in Appendix 8. Appendices 7 and 8 pertain to any wetland survey in South Australia intended for addition to the SAWID. Further information specific to the LSEWI is provided below.

2.2.1 Survey Site Prioritisation

Initial field work for the LSEWI was undertaken with the intention of surveying all 545 wetlands identified at that time in the GIS layer LANDSCAPE_Wetlands. When it became apparent that the existing wetland mapping was grossly inadequate a prioritisation of field survey sites was undertaken. Well documented wetlands (e.g. Piccaninnie Ponds, Bool Lagoon) were generally not surveyed. Priority was given to wetlands that were poorly documented, large, in apparently good condition and outside of existing conservation reserves, however not all of the wetlands surveyed met all of these criteria. It was anticipated this approach would provide the most useful information for the identification of opportunities to further protect and/or restore wetlands in the region. The January 2003 infra-red aerial photography, which became available towards the end of the field survey phase, was a particularly useful tool for the prioritisation of sites for field survey.

2.2.2 General Hydrology and Landform

Determination of water regime, water source, average depth when full and maximum depth when full was typically a 'best guess' based on the evidence available. For some wetlands landholders were a source of information.

2.2.3 Water Chemistry

Surface water, when present at the time of survey, was measured for temperature and dissolved oxygen using a YSI™ 5739 model field probe (YSI Incorporated, Yellow Springs, Ohio, USA) attached to a TPS™ WP-82Y model dissolved oxygen meter (TPS Pty Ltd, Brisbane, Australia). The conductivity and pH of surface water was also measured using a TPS™ k=1 conductivity sensor and TPS™ pH electrode respectively, both attached to a TPS™ WP-81 model meter. All readings were taken at approximately 5cm depth unless wetland depth was less than 5cm. Turbidity was measured to a low level of precision using a tube nephelometer filled with surface water.

2.2.4 Wetland Fauna

Fauna was not systematically surveyed at most sites. However, opportunistic fauna sightings were documented where species were confidently identified. Additionally, an audio recording was made at the survey site for most wetlands. These recordings were analysed by frog call identification expert Steve Walker and records entered into SAWID.

2.2.5 Flora Species Record

To describe the vegetation, each wetland was divided into up to seven vegetation zones across the elevation gradient:

Zone 1: Buffer (peripheral non-wetland native vegetation);
Zone 2: Bank (buffer to high water mark);
Zone 3: Shore (high water to low water);

Zone 4: Emergent (damp to < 0.2m depth);
Zone 5: Aquatic submerged/Emergent (0.2 to 1m depth);
Zone 6: Aquatic (depth > 1m) and;
Zone 7: Open water (no vegetation).

For each zone present the cover/abundance of plant species was recorded according to a semi-quantitative scale modified from Braun-Blanquet (1965). Only those plant species with a cover/abundance score of ∅2 were routinely recorded. Plant species of lesser cover/abundance score were recorded only opportunistically, therefore the list of plant species recorded at each site should not be considered comprehensive. Plant species regularly occurred within more than one vegetation zone. The score for a given species was therefore assigned for the zone within which it's cover/abundance was maximal. At each wetland the vegetation was described along a radial transect of approximately 10 m width and of length adequate to include all vegetation zones present. Plant species were identified in the field by the author. Where identification was uncertain, a specimen was collected for later identification by professional botanist Rosemary Taplin. Identification to the species level was not possible for all plants because reproductive structures were not always present at the time of survey.

Because wetland vegetation is generally not uniform around the perimeter, a single survey cannot be considered a comprehensive description of floristic composition for any wetland. However, the location of each survey site was always chosen in an attempt to be as comprehensive as possible. Thus, survey sites at each wetland were chosen to have vegetation typical of the wetland and to have the greatest number of distinct vegetation zones. Inaccessibility occasionally caused some compromise in site selection. The confidence of a single survey as a representation of floristic composition for the entire wetland decreases with increasing wetland size.

2.2.6 Subjective Assessment

The final parameters recorded at each site were the subjective assessment of the condition of aquatic vegetation, riparian vegetation and the wetland overall. Although the descriptors used are qualitative, given that all other parameters had been given consideration before assigning condition and that only one assessor, the author, assigned condition for all wetlands surveyed, the subjective assessment provides a useful comparison between wetlands. The condition ratings assigned to the wetland overall via this process are explained in Table 2.

Table 2. Description of condition ratings used for the LSEWI.

Wetland Condition Rating	Description
Pristine	No (or very minor) obvious degradation, with a high proportion of native species diversity and cover. Native vegetation buffer present for the majority of the wetland perimeter. Received vegetation condition assessments of 'intact'. Water regime unaltered or only slightly altered from pre-European state. Usually formally conserved within the reserve system or similar.
Intact	Small amounts of relatively insignificant degradation evident, with a high proportion of native species diversity. Native vegetation buffer present for at least some of the wetland perimeter. Water regime unaltered to somewhat modified from pre-European state. Degradation generally rectifiable. Received vegetation condition assessments of 'intact' or 'moderate'.
Moderate	Degradation obvious although many natural values remaining. Most damage rectifiable with improved management. Native vegetation buffer typically absent. Water regime somewhat to considerably altered from pre-European state. Received vegetation condition assessment scores of mostly 'moderate'.

Degraded	High level of degradation evident verging on un-rectifiable damage. Few natural values remaining. Water regime somewhat to considerably altered from pre-European state. Received vegetation condition assessments of 'degraded'.
Severely Degraded	Very high level of degradation evident to the extent that wetland values are destroyed or irreversibly modified. No apparent natural values remaining. Water regime typically highly modified from pre-European state. Received vegetation condition assessments of 'none' or 'degraded'.

2.3 Data Management, Storage and Retrieval: SAWID

All data collected and collated for the LSEWI was entered into the South Australian Wetland Inventory Database (SAWID). SAWID is a geodatabase which utilises Microsoft Access® 2000 format to provide relational database abilities with user friendly data entry, querying and reporting front-end. Specifically designed database security, user logons, data verification, locks and input masks provided by the Microsoft Access® data entry and edit forms ensure the integrity of data entered into the database. The geodatabase format also provides direct links between mapping tools (ESRI ArcMap® 9.1) and data entry, edit and querying functions. A simple users guide to SAWID is provided (Appendix 3), however a much more detailed account is provided by Harding (in prep.).

2.4 Population of Database

Data obtained via field survey was entered into SAWID. Additionally, SAWID was populated with data from other sources. This was done primarily via transfer from the DEH Biological Database of South Australia (BDBSA) on 4 September 2006 following the completion of wetland mapping. The date is significant because the BDBSA is regularly updated. A buffer of 25 m was applied to each wetland polygon to overcome spatial errors. All BDBSA survey points falling within the polygon plus buffer were entered into SAWID. Data from the South East Fish Inventory (Hammer 2002) and more recent unpublished fish data provided by Hammer were also entered. A complete list of the data sources that currently populate the LSE SAWID, including both BDBSA data sets and other data entered manually, is provided as Appendix 1.

2.5 Biodiversity Conservation Value

Biodiversity Conservation Value (BCV) for each wetland was quantified according to an equation that differs from those of Lloyd and Balla (1986) and Howe *et al.* (2005). The measures included in the equation are believed to be useful surrogates of biodiversity and/or incorporate data currently available for the LSE. The measures are size, condition and number of threatened species. The BCV equation is:

$$BCV = \log_{10}Area + 5ConditionScore + [No.NationallyThreatenedSpecies + (No.StateThreatenedSpecies/2)]/2$$

Where:

- Area is recorded in hectares
- Condition Scores are as follows:
  - Pristine = 4
  - Intact = 3
  - Moderate = 2
  - Degraded = 1

- ü Severely Degraded = 0
- ¢# No. Nationally Threatened Species includes all EPBC Act listed species (fauna plus flora) including JAMBA and CAMBA listed species
- ¢# No. State Threatened Species includes all NPW Act listed species that are not also EPBC Act listed

The maximum score for area was 3.92 (Lake Bonney), for condition was 20 (all pristine wetlands) and for threatened species was 24.5 (Bool Lagoon), giving an approximate weighting of 1:5:6 respectively. Wetlands were classified according to their BCV scores as follows:

BCV Score	*BCV Class*
Ó 21.00	Very High
Ó 15.50	High
Ó 10.00	Moderate
< 10.00	Low
No surveys	Insufficient Data

Wetlands without flora or fauna records, or not visited for the LSEWI, were classified as 'Insufficient Data' (11 892 wetlands). All other wetlands were assigned a condition score. It is important to note that the condition scores assigned have three levels of confidence. Condition score confidence is high for those wetlands surveyed for the LSEWI (258 wetlands), medium for those wetlands visited for the LSEWI but not surveyed (36 wetlands), and low for those wetlands not visited but with condition assigned via assessment of January 2003 infra-red aerial photography (345 wetlands).

The cut-off BCV scores for each BCV class were chosen to reflect wetland condition. For example, a pristine wetland needs to score only one additional point, either for its size or its threatened species, to be classified Very High BCV. A wetland in poorer condition would have to score highly for area and/or threatened species to be classified Very High BCV.

There are several limitations to the prioritisation of LSE wetlands according to BCV score and the resultant ranking should be used as a guide only. Limitations, i.e. factors that may contribute to misleading results, include:

- ¢# The number of threatened species recorded for a wetland is, in part, a reflection of the number of surveys that have been undertaken. Poorly surveyed wetlands are more likely to have undiscovered populations of threatened species that do not contribute to the BCV score than well documented wetlands.
- ¢# The BDBSA data includes SA Museum records from as early as 1900. Species recorded for a wetland may have become locally extinct since the record was obtained.
- ¢# The BDBSA does not contain all known records. While the LSE SAWID has been populated with data from sources other than BDBSA, the information in SAWID is not a complete catalogue of all known data.
- ¢# It is assumed that the national and state threatened species lists are an accurate reflection of the status of native species in the wild. This may not be the case.
- ¢# The variable confidence with which condition has been assigned.
- ¢# The condition of wetlands may not be consistent across the area of the wetland. This is increasingly likely with increasing wetland size.
- ¢# The BCV approach may not work as well for small sinkholes and other karst features than it does for palustrine wetlands. It is very difficult to remotely assign a condition score to a small sinkhole.

The incorporation of wetland type into the BCV equation was investigated because it was assumed that, all other factors being equal, a wetland type with a lower % remnancy would have higher conservation value. The DEH pre-European vegetation mapping was used to assign wetland type. The % remnancy values for the various wetland vegetation types were those identified by Foulkes and Heard (2003). Various approaches to assigning a score according for wetland type were attempted but all gave very similar scores to most wetlands. Therefore wetland type was not incorporated into the BCV equation. This reflects the fact that % remnancy is similar for most wetland vegetation types in the LSE. It is typically less than 10 %.

3.0 INVENTORY RESULTS

3.1 Wetland Extent

Updated wetland mapping for the LSE is a major achievement of the LSEWI. It is important to note that the mapping methods employed were not completely unambiguous and there is scope for further refinement. However, the mapping is a vast improvement upon what was previously available. The shapefile LANDSCAPE_Wetlands now contains 12 531 polygons (distinct wetlands) for the LSE (this includes a narrow band within Victoria adjacent to the border), covering a total area of 100 034 ha, or 10 % of the region (Fig. 2). The pre-European vegetation mapping indicates that 544 106 ha, or 54.6% of the LSE was originally wetland. Therefore, the updated wetland mapping indicates that 18.3% of the pre-European wetland area of the LSE can still be described as wetland. This is a marked increase on previous estimates of 6% (Bachmann 2002) and 2% (Department for Environment Heritage and Aboriginal Affairs 1998) for the South East as a whole. However, it is important to note that much of the additional wetland area now mapped is likely to be degraded. Also, the definition of 'wetland' used for previous estimates of contemporary extent may differ from that used for the LSEWI.

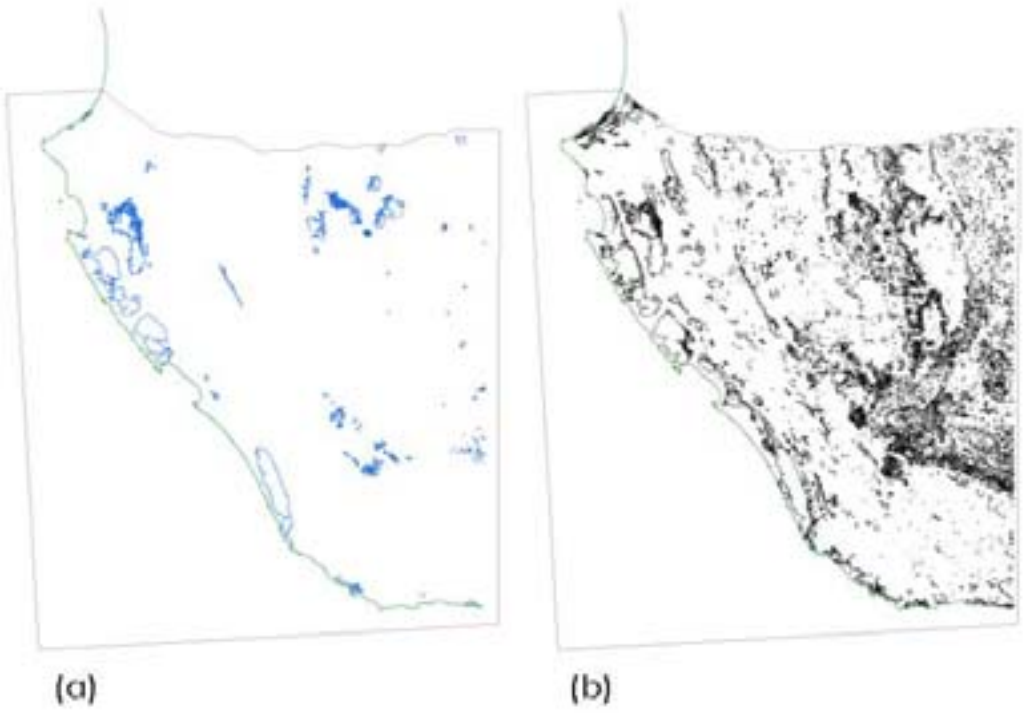


Fig. 2. Comparison of old wetland mapping (a) with updated wetland mapping undertaken for the LSEWI (b).

3.2 Wetland Biophysical Character, Condition and Threats

Field surveys of 258 wetlands were undertaken for the LSEWI. The complete information for each surveyed wetland is stored within SAWID. There are many questions that could be investigated using the LSEWI data. Some of the more interesting features of the data, with relevance to wetland conservation and restoration, are discussed in this section.

3.2.1 Wetland Flora

New records of 32 threatened flora species were obtained via field survey for the LSEWI. Table 3 summarises this information.

Table 3. Summary of new threatened flora records obtained via field survey for the LSEWI.

Species	Common Name	NPW Act (State)*	EPBC Act (Federal)*	No. Sites Recorded (max. 258)
Acacia stricta	Hop Wattle	R		1
Allittia cardiocarpa	Swamp Daisy	R		2
Amphibromus recurvatus	Dark Swamp Wallaby-grass	R		1
Baloskion tetraphyllum ssp. tetraphyllum	Tassel Cord-rush	V		11
Baumea acuta	Pale Twig-rush	R		1
Baumea laxa	Lax Twig-rush	R		1
Brachyscome graminea	Grass Daisy	R		1
Cardamine tenuifolia	Slender Bitter-cress	R		1
Chorizandra australis	Bristle-rush	E		3
Cladium procerum	Leafy Twig-rush	R		1
Dillwynia cinerascens	Grey Parrot-pea	E		1
Eucalyptus fasciculosa	Pink Gum	R		2
Euphrasia collina ssp. collina	Purple Eyebright	V		2
Gahnia clarkei	Tall Saw-sedge	R		61
Gleichenia microphylla	Coral Fern	R		6
Gonocarpus micranthus ssp. micranthus	Creeping Raspwort	R		2
Haloragis brownii	Swamp Raspwort	R		1
Isotoma fluviatilis ssp. australis	Swamp Isotome	R		1
Juncus amabilis		V		1
Juncus procerus	Tall Rush	R		57
Lobelia pratioides	Poison Lobelia	R		1
Melaleuca squamea	Swamp Honey-myrtle	R		7
Melaleuca squarrosa	Bottlebrush Tea-tree	R		89
Montia australasica	White Purslane	R		4
Myoporum parvifolium	Creeping Boobialla	R		3
Poa meionectes	Fine-leaf Tussock-grass	V		1
Pratia concolor	Poison Pratia	R		1
Schoenus tesquorum	Grassy Bog-rush	R		1
Senecio psilocarpus		V	V	7
Triglochin alcockiae	Alcock's Water-ribbons	R		12
Viola betonicifolia ssp. betonicifolia	Showy Violet	E		1
Zoysia macrantha ssp. walshii	Manila Grass	R		2

*R = rare, V = vulnerable, E = endangered

For the surveyed wetland sites that had an intact buffer (112 sites) the distribution of species across the elevation gradient is summarised in Table 4. The total number of species recorded in each zone for all 112 wetlands is shown. The number of species that are unique to each zone, occurring in no other zone, is also shown. The number of species unique to each zone is similar for buffer, bank, shore and emergent zones. This indicates that conservation of all zones is necessary for the conservation of the complete floristic diversity of LSE wetlands. Wetlands with all zones intact are rare in the LSE and should be a very high priority for conservation. Note that the BCV score developed for this report takes this feature into account.

Table 4. Summary of plant distribution across the elevation gradient for LSEWI survey sites with an intact buffer.

Zone	No. Species Recorded	No. Species Unique to Zone
1 – Buffer	80	37
2 – Bank	140	46
3 – Shore	158	44
4 – Emergent	131	34
5 - Aquatic submerged/Emergent	34	1

Exotic plants are ubiquitous in the LSE and not even the most pristine sites are entirely weed free. By far the most commonly recorded exotic plant of the LSEWI was *Holcus lanatus* (Yorkshire Fog), which was present at 104 of the 258 sites surveyed for flora. A summary of the 12 most commonly recorded weeds is shown in Table 5. Summing the zone number in which a species was recorded at each site and dividing by the total number of sites at which it was recorded determined the "Average Zone" for a species. The Average Zone indicates the favoured zone for the species. Table 5 indicates that the most commonly recorded exotic plants tend to favour wetland edges. There were few specialist aquatic weeds present at LSEWI survey sites, and those that were present, eg. *Potamogeton crispus*, are not of great concern.

Table 5. Exotic plants most commonly recorded (ó10 sites) for the LSEWI.

Species	Common Name	No. Sites Recorded (max. 258)	Average Zone
Holcus lanatus	Yorkshire Fog	104	2.8
Cirsium vulgare	Spear Thistle	40	3.1
Trifolium sp. /T. fragiferum var. fragiferum	Clover /Strawberry clover	35	2.9
Rubus sp.	Blackberry	30	2.2
Leontodon taraxacoides ssp. taraxacoides	Lesser Hawkbit	30	3.0
Phalaris sp./Phalaris aquatica	Canary grass /Phalaris	21	1.8
Pinus radiata	Radiata pine	19	1.5
Potamogeton crispus	Curly pondweed	16	4.2
Hypochaeris radicata	Rough Cat's Ear	13	2
Festuca arundinacea	Tall Meadow Fescue (Williams Grass)	12	2.7
Critesion marinum	Sea Barley-grass	11	3
Lagurus ovatus	Hare's Tail Grass	11	2

Note that exotic plants not listed Table 5 are present in the LSE and have the potential to cause significant wetland degradation. A recently observed infestation of spikey rush (*Juncus acutus*) near the outlet of Lake George (S0101818) is an example.

3.2.2 Wetland Fauna

Fauna records were collected only opportunistically for the LSEWI. However, new records of 14 threatened fauna species were obtained. These records are summarised in Table 6.

Table 6. Summary of new threatened fauna records obtained via field survey for the LSEWI.

Species	Common Name	NPW Act (State)*	EPBC Act (Federal)*	Breeding Record?	Wetland Name	Wetland ID
Anas rhynchotis	Australasian Shoveler	R				S0108578
					SALT LAKE	S0116936
					SALT LAKE	S0110344
					OSCHAR SWAMP	S0110925
Biziura lobata	Musk Duck	R			WATERHOUSE	S0110556
					GHOST LAKE	S0110539
Botaurus poiciloptilus	Australasian Bittern	V			LAKE FROME	S0105943
Calyptorhynchus funereus	Yellow-tailed Black-cockatoo	V			HONAN NFR	S0110764
					MT LYON LF	S0110227
					THE EVERGLADES	S0110944
					THE MARSHES	S0110595
					TOPPERWEIN NFR	S0105797
Cisticola exilis	Golden-headed Cisticola	R			DISMAL SWAMP	S0110689
Falco peregrinus	Peregrine Falcon	R				S0108578
Gallinago hardwickii	Latham's Snipe	V				S0108578
Geocrinia laevis	Smooth Frog	R			LONGS C	S0110904
					TRIAL WATERHOLE	S0110601
					HORSESHOE PADDOCK	S0120851
Grus rubicunda	Brolga	V			DISMAL SWAMP	S0107704
					HONAN NFR	S0110764
					HONAN NFR	S0110767
				Yes	CLAYPANS	S0110945
				Yes	MCROSTIES NFR	S0113560
				Yes	OLD WASHPOOL SWAMP	S0106829
					TILLAR SWAMP	S0105847
					NANGKITA	S0120741
Litoria raniformis	Growling Grass Frog	V	V		TWIG RUSH LAGOONS	S0120842
					GOOSE NECK SWAMP	S0107894
Macropus giganteus	Eastern Grey Kangaroo	R			TOPPERWEIN NFR	S0105797
Neophema chrysostoma	Blue-winged Parrot	V				S0108578
Oxyura australis	Blue-billed Duck	R				S0108998
						S0108578
Rallus pectoralis	Lewin's Rail	V			HACKET HILL NFR	S0110661

*R = rare, V = vulnerable

3.2.3 Wetland Condition

A wetland condition score was assigned via field survey at 272 sites within 258 wetlands. Of those sites 64 were pristine, 93 were intact, 83 were moderate, 25 were degraded and 7 were severely degraded. These numbers reflect the LSEWI priority to survey wetlands in the best condition. They do not reflect the proportions of wetlands in each condition class across the LSE.

3.2.4 Threats

The LSEWI identified 32 forms of degradation within LSE wetlands. These are summarised and grouped according to wetland condition in Table 7.

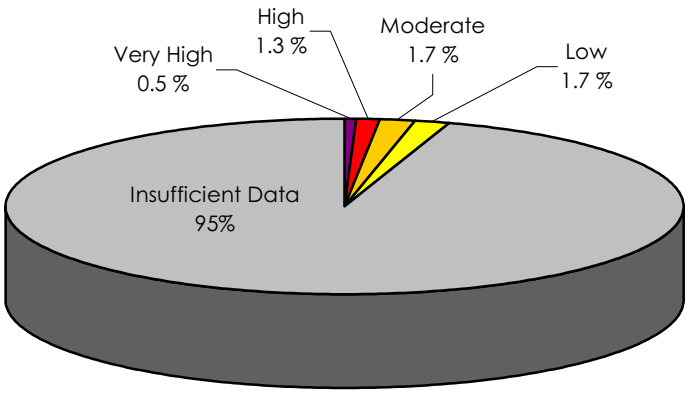
Table 7. Forms of degradation recorded within LSE wetlands grouped according to condition. Note that the intensity of each form of degradation at each site was also recorded but is not represented here.

Form of Degradation	Number of LSEWI Field Survey Sites				
	Pristine (max. 64)	Intact (max. 93)	Moderate (max. 83)	Degraded (max. 25)	Severely Degraded (max. 7)
Altered Water Regime - decreased duration	3	19	22	6	2
Altered Water Regime - increased duration				1	
Altered water regime - water extraction			1	1	
Changed Soil Character - pugging	3	5	31	14	3
Dams - within wetland		1	3	1	
Degraded buffer - absent	8	41	63	20	7
Degraded buffer - degraded	7	18	19	3	
Degraded buffer - levee construction		1	1		
Dumping - garden refuse		1			
Fragmentation - fenceline	1	1	7	3	
Fragmentation - levee banks			2	2	
Fragmentation - roads	1	4	4		
Nutrient enrichment - agricultural	1	15	26	11	2
Nutrient enrichment - lead shot		1			
Nutrient enrichment - urban runoff		1	1		
Overgrazing - native	1	1			
Overgrazing - stock		5	35	14	5
Recreational - campsites/camp litter			2		
Recreational - visitor disturbance	1	4	1		
Salinity - increased from natural state			1		
Tracks - vehicle	23	33	16		
Vegetation destruction - ploughing					1
Vermin - cats			1		
Vermin - feral deer		3	2		
Vermin - foxes	1	5	10	3	
Vermin - introduced fish		2			
Vermin - rabbits	1	2	2	1	
Water obstruction - drain		1	1		
Weeds - noxious	13	22	10		
Weeds - pasture	13	66	69	22	7
Weeds - pine forest encroachment	28	29	5	1	
Weeds - woody		4	2		

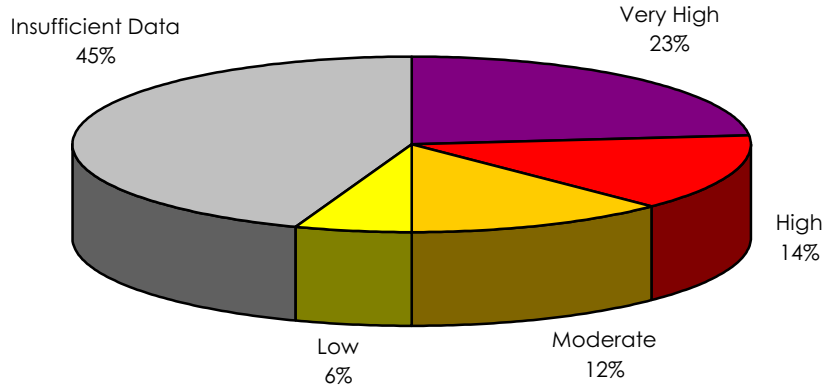
3.3 Biodiversity Conservation Value

The proportion of wetlands in each BCV class for the LSE by number is shown in Figure 3(a) and by area in Figure 3(b). The proportions shown reflect the LSEWI focus in higher value wetlands and also the lack of information available for the vast majority of LSE wetlands. The proportions also reflect the large size of several of the well

documented wetlands that were assigned a BCV score and were classified as "High" or "Very High".



(a) Number of wetlands



(b) Area of wetlands

Fig. 3. Pie chart showing proportion of wetlands in each Biodiversity Conservation Value class in the LSE (a) by number and (b) by area.

Classification as "Low" does not imply that a wetland is devoid of conservation value. For example, wetland S0108706 (Stratman Pond) is classified as low due to its degraded condition yet it is home to a population of nationally vulnerable Ewen's pygmy perch (*Nannoperca variegata*). The degree of caution required when using BCV classification as a decision making tool cannot be overstated. BCV classification has been developed to guide wetland conservation efforts, not to legitimise the future degradation of particular wetlands. Note also that classification as "Insufficient Data" does not imply a wetland has low conservation value. On the contrary, many wetlands without flora or fauna records appear to be in good condition and may turn

out to have high value following further investigation (see section 4.4.4). A map showing the LSE wetlands according to BCV Class is provided (Fig. 4) and the same information is provided in table form (Appendix 4).

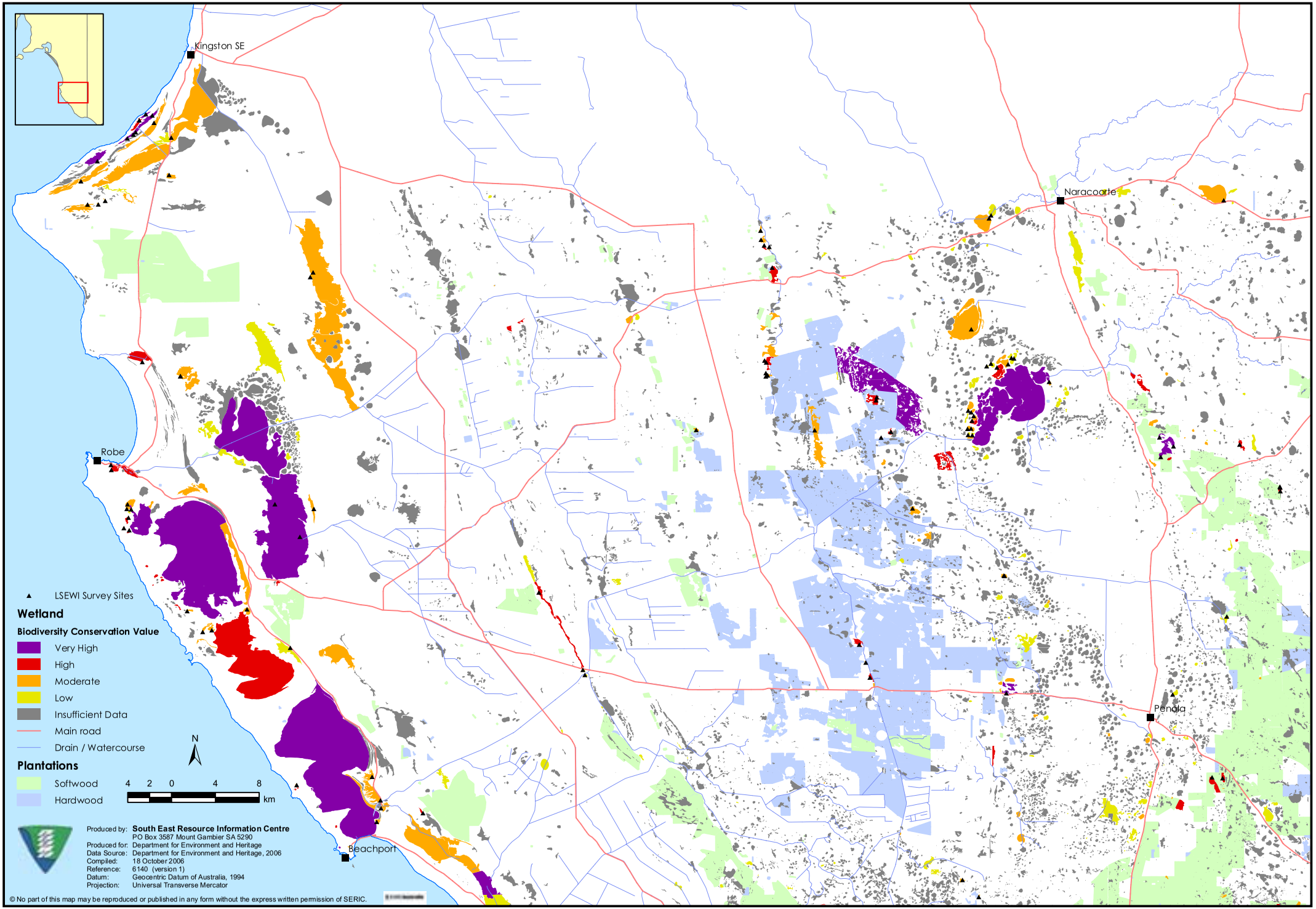


Fig. 4(a). Wetlands of the northern half of the Lower South East

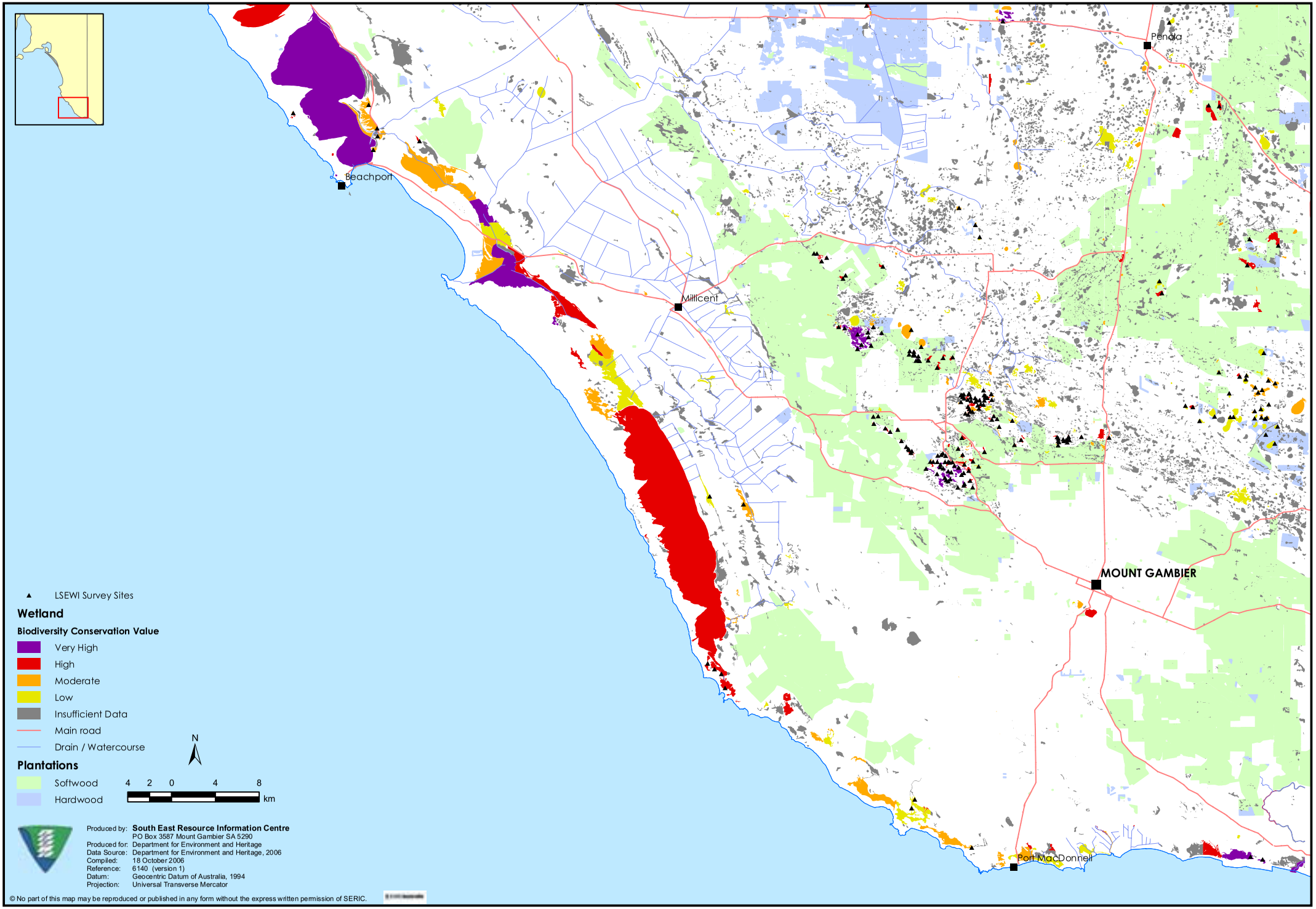


Fig. 4(b). Wetlands of the southern half of the Lower South East

4.0 CONCLUSIONS & RECOMMENDATIONS

Summary of Key Recommendations		
Action		*Responsible Agency*
1.	Proclaim Lake Hawdon South Conservation Park	DEH
2.	Ramsar nomination of Lake Hawdon South and Piccaninnie Ponds	DEH
3.	DIWA nomination of 6 recommended wetlands/complexes	DEH
4.	Incorporate new wetlands mapping into native vegetation policy and assessment processes	DEH/DWLBC
5.	Recalculate EPZ wetland list based on LSEWI	SENRMB
6.	Regulate plantation forestry expansion in Victoria	?
7.	Eliminate tracks through significant wetlands	All wetland landholders
8.	Corporate support of SAWID	DEH
9.	Hydrological restoration of Big Heath CP	DEH
10.	Hydrological restoration of Lake Frome CP	DEH
11.	Development of a regional TLA response model	SENRMB/DWLBC
12.	Determine environmental water requirements of "A-List" wetlands	SENRMB
13.	Establishment of vegetation monitoring for adaptive management of Lake Hawdon South	DEH
14.	Stock exclusion trial, Lake Hawdon South catchment drains	SENRMB

4.1 Significance

For the purposes of the LSEWI, the significance of a wetland was assigned according to (1) any existing level of recognition (eg. Ramsar, DIWA), (2) its BCV score and (3) and whether or not it meets criteria for international or national significance (see Appendix 9). Some wetlands with a relatively low BCV score have high significance because they occur within complexes that are currently Ramsar or DIWA listed. Some of the highest ranking wetlands according to BCV score are currently not recognised under any conservation convention. These wetlands are recommended for listing under relevant conventions. LSE wetlands of significance at the international, national, state and regional scale, as identified via the LSEWI and previous reports, are listed in Appendix 5. This list should not be considered complete since approximately 95 % of LSE wetlands currently have insufficient data for BCV to be calculated.

4.1.1 International Significance (Actions 1 and 2)

In addition to the existing Ramsar site (Bool and Hacks Lagoon) and the pending East Asian-Australasian Flyway Network site (Lake George), two LSE wetland sites readily meet criteria for international significance.

The Piccaninnie Ponds wetland system is an internationally renowned cave diving location with very high ecological values. DEH have assessed Piccaninnie Ponds against the criteria for international importance under the Ramsar convention. The system meets criteria 1, 2, 3, 4, 6 and 7. Nomination of Piccaninnie Ponds as a Ramsar site is currently being progressed by DEH, South East Region.

Lake Hawdon South (S0108314) has not been thoroughly assessed against the Ramsar criteria, however even a preliminary examination of the available information makes

a very strong case for its international importance. Lake Hawdon South meets Ramsar criteria 1, 2, 3, 4 and 6. It is possibly the largest and most intact wetland of its type in existence and its highly unusual thrombolites are likely to be of international scientific significance. Its current water regime appears relatively unaltered from the pre-European state. The wetland regularly supports a population of sharp-tailed sandpiper (*Calidris acuminata*) of international significance, as well as large numbers of other JAMBA and/or CAMBA listed species (Gosbell and Christie 2005). The current tenure of Lake Hawdon South is unallotted crown land over which a single grazing licence exists. However, its proclamation as a Conservation Park is anticipated within the next two years. The process for its Ramsar nomination should commence as soon as possible. Ramsar nomination should not proceed without the support of the Lake Hawdon Management Planning Steering Committee or its replacement body.

Note that Big Heath Conservation Park (S0120855) and The Marshes (S0110548) are not recommended for Ramsar nomination, despite receiving BCV scores similar to Piccaninnie Ponds and Lake Hawdon South. Although Big Heath meets Ramsar criterion 2 and possibly criterion 3, its water regime appears to have been dramatically altered by Drain M and, potentially, by the recent establishment of plantation forestry in its immediate vicinity. Given recent changes to the Ramsar nomination process, Ramsar nomination is now an undertaking that requires considerable financial resources. For Big Heath, the highest priority at the present time is hydrological restoration and available resources should be directed toward that end. If hydrological restoration is achieved, Ramsar nomination of Big Heath could be investigated. The Marshes also meets Ramsar criterion 2 and possibly criterion 3. The Marshes is not recommended for Ramsar nomination at the present time because the case for nomination of Lake Hawdon South and Piccaninnie Ponds is considerably stronger, the latter wetlands meeting more of the Ramsar criteria. It should be noted that many, perhaps hundreds, of LSE wetlands meet Ramsar criterion 2.

4.1.2 National Significance (Action 3)

In addition to the 9 LSE wetlands/wetland complexes currently listed in the DIWA, the LSEWI has identified a further 6 wetlands/wetland complexes worthy of DIWA listing and thus of national significance. These additional wetlands are those that received a BCV score of Ó 22 yet are not currently listed in the DIWA. The BCV cut-off of 22 is somewhat arbitrary but was selected in order to include those wetlands of obvious importance while keeping the number of new nominations to a reasonable level. Note that many of the currently DIWA listed wetlands received a BCV score of less than 22. Thus the cut-off of BCV Ó 22 in no way lowers the standard for DIWA listing in the LSE. Where such a wetland was part of an obvious wetland complex, the entire complex is recommended for DIWA listing, as is the case with currently DIWA listed sites.

Big Heath Conservation Park (S0120855) had a BCV score second only to Bool Lagoon (see Appendix 4), meaning it has greater biodiversity conservation value than 8 of the 9 LSE wetland complexes currently listed in the DIWA. Big Heath provides habitat for no less than 10 species protected under the EPBC Act and an additional 65 species listed under the NPW Act. The wetland contains wet heath and some macrophyte dominated vegetation in "intact" condition. Its large size also contributes to its value. Big Heath meets DIWA criteria 1, 2 and 5 and possibly others.

As a wetland that readily meets the criteria for Ramsar listing, Lake Hawdon South is also worthy of DIWA listing. The Lake Hawdon Management Planning Steering Committee has expressed its support for the DIWA nomination of the lake and should be involved in the nomination process.

The current DIWA listing of Lake George appears to exclude the small peripheral wetlands known as Two Lakes (S0109691) and Lake Wooley (S0106227). The BDBSA suggests that Two Lakes provides habitat for many of the threatened species that occur within Lake George. Both wetlands appear to be in pristine condition and both rated highly according to BCV score. Two Lakes and Lake Wooley should be incorporated into the "South East Coastal Salt Lakes" DIWA site.

Lake Hawdon North (S0109028) rated very highly according to BCV score. Although grazed it is relatively intact and provides habitat for no less than 7 species protected under the EPBC Act and an additional 7 listed under the NPW Act. Its large size also contributes to its value. Lake Hawdon North appears to meet DIWA criteria 1, 2, 3 and 5. Its nomination as a DIWA site should not proceed without the endorsement of the Lake Hawdon Management Planning Steering Committee or its replacement body.

Penola Conservation Park contains several wetlands (S0110581, S0110576, S0120241, S0110629) that rated very highly according to BCV score. These wetlands are in pristine condition with intact buffers of terrestrial vegetation in a district in which clearance has been extensive. Although the duration of inundation of these wetlands may be shorter than other DIWA sites in the LSE, they clearly meet DIWA criteria 1, 5 and possibly others. The Penola Conservation Park wetlands provide habitat for no less than 3 species protected under the EPBC Act and an additional 7 listed under the NPW Act.

Hog Lake (S0120847) received a very high BCV score due largely to its pristine condition. This wetland and a small, adjacent unnamed wetland (S0120237) are within a band of remnant coastal vegetation that is contiguous with the "Butchers and Salt Lakes" DIWA site. However, unlike the adjacent DIWA listed wetlands, Hog Lake is not formally reserved for conservation. Hog Lake is similar to the Butchers and Salt Lakes wetlands in many respects and could readily be considered part of the same complex. Hog Lake may in fact have superior conservation value since, unlike Butchers and Salt Lakes, its hydrology is unaffected by a drain. Hog Lake also features areas of silky tea-tree (*Leptospermum lanigerum*), suggesting the presence of freshwater springs. Hog Lake is likely to provide habitat for the orange-bellied parrot (*Neophema chrysogaster*) that is known to utilise the Butchers and Salt Lakes wetlands (Australian Nature Conservation Agency 1996). Either the Butchers and Salt Lakes DIWA site should be extended to include Hog Lake and wetland S0120237, or a separate site should be nominated.

4.1.3 State and Regional Significance

There are currently no standard criteria against which to assess wetlands for significance at the state and regional levels. It is therefore proposed that all LSE wetlands that fall within BCV classes "High" and "Very High" are significant at the state level while those in BCV class "Moderate" are significant at the regional level. LSE wetlands of state significance include the majority of wetlands in pristine or intact condition. Many are within existing conservation reserves. LSE wetlands of regional significance include the majority of wetlands in at least moderate condition.

4.2 Policy and Planning

4.2.1 Native Vegetation Act (Action 4)

The *Native Vegetation Act (1991)* states that:

"Native vegetation should not be cleared if, in the opinion of the [Native Vegetation] Council—
(f) it is growing in, or in association with, a wetland environment;"

It is likely that the majority, if not all, of the 12 531 wetlands now mapped for LSE contain native vegetation. For many wetlands in poor condition native vegetation is not apparent during summer and autumn because terrestrial species, typically exotic pasture grasses, become dominant when wetlands are dry. However, when even poor condition wetlands become inundated the shoots of native aquatic plants emerge from below ground storage organs. This vegetation has ecological value providing habitat, food and nesting material for native fauna. A large proportion of the wetlands mapped for the LSEWI are not mapped as native vegetation in the DEH GIS database. It is therefore likely that the native vegetation within these wetlands is not being given due consideration under the Native Vegetation Act. To ensure that native vegetation within wetlands is given due consideration under the Act, the updated GIS layer LANDSCAPE_Wetlands should be used as a map of the contemporary extent of native vegetation in addition to other DEH GIS layers currently used for this purpose.

It is widely accepted that water regime is the primary ecological determinant in wetlands (Bunn and Arthington 2002). The conservation of water regime is therefore fundamental to the conservation of wetlands. Water regime is a complex variable consisting of the depth, duration, rate, timing, frequency, and predictability of the inundation of a wetland with water (Blanch 1997). The vegetation of a wetland reflects its water regime and wetland vegetation is readily degraded by changes to water regime. Although the clearance of wetland vegetation is illegal in South Australia without the consent of the Native Vegetation Council, land use change that results in altered wetland water regimes, both in the immediate vicinity and at downstream locations, continues to occur. Such changes have the same result as land clearance: the loss or degradation of native wetland vegetation and biodiversity. There is an urgent need to regulate the clearance of wetland vegetation via water regime alteration in the LSE.

4.2.2 Water Allocation Planning (Actions 5 and 6)

The vast majority of LSE wetlands are groundwater dependent ecosystems (GDEs) to a greater or lesser degree. The groundwater source for these wetlands is typically the Tertiary Limestone Aquifer (TLA), also referred to as the unconfined aquifer. GDEs require the maintenance of water table levels for their ongoing existence. Water table levels in the immediate vicinity of a wetland, as well as levels at upstream locations for those wetlands directly connected to the drainage network, are important for maintaining wetland water regime. Water table levels are influenced by a variety of factors including season, climatic trends, surface water drainage, groundwater drainage, direct groundwater extraction and landuse. The primary planning mechanisms to manage groundwater extraction are the Water Allocation Plans (WAPs) for prescribed water resources, developed and administered by the South East Natural Resources Management Board (SENRMB). Historically, the WAPs have accounted for the influence of direct groundwater extraction upon water table levels. Policies are under development to account for surface water drainage and landuse (e.g. plantation forestry) upon groundwater resources.

A recent initiative of the SENRMB is the development of an Environmental Protection Zone (EPZ) policy as part of the review process for the Water Allocation Plans pursuant to the NRM Act. While this policy will not protect the vast majority of LSE wetlands, nor those wetlands that depend upon surface water (e.g. drain) inflows, it is a promising

step forward for wetland conservation. The EPZ aims to protect a small number of important wetlands at high risk of degradation via water table decline (Howe *et al.* 2005). The EPZ will limit new water effecting activities within a buffer or protection zone around selected wetlands, thus reducing the risk of water table decline. The method used by Howe *et al.* (2005) to select wetlands for inclusion in the EPZ policy is discussed in section 1.3.2 above. In the light of updated mapping and data availability and the BCV classification developed for the LSEWI, the EPZ wetland list is now out of date. The SENRMB should undertake to recalculate the EPZ list based upon the new information contained in this report. Recalculation should also include recent wetland inventory and risk assessment work undertaken for the Upper South East (Harding in prep.). Additionally, the development of improved techniques for determining the degree of groundwater dependence of a wetland (Fass and Cook 2006) may provide more certainty to the EPZ list than the approach used by Howe *et al.* (2005). It is important to note that the vast majority of LSE wetlands are completely lacking in biophysical information (see section 3.3) and therefore their value is unknown. The precautionary principle dictates that such wetlands should be protected until their value is ascertained.

The influence of plantation development upon water tables and stream/drain discharge is an issue that crosses state borders. Mosquito Creek is the main water source for the Ramsar listed Bool Lagoon wetlands protected under the EPBC Act. The catchment area of Mosquito Creek extends well into Victoria. The current expansion of plantation forestry in the Mosquito Creek catchment in Victoria poses a serious threat to flows in Mosquito Creek. The ecological character of Bool Lagoon is at risk but the EPBC Act is not being enforced because in Victoria there is no licence requirement for new plantations. Victorian planning regulations pertaining to the establishment of plantation forestry are in urgent need of review.

4.2.3 Tracks Through Wetlands (Action 7)

One of the most common forms of wetland degradation documented for the LSEWI, particularly for pristine and intact wetlands, was vehicular tracks (Table 7). Tracks through wetlands promote the establishment of weeds, detract from aesthetic appeal and may render wetlands less favourable for cryptic species such as crakes and rails. Where tracks are on raised causeways they can also impact upon wetland water regime. Where opportunities exist, tracks through wetlands should be closed.

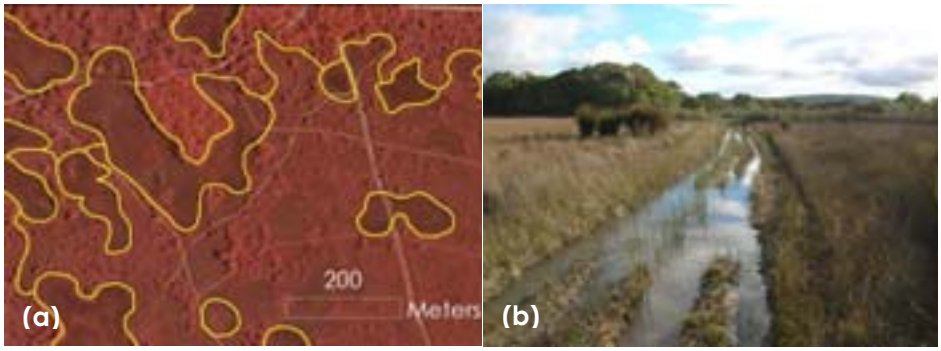


Fig. 5. The Marshes NFR showing (a) extensive network of tracks passing through wetlands, and (b) track through a pristine wetland.

4.2.4 Corporate Support of SAWID (Action 8)

There is currently no formal commitment from DEH for the future maintenance, management and development of SAWID. Consequently, the biophysical wetland data collected for the LSEWI, and also for the Fleurieu Peninsula and Upper South East inventories, is at risk. If the objectives of the Wetlands Strategy for South Australia

(Department for Environment and Heritage and Department of Water Land and Biodiversity Conservation 2003) are to be realised, e.g. if a comprehensive inventory of South Australia's wetlands and their resources is to be developed, maintained and make readily accessible to all, adequate resourcing of a wetland inventory database is a necessity. SAWID provides the best example currently available but requires further development and support to meet the objectives of the Wetlands Strategy. The development of SAWID will enable all regional wetland inventories to be combined within a single database, facilitating a more consistent and coordinated approach to wetland management and research in the state. In the short term, amalgamation of the LSE and Upper South East versions of SAWID should be undertaken to ensure coordination within the South East NRM region.

4.3 On-Ground Works

The prioritisation of wetlands according to their biodiversity conservation value can inform the prioritisation of on-ground wetland works. However, other factors such as cost/benefit and the willingness of landholders to commit to restoration need to be considered. The LSEWI has not involved a detailed analysis to prioritise potential wetland restoration projects. However, conservation actions that could combat degrading processes have been identified at survey sites and this information is stored within SAWID. Together with the BCV ranking system, this information should be used to prioritise future on-ground works. Additionally, several obvious high-priority projects are discussed below.

4.3.1 Big Heath Conservation Park (Action 9)

The wetland within Big Heath Conservation Park (S0120855) scored a BCV value second only to Bool Lagoon and is therefore one of the most important wetlands in the LSE. The water regime of Big Heath has almost certainly been dramatically altered by the construction of Drain M. Big Heath's water regime is also greatly threatened by surrounding blue gum plantations that have been planted within the last 5 years or so. According to Jolly *et al.* (1985) the main source of water for Big Heath, post Drain M, is local run-off from the north east. A considerable proportion of this area is now planted with blue gums. Extensive recently established blue gum plantations also occur to the Park's immediate south west. Jolly *et al.* (1985) commissioned a study that found it was feasible to divert water from Drain M into Big Heath. The study has been ignored to date, however it should now be re-examined as a matter of priority, given the greatly increased intensity of threat to the hydrology of Big Heath. It may be possible to construct a viaduct from the Bool Lagoon regulator to Big Heath that diverts a proportion of the water from Drain M. Increased inflows to Big Heath may require the construction of low stopbanks around some of the perimeter of the Park. The hydrological restoration of Big Heath should be incorporated into the feasibility of the proposed LSE to Upper South East connection project.

4.3.2 Lake Frome Conservation Park (Action 10)

Lake Frome (S0105943) is drained to the sea via the Lake From Outlet Drain. The spoil bank of this drain lies adjacent to the wetland for a distance of approximately 3.5 km and acts as a barrier to flow, ensuring water exits the wetland only at the head of the drain. However, in several locations, low points in the spoil bank have been breached. The maximum depth and duration of inundation of Lake Frome may consequently have been reduced. Blocking these low points would be a relatively simple task and would restore the hydrology of this large wetland of very high biodiversity conservation value. Additionally, the sill of Lake Frome, at the head of the

Lake Frome Outlet Drain, appears to be lowering via erosion. The Lake Frome Technical Committee should be established to investigate options for the maintenance/restoration of the hydrology of this wetland, as recommended in the Lake Frome Conservation Park Management Plan (Department for Environment and Heritage 2003).

4.3.3 Other Sites

Middle Point Swamp (S0107004) has recently been partially hydrologically restored (Taylor 2006). The complete hydrological restoration of this large (172 ha) wetland of significance at the regional scale could be simply and cheaply achieved via the installation of a flow control structure across its western outlet drain. Discussions with relevant landholders are yet to occur. The need to maintain connectivity between the wetland and the sea for fish migration should be investigated. One nationally threatened fauna species (growling grass frog (*Litoria raniformis*)) and four state threatened fauna species are known to occur at Middle Point Swamp.

There are a number of wetland restoration projects proposed by Bachmann (2002). Some of these projects have subsequently been completed (Taylor 2005; Taylor 2006) while others require attention.

4.4 Future Research

4.4.1 Regional TLA Response Model (Action 11)

One of the major threats to water table levels in the LSE is the expansion of plantation forestry. While it has been known for some time that plantations reduce groundwater recharge (Holmes and Waterhouse 1983), recent work has shown that plantations also take up groundwater directly (Leaney *et al.* 2005; Benyon *et al.* 2006), leading to a likely decline in water table level in recently planted areas. However, there is a paucity of research illustrating a link between plantation forestry and water table decline in the LSE. It may be possible, using existing knowledge of plantation extent, age and water table trends, to confirm the influence of plantation forestry upon water table levels. Furthermore, it may be possible to quantify the impact of plantation forestry upon rates of water table change at the regional scale. A model could then be developed to predict past, current and future impacts of plantation development upon wetland water regimes. Such a model would be likely to require fine scale topographical mapping of the land surface and of the water table surface. The model could potentially be extended to all major water effecting activities including surface water drainage, groundwater drainage, direct extraction and other forms of land use (e.g. grazing, native vegetation conservation) to become a regional TLA response model. Ultimately the model could play a role in protecting GDEs from water table decline.

4.4.2 Environmental Water Requirements of "A-List" Wetlands (Action 12)

There is a need for a proactive approach to the conservation of the water regimes of the most significant wetlands in the LSE irrespective of their water source. The list of wetlands to be protected under the EPZ policy of the SENRMB will omit some highly significant wetlands because they have low groundwater dependence or are currently at low risk of degradation due to the intensification of water effecting activities. However, it is preferable to take action to protect the best habitat than to restore habitat that has become degraded. It is proposed that a list of highly significant wetlands, that are to be protected from water effecting activities, be compiled. For simplicity this list shall be referred to as the "A-List". Appendices 4 and

5 of this report provide a useful guide to develop the A-List. In order to conserve A-List wetlands it will be necessary to determine their environmental water requirements (EWRs). Research will need to be undertaken to answer the following questions:

1. What is the ideal water regime for the wetland (i.e. the ideal depth, duration, rate, timing, frequency, and predictability of the inundation of the wetland with water)?
2. What is the range of water regime conditions required to maintain the ecological character of the wetland?
3. What are the sources of water for the wetland (e.g. drain flows, TLA, local run off etc.) and their proportional contributions to total supply?
4. What is the catchment area for the wetland?

By answering the above questions it will be possible to protect the hydrology of A-List wetlands via the regulation of water effecting activities. Remarkably, information of this nature is currently unavailable for even the most iconic of LSE wetlands. For example, although the water source of the Piccaninnie Ponds is obviously ground water, knowledge of which part of the aquifer the water comes from is currently lacking. It is therefore currently impossible to put in place measures to conserve the water regime of this wetland.

It should be noted that the knowledge of the EWRs of A-List wetlands is required for the listing of a wetland as internationally significant under the Ramsar convention. In theory, the EWRs of Ramsar listed Bool Lagoon are protected under the EPBC Act (1999). However, as discussed in section 4.2.2, Bool Lagoon's EWRs are not being adequately protected. The research required to determine EWRs to a degree adequate to ensure protection is already a necessity for Bool Lagoon and will become a necessity for Piccaninnie Ponds and Lake Hawdon South should they be Ramsar listed. The A-List should include at least these three wetlands/wetland complexes and the additional internationally significant wetland of Lake George.

4.4.3 Refinement of Mapping

Further refinement of the wetland mapping of the LSE, although not a high priority, may be desirable in some areas for some purposes. The recently funded project "Regional Flows Management Strategy for the South East" proposes to develop a digital elevation model (DEM) for the entire South East region. It is important that any consequent refinement of wetland mapping builds on current knowledge rather than developing something new. Attributes in the existing GIS layer LANDSCAPE_Wetlands, particularly the wetland polygon unique identifier, need to be retained so that existing inventory work remains compatible with mapping.

4.4.4 Field Survey

The wetland mapping process involved a close examination of January 2003 infra-red aerial photography for the entire LSE. During this process 143 wetlands were identified as high priority for future survey because they appear in good condition and/or are data poor. These wetlands are listed in Appendix 6.

4.4.5 Lake Hawdon South (Actions 13 and 14)

The Lake Hawdon Management Planning Steering Committee (LHMPSC) has recently agreed to extinguish the grazing licence over Lake Hawdon South (S0108314) and have the lake proclaimed as a conservation park. It is likely that Lake Hawdon South has been grazed continuously since European colonisation approximately 150 years ago. The grazing of stock will probably cease in early 2008. This will be a profound

change to the disturbance regime of the lake's vegetation and may have unforeseen consequences. It is essential that a vegetation monitoring program be established to inform the adaptive management of Lake Hawdon South into the future. Ideally, each of the various vegetation types within the lake would be monitored within a statistically robust monitoring framework. It is essential that monitoring be established as soon as possible to capture important pre stock exclusion data. Monitoring should utilise the existing stock exclosure within the lake but will need to expand considerably upon this limited investigation. Monitoring should also be used to investigate the impact of the Lake Hawdon Connecting Drain upon the vegetation of the northern most area of the lake as this will inform the need for future hydrological restoration. The adaptive management of Lake Hawdon South is likely to require the use of a disturbance tool (eg. fire) to optimise species richness. The intermediate disturbance hypothesis (Connell 1978) should be considered in the management of this very high biodiversity conservation value wetland. The intermediate disturbance hypothesis predicts that higher species richness is maintained at an intermediate level of disturbance than if disturbance levels are high (eg. very frequent fires) or low (eg. very infrequent fires).

Maintaining or improving the quality and quantity of water supply to Lake Hawdon South is a matter of the highest priority. Profound ecological changes have recently occurred within Lake George (S0101818) that are likely to be related to the quality and quantity of inflows. Lake Hawdon South, and indeed many other LSE wetlands, is not immune to such impacts and prevention is far more cost effective and achievable than cure. Water quality testing of drain water in the catchment of Lake Hawdon South has been carried out on four occasions; autumn and spring in 1997 and 1998 as part of the national river health program. Samples were collected from the Bray drain at the gauging station near Lake Hawdon homestead (E410600, N5880250) and Biscuit Flat drain near the Robe to Naracoorte road bridge (E416300, N5875350). In autumn 1997 water in the Bray drain had very high oxidized nitrogen measurement of 0.6 mg/L. Water in the Biscuit Flat drain was occasionally turbid, showed elevated concentrations of total phosphorus (>0.2 mg/L) in autumn 1998 and high oxidized nitrogen concentration (0.3 mg/L) in spring 1998. These results suggest that there is a source of sediment, nitrogen and phosphorus in the catchment that may be adversely impacting on the condition of this drain and potentially of Lake Hawdon South.

Most of the drains that form the catchment of Lake Hawdon South occur within drainage reserves, land parcels that are managed by the SEWCDB. The SEWCDB leases most of its drainage reserves to pastoralists. This arrangement benefits pastoralists and the SEWCDB by controlling weeds and providing fodder for stock. However, the grazing of drainage reserves could be contributing to poor water quality and thereby putting at risk the ecological values of the lake. Livestock defecating and urinating directly into drains may impact water quality. Additionally, by preventing the establishment of vegetation (native or non-native), livestock may be reducing the buffering effect of drainage reserves. Research suggests that buffer zones of riparian vegetation can reduce nutrient inputs to streams in agricultural landscapes (Kuusemets *et al.* 2001; Lee *et al.* 2003; Sabater *et al.* 2003). Grasses can be more effective than other vegetation types in this regard (Kuusemets *et al.* 2001). A study should be undertaken to answer the following questions:

1. How does contemporary water quality in the catchment of Lake Hawdon South compare to pre-European water quality?
2. Where are the water quality impact "hotspots" in the Lake Hawdon South catchment?
3. How does water quality in drains respond following the exclusion of livestock from drainage reserves?

Such a research project would need to include funding for the alternative management of proclaimed weeds within livestock excluded drainage reserves for the life of the study. The findings of such a study could have region-wide implications and applications.

4.4.6 Use of Wetlands to Reverse Climate Change

Due to the relatively low rates of decomposition of organic matter in wetlands as compared to other ecosystems, wetlands can act as long term carbon reservoirs (Kusler 1999). Coal deposits illustrate the effectiveness of long term carbon storage in wetlands because these deposits were formed in wetlands or wetland-like conditions. Wetlands can also function as active carbon sinks, taking up atmospheric carbon at faster rates than it is decomposed and released back into the atmosphere. The drainage of wetlands can cause carbon stored in sediments to be released into the atmosphere (Kusler 1999), exacerbating anthropogenic climate change. Protecting existing wetlands and restoring those that have been drained or otherwise degraded is a potentially powerful tool to reverse climate change. If economic incentives for greenhouse gas reduction and long term carbon sequestration are ever implemented in Australia, it may become more profitable for landholders to protect and restore wetlands than to utilise drained wetlands for agriculture. The LSE has great potential in this regard.

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APPENDIX 1 – Data Sources Populating LSE SAWID

Project Name	No. Surveys in LSE SAWID	Data Source
A Directory of Important Wetlands in Australia (in part)	5	Report - manual entry
Australasian Wader Study Group -SA, Birds Australia	119	BDBSA - electronic transfer 04/09/2006
Biological Database - Opportune records (no project)	84	BDBSA - electronic transfer 04/09/2006
Biological Database - Plant Population (no project)	19	BDBSA - electronic transfer 04/09/2006
Biological Database - Reserve records (no project)	72	BDBSA - electronic transfer 04/09/2006
Bird Atlas Data (Birds Australia)	284	BDBSA - electronic transfer 04/09/2006
Brolga Survey (Ballarat University - honours study)	5	Report - manual entry
Coastal Dune and Clifftop	1	BDBSA - electronic transfer 04/09/2006
EPA Frogwatch - census data	214	BDBSA - electronic transfer 04/09/2006
Gordon Swamp assessment	1	Report - manual entry
Lake Hawdon	69	BDBSA - electronic transfer 04/09/2006
Lower South East Wetland Inventory	293	SAWID - manual entry
Mundulla Yellows Project	6	BDBSA - electronic transfer 04/09/2006
PAMS - Park asset database	22	BDBSA - electronic transfer 04/09/2006
SA Museum Vertebrate Data Load (copy)	400	BDBSA - electronic transfer 04/09/2006
SAOA Parks Database (originally collated by Bob Detman)	12	BDBSA - electronic transfer 04/09/2006
South East	203	BDBSA - electronic transfer 04/09/2006
South East Fish Inventory	85	BDBSA - electronic transfer 04/09/2006
South-East (Woods & Forests)	8	BDBSA - electronic transfer 04/09/2006
South-East Coast	94	BDBSA - electronic transfer 04/09/2006
State Herbarium (AD) Download	911	BDBSA - electronic transfer 04/09/2006
Striped Legless Lizard Survey	1	Report - manual entry
Threatened South-East Mammal (Van Weenen 1997)	42	BDBSA - electronic transfer 04/09/2006
Wetland Resources of South East SA (in part)	1	Report - manual entry

APPENDIX 2 – DEH Wetland Mapping Rules

GIS Wetland Spatial Management

What are Wetlands?

The wetland layer is seen as an amalgamation of water body and vegetation information. From a management perspective the data will be a stand alone layer, with information derived from waterbodies as they stood in April 2005, vegetation, imagery and field work. To achieve this EI has identified through discussion with Darren Herpich, Ben Taylor, Claire Harding and Paul Wainwright the business needs of wetlands GIS data in conjunction with the current approach undertaken for other corporate datasets.

Spatial Management Overview

The following is the model for the wetlands mapping.

1. SDE will be the storage location of the data.
2. ArcMap is the software to be used to undertake the mapping, and will require editing licence to ensure domains and topology rules are accessible.
3. The new layer has been created for the State that is a copy of the DEH water body layer (TOPO.Waterbodies) and the Geoscience 250k Water body data (TOPO.Geo_250k_Waterbodies) to provide a complete statewide picture of the water body data as of April 2005.
4. For the wetlands that are not represented in any form in the waterbody layer they have been copied into the wetland GDB.
5. Wetlands for Eyre Peninsula, Kangaroo Island, Mount Lofty, NAD and Murray Valley have been added to the water body features that represent the similar/same feature in the new wetland layer. No changes to the water body line work has been undertaken, except for around Lake Albert where some LANDSCAPE.Wetland features better represented the imagery and replaced the water body features. Work still needs to be undertaken by EI on the mapping, for example around Lake Alexandrina and along the River Murray, to ensure that the original mapping is all represented.

Check Out databases

1. Data was extracted within the project boundaries. There is overlap of wetland features between the two databases.
2. Contains the Wetlands Feature Dataset (editing dataset) that contains the following feature classes (figure represents the dataset as you will see it in the geodatabase):
   - Wetlands_Topology
   - Wetlands_Map
   - Wetlands_Construct

3. Other layers of interest:
   - Wetlands – original wetlands mapping
   - Wetlands_Coastal (only in LSE) – wetlands along the coastline identified in National Directory and mapped from available data by Alison Wright and Debra
   - NvisDraft – vegetation mapping. This is the joined regional layers of the SthEast and Murray Mallee. Within LSE all mu_250 are as one would recognize from the regional data and be able to query on. For interest these have been translated to the SA1, SA2, SA3 fields as a unique statewide code. For USE the regional mapping from stheast and murray mallee are within mu_250 and mu_50 codes respectively and these have been translated to the SA1, SA2, SA3 fields as a unique statewide code. To determine which region the mapping is from refer to the MAP_REGION field which can then enable you to search for the desired regional group code.
   - WaterCoursesPoly – polygons of watercourses in region
   - WaterCourses – lines of watercourses in region
   - HYDRO_COASTLINE_LINE – coastline being mapped/updated by Brian Batty's group
   - PlaceNames_50 – this would not extract from SDE, unfortunately.

Process for mapping by South East staff

1. Two disconnected versions will be created based on the USE and LSE boundaries.
2. There is overlap of features between the regions and there needs to be agreement between the officers as to which wetlands are to be picked up in which project region before both start mapping/editing all the features in their database.
3. The data should be checked in and out on a biweekly/monthly basis.
4. This will be managed through Felicity.
5. There will be a polygon feature layer and a construct layer, the latter to enable the editing as lines to construct polygons.
6. Topology rules of "no overlap of polygons", "must not have dangles", "must not self intersect".
7. Currently the wetland numbers for South East are S0100001 to S0100338, these will only be used to map what they were from the first South East Wetland Inventory.

8. All features that did not had the aus_wetnr transferred across from the landscape wetland mapping and were not dams and could be considered new wetlands have been automatically numbered from 339 to 10375. This automatic numbering will need to be reviewed based on the water regime of the waterbody identified by featurecode, for example merging intermittent and perennial adjacent waterbodies. It will also need to be reviewed based on the original number of the first inventory.
9. LSE – to add new mapping with numbers 10376 to 10999, as well as using any numbers that have become obsolete from a merge process or an attribution based on original inventory
10. USE – to start mapping with numbers 11000 to 11500.
11. As project mapping progresses we can review and extend the allocated numbers for each region.

Undertaking the mapping

When is it a new feature, with a new wetland id?

- Á Does not exist in the current wetland layer.
- Á Exists as more than one feature from the previously mapped entity(s) and are being split into more than one feature for a wetland.

When is it the same feature, with the original wetland id?

- Á The same numbers of features are mapped in the new layer.
- Á Changes to edges that are seen as an improvement to the accuracy of the feature rather than mapping something new.

1. The current Wetlands layer should be referred to (layer extracted from SDE was LANDSCAPES.Wetlands). From this layer the aus_wetnr, wetland name, water regime, watercourse and complex, can be transferred to the appropriate fields for a waterbody feature(s) in the feature layer. (provided in geodatabase as Wetlands)
2. Other layers that may be of relevance WaterCoursesPoly, WaterCourses (layers extracted from SDE were TOPO.WaterCoursesPoly , TOPO.WaterCourses)
3. NvisDraft can be used to extract relevant wetland vegetation to map, it should be noted that this data is being re-assessed based on the imagery to ensure that there is spatial coincidence of the boundaries to the imagery. What is pulled out for the wetlands mapping may be moved in this project. It is therefore encouraged that this data be re-aligned to the imagery, but may be different to what is done in the vegetation layer (layer extracted from SDE were VEG.NvisDraft).
4. The Wetlands_Coastal (layer extracted from SDE were LANDSCAPE.Wetlands_Coastal) is the data as best mapped by Debra Frankeweiz. There has been some discussion that the data has accuracy issues with non-wetland features mapped and is open to review by these inventories with the aid of imagery. Refer to metadata for more information http://envoracle.deh.sa.gov.au/sim/plsql/simpwebutil.p_showdataset?p_datasetnr=683
5. If the wetlands mapped from previous project (represented in Wetlands) are being given a new wetland id, then the project is the new inventory project, with appropriate capture method information (refer to point 6).
6. If the wetland is being mapped as it was (represented in Wetlands) then the original project (South East Wetland Database) should be used with all the original wetland numbers and wetland details of name, complex, water_regime, water courses. This can include changes to the feature to reflect the imagery. Boundary changes will be reflected in the metadata as detailed in point 6.
7. Through updating of the Vegetation data, it has been decided that line work will be captured at 10,000 with zooming appropriate to the resolution of the image. 1:10,000 was chosen as for the following reasons:
   - Á any smaller took longer to capture and did not result in no more accurate representation of the feature,
   - Á when zooming in the feature stood up well against the imagery from a capture at 1:10,000.
8. Metadata attribution based on mapping of the feature:
   a. Project (Table 8) = eg Upper South East Inventory
   b. Groundtruth (Table 7) = NV or GT or UN are the appropriate options, if there are new options can discuss them, but will not be able to update until the database has been checked back in.
   c. CaptureSource = "Landscape: Wetlands Mapping" (code = 13)
   d. CaptureMethod (Table 9) = "Trace - Ortho Image" (code = 2) if the feature is being mapped from scratch or being re-interpreted based on the image. If the feature is derived from an old source then = "Table Digitisation" (code = 3)
   e. FeatureSource (Table 10) = "Infra Red - Ortho Recitified - Aerial Photography" (code = 4) if the feature is being mapped from scratch or being re-interpreted based on the image. If the feature is derived from an old source then = "True Colour - Hard Copy - Aerial Photography" (code = 3)
   f. Minscale = 10000 or 40000 if using other data uninterpreted.
   g. Maxscale = 40000

h. HorizontalAccuracy = 5 (imagery is +/- 5m) or 25 if using other data uninterpreted.
i. FeatureReliabilityDate = 23/1/2004
j. AttributeReliabilityDate = 23/1/2005 or date of visit if ground truthed

9. New types can be added to domain but involve "checkin" and "checkout" to refresh the changes.

Spatial Table and Domains

Table 1 Wetland Attributes, those in italics are not to be included.

Name	Description	Domain
FeatureCode	Australian standard coding for mapped information The pre-existing waterbody data can provide information for the water regime attribute. All wetlands mapped should be = 4520	dWetland_FeatureCode (Table 1)
Region	Unique code for each region. For example S00 is Murray Valley, S01 is South East All mapping should be S01	dWetland_RegionCode (Table 2)
WetlandId	Unique number within the region to identify the wetland. Altready generated but requires re-visiting based on water regimes and original data.	NA
Aus_wetnr	Unique identifier for labelling all South Australian wetlands. Format: S0000001 S = South Australia; 00 = region; 00001 = unique number for wetland This will be generated from RegionCode and WetlandId field	Generated
Aus_wetnr_old	Unique identifier for labeling all South Australian wetlands. All wetlands begin with S followed by an assigned number eg S0001	NA
Name	Individual name of Wetland. Use Title Case format.	NA
Complex	Name of group of wetland sharing hydrogeological properties. Use Title Case format.	NA
WetlandType	Wetland classification system adopted by Ramsar	dWetland_Type (Table 3)
WaterRegime	Item describes the type of water regimes of the waterbodies that comprise each major area of a wetland, such as permanent, temporary, runoff or seepage, seasonal etc and combinations of these. Feature Code from waterbodies layer will be informative here.	dWaterRegime (Table 4)
WetlandSystem	Basic classification system for wetlands agreed upon at the National level.	dWetland_SystemCode (Table 5)
AusDir_no	This is the official Directory of Important Wetlands identifier (taken from the 3rd Edition - 2001) **Create a domain of all the current list of idenitifiers in the directory SA001 to SA063	dWetland_AusDirNum (Table 6)
Watercourse	Name of the watercourse that the wetland is part of. Not complete for Murray wetlands. Use Title Case format.	NA
InternationalStatus	Ramsar listed wetlands of International Importance	Y/N
NationalStatus	Directory of Important Wetlands (ANCA 1996) listed wetlands of National Importance	Y/N
GroundTruth	Detail on reliability of the wetland mapped, has it been visited?	dVegGroundTruth (Table 7)
Project	Description to describe the project undertaking the mapping	dWetland_Project (Table 8)
CaptureSource	Type of Data Layer, all wetlands captured and described should be coded with 13 Landscape: Wetland Mapping	dCaptureSource
CaptureMethod	Indicates whether digital, hardcopy maps etc	dCaptureMethod (Table 9)
FeatureSource	Information used to delineate the boundary	dFeatureSource (Table 10)
FeatureRelDate	Date of the Feature source = date of photography used to map the wetland	NA

AttributeRelDate	Date of digitizing or field work to verify the wetland	NA
HorizontalAccuracy	Accuracy of image or base data	NA
Minscale	Scale of photography at which feature was captured	NA
Maxscale	Scale of photography or base data.	NA
EditDate	Automatic	NA
UserId	Automatic when loaded back as CHARDING, DHERPICH	NA
Shape	Automatic	NA
Area	Automatic	NA

Table 1 Domain for Feature Code

Code	Description
3236	Reservoir
4400	Inland Water Feature
4401	Lake – Perennial
4402	Lake - Intermittent
4403	Lake - Mainly Dry
4404	Lake – Perennial – change all these to 4431 if River Murray
4407	Land Subject to Inundation (STI)
4420	Double Line Watercourse
4431	River Murray
4450	Wetland
4812	Dam
4870	Double Line Channel, Drain, Canal, Ditch

Table 2 Region Code domain

Code	Description
S00	Murray Valley
S01	South East
S02	Mount Lofty
S03	Eyre Peninsula
S04	Northern Agricultural Districts
S05	Kangaroo Island

Table 3 Wetland type domain

Code	Description
A1	Marine waters - permanent shallow waters less than six metres deep at low tide, includes sea bays straits
A2	Subtidal aquatic beds, includes kelp beds, sea-grasses, tropical marine meadows
A3	Coral reefs
A4	Rocky marine shores, includes rocky offshore islands, sea cliffs
A5	Sand, shingle or pebble beaches, includes sand bars, spits, sandy islets
A6	Estuarine waters, permanent waters of estuaries and estuarine systems of deltas
A7	Intertidal mud, sand or salt flats
A8	Intertidal marshes, includes salt marshes, salt meadows, saltings, raised salt marshes, tidal brackish and freshwater marshes
A9	Intertidal forested wetlands, includes mangrove swamps, nipa swamps, tidal freshwater swamps forests
A10	Brackish to saline lagoons and marshes with one or more relatively narrow connections with the sea
A11	Freshwater lagoons and marshes in the coastal zone
A12	Non tidal freshwater forested wetlands
B1	Permanent rivers and streams includes waterfalls
B2	Seasonal and irregular rivers and streams
B3	Inland deltas(permanent)
B4	Riverine floodplains, includes river flats, flooded river basins, seasonally flooded grassland, savanna and palm savanna
B5	Permanent freshwater lakes (8 ha) includes large oxbow lakes
B6	Seasonal/intermittent freshwater lakes (>8 ha) floodplain lakes
B7	Permanent saline /brackish lakes
B8	Seasonal/intermittent saline lakes
B9	Permanent freshwater ponds (<8 ha) marshes and swamps on inorganic sols, with emergent

	vegetation waterlogged for at least most of the growing season
B10	Seasonal/intermittent freshwater ponds and marshes on inorganic soils includes sloughs, potholes, seasonally flooded meadows, sedge marshes
B11	Permanent saline/brackish marshes
B12	Seasonal saline marshes
B13	Shrub swamps, shrub dominated freshwater marsh, shrub carr, alder thicket on inorganic soil
B14	Freshwater swamp forest, seasonally flooded forest, wooded swamps, on inorganic soils
B15	Pearlands, forest, shrubs or open bogs
B16	Alpine and tundra wetlands: includes alpine meadows, tundra pools, temporary waters from snow melt
B17	Freshwater springs, oasis and rock pools
B18	Geothermal wetlands
B19	Inland, subterranean karst wetlands
C1	Water storage areas; reservoirs, barrages, hydro-electric dams, impoundment's (generally over 8 ha).
C2	Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
C3	Aquaculture ponds; fish ponds shrimp ponds
C4	Salt exploitation, salt pans, salines
C5	Excavations; gravel pits; borrow pits, mining pools.
C6	Wastewater treatment areas; sewage farms, settling ponds, oxidation basins.
C7	Irrigated land; includes irrigation channels and rice fields, canals, ditches
C8	Seasonally flooded arable land, farm land
C9	Canals
C10	Artificial wetlands with conservation values, Includes constructed wetlands and dams

Table 4 List of codes and descriptions for the Water Regime Domain, those italised should not be used.

Code and Description	Definition
Artificially Dry	Inland: Water source cut off or wetland drained
Controlled Irrigation	
Episodic	Inland: Only contains water at infrequent and irregular intervals (<1year in 10)
Intermittent	Inland: Floods irregularly
Intertidal Flat	Marine: Inundated by most if not all high tides
Permanent	Inland: Contains water throughout the year, although level may vary.
Permanent Soak	
Permanent / Seasonal	*Not to be used in future, need removal of combination word*
Permanent / Temporary	*Not to be used in future*
Runoff or Seepage	
Runoff / Permanent	*Not to be used in future*
Runoff / Temporary	*Not to be used in future*
Seasonal	Inland: Floods and dries in most years
Seasonal Soak	
Seasonal / Permanent	*Not to be used in future*
Semi-permanent	Inland: Contains water throughout the year but dries out in dry years (e.g. 1 year in 10).
Semi- Permanent / Permanent	*Not to be used in future*
Supratidal Flat	Marine: Covered only at spring tides or less frequently
Supratidal Flat & Flooding	Marine: Relatively rare tidal coverage is combined with seasonal freshwater flooding.
Temporary	
Unknown	
Not Assessed	

Table 5 List of Wetland Systems as defined by National guidelines

SystemCode	System	Description
EST	Estuarine	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.
LAC	Lacustrine	Inland waterbodies that are situated in topographic depressions, lack emergent trees and shrubs, have <30% vegetation cover. E.g. large lakes.
MAR	Marine	Open ocean, continental shelf, including beaches, rocky shores, lagoons, and shallow coral reefs. Minimal influence from rivers or estuaries.
PAL	Palustrine	All non-tidal wetlands that are substantially covered with emergent vegetation. Includes bogs, swamps, floodplains and marshes.
RIV	Riverine	Perennial streams and rivers. Excludes floodplains adjacent to the channel.

Table 6 Domain for the list of Australian Directory of Important Wetlands

Code	Wetland name
SA021	American River Wetland System
SA004	Baird Bay
SA039	Banrock Swamp Wetland Complex
SA005	Barker Inlet & St Kilda
SA006	Big Swamp
SA022	Birchmore Lagoon
SA052	Bool & Hacks Lagoons
SA023	Busby and Beatrice Islets
SA053	Butchers & Salt Lakes
SA007	Clinton
SA008	Coffin Bay Coastal Wetland System
SA001	Coongie Lakes
SA024	Cygnet Estuary
SA025	Cygnet River
SA067	Dalhousie Springs
SA009	Davenport Creek
SA054	Deadmans Swamp
SA026	D'Estrees Bay
SA002	Diamantina River Wetland System
SA055	Ewens Ponds
SA027	Flinders Chase River Systems
SA010	Franklin Harbour
SA028	Grassdale Lagoons
SA040	Gurra Lakes Wetland Complex
SA056	Honans Scrub
SA065	Inland Saline Lakes
SA041	Irwin Flat
SA029	Lake Ada
SA066	Lake Eyre
SA068	Lake Eyre Mound Springs
SA057	Lake Frome & Mullins Swamp
SA011	Lake Hamilton
SA012	Lake Newland
SA030	Lanacoona Road Swamps
SA031	Lashmar Lagoon
SA042	Loch Luna Wetland Complex
SA043	Loveday Swamps
SA044	Lower Murray Swamps
SA045	Marne River Mouth
SA058	Marshes Swamp
SA069	Murray Bridge Army Training Area Wetlands
SA032	Murrays Lagoon
SA059	Naen Naen Swamp & Gum Lagoon
SA046	Noora Evaporation Lakes
SA033	Onkaparinga Estuary
SA060	Piccaninnie Ponds
SA047	Pike-Mundic Wetland Complex
SA013	Point Davenport
SA014	Point Labatt
SA061	Poocher & Mundulla Swamps
SA015	Port Gawler & Buckland Park Lake
SA048	Riverland Wetland Complex
SA062	South East Coastal Salt Lakes
SA049	Spectacle Lakes
SA050	Stockyard Plain
SA016	Streaky Bay
SA003	Strzelecki Creek Wetland System
SA051	Swan Reach Wetland Complex
SA063	The Coorong, Lake Alexandrina & Lake Albert
SA017	Tod River Wetland System
SA034	Tookayerta & Finniss Catchments
SA018	Tumby Bay
SA035	Upper Hindmarsh River Catchment
SA020	Upper Spencer Gulf
SA036	Upper Tunkalilla Creek Swamps
SA037	Waidrowski Lagoon
SA064	Watervalley Wetlands
SA038	White Lagoon Wetland System
SA019	Wills Creek

Table 7 List of Groundtruth types

Code	Description	Explanation
SU	Survey Site	Biological Survey site located within the polygon
FT	Field Trip	For vegetation mapping only
GS	Ground Truth Site	For vegetation mapping only - Ground Truth methodology – not a full vegetation site.
RV	Road side vegetation survey	For vegetation mapping only - Roadside Vegetation Mapping data through mapping polygon
GT	Ground Truth Trip	As part of the inventory, wetland has been visited and feature has been verified
NC	Needs Checking	Areas highlighted for further checking
NV	Not Visited	
UN	Unknown visit status	Default for data

Table 8 List of the Project domain for wetland mapping

Project Description
Upper South East Wetland Inventory
Lower south East Wetland Inventory
Mount Lofty Ranges Wetland Inventory
South East Wetland Database
Kangaroo Island Wetland Inventory
Eyre Peninsula Wetland Inventory
NYAD Wetland Inventory
Murray Valley Wetland Atlas
Fleurieu Swamps Wetland Inventory
Channel Country Wetland Inventory
NPWS Wetland Inventory
DEH 50k Waterbody
Geoscience 250k Waterbody

Table 9 List of Capture methods

Code	Description
17	Aggregation of existing line segments
5	ArcPad Digitisation
12	Comparative estimate (eyeballed)
9	GPS – Differential
11	GPS - estimated correction
14	GPS – Mobile
10	GPS - Non corrected
15	Intersection point by FN resection
8	Scan / Vectorize
13	Survey Controlled
3	Table Digitisation
4	Trace – DCDB
2	Trace - Ortho Image
1	Trace - Registered Image
16	Trace - Stereo Image
0	Unknown (default)

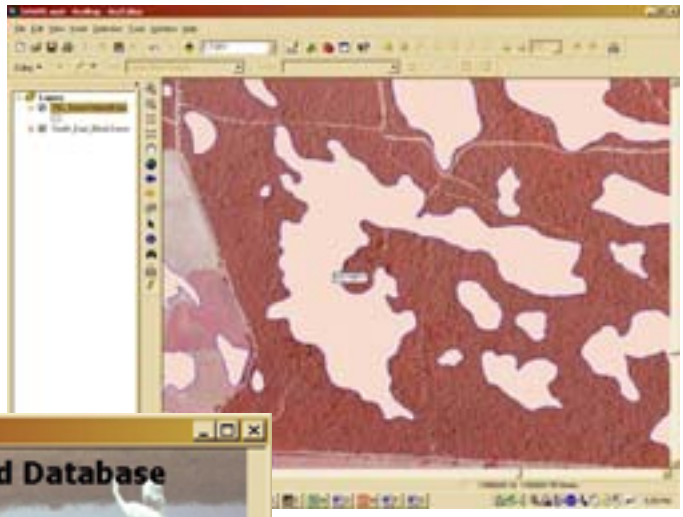
Table 10 List of Feature Sources

Code	Description
21	Black&White - Aerial Photography
8	Black&White - Georeferenced Only - Aerial Photography
9	Black&White - Hard Copy - Aerial Photography
7	Black&White - Ortho Rectified - Aerial Photography
23	Infra Red - Aerial Photography
5	Infra Red - Georeferenced Only - Aerial Photography
6	Infra Red - Hard Copy - Aerial Photography
4	Infra Red - Ortho Recified - Aerial Photography
13	Mud Map / Sketch
31	Official Plan - Rack Plan
30	Official Plan - Surveyed Plan

26	Satellite - MSS Imagery
24	Satellite - Non Landsat
25	Satellite - TM Imagery
10	Satellite Imagery
22	True Colour - Aerial Photography
2	True Colour - Georeferenced Only - Aerial Photography
3	True Colour - Hard Copy - Aerial Photography
1	True Colour - Ortho Rectified - Aerial Photography
0	Unknown

APPENDIX 3 – SAWID: A Users Guide

In ArcMap, using the hyperlink tool, click on a wetland of interest.

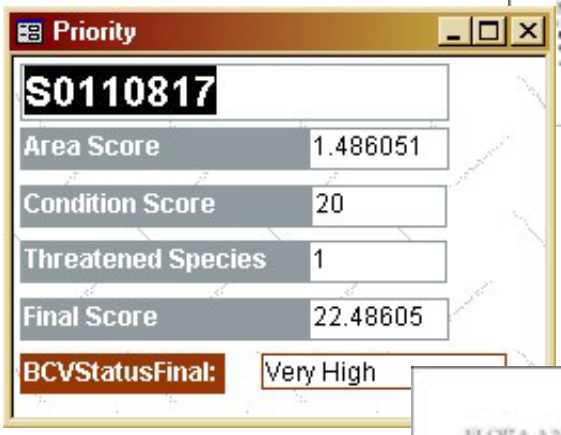


A form appears, providing you with 8 options.

Clicking on the "Edit" option enables you to add new information and data for that wetland.

Clicking the "View Photos" option enables you to view the available photographs of that wetland.

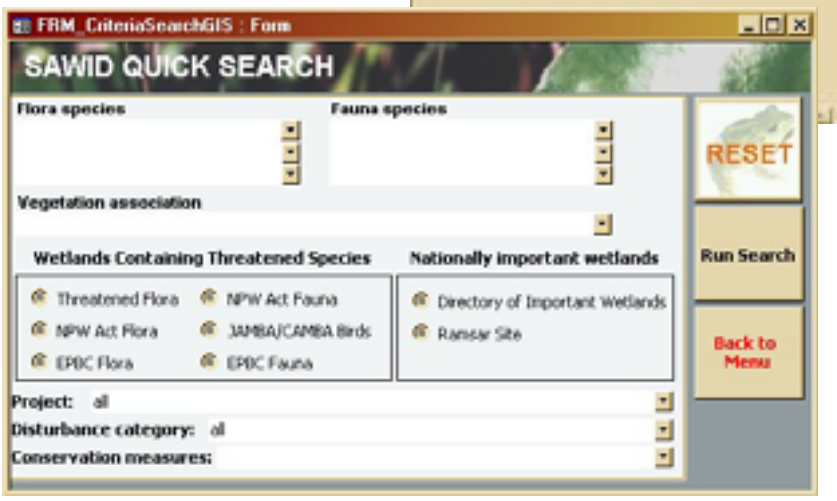
Clicking "wetland Summary Report" produces a report summarising the biophysical information for all surveys of that wetland. The report includes available information on location, status, tenure, hydrology, water chemistry, type, threats, conservation measures, flora and fauna.



Clicking "Calculate Ecological Significance" provides the BCV Score and BCV Class of that wetland.

The "Flora and Fauna" list button provides a list of all flora and fauna records for all surveys of that wetland stored in the database.

The "Main Menu" button takes you to the front end of the database from where you can search the entire database for other wetlands or wetland features.



By clicking on "Quick Search" you can find all the wetlands with records of a specific feature of interest.

APPENDIX 4 – LSE Wetlands Ranked by BCV Score

This list does not include those wetlands in BCV Class "Insufficient Data".
Note: Confidence in BCV score varies according to method used to determine condition as follows:

- ⊄# Field Survey = High Confidence
- ⊄# Site Visit = Medium Confidence
- ⊄# Aerial Photograph = Lowest Confidence

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0110446	BOOL LAGOON	3.38	15	24.5	365	Site Visit	42.88	Very High
S0120855	BIG HEATH CP	3.22	15	21.25	164	Site Visit	39.47	
S0110548	THE MARSHES	2.01	20	4.75	17	Site Visit	26.76	
S0101060	PICCANINNIE PONDS	2.25	20	4	78	Field Survey	26.25	
S0101818	LAKE GEORGE	3.81	15	7	102	Site Visit	25.81	
S0108314	LAKE HAWDON SOUTH	3.52	15	7	61	Field Survey	25.52	
S0109691	TWO LAKES	0.42	20	5	13	Site Visit	25.42	
S0110750	HONAN NFR	0.71	20	4.25	7	Field Survey	24.96	
S0110764	HONAN NFR	1.52	20	3.25	10	Field Survey	24.77	
S0100098	BUTCHERS LAKE	1.78	20	2.25	6	Field Survey	24.03	
S0107299	THE MARSHES	1.68	20	2.25	4	Field Survey	23.93	
S0109028	LAKE HAWDON NORTH	3.39	15	5.25	34	Site Visit	23.64	
S0120800	HONAN NFR	0.97	20	2.5	20	Field Survey	23.47	
S0107373	THE MARSHES	1.08	20	2.25	10	Field Survey	23.33	
S0105592	MULLINS SWAMP	2.44	15	5.75	28	Aerial Photograph	23.19	
S0120280	BUTCHERS LAKE	1.16	20	2	2	Field Survey	23.16	
S0110629	PENOLA CONSERVATION PARK	0.56	20	2.5	7	Aerial Photograph	23.06	
S0120246	DEADMANS SWAMP NFR	2.06	20	1	11	Field Survey	23.06	
S0109071	HACKS LAGOON	2.20	15	5.75	21	Site Visit	22.95	
S0105943	LAKE FROME	2.95	15	4.75	22	Site Visit	22.70	
S0110595	THE MARSHES	0.60	20	2	1	Field Survey	22.60	
S0110817	HONAN NFR	1.49	20	1	2	Field Survey	22.49	
S0107026	PICCANINNIE PONDS Eastern Wetland	1.10	20	1.25	3	Field Survey	22.35	
S0110576	PENOLA CONSERVATION PARK	1.00	20	1.25	5	Aerial Photograph	22.25	
S0110765	HONAN NFR	1.22	20	1	2	Field Survey	22.22	
S0120847	HOG LAKE	2.00	20	0	1	Field Survey	22.00	
S0107273	BLUE TEA TREE SWAMP	1.18	20	0.75	2	Field Survey	21.93	
S0110767	HONAN NFR	1.10	20	0.75	1	Field Survey	21.85	
S0110622	THE MARSHES	0.00	20	1.75	6	Site Visit	21.75	
S0110634	MT LYON LF	0.23	20	1.5	1	Field Survey	21.73	
S0110787	HONAN NFR	0.71	20	1	4	Site Visit	21.71	
S0120244	BIG DIP LAKE	1.66	20	0	1	Aerial Photograph	21.66	
S0107240	THE MARSHES	0.89	20	0.75	1	Field Survey	21.64	
S0107304	THE MARSHES	1.13	20	0.5	1	Field Survey	21.63	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0110661	HACKET HILL NFR	0.38	20	1.25	1	Field Survey	21.63	Very High
S0116936	SALT LAKE	1.36	20	0.25	2	Field Survey	21.61	
S0105650	DISCOVERY BAY	1.78	15	4.75	34	Aerial Photograph	21.53	
S0120241	PENOLA CONSERVATION PARK	1.51	20	0	2	Aerial Photograph	21.51	
S0110581	GREEN SWAMP	1.23	20	0.25	5	Field Survey	21.48	
S0107267	THE MARSHES	0.69	20	0.75	1	Field Survey	21.44	
S0110562	HONAN NFR	0.92	20	0.5	1	Field Survey	21.42	
S0101778	POOL OF SILOAM	0.41	15	6	46	Aerial Photograph	21.41	
S0110534	LAKE ROBE GAME RESERVE	1.40	20	0	10	Field Survey	21.40	
S0110344	SALT LAKE	1.15	20	0.25	1	Field Survey	21.40	
S0105778		1.32	20	0	1	Aerial Photograph	21.32	
S0108357	LAKE ROBE	2.56	15	3.75	41	Site Visit	21.31	
S0110521	DEADMANS SWAMP NFR	1.02	20	0.25	5	Field Survey	21.27	
S0120212	HONAN NFR	0.74	20	0.5	2	Field Survey	21.24	
S0108474	LAKE ELIZA	3.71	15	2.5	51	Site Visit	21.21	
S0110014	HONAN NFR	0.45	20	0.75	1	Field Survey	21.20	
S0120251	OLD WOOLWASH	0.08	20	1	1	Field Survey	21.08	
S0110734	HONAN NFR	0.33	20	0.75	2	Field Survey	21.08	
S0110773	HONAN NFR	0.58	20	0.5	1	Field Survey	21.08	
S0110742	HONAN NFR	0.58	20	0.5	1	Field Survey	21.08	
S0110760	HONAN NFR	0.79	20	0.25	1	Field Survey	21.04	
S0107281	THE MARSHES	0.77	20	0.25	1	Field Survey	21.02	
S0110621	THE MARSHES	0.75	20	0.25	1	Site Visit	21.00	
S0110373	OLD WOOLWASH	0.00	20	1	1	Aerial Photograph	21.00	
S0110632	MT LYON LF	0.00	20	1	1	Field Survey	21.00	
S0106799	OLD WOOLWASH	0.50	20	0.5	1	Field Survey	21.00	
S0110539	GHOST LAKE	0.71	20	0.25	1	Field Survey	20.96	High
S0110500	WHENNAN NFR	0.96	20	0	2	Site Visit	20.96	
S0110563	LAKE ST. CLAIR	3.45	15	2.5	41	Aerial Photograph	20.95	
S0110579	THE MARSHES	0.68	20	0.25	1	Site Visit	20.93	
S0108264	FRESH DIP LAKE	0.87	20	0	2	Aerial Photograph	20.87	
S0110703	GRUNDY LANE NFR	0.59	20	0.25	1	Field Survey	20.84	
S0110775	HONAN NFR	0.58	20	0.25	1	Field Survey	20.83	
S0108290		0.30	20	0.5	1	Aerial Photograph	20.80	
S0106227	LAKE WOOLEY	0.53	20	0.25	7	Aerial Photograph	20.78	
S0110599	MT MCINTYRE NFR	0.00	20	0.75	1	Field Survey	20.75	
S0110648	HACKET HILL NFR	0.00	20	0.75	1	Field Survey	20.75	
S0110677	HACKET HILL NFR	0.49	20	0.25	1	Field Survey	20.74	
S0110522	THE MARSHES	0.21	20	0.5	1	Field Survey	20.71	
S0108280	LITTLE DIP LAKE	0.70	20	0	3	Aerial Photograph	20.70	
S0110639	HACKET HILL NFR	0.37	20	0.25	1	Field Survey	20.62	
S0108304		0.59	20	0	1	Aerial Photograph	20.59	
S0110377	OLD WOOLWASH	0.07	20	0.5	1	Site Visit	20.57	
S0106317	LONGS NFR	0.00	20	0.5	1	Field Survey	20.50	
S0110371	OLD WOOLWASH	0.00	20	0.5	1	Site Visit	20.50	
S0110763	HONAN NFR	0.00	20	0.5	1	Field Survey	20.50	
S0106778	OLD WOOLWASH	0.46	20	0	1	Field Survey	20.46	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0110788	HONAN NFR	0.14	20	0.25	1	Field Survey	20.39	High
S0110746	HONAN NFR	0.12	20	0.25	1	Field Survey	20.37	
S0109690	SEA LAKE	0.32	20	0	1	Site Visit	20.32	
S0110998	GRUNDY LANE NFR	0.05	20	0.25	1	Field Survey	20.30	
S0110659	HACKET HILL NFR	0.04	20	0.25	1	Aerial Photograph	20.29	
S0110554	HACKET HILL NFR	0.00	20	0.25	2	Field Survey	20.25	
S0110667	HACKET HILL NFR	0.00	20	0.25	1	Aerial Photograph	20.25	
S0110761	HONAN NFR	0.00	20	0.25	1	Field Survey	20.25	
S0110825	HONAN NFR	0.00	20	0.25	1	Field Survey	20.25	
S0110920	WANDILLO / THREE CHAIN RD	0.00	20	0.25	1	Field Survey	20.25	
S0121483	LAKE BONNEY S.E.	3.92	10	6.25	45	Site Visit	20.17	
S0109688	BOUCHIES LAKE	0.12	20	0	1	Site Visit	20.12	
S0110913	GRUNDY LANE NFR	0.12	20	0	1	Field Survey	20.12	
S0107060	BUCKS LAKE	1.85	15	3.25	23	Field Survey	20.10	
S0110912	GRUNDY LANE NFR	0.09	20	0	1	Field Survey	20.09	
S0109973	PERCH HOLE	0.05	20	0	1	Aerial Photograph	20.05	
S0110499	WHENNAN NFR	0.03	20	0	1	Field Survey	20.03	
S0110717	GRUNDY LANE NFR	0.00	20	0	1	Field Survey	20.00	
S0110680	WANDILO NFR	0.00	20	0	1	Field Survey	20.00	
S0110718	GRUNDY LANE NFR	0.00	20	0	1	Field Survey	20.00	
S0107045	BLACKFELLOWS CAVE WETLAND	1.60	15	3.25	25	Aerial Photograph	19.85	
S0108578		1.63	15	3	7	Field Survey	19.63	
S0113806		2.87	5	11.75	17	Aerial Photograph	19.62	
S0120854	EWENS PONDS	1.01	15	3.5	15	Site Visit	19.51	
S0120240	BUTCHERS LAKE	0.00	15	4	5	Aerial Photograph	19.00	
S0110343	PICK SWAMP	2.17	15	1.75	6	Site Visit	18.92	
S0105797	TOPPERWEIN NFR	1.87	15	2	9	Field Survey	18.87	
S0110497	LAKE FELLMONGERY	1.49	15	2.25	8	Field Survey	18.74	
S0110759	DIAGONAL ROAD	0.93	15	2.75	6	Field Survey	18.68	
S0110533	GORDON LAGOON	1.38	15	2.25	11	Field Survey	18.63	
S0120859	MARY SEYMOUR CONSERVATION PARK	2.10	15	1.5	21	Site Visit	18.60	
S0107079	BLACKFELLOWS CAVE WETLAND	1.81	15	1.75	5	Aerial Photograph	18.56	
S0106808	TELFORD SCRUB CP	1.57	15	1.5	10	Aerial Photograph	18.07	
S0116933	MARY SEYMOUR CONSERVATION PARK	1.53	15	1.25	2	Site Visit	17.78	
S0107062		1.42	15	1.25	6	Field Survey	17.67	
S0116890		1.83	15	0.75	2	Field Survey	17.58	
S0113840		1.77	15	0.75	5	Aerial Photograph	17.52	
S0120851	HORSESHOE PADDOCK	1.77	15	0.75	5	Field Survey	17.52	
S0110945	CLAYPANS	0.89	15	1.5	1	Field Survey	17.39	
S0107056		1.63	15	0.75	2	Field Survey	17.38	
S0108757	MCINNES WETLAND	2.13	15	0.25	11	Field Survey	17.38	
S0116900		1.11	15	1.25	1	Field Survey	17.36	
S0121482	THE MARSHES	0.61	15	1.5	6	Field Survey	17.11	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0101999	KATANI PARK WETLAND	1.86	15	0.25	5	Field Survey	17.11	High
S0110997	HORSESHOE PADDOCK	1.32	15	0.75	3	Field Survey	17.07	
S0107052		1.51	15	0.5	3	Field Survey	17.01	
S0115665	NANGWARRY NFR	1.71	15	0.25	4	Aerial Photograph	16.96	
S0110601	TRIAL WATERHOLE	1.70	15	0.25	1	Field Survey	16.95	
S0110947	CLAYPANS	0.92	15	1	1	Field Survey	16.92	
S0108952		1.67	15	0.25	2	Aerial Photograph	16.92	
S0110443	LITTLE BOOL LAGOON	1.91	10	5	12	Field Survey	16.91	
S0108479	WOAKWINE CR	0.89	15	1	1	Aerial Photograph	16.89	
S0110944	THE EVERGLADES	1.13	15	0.75	4	Field Survey	16.88	
S0120253	GLENELG RIVER	1.63	15	0.25	14	Site Visit	16.88	
S0110600	MT MCINTYRE NFR	0.87	15	1	2	Field Survey	16.87	
S0110771	HONAN NFR	0.83	15	1	2	Field Survey	16.83	
S0114971		0.83	15	1	4	Aerial Photograph	16.83	
S0120842	TWIG RUSH LAGOONS	1.32	15	0.5	1	Field Survey	16.82	
S0106954	BLUE LAKE	1.78	15	0	7	Site Visit	16.78	
S0107313		1.52	15	0.25	5	Aerial Photograph	16.77	
S0110108	SHEEPWASH SWAMP	1.51	15	0.25	3	Field Survey	16.76	
S0120659		0.96	15	0.75	2	Aerial Photograph	16.71	
S0106202	BURKS ISLAND - WEST	0.94	15	0.75	1	Field Survey	16.69	
S0110737	KANGAROO FLAT	1.17	15	0.5	2	Field Survey	16.67	
S0120856	REEDY CREEK LF	2.16	10	4.5	14	Field Survey	16.66	
S0108130	LAKE NUNAN	1.35	15	0.25	1	Aerial Photograph	16.60	
S0110394	LONGS NFR	0.84	15	0.75	1	Field Survey	16.59	
S0121485	ISLAND SWAMP LF	1.34	15	0.25	1	Field Survey	16.59	
S0114982	CRESS CREEK SPRING	1.07	15	0.5	1	Site Visit	16.57	
S0110749	HONAN NFR	0.81	15	0.75	1	Field Survey	16.56	
S0110901	CLAYPANS EAST	1.02	15	0.5	1	Field Survey	16.52	
S0114945		1.51	15	0	3	Aerial Photograph	16.51	
S0114763	PENOLA FOREST	1.50	15	0	1	Aerial Photograph	16.50	
S0110740	KANGAROO FLAT	0.98	15	0.5	1	Field Survey	16.48	
S0114989	JERUSALEM CREEK SPRING	1.23	15	0.25	1	Aerial Photograph	16.48	
S0117807	HILLVIEW	1.21	15	0.25	2	Aerial Photograph	16.46	
S0109485	MONBULLA	1.46	15	0	1	Aerial Photograph	16.46	
S0113560	MCROSTIES NFR	0.95	15	0.5	2	Field Survey	16.45	
S0120846	SALT LAKE	1.44	15	0	1	Field Survey	16.44	
S0110702	KANGAROO FLAT	0.93	15	0.5	1	Aerial Photograph	16.43	
S0107937	LAKE BATTYE	1.38	15	0	10	Aerial Photograph	16.38	
S0110291	WHENNAN NFR	0.62	15	0.75	2	Field Survey	16.37	
S0107058		1.36	15	0	1	Aerial Photograph	16.36	
S0110925	OSCHAR SWAMP	1.11	15	0.25	2	Field Survey	16.36	
S0110664	HACKET HILL NFR	0.60	15	0.75	1	Field Survey	16.35	
S0107493	THE MARSHES	0.59	15	0.75	3	Field Survey	16.34	
S0110731	KANGAROO FLAT	0.84	15	0.5	1	Field Survey	16.34	
S0115817	LOWAN LANE LF	1.33	15	0	3	Aerial Photograph	16.33	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0110635	MT LYON LF	0.32	15	1	1	Field Survey	16.32	High
S0110848	KANGAROO FLAT	0.55	15	0.75	1	Aerial Photograph	16.30	
S0120841	DISMAL SWAMP	1.04	15	0.25	2	Field Survey	16.29	
S0110744	HONAN NFR	0.79	15	0.5	2	Field Survey	16.29	
S0108154	LAKE FOX	0.76	15	0.5	1	Aerial Photograph	16.26	
S0120858	TOPPERWEIN NFR	0.75	15	0.5	1	Field Survey	16.25	
S0110630	MT LYON LF	0.00	15	1.25	1	Field Survey	16.25	
S0110672	HACKET HILL NFR	0.74	15	0.5	2	Field Survey	16.24	
S0108849		1.22	15	0	2	Aerial Photograph	16.22	
S0110627	MT LYON LF	0.21	15	1	1	Field Survey	16.21	
S0110656	HACKET HILL NFR	0.92	15	0.25	1	Field Survey	16.17	
S0110903	LONGS NFR	0.42	15	0.75	1	Field Survey	16.17	
S0108171	THE PUB LAKE	1.16	15	0	1	Aerial Photograph	16.16	
S0120486	HACKET HILL NFR	1.14	15	0	2	Aerial Photograph	16.14	
S0109883	KARINYA	0.87	15	0.25	1	Aerial Photograph	16.12	
S0110919	WOOLWASH C	0.35	15	0.75	2	Field Survey	16.10	
S0110679	WANDILO NFR	0.34	15	0.75	1	Field Survey	16.09	
S0110536	LAKE AMY	1.09	15	0	2	Field Survey	16.09	
S0108211	RULE SWAMP	0.80	15	0.25	2	Field Survey	16.05	
S0121513	Spencers Pond	0.00	15	1	1	Aerial Photograph	16.00	
S0110272	WHENNAN NFR	0.23	15	0.75	1	Field Survey	15.98	
S0110251	WANDILO NFR	0.71	15	0.25	1	Field Survey	15.96	
S0120643	COMAUM FOREST	0.71	15	0.25	1	Aerial Photograph	15.96	
S0107894	GOOSE NECK SWAMP	0.46	15	0.5	1	Field Survey	15.96	
S0110857		0.92	15	0	1	Field Survey	15.92	
S0117816	HILLVIEW	0.91	15	0	1	Aerial Photograph	15.91	
S0110729	HONAN NFR	0.40	15	0.5	1	Field Survey	15.90	
S0110647	HACKET HILL NFR	0.39	15	0.5	2	Field Survey	15.89	
S0110655	HACKET HILL NFR	0.62	15	0.25	1	Field Survey	15.87	
S0110905	LONGS NFR	0.37	15	0.5	1	Field Survey	15.87	
S0107805	PLEASANT PARK	0.87	15	0	1	Field Survey	15.87	
S0120824	KANGAROO FLAT	0.09	15	0.75	1	Field Survey	15.84	
S0110668	HACKET HILL NFR	0.51	15	0.25	1	Field Survey	15.76	
S0110626	MT LYON LF	0.00	15	0.75	1	Field Survey	15.75	
S0110631	MT LYON LF	0.00	15	0.75	1	Field Survey	15.75	
S0114903		0.74	15	0	1	Aerial Photograph	15.74	
S0110922	WANDILLO / THREE CHAIN RD	0.48	15	0.25	1	Field Survey	15.73	
S0108866		0.72	15	0	3	Aerial Photograph	15.72	
S0120605	DIAGONAL ROAD	0.71	15	0	1	Field Survey	15.71	
S0121514	Bones Pond	0.19	15	0.5	1	Aerial Photograph	15.69	
S0107043		0.43	15	0.25	2	Aerial Photograph	15.68	
S0110670	HACKET HILL NFR	0.68	15	0	1	Aerial Photograph	15.68	
S0110878	KANGAROO FLAT	0.65	10	5	39	Aerial Photograph	15.65	
S0110682	WANDILO NFR	0.63	15	0	1	Field Survey	15.63	
S0110704	GRUNDYS WOODLANDS	0.38	15	0.25	1	Field Survey	15.63	
S0110654	HACKET HILL NFR	0.11	15	0.5	1	Field Survey	15.61	
S0110676	HACKET HILL NFR	0.09	15	0.5	1	Field Survey	15.59	
S0110243	WANDILO NFR	0.56	15	0	1	Aerial Photograph	15.56	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0107822	HACKETS HILL WOODLAND	0.00	15	0.5	1	Aerial Photograph	15.50	High
S0110666	HACKET HILL NFR	0.00	15	0.5	1	Field Survey	15.50	
S0110735	HONAN NFR	0.00	15	0.5	1	Field Survey	15.50	
S0110923	SEWCDB SWAMP	0.50	15	0	1	Field Survey	15.50	
S0107479	THE MARSHES	1.24	10	4.25	35	Site Visit	15.49	Moderate
S0114963	NENE VALLEY	0.48	15	0	3	Aerial Photograph	15.48	
S0110719	GRUNDY LANE NFR	0.18	15	0.25	1	Field Survey	15.43	
S0110849	KANGAROO FLAT	0.37	15	0	1	Aerial Photograph	15.37	
S0110261	THE MARSHES	0.36	15	0	1	Aerial Photograph	15.36	
S0110930	LAKE GEORGE GAME RESERVE PERIPHERAL	0.09	15	0.25	1	Field Survey	15.34	
S0110843	KANGAROO FLAT	0.34	15	0	3	Aerial Photograph	15.34	
S0109731		0.34	15	0	1	Site Visit	15.34	
S0110274	WHENNAN NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110641	HACKET HILL NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110657	HACKET HILL NFR	0.00	15	0.25	2	Field Survey	15.25	
S0110673	HACKET HILL NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110714	GRUNDY LANE NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110726	HONAN NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110733	HONAN NFR	0.00	15	0.25	1	Field Survey	15.25	
S0120276	HACKET HILL NFR	0.00	15	0.25	1	Field Survey	15.25	
S0110738	HONAN NFR	0.23	15	0	1	Field Survey	15.23	
S0114400	TELFORD SCRUB CP	0.11	15	0	1	Aerial Photograph	15.11	
S0120492	HACKET HILL NFR	0.10	15	0	1	Field Survey	15.10	
S0114397	TELFORD SCRUB CP	0.01	15	0	1	Aerial Photograph	15.01	
S0110544	THE MARSHES	0.00	15	0	2	Site Visit	15.00	
S0110709	GRUNDY LANE NFR	0.00	15	0	1	Field Survey	15.00	
S0110713	GRUNDY LANE NFR	0.00	15	0	1	Field Survey	15.00	
S0110720	GRUNDY LANE NFR	0.00	15	0	1	Field Survey	15.00	
S0110739	HONAN NFR	0.00	15	0	1	Field Survey	15.00	
S0110774	HONAN NFR	0.00	15	0	1	Field Survey	15.00	
S0110938	WOOLWASH	0.00	15	0	1	Aerial Photograph	15.00	
S0114396	TELFORD SCRUB CP	0.00	15	0	1	Aerial Photograph	15.00	
S0121510	SISTERS SINKHOLE	0.00	15	0	1	Aerial Photograph	15.00	
S0121511	GOULDENS HOLE	0.00	15	0	1	Site Visit	15.00	
S0107011	NENE VALLEY	2.48	10	2	5	Aerial Photograph	14.48	
S0107013		1.37	10	2.75	6	Aerial Photograph	14.12	
S0102176	LAKE ORMEROD	2.24	10	1.75	13	Field Survey	13.99	
S0107004	MIDDLE POINT SWAMP	2.24	10	1.5	16	Field Survey	13.74	
S0106076	BURKS ISLAND	2.92	10	0.75	4	Site Visit	13.67	
S0110507	THE SALT SWAMP	1.05	10	2.5	2	Field Survey	13.55	
S0101959	RUSHY SWAMP	3.13	10	0.25	5	Field Survey	13.38	
S0120750	BARNETT ROAD SWAMP	3.01	10	0.25	1	Aerial Photograph	13.26	
S0121498		2.98	10	0.25	1	Field Survey	13.23	
S0107740	GRUB RD	1.21	10	2	6	Aerial Photograph	13.21	
S0106346		2.38	10	0.75	3	Aerial Photograph	13.13	
S0108727	BARNETT ROAD SWAMP	2.79	10	0.25	1	Aerial Photograph	13.04	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0107295	LAKE LEAKE	1.94	10	1	6	Field Survey	12.94	Moderate
S0120227		2.40	10	0.5	2	Field Survey	12.90	
S0105970		2.64	10	0.25	12	Aerial Photograph	12.89	
S0108734	MARIA CREEK SWAMP	2.86	10	0	11	Aerial Photograph	12.86	
S0108794	MOYHALL SWAMP	2.85	10	0	1	Field Survey	12.85	
S0108610	WEST OF LAKE HAWDON NORTH	2.34	10	0.5	2	Field Survey	12.84	
S0107690	KALADBRO SWAMP	2.07	10	0.75	4	Aerial Photograph	12.82	
S0120652		2.51	10	0.25	8	Aerial Photograph	12.76	
S0107035	GERMEIN RESERVE	1.49	10	1.25	8	Site Visit	12.74	
S0109310	WINDAMERE	1.40	10	1.25	8	Aerial Photograph	12.65	
S0110585		2.14	10	0.5	4	Field Survey	12.64	
S0113839	CANUNDA FLAT	2.34	10	0.25	4	Aerial Photograph	12.59	
S0120264	LEGOES SWAMP	2.54	10	0	1	Site Visit	12.54	
S0107599	KEARNEY LAKE	1.77	10	0.75	3	Aerial Photograph	12.52	
S0110366	DINE SWAMP	2.48	10	0	2	Field Survey	12.48	
S0107023	EIGHT MILE CREEK	1.22	10	1.25	4	Aerial Photograph	12.47	
S0108901		2.44	10	0	1	Field Survey	12.44	
S0107833		2.43	10	0	2	Aerial Photograph	12.43	
S0113818		1.12	10	1.25	1	Aerial Photograph	12.37	
S0102800		2.07	10	0.25	1	Field Survey	12.32	
S0110435	COPPINGS SWAMP	1.80	10	0.5	23	Field Survey	12.30	
S0110625	LAKE EDWARD	1.55	10	0.75	2	Field Survey	12.30	
S0108755	BARNETT ROAD SWAMP	1.27	10	1	2	Aerial Photograph	12.27	
S0107867	DEADMANS LF	1.43	10	0.75	1	Aerial Photograph	12.18	
S0108514		1.92	10	0.25	3	Aerial Photograph	12.17	
S0110587		1.12	10	1	4	Field Survey	12.12	
S0106688	CONDSIDINE	2.10	10	0	1	Field Survey	12.10	
S0114968	WINTERFIELD CREEK	0.31	10	1.75	6	Field Survey	12.06	
S0120744	MANGE SWAMP	2.02	10	0	1	Field Survey	12.02	
S0114813	PENOLA FOREST	0.96	10	1	4	Aerial Photograph	11.96	
S0110028		1.69	10	0.25	5	Field Survey	11.94	
S0107949		1.91	10	0	1	Aerial Photograph	11.91	
S0114954		1.65	10	0.25	4	Aerial Photograph	11.90	
S0107291	LAKE LEAKE	1.09	10	0.75	13	Aerial Photograph	11.84	
S0108779		1.83	10	0	1	Aerial Photograph	11.83	
S0110074		1.83	10	0	1	Aerial Photograph	11.83	
S0110586	WHITES FLAT	1.53	10	0.25	2	Field Survey	11.78	
S0109696	DEADMAN SWAMP	1.23	10	0.5	3	Aerial Photograph	11.73	
S0110584		1.69	10	0	1	Field Survey	11.69	
S0110540	BACHMANN	1.69	10	0	1	Field Survey	11.69	
S0108737		1.44	10	0.25	1	Aerial Photograph	11.69	
S0108213	ARCOONA	1.68	10	0	1	Field Survey	11.68	
S0101642		1.67	10	0	2	Aerial Photograph	11.67	
S0108805	ST. HELENA SWAMP	1.41	10	0.25	2	Aerial Photograph	11.66	
S0105547	MOCORCO	1.63	10	0	1	Aerial Photograph	11.63	
S0107036		2.12	5	4.5	14	Aerial Photograph	11.62	
S0107959		1.61	10	0	1	Aerial Photograph	11.61	
S0109874	LAKE ST CLAIR	1.31	10	0.25	2	Field Survey	11.56	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0106925	BENARA CREEK	1.52	10	0	3	Aerial Photograph	11.52	Moderate
S0115657	INVERLOCH	0.27	10	1.25	5	Aerial Photograph	11.52	
S0107021	LIONS PARK	1.26	10	0.25	1	Aerial Photograph	11.51	
S0110473	BOOL LAGOON	1.49	10	0	1	Aerial Photograph	11.49	
S0110203	CAT SWAMP	1.24	10	0.25	2	Site Visit	11.49	
S0120806		1.48	10	0	1	Field Survey	11.48	
S0106551	REEDY LAGOON	1.23	10	0.25	12	Aerial Photograph	11.48	
S0102605		1.48	10	0	2	Aerial Photograph	11.48	
S0110556	WATERHOUSE	0.97	10	0.5	2	Field Survey	11.47	
S0107552	LYNWOOD	1.46	10	0	1	Field Survey	11.46	
S0108263	ALLAMBI	1.45	10	0	2	Aerial Photograph	11.45	
S0109818	NE LAKE ST CLAIR	1.45	10	0	1	Field Survey	11.45	
S0106951	VALLEY LAKE	1.42	10	0	1	Site Visit	11.42	
S0108998		1.16	10	0.25	3	Field Survey	11.41	
S0110674	LYNWOOD	1.34	10	0	1	Field Survey	11.34	
S0114975		1.32	10	0	1	Aerial Photograph	11.32	
S0120805	TEA TREE GULLY	1.31	10	0	7	Aerial Photograph	11.31	
S0110859		1.31	10	0	1	Field Survey	11.31	
S0106897	PENOLA ROAD LF	1.05	10	0.25	1	Aerial Photograph	11.30	
S0120321	MUNDI-SELKIRK WETLAND	1.04	10	0.25	1	Aerial Photograph	11.29	
S0120681		1.29	10	0	2	Field Survey	11.29	
S0110660	DISMAL SWAMP	1.28	10	0	1	Field Survey	11.28	
S0110227	MT LYON LF	0.00	10	1.25	1	Field Survey	11.25	
S0110628	MT LYON PERCHED SWAMP	0.00	10	1.25	1	Field Survey	11.25	
S0115825	NANGWARRY MILL	0.00	10	1.25	17	Aerial Photograph	11.25	
S0106486	RAMILLIES	1.20	10	0	7	Aerial Photograph	11.20	
S0108550		1.19	10	0	1	Aerial Photograph	11.19	
S0105847	TILLAR SWAMP	0.93	10	0.25	1	Field Survey	11.18	
S0110571		1.17	10	0	1	Aerial Photograph	11.17	
S0107625	MAGPIE SWAMP	1.16	10	0	2	Field Survey	11.16	
S0108476	WIRRINGULLA	1.15	10	0	1	Aerial Photograph	11.15	
S0110991	TWIG RUSH LAGOONS	1.14	10	0	1	Field Survey	11.14	
S0108347	LAKE ROBE GAME RESERVE PERIPHERAL	0.88	10	0.25	1	Field Survey	11.13	
S0108342	GREEN SWAMP	1.13	10	0	3	Aerial Photograph	11.13	
S0120655		1.12	10	0	3	Aerial Photograph	11.12	
S0110225	WANDILO NFR	0.84	10	0.25	1	Field Survey	11.09	
S0112301	AUSPINE - CHEVRON DOWNS	0.58	10	0.5	3	Aerial Photograph	11.08	
S0110453	BOOL LAGOON / HACKS LAGOON	0.83	10	0.25	2	Field Survey	11.08	
S0110653	DISMAL SWAMP	1.06	10	0	1	Field Survey	11.06	
S0113849	LAKE MCINTYRE	0.80	10	0.25	18	Aerial Photograph	11.05	
S0112558	TIMOTHY SWAMP	1.04	10	0	1	Aerial Photograph	11.04	
S0110904	LONGS C	0.03	10	1	1	Field Survey	11.03	
S0110509	BOOL LAGOON	1.02	10	0	1	Field Survey	11.02	
S0110858		1.01	10	0	1	Field Survey	11.01	
S0110646	HACKET HILL NFR	0.00	10	1	7	Field Survey	11.00	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0116934		1.00	10	0	4	Aerial Photograph	11.00	Moderate
S0110748	KANGAROO FLAT	0.74	10	0.25	1	Field Survey	10.99	
S0109472	MAE-BURNE	0.95	10	0	1	Aerial Photograph	10.95	
S0110476		0.95	10	0	1	Field Survey	10.95	
S0105784	GALPIN SWAMP	0.69	10	0.25	1	Aerial Photograph	10.94	
S0108056		0.94	10	0	1	Field Survey	10.94	
S0110689	DISMAL SWAMP	0.69	10	0.25	1	Field Survey	10.94	
S0109353	GREENVIEW	0.93	10	0	1	Aerial Photograph	10.93	
S0110637	PALTRIDGE SWAMPS	0.64	10	0.25	1	Field Survey	10.89	
S0109951	ALLAMBI	0.88	10	0	1	Aerial Photograph	10.88	
S0110560	GRANTS SWAMP	0.86	10	0	1	Field Survey	10.86	
S0121478	MT LYON LF	0.10	10	0.75	2	Field Survey	10.85	
S0113997	PENOLA ROAD LF	0.85	10	0	2	Aerial Photograph	10.85	
S0110906	LONGS D	0.09	10	0.75	1	Field Survey	10.84	
S0109727	TREVINCE	0.82	10	0	1	Aerial Photograph	10.82	
S0106938		0.81	10	0	1	Aerial Photograph	10.81	
S0108396		0.81	10	0	1	Aerial Photograph	10.81	
S0110694	DISMAL SWAMP	0.79	10	0	1	Field Survey	10.79	
S0108870	ABERDARE	0.78	10	0	1	Aerial Photograph	10.78	
S0107446	ISLAND SWAMP LF	0.53	10	0.25	1	Aerial Photograph	10.78	
S0120479	MAAOUPE	0.78	10	0	1	Aerial Photograph	10.78	
S0102537		0.51	10	0.25	1	Field Survey	10.76	
S0107298	HEMMINGS LF	0.75	10	0	1	Aerial Photograph	10.75	
S0107063		0.75	10	0	1	Aerial Photograph	10.75	
S0115792	PENOLA FOREST	0.72	10	0	1	Aerial Photograph	10.72	
S0115039	LACHEN STATION	0.22	10	0.5	4	Aerial Photograph	10.72	
S0110926	WOOLAWAY	0.70	10	0	1	Aerial Photograph	10.70	
S0107711	PALTRIDGE SWAMPS	0.68	10	0	2	Aerial Photograph	10.68	
S0115886	WILDERNESS LF	0.42	10	0.25	1	Aerial Photograph	10.67	
S0110558	GRANTS SWAMP	0.66	10	0	1	Field Survey	10.66	
S0120457	WANDILLO	0.66	10	0	1	Aerial Photograph	10.66	
S0101696	MACKERETH	0.66	10	0	1	Field Survey	10.66	
S0109433	GREENVIEW	0.40	10	0.25	1	Aerial Photograph	10.65	
S0110793	HONAN NFR	0.65	10	0	1	Aerial Photograph	10.65	
S0107946	STIRLING	0.14	10	0.5	1	Aerial Photograph	10.64	
S0110776	HONAN NFR	0.62	10	0	3	Field Survey	10.62	
S0106829	OLD WASHPOOL SWAMP	0.37	10	0.25	1	Field Survey	10.62	
S0110662	HACKET HILL NFR	0.36	10	0.25	1	Field Survey	10.61	
S0110855	DISMAL SWAMP	0.59	10	0	1	Field Survey	10.59	
S0112471	COOLOOLIE	0.56	10	0	1	Aerial Photograph	10.56	
S0108258	SAMS FOREST RESERVE	0.55	10	0	3	Aerial Photograph	10.55	
S0110671	HACKET HILL NFR	0.00	10	0.5	1	Field Survey	10.50	
S0110724	HONAN NFR	0.00	10	0.5	1	Field Survey	10.50	
S0112232	AUSPINE - NANGWARRY NORTH	0.00	10	0.5	1	Aerial Photograph	10.50	
S0110721	GRUNDY LANE NFR	0.00	10	0.5	2	Field Survey	10.50	
S0106491	MIDLAND PARK	0.21	10	0.25	1	Aerial Photograph	10.46	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0106362	YEATES LF	0.46	10	0	1	Aerial Photograph	10.46	Moderate
S0114765	PENOLA FOREST	0.44	10	0	10	Aerial Photograph	10.44	
S0110568	HACKET HILL NFR	0.44	10	0	2	Field Survey	10.44	
S0105716	TARINGA	0.16	10	0.25	1	Field Survey	10.41	
S0108043	LAKE CHARRA	0.38	10	0	1	Field Survey	10.38	
S0110651	HACKET HILL NFR	0.33	10	0	2	Field Survey	10.33	
S0110943	MACKERETH HOUSE SWAMP	0.07	10	0.25	1	Field Survey	10.32	
S0113326	KOOMA	0.31	10	0	1	Aerial Photograph	10.31	
S0106506	INVERLOCH	0.04	10	0.25	2	Aerial Photograph	10.29	
S0101785	BEACHPORT	0.28	10	0	1	Aerial Photograph	10.28	
S0108215	RULE SWAMP	0.26	10	0	1	Field Survey	10.26	
S0110650	HACKET HILL NFR	0.25	10	0	2	Field Survey	10.25	
S0110705	WOOLWASH	0.00	10	0.25	1	Field Survey	10.25	
S0116248	BOONDEROO	0.00	10	0.25	2	Aerial Photograph	10.25	
S0119834		0.00	10	0.25	4	Aerial Photograph	10.25	
S0120721		0.00	10	0.25	2	Aerial Photograph	10.25	
S0121512	WILKES POND	0.00	10	0.25	1	Aerial Photograph	10.25	
S0121515	Dead Pond	0.00	10	0.25	1	Aerial Photograph	10.25	
S0110669	HACKET HILL NFR	0.00	10	0.25	1	Field Survey	10.25	
S0108422	LAKE ROBE GAME RESERVE PERIPHERAL	0.17	10	0	1	Field Survey	10.17	
S0107504	THE MARSHES	0.16	10	0	1	Aerial Photograph	10.16	
S0110208	HACKET HILL NFR	0.12	10	0	1	Field Survey	10.12	
S0102667		0.07	10	0	1	Aerial Photograph	10.07	
S0109546	NETHERLEY	0.06	10	0	3	Aerial Photograph	10.06	
S0107066	LITTLE BLUE LAKE	0.01	10	0	1	Aerial Photograph	10.01	
S0110640	HACKET HILL NFR	0.00	10	0	1	Field Survey	10.00	
S0110642	HACKET HILL NFR	0.00	10	0	1	Field Survey	10.00	
S0110643	HACKET HILL NFR	0.00	10	0	1	Field Survey	10.00	
S0113679	GLENCOE	0.00	10	0	1	Aerial Photograph	10.00	
S0114317	MT GAMBIER FOREST	0.00	10	0	1	Aerial Photograph	10.00	
S0114959	WINTERFIELD CREEK	0.00	10	0	2	Field Survey	10.00	
S0107024	RIDDOCH BAY	2.16	5	2.25	10	Aerial Photograph	9.41	Low
S0109067		0.76	5	3.5	8	Aerial Photograph	9.26	
S0107321		1.69	5	2.5	6	Aerial Photograph	9.19	
S0108706	STRATMAN POND	2.87	5	1.25	4	Aerial Photograph	9.12	
S0108505		1.88	5	1.5	5	Aerial Photograph	8.38	
S0105894		2.78	5	0.5	4	Aerial Photograph	8.28	
S0108657	KAY SWAMP	2.52	5	0.75	6	Aerial Photograph	8.27	
S0120644	WESTVALE	2.01	5	1.25	1	Aerial Photograph	8.26	
S0115228	DONEGAL	1.34	5	1.75	20	Aerial Photograph	8.09	
S0107542	THE MARSHES	0.00	5	3	38	Aerial Photograph	8.00	
S0109005		1.82	5	1	8	Aerial Photograph	7.82	
S0105703		0.51	5	2.25	46	Aerial Photograph	7.76	
S0108054		1.94	5	0.75	4	Aerial Photograph	7.69	
S0115271	THE OAK FOLAND	1.98	5	0.5	1	Aerial Photograph	7.48	
S0110575		1.62	5	0.75	3	Aerial Photograph	7.37	
S0114974		2.08	5	0.25	4	Aerial Photograph	7.33	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0114972		0.57	5	1.75	2	Aerial Photograph	7.32	Low
S0106098	STILL WATERS	2.06	5	0.25	6	Aerial Photograph	7.31	
S0102535		2.28	5	0	1	Aerial Photograph	7.28	
S0106437	THE LONG SWAMP	2.28	5	0	3	Aerial Photograph	7.28	
S0106539	MACKINNON SWAMP	2.18	5	0	1	Aerial Photograph	7.18	
S0115069	AVONDALE	1.92	5	0.25	2	Aerial Photograph	7.17	
S0108942		1.61	5	0.5	7	Aerial Photograph	7.11	
S0120576	ANDABAGO	2.11	5	0	1	Aerial Photograph	7.11	
S0113808		2.09	5	0	2	Aerial Photograph	7.09	
S0105544	SWANLEY	1.41	5	0.5	1	Aerial Photograph	6.91	
S0108751		1.64	5	0.25	9	Aerial Photograph	6.89	
S0110058		1.87	5	0	1	Aerial Photograph	6.87	
S0102199	LANGKYNE	1.85	5	0	1	Aerial Photograph	6.85	
S0110079		1.81	5	0	1	Aerial Photograph	6.81	
S0105776	TERINGA	1.80	5	0	3	Aerial Photograph	6.80	
S0106858	GERMAN FLAT	1.53	5	0.25	1	Field Survey	6.78	
S0102186	LANGKYNE	1.78	5	0	1	Aerial Photograph	6.78	
S0121490	LAKE WANWARRIE	1.28	5	0.5	2	Field Survey	6.78	
S0109627		1.77	5	0	1	Aerial Photograph	6.77	
S0110693	DISMAL SWAMP	1.76	5	0	1	Aerial Photograph	6.76	
S0107042		1.74	5	0	1	Aerial Photograph	6.74	
S0113853		1.71	5	0	2	Aerial Photograph	6.71	
S0105880	TRIHI	1.71	5	0	1	Aerial Photograph	6.71	
S0107404	AKOOLYA SWAMP	1.42	5	0.25	1	Aerial Photograph	6.67	
S0105381	MANGA	1.39	5	0.25	2	Aerial Photograph	6.64	
S0108356	KARINGAL	1.64	5	0	1	Aerial Photograph	6.64	
S0101702		1.60	5	0	6	Aerial Photograph	6.60	
S0113857		1.56	5	0	1	Aerial Photograph	6.56	
S0114177	DISMAL DOWNS	1.53	5	0	1	Aerial Photograph	6.53	
S0113802	SEBASTOPOL SPRINGS	1.28	5	0.25	1	Aerial Photograph	6.53	
S0115276	PENOLA STATION	1.25	5	0.25	1	Aerial Photograph	6.50	
S0110745	DISMAL SWAMP	0.00	5	1.5	31	Field Survey	6.50	
S0106498	GLENBROOK	1.49	5	0	1	Aerial Photograph	6.49	
S0109992	UNDOOLYA PARK	1.48	5	0	3	Aerial Photograph	6.48	
S0106549	GLENBROOK	1.47	5	0	2	Aerial Photograph	6.47	
S0121491		0.95	5	0.5	1	Aerial Photograph	6.45	
S0110426	COPPINGS SWAMP	1.45	5	0	7	Field Survey	6.45	
S0106929		1.43	5	0	1	Aerial Photograph	6.43	
S0114984	JERUSALEM CREEK WETLAND	1.42	5	0	1	Aerial Photograph	6.42	
S0108068		1.41	5	0	1	Aerial Photograph	6.41	
S0102056		1.40	5	0	1	Aerial Photograph	6.40	
S0120532	ISLAND SWAMP	1.14	5	0.25	1	Field Survey	6.39	
S0108962		1.38	5	0	1	Aerial Photograph	6.38	
S0101788	WATER RESERVE N0. 2	1.37	5	0	1	Field Survey	6.37	
S0108955		1.36	5	0	1	Aerial Photograph	6.36	
S0106594	MACKINNON SWAMP	1.35	5	0	1	Aerial Photograph	6.35	
S0114280	HACKET HILL NFR	1.10	5	0.25	1	Aerial Photograph	6.35	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0107034		1.33	5	0	1	Aerial Photograph	6.33	Low
S0108044		1.32	5	0	1	Aerial Photograph	6.32	
S0109277	LEICESTER PARK	1.31	5	0	2	Aerial Photograph	6.31	
S0115065	AVONDALE	0.80	5	0.5	1	Aerial Photograph	6.30	
S0113941	BORDERLANDS	1.27	5	0	1	Aerial Photograph	6.27	
S0108772		0.26	5	1	3	Aerial Photograph	6.26	
S0107585	BRAKEPOLE MARSH	1.25	5	0	1	Aerial Photograph	6.25	
S0108383		0.00	5	1.25	47	Aerial Photograph	6.25	
S0116944		1.24	5	0	6	Aerial Photograph	6.24	
S0110716	DISMAL SWAMP	1.24	5	0	1	Field Survey	6.24	
S0106138	COOMOOROO	0.97	5	0.25	1	Aerial Photograph	6.22	
S0109625		1.22	5	0	1	Aerial Photograph	6.22	
S0102036		0.96	5	0.25	7	Aerial Photograph	6.21	
S0110715	DISMAL SWAMP	0.95	5	0.25	11	Aerial Photograph	6.20	
S0119968	ROSSMORE	1.18	5	0	1	Aerial Photograph	6.18	
S0120628	PLANA	1.17	5	0	2	Aerial Photograph	6.17	
S0110020	GEANNA	1.16	5	0	1	Aerial Photograph	6.16	
S0109208	ALLEENA	1.16	5	0	1	Aerial Photograph	6.16	
S0110245	MAAOUPE	1.15	5	0	2	Aerial Photograph	6.15	
S0108391		1.15	5	0	1	Aerial Photograph	6.15	
S0108069	KARALEE	1.13	5	0	3	Aerial Photograph	6.13	
S0110031	WARRA-MURRA	0.63	5	0.5	1	Aerial Photograph	6.13	
S0108656		1.11	5	0	1	Aerial Photograph	6.11	
S0120617	GREENVIEW	1.10	5	0	1	Aerial Photograph	6.10	
S0110708	DISMAL SWAMP	1.10	5	0	1	Aerial Photograph	6.10	
S0110430	ROUND SWAMP	1.09	5	0	1	Aerial Photograph	6.09	
S0108862		1.09	5	0	1	Aerial Photograph	6.09	
S0110419	COPPINGS SWAMP	1.08	5	0	1	Field Survey	6.08	
S0118188	PENOLA STATION	1.07	5	0	1	Aerial Photograph	6.07	
S0102544		0.82	5	0.25	1	Aerial Photograph	6.07	
S0109740	DEADMAN SWAMP	1.06	5	0	1	Aerial Photograph	6.06	
S0110688	DISMAL SWAMP	1.04	5	0	1	Field Survey	6.04	
S0107790	PLEASANT PARK	1.04	5	0	1	Aerial Photograph	6.04	
S0108052		1.03	5	0	1	Aerial Photograph	6.03	
S0115026	LACHEN STATION	1.01	5	0	1	Aerial Photograph	6.01	
S0107538	THE MARSHES	1.00	5	0	1	Aerial Photograph	6.00	
S0109674	PENOLA STATION	0.98	5	0	4	Aerial Photograph	5.98	
S0102040		0.97	5	0	1	Aerial Photograph	5.97	
S0110863	CARUNGWINNA SWAMP	0.96	5	0	1	Aerial Photograph	5.96	
S0109670	PENOLA STATION	0.96	5	0	1	Aerial Photograph	5.96	
S0108799	ST HELENA SWAMP	0.94	5	0	2	Aerial Photograph	5.94	
S0114973		0.93	5	0	1	Aerial Photograph	5.93	
S0120741	NANGKITA	0.67	5	0.25	5	Field Survey	5.92	
S0105694	POOLNA SPRING	0.65	5	0.25	1	Aerial Photograph	5.90	
S0119790		0.89	5	0	1	Aerial Photograph	5.89	
S0105737		0.87	5	0	6	Aerial Photograph	5.87	
S0109547	WOODLEIGH PARK	0.61	5	0.25	3	Aerial Photograph	5.86	
S0115300	DISMAL SWAMP	0.86	5	0	1	Aerial Photograph	5.86	
S0110852	DISMAL SWAMP	0.61	5	0.25	1	Aerial Photograph	5.86	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0119172	BULL ISLAND	0.84	5	0	1	Aerial Photograph	5.84	Low
S0110244		0.83	5	0	2	Aerial Photograph	5.83	
S0119948	AVONLEA	0.83	5	0	1	Aerial Photograph	5.83	
S0108691		0.83	5	0	1	Aerial Photograph	5.83	
S0115438	SUNNYMEADE	0.83	5	0	1	Aerial Photograph	5.83	
S0109092		0.83	5	0	1	Aerial Photograph	5.83	
S0110127	PIC PONDS AREA	0.82	5	0	1	Aerial Photograph	5.82	
S0116039	GLENRISE	0.82	5	0	1	Aerial Photograph	5.82	
S0110514	BOOL LAGOON	0.81	5	0	1	Field Survey	5.81	
S0114205	HACKET HILL NFR	0.77	5	0	1	Aerial Photograph	5.77	
S0105388	CHETWYND	0.51	5	0.25	2	Aerial Photograph	5.76	
S0107478	THE MARSHES	0.25	5	0.5	1	Aerial Photograph	5.75	
S0114985		0.74	5	0	1	Aerial Photograph	5.74	
S0109449	RACKHAMS	0.74	5	0	1	Aerial Photograph	5.74	
S0106953	BROWNE LAKE	0.48	5	0.25	13	Aerial Photograph	5.73	
S0119180	TIBOOROO	0.23	5	0.5	1	Aerial Photograph	5.73	
S0114969	WINTERFIELD CREEK	0.72	5	0	1	Field Survey	5.72	
S0106310	MORGEN	0.70	5	0	2	Aerial Photograph	5.70	
S0110512	BOOL LAGOON	0.70	5	0	1	Field Survey	5.70	
S0116913		0.45	5	0.25	2	Aerial Photograph	5.70	
S0109286	LEICESTER PARK	0.17	5	0.5	1	Aerial Photograph	5.67	
S0110432	HOUSE SWAMP	0.65	5	0	1	Field Survey	5.65	
S0120286	REEDY CREEK	0.61	5	0	1	Aerial Photograph	5.61	
S0109171	BIMBRIMBIE	0.61	5	0	1	Aerial Photograph	5.61	
S0115115	AVONDALE	0.60	5	0	1	Aerial Photograph	5.60	
S0109136		0.60	5	0	1	Aerial Photograph	5.60	
S0106561	GLENBROOK	0.59	5	0	1	Aerial Photograph	5.59	
S0102044		0.58	5	0	5	Aerial Photograph	5.58	
S0119930	CHETWYND	0.58	5	0	1	Aerial Photograph	5.58	
S0108076		0.56	5	0	1	Aerial Photograph	5.56	
S0110722	DISMAL SWAMP	0.55	5	0	1	Field Survey	5.55	
S0108463	LAKE ROBE GAME RESERVE PERIPHERAL	0.54	5	0	3	Aerial Photograph	5.54	
S0107788	PLEASANT PARK	0.54	5	0	1	Field Survey	5.54	
S0109375	WOOMERA	0.53	5	0	1	Aerial Photograph	5.53	
S0107516	THE MARSHES	0.52	5	0	2	Aerial Photograph	5.52	
S0107188	TEA TREE SWAMP	0.26	5	0.25	2	Aerial Photograph	5.51	
S0108667		0.51	5	0	3	Aerial Photograph	5.51	
S0107810	GLENHAVEN	0.24	5	0.25	2	Aerial Photograph	5.49	
S0114857	ECHO VALLEY	0.46	5	0	1	Aerial Photograph	5.46	
S0110336	REEDY CREEK	0.44	5	0	1	Aerial Photograph	5.44	
S0106276	COOMOOROO	0.44	5	0	1	Aerial Photograph	5.44	
S0110866	DISMAL SWAMP	0.42	5	0	1	Field Survey	5.42	
S0109405		0.40	5	0	1	Aerial Photograph	5.40	
S0107975	WALNAMERE	0.37	5	0	3	Aerial Photograph	5.37	
S0112897	TALLALA	0.36	5	0	3	Aerial Photograph	5.36	
S0106351	GLENBROOK	0.35	5	0	1	Aerial Photograph	5.35	
S0116238	ABERDARE	0.35	5	0	1	Aerial Photograph	5.35	
S0119218	RUTLEIGH	0.33	5	0	1	Aerial Photograph	5.33	

Wetland ID	Name	Area Score	Condition Score	Threatened Species Score	Number of Surveys	Method Used to Determine Condition	BCV Score	BCV Class
S0114192	DISMAL DOWNS	0.28	5	0	1	Aerial Photograph	5.28	Low
S0105406	GUNGA-DIN	0.26	5	0	1	Aerial Photograph	5.26	
S0105500	WATTLE PARK	0.00	5	0.25	1	Aerial Photograph	5.25	
S0106934	BROWNES LAKE	0.00	5	0.25	13	Aerial Photograph	5.25	
S0113627	GLENCOE FOREST	0.00	5	0.25	2	Aerial Photograph	5.25	
S0114867	ECHO VALLEY	0.00	5	0.25	1	Aerial Photograph	5.25	
S0118002	GEANNA	0.00	5	0.25	1	Aerial Photograph	5.25	
S0119966	ROSSMORE	0.00	5	0.25	2	Aerial Photograph	5.25	
S0101794	THE GUMS	0.24	5	0	1	Aerial Photograph	5.24	
S0106258	ANNAN	0.20	5	0	1	Aerial Photograph	5.20	
S0107115	BORDERLANDS	0.18	5	0	1	Aerial Photograph	5.18	
S0120585	KAILLARNEY	0.13	5	0	1	Aerial Photograph	5.13	
S0110884		0.11	5	0	1	Aerial Photograph	5.11	
S0119801		0.08	5	0	1	Aerial Photograph	5.08	
S0107965		0.06	5	0	1	Aerial Photograph	5.06	
S0105609	STILL WATERS	0.04	5	0	1	Aerial Photograph	5.04	
S0108411	STIRLING	0.02	5	0	3	Aerial Photograph	5.02	
S0106603	ARGYLL	0.00	5	0	1	Aerial Photograph	5.00	
S0109715	SPION KOP	0.00	5	0	2	Aerial Photograph	5.00	
S0113698	MT BURR	0.00	5	0	1	Aerial Photograph	5.00	
S0113983	MT GAMBIER FOREST	0.00	5	0	1	Aerial Photograph	5.00	
S0115150	RONELSIANDE	0.00	5	0	1	Aerial Photograph	5.00	
S0115319	DISMAL SWAMP	0.00	5	0	1	Aerial Photograph	5.00	
S0118071	COMAUM FOREST	0.00	5	0	1	Aerial Photograph	5.00	
S0119803	KOOMA	0.00	5	0	1	Aerial Photograph	5.00	
S0120048		0.00	5	0	1	Aerial Photograph	5.00	
S0120773		0.00	5	0	1	Aerial Photograph	5.00	
S0114987	JERUSALEM CREEK WETLAND	1.91	0	2.75	8	Aerial Photograph	4.66	
S0107049		1.02	0	1	1	Aerial Photograph	2.02	
S0110697	DISMAL SWAMP	1.81	0	0	1	Field Survey	1.81	
S0110690	BRAKEPOLE MARSH	1.51	0	0	1	Aerial Photograph	1.51	
S0110636	MINGBOOL SWAMP	1.37	0	0	1	Field Survey	1.37	
S0110652	PLEASANT PARK	1.23	0	0	1	Field Survey	1.23	
S0109194	SAWPIT SWAMP	1.22	0	0	1	Aerial Photograph	1.22	
S0102216	DINE SWAMP	1.22	0	0	1	Aerial Photograph	1.22	
S0120078	HILLSIDE	0.85	0	0.25	3	Aerial Photograph	1.10	
S0110699	DISMAL SWAMP	0.99	0	0	1	Field Survey	0.99	
S0113370	MT GAMBIER FOREST	0.70	0	0.25	4	Aerial Photograph	0.95	
S0107704	DISMAL SWAMP	0.67	0	0.25	1	Field Survey	0.92	
S0110695	DISMAL SWAMP	0.83	0	0	1	Field Survey	0.83	
S0114924		0.82	0	0	2	Aerial Photograph	0.82	
S0102171	STUNTILES	0.60	0	0	1	Aerial Photograph	0.60	
S0107553		0.57	0	0	1	Aerial Photograph	0.57	
S0110331	KILLANOOLA	0.33	0	0	1	Aerial Photograph	0.33	
S0112474	COOLOOLIE	0.00	0	0	1	Aerial Photograph	0.00	
S0115650	INVERLOCH	0.00	0	0	1	Aerial Photograph	0.00	

APPENDIX 5 – LSE Wetland Significance

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Internationally Significant	Bool and Hacks Lagoon	S0108158 S0109071 S0110430 S0110432 S0110443 S0110446 S0110473 S0110476 S0110507 S0110509 S0110512 S0110514 S0110991 S0116904 S0116905 S0116934 S0116935 S0120842	Ramsar listed (Criteria 1,2,3,4,5,6,7 and 8) DIWA listed (Criteria 1, 2, 3, 4, 6)	Game Reserve, Conservation Park
	Lake George	S0101818	East Asian-Australasian Flyway network nomination progressing (Criterion 2) DIWA listed (Criteria 1,3,6)	Unallotted Crown land
	Piccaninnie System	S0101060 S0107026 S0107022 S0110343	**Recommended for Ramsar nomination** **(Criteria 1,2,3,4,7,8)** DIWA listed (Criteria 1,5,6)	Conservation Park Unallotted Crown land
	Lake Hawdon South	S0108314	**Recommended for Ramsar nomination** **(Criteria 1,2,3,4,6)**	Unalloted Crown land **Proclamation as a Conservation Park pending**
Nationally Significant	All of the above wetlands plus:			
	Big Heath	S0120855	**Recommended for DIWA nomination** **(Criteria 1,2,5)**	Conservation Park
	Lake Hawdon North	S0109028	**Recommended for DIWA nomination** **(Criteria 1,2,3,5)**	Unallotted Crown Land
	Penola Conservation Park	S0110576 S0110581 S0110629 S0120241	**Recommended for DIWA nomination** **(Criteria 1,5)**	Conservation Park
	Butchers and Salt Lakes	S0100098 S0110344 S0120240 S0120280 S0120846 S0116936 S0120238	DIWA listed (Criteria 1,3,5)	Conservation Park Private Ownership
	Hog Lake	S0120847 S0120237	**Recommended for DIWA nomination** **(Criteria 1,3,5)**	Private Ownership
	Deadmans Swamp	S0110521 S0120246	DIWA listed (Criteria 1,3)	ForestrySA Native Forest Reserve
	Ewens Ponds	S0120854	DIWA listed (Criteria 1,5,6)	Conservation Park
	Honans NFR	S0110014	DIWA listed	ForestrySA Native Forest

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Nationally Significant		S0110538	(Criteria 1,5)	Reserve
		S0110561		
		S0110562		
		S0110564		
		S0110565		
		S0110566		
		S0110567		
		S0110724		
		S0110726		
		S0110729		
		S0110732		
		S0110733		
		S0110734		
		S0110735		
		S0110739		
		S0110742		
		S0110743		
		S0110744		
		S0110746		
		S0110749		
		S0110750		
		S0110752		
		S0110755		
		S0110756		
		S0110757		
		S0110758		
		S0110760		
		S0110761		
		S0110763		
		S0110764		
		S0110765		
		S0110766		
		S0110767		
		S0110769		
		S0110771		
		S0110772		
		S0110773		
		S0110774		
		S0110775		
		S0110776		
		S0110787		
		S0110788		
		S0110789		
		S0110790		
		S0110791		
		S0110794		
		S0110795		
		S0110796		
		S0110797		
		S0110802		
		S0110803		
		S0110808		
		S0110809		
		S0110810		
		S0110811		
		S0110812		
		S0110813		
		S0110814		
		S0110815		
		S0110816		
		S0110817		
		S0110818		
		S0110820		
		S0110825		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Nationally Significant		S0110826 S0110827 S0110828 S0110829 S0110871 S0110963 S0120212 S0120800		
	Lake Frome and Mullins Swamp	S0105592 S0105943	DIWA listed (Criteria 1,2,3)	Private Ownership Conservation Park
	The Marshes NFR	S0107240 S0107267 S0107273 S0107281 S0107299 S0107304 S0107367 S0107373 S0107493 S0107493 S0107498 S0110265 S0110503 S0110504 S0110505 S0110506 S0110522 S0110523 S0110524 S0110525 S0110526 S0110527 S0110528 S0110529 S0110530 S0110531 S0110532 S0110541 S0110542 S0110543 S0110544 S0110545 S0110546 S0110547 S0110548 S0110549 S0110550 S0110578 S0110579 S0110580 S0110582 S0110583 S0110588 S0110589 S0110590 S0110591 S0110592 S0110593 S0110594 S0110595 S0110596 S0110597	DIWA listed (Criteria 1,3,5)	ForestrySA Native Forest Reserve

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Nationally Significant		S0110598 S0110602 S0110603 S0110604 S0110605 S0110606 S0110607 S0110608 S0110609 S0110610 S0110611 S0110612 S0110613 S0110614 S0110615 S0110616 S0110617 S0110619 S0110621 S0120224 S0120245 S0120247 S0120449 S0120451 S0120864		
	South East Coastal Salt Lakes	S0108357 S0110534 S0108474 S0110563 S0109691 S0106227	DIWA listed (Criteria 1,3,6) **Recommended for DIWA nomination** **(Criteria 1,3,6)**	Game Reserve Unallotted Crown Land Conservation Park
State Significant	All of the above wetlands plus:			
	MT LYON LF	S0110634		
	BIG DIP LAKE	S0120244		
	HACKET HILL NFR	S0110661		
	POOL OF SILOAM	S0101778 S0105778		
	OLD WOOLWASH	S0120251		
	OLD WOOLWASH	S0110373		
	MT LYON LF	S0110632		
	OLD WOOLWASH	S0106799		
	GHOST LAKE	S0110539		
	WHENNAN NFR	S0110500		
	FRESH DIP LAKE	S0108264		
	GRUNDY LANE NFR	S0110703 S0108290		
	MT MCINTYRE NFR	S0110599		
	HACKET HILL NFR	S0110648		
	HACKET HILL NFR	S0110677		
	LITTLE DIP LAKE	S0108280		
	HACKET HILL NFR	S0110639 S0108304		
	OLD WOOLWASH	S0110377		
	LONGS NFR	S0106317		
	OLD WOOLWASH	S0110371		
	OLD WOOLWASH	S0106778		
	SEA LAKE	S0109690		
	GRUNDY LANE NFR	S0110998		
	HACKET HILL NFR	S0110659		
	HACKET HILL NFR	S0110554		
	HACKET HILL NFR	S0110667		
	WANDILLO / THREE CHAIN RD	S0110920		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
State Significant	LAKE BONNEY S.E.	S0121483		
	BOUCHIES LAKE	S0109688		
	GRUNDY LANE NFR	S0110913		
	BUCKS LAKE	S0107060		
	GRUNDY LANE NFR	S0110912		
	PERCH HOLE	S0109973		
	WHENNAN NFR	S0110499		
	GRUNDY LANE NFR	S0110717		
	WANDILO NFR	S0110680		
	GRUNDY LANE NFR	S0110718		
	BLACKFELLOWS CAVE WETLAND	S0107045		
		S0108578		
		S0113806		
	PICK SWAMP	S0110343		
	TOPPERWEIN NFR	S0105797		
	LAKE FELLMONGERY	S0110497		
	DIAGONAL ROAD	S0110759		
	GORDON LAGOON	S0110533		
	MARY SEYMOUR CONSERVATION PARK	S0120859		
	BLACKFELLOWS CAVE WETLAND	S0107079		
	TELFORD SCRUB CP	S0106808		
	MARY SEYMOUR CONSERVATION PARK	S0116933		
		S0107062		
		S0116890		
		S0113840		
	HORSESHOE PADDOCK	S0120851		
	CLAYPANS	S0110945		
		S0107056		
	MCINNES WETLAND	S0108757		
		S0116900		
	KATANI PARK WETLAND	S0101999		
	HORSESHOE PADDOCK	S0110997		
		S0107052		
	NANGWARRY NFR	S0115665		
	TRIAL WATERHOLE	S0110601		
	CLAYPANS	S0110947		
		S0108952		
	WOAKWINE CR	S0108479		
	THE EVERGLADES	S0110944		
	GLENELG RIVER	S0120253		
	MT MCINTYRE NFR	S0110600		
		S0114971		
	BLUE LAKE	S0106954		
		S0107313		
	SHEEPWASH SWAMP	S0110108		
		S0120659		
	BURKS ISLAND - WEST	S0106202		
	KANGAROO FLAT	S0110737		
	REEDY CREEK LF	S0120856		
	LAKE NUNAN	S0108130		
	LONGS NFR	S0110394		
	ISLAND SWAMP LF	S0121485		
	CRESS CREEK SPRING	S0114982		
	CLAYPANS EAST	S0110901		
		S0114945		
	PENOLA FOREST	S0114763		
	KANGAROO FLAT	S0110740		
	JERUSALEM CREEK SPRING	S0114989		
	HILLVIEW	S0117807		
	MONBULLA	S0109485		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
State Significant	MCROSTIES NFR	S0113560		
	KANGAROO FLAT	S0110702		
	LAKE BATTYE	S0107937		
	WHENNAN NFR	S0110291		
		S0107058		
	HACKET HILL NFR	S0110664		
	OSCHAR SWAMP	S0110925		
	KANGAROO FLAT	S0110731		
	LOWAN LANE LF	S0115817		
	MT LYON LF	S0110635		
	KANGAROO FLAT	S0110848		
	DISMAL SWAMP	S0120841		
	LAKE FOX	S0108154		
	TOPPERWEIN NFR	S0120858		
	MT LYON LF	S0110630		
	HACKET HILL NFR	S0110672		
		S0108849		
	MT LYON LF	S0110627		
	HACKET HILL NFR	S0110656		
	LONGS NFR	S0110903		
	THE PUB LAKE	S0108171		
	HACKET HILL NFR	S0120486		
	KARINYA	S0109883		
	WOOLWASH C	S0110919		
	WANDILO NFR	S0110679		
	LAKE AMY	S0110536		
	RULE SWAMP	S0108211		
	Spencers Pond	S0121513		
	WHENNAN NFR	S0110272		
	WANDILO NFR	S0110251		
	COMAUM FOREST	S0120643		
	GOOSE NECK SWAMP	S0107894		
		S0110857		
	HILLVIEW	S0117816		
	HACKET HILL NFR	S0110647		
	HACKET HILL NFR	S0110655		
	LONGS NFR	S0110905		
	PLEASANT PARK	S0107805		
	KANGAROO FLAT	S0120824		
	HACKET HILL NFR	S0110668		
	MT LYON LF	S0110626		
	MT LYON LF	S0110631		
		S0114903		
	WANDILLO / THREE CHAIN RD	S0110922		
		S0108866		
	DIAGONAL ROAD	S0120605		
	Bones Pond	S0121514		
		S0107043		
	HACKET HILL NFR	S0110670		
	KANGAROO FLAT	S0110878		
	WANDILO NFR	S0110682		
	GRUNDYS WOODLANDS	S0110704		
	HACKET HILL NFR	S0110654		
	HACKET HILL NFR	S0110676		
	WANDILO NFR	S0110243		
	HACKETS HILL WOODLAND	S0107822		
	HACKET HILL NFR	S0110666		
	All of the above wetlands plus:			
	SEWCDB SWAMP	S0110923		
	THE MARSHES	S0107479		
	NENE VALLEY	S0114963		
	GRUNDY LANE NFR	S0110719		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Regionally Significant	KANGAROO FLAT	S0110849		
	THE MARSHES	S0110261		
	LAKE GEORGE GAME RESERVE PERIPHERAL	S0110930		
	KANGAROO FLAT	S0110843		
		S0109731		
	WHENNAN NFR	S0110274		
	HACKET HILL NFR	S0110641		
	HACKET HILL NFR	S0110657		
	HACKET HILL NFR	S0110673		
	GRUNDY LANE NFR	S0110714		
	HACKET HILL NFR	S0120276		
	TELFORD SCRUB CP	S0114400		
	HACKET HILL NFR	S0120492		
	TELFORD SCRUB CP	S0114397		
	THE MARSHES	S0110544		
	GRUNDY LANE NFR	S0110709		
	GRUNDY LANE NFR	S0110713		
	GRUNDY LANE NFR	S0110720		
	WOOLWASH	S0110938		
	TELFORD SCRUB CP	S0114396		
	SISTERS SINKHOLE	S0121510		
	GOULDENS HOLE	S0121511		
	NENE VALLEY	S0107011		
		S0107013		
	LAKE ORMEROD	S0102176		
	MIDDLE POINT SWAMP	S0107004		
	BURKS ISLAND	S0106076		
	RUSHY SWAMP	S0101959		
	BARNETT ROAD SWAMP	S0120750		
		S0121498		
	GRUB RD	S0107740		
		S0106346		
	BARNETT ROAD SWAMP	S0108727		
	LAKE LEAKE	S0107295		
		S0120227		
		S0105970		
	MARIA CREEK SWAMP	S0108734		
	MOYHALL SWAMP	S0108794		
	WEST OF LAKE HAWDON NORTH	S0108610		
	KALADBRO SWAMP	S0107690		
		S0120652		
	GERMEIN RESERVE	S0107035		
	WINDAMERE	S0109310		
		S0110585		
	CANUNDA FLAT	S0113839		
	LEGOES SWAMP	S0120264		
	KEARNEY LAKE	S0107599		
	DINE SWAMP	S0110366		
	EIGHT MILE CREEK	S0107023		
		S0108901		
		S0107833		
		S0113818		
		S0102800		
	COPPINGS SWAMP	S0110435		
	LAKE EDWARD	S0110625		
	BARNETT ROAD SWAMP	S0108755		
	DEADMANS LF	S0107867		
		S0108514		
		S0110587		
	CONDSIDINE	S0106688		
	WINTERFIELD CREEK	S0114968		
	MANGE SWAMP	S0120744		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Regionally Significant	PENOLA FOREST	S0114813		
		S0110028		
		S0107949		
		S0114954		
	LAKE LEAKE	S0107291		
		S0108779		
		S0110074		
	WHITES FLAT	S0110586		
	DEADMAN SWAMP	S0109696		
		S0110584		
	BACHMANN	S0110540		
		S0108737		
	ARCOONA	S0108213		
		S0101642		
	ST. HELENA SWAMP	S0108805		
	MOCORCO	S0105547		
		S0107036		
		S0107959		
	LAKE ST CLAIR	S0109874		
	BENARA CREEK	S0106925		
	INVERLOCH	S0115657		
	LIONS PARK	S0107021		
	CAT SWAMP	S0110203		
		S0120806		
	REEDY LAGOON	S0106551		
		S0102605		
	WATERHOUSE	S0110556		
	LYNWOOD	S0107552		
	ALLAMBI	S0108263		
	NE LAKE ST CLAIR	S0109818		
	VALLEY LAKE	S0106951		
		S0108998		
	LYNWOOD	S0110674		
		S0114975		
	TEA TREE GULLY	S0120805		
		S0110859		
	PENOLA ROAD LF	S0106897		
	MUNDI-SELKIRK WETLAND	S0120321		
	DISMAL SWAMP	S0110660		
	MT LYON LF	S0110227		
	MT LYON PERCHED SWAMP	S0110628		
	NANGWARRY MILL	S0115825		
	RAMILLIES	S0106486		
		S0108550		
	TILLAR SWAMP	S0105847		
		S0110571		
	MAGPIE SWAMP	S0107625		
	WIRRINGULLA	S0108476		
	LAKE ROBE GAME RESERVE PERIPHERAL	S0108347		
	GREEN SWAMP	S0108342		
		S0120655		
	WANDILO NFR	S0110225		
	AUSPINE - CHEVRON DOWNS	S0112301		
	DISMAL SWAMP	S0110653		
	LAKE MCINTYRE	S0113849		
	TIMOTHY SWAMP	S0112558		
	LONGS C	S0110904		
		S0110858		
	HACKET HILL NFR	S0110646		
		S0116934		
	KANGAROO FLAT	S0110748		
	MAE-BURNE	S0109472		
		S0110476		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Regionally Significant	GALPIN SWAMP	S0105784		
		S0108056		
	DISMAL SWAMP	S0110689		
	GREENVIEW	S0109353		
	PALTRIDGE SWAMPS	S0110637		
	ALLAMBI	S0109951		
	GRANTS SWAMP	S0110560		
	MT LYON LF	S0121478		
	PENOLA ROAD LF	S0113997		
	LONGS D	S0110906		
	TREVINCE	S0109727		
		S0106938		
		S0108396		
	DISMAL SWAMP	S0110694		
	ABERDARE	S0108870		
	ISLAND SWAMP LF	S0107446		
	MAAOUPE	S0120479		
		S0102537		
	HEMMINGS LF	S0107298		
		S0107063		
	PENOLA FOREST	S0115792		
	LACHEN STATION	S0115039		
	WOOLAWAY	S0110926		
	PALTRIDGE SWAMPS	S0107711		
	WILDERNESS LF	S0115886		
	GRANTS SWAMP	S0110558		
	WANDILLO	S0120457		
	MACKERETH	S0101696		
	GREENVIEW	S0109433		
	HONAN NFR	S0110793		
	STIRLING	S0107946		
	OLD WASHPOOL SWAMP	S0106829		
	HACKET HILL NFR	S0110662		
	DISMAL SWAMP	S0110855		
	COOLOOLIE	S0112471		
	SAMS FOREST RESERVE	S0108258		
	HACKET HILL NFR	S0110671		
	AUSPINE - NANGWARRY NORTH	S0112232		
	GRUNDY LANE NFR	S0110721		
	MIDLAND PARK	S0106491		
	YEATES LF	S0106362		
	PENOLA FOREST	S0114765		
	HACKET HILL NFR	S0110568		
	TARINGA	S0105716		
	LAKE CHARRA	S0108043		
	HACKET HILL NFR	S0110651		
	MACKERETH HOUSE SWAMP	S0110943		
	KOOMA	S0113326		
	INVERLOCH	S0106506		
	BEACHPORT	S0101785		
	RULE SWAMP	S0108215		
	HACKET HILL NFR	S0110650		
	WOOLWASH	S0110705		
	BOONDEROO	S0116248		
		S0119834		
		S0120721		
	WILKES POND	S0121512		
	Dead Pond	S0121515		
	HACKET HILL NFR	S0110669		
	LAKE ROBE GAME RESERVE PERIPHERAL	S0108422		
	THE MARSHES	S0107504		
	HACKET HILL NFR	S0110208		

	Wetland/Complex Name	Wetland ID	Official Recognition	Current tenure
Regionally Significant		S0102667		
	NETHERLEY	S0109546		
	LITTLE BLUE LAKE	S0107066		
	HACKET HILL NFR	S0110640		
	HACKET HILL NFR	S0110642		
	HACKET HILL NFR	S0110643		
	GLENCOE	S0113679		
	MT GAMBIER FOREST	S0114317		
	MACKERETH HOUSE SWAMP	S0110943		
	KOOMA	S0113326		
	INVERLOCH	S0106506		
	BEACHPORT	S0101785		
	RULE SWAMP	S0108215		
	WOOLWASH	S0110705		
	BOONDEROO	S0116248		
		S0119834		
		S0120721		
	WILKES POND	S0121512		
	Dead Pond	S0121515		
	HACKET HILL NFR	S0110669		
	LAKE ROBE GAME RESERVE PERIPHERAL	S0108422		
	THE MARSHES	S0107504		
	HACKET HILL NFR	S0110208		
		S0102667		
	NETHERLEY	S0109546		
	LITTLE BLUE LAKE	S0107066		
	HACKET HILL NFR	S0110640		
	HACKET HILL NFR	S0110642		
	HACKET HILL NFR	S0110643		
	GLENCOE	S0113679		
	MT GAMBIER FOREST	S0114317		

APPENDIX 6 – LSE Wetlands of Priority for Field Survey

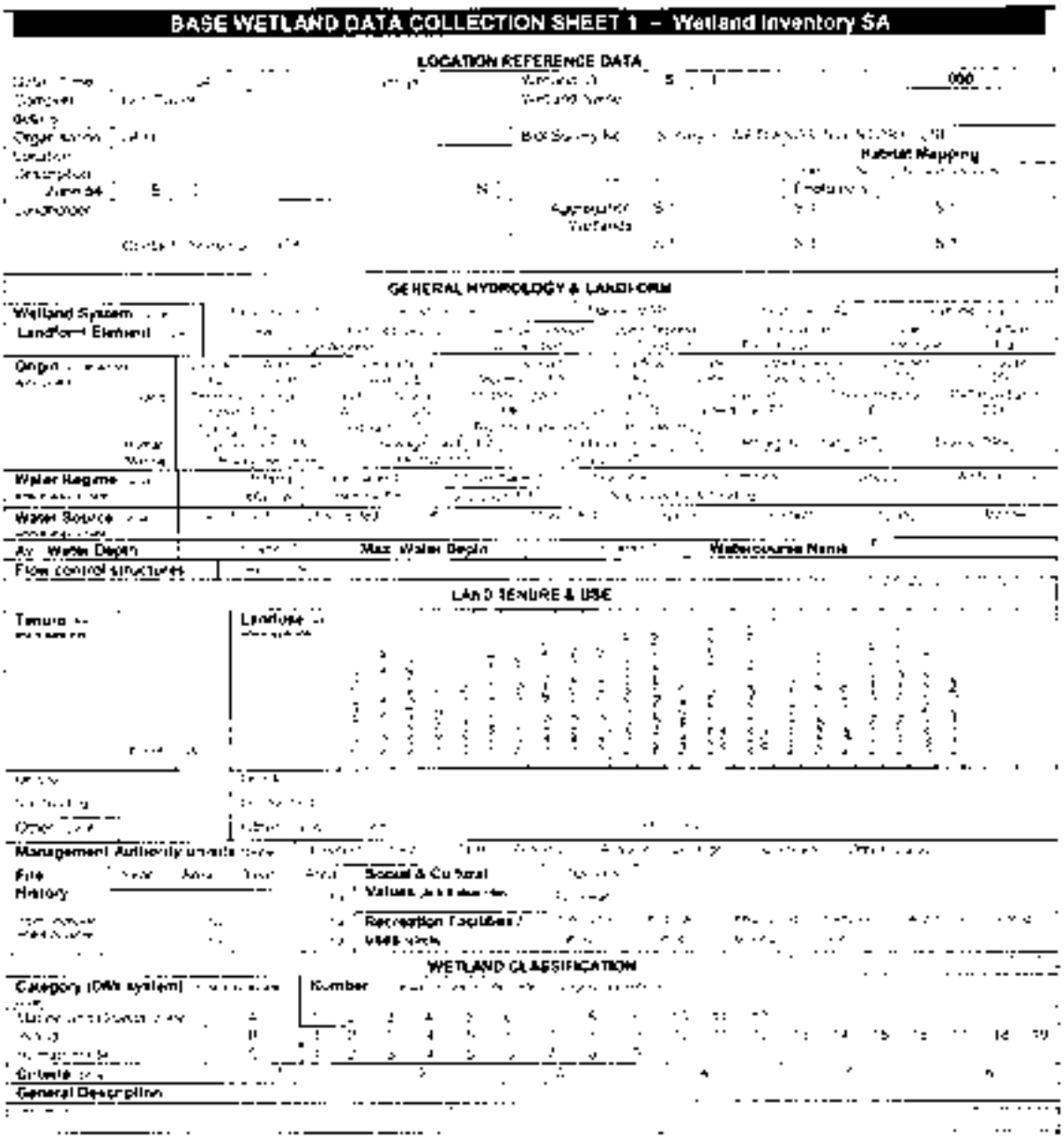
Wetland ID	Name
S0102054	
S0105395	COTTAGE GARDEN SWAMP
S0105437	COTTAGE GARDEN SWAMP
S0105471	COTTAGE GARDEN SWAMP
S0105507	COTTAGE GARDEN SWAMP
S0105671	GUM FLAT SWAMP
S0105681	
S0105700	ECHO VALLEY
S0105749	TOPPERWEIN NFR
S0105755	COLE SWAMP
S0105764	PENOLA FOREST
S0105765	NANGWARRY STATION
S0105780	ISLAND SWAMP LF
S0105782	ECHO VALLEY
S0105784	GALPIN SWAMP
S0105785	CARUNGWINNA SWAMP
S0105786	ISLAND SWAMP LF
S0105791	TOPPERWEIN NFR
S0105842	NANGKITA
S0105904	NANGKITA
S0105937	WATTLE PARK
S0106145	JULIA HILL
S0106170	INVERLOCH
S0106362	YEATES LF
S0106599	AUSPINE - NANGWARRY NORTH
S0106836	
S0106846	BORDERLEA
S0107275	RUSTS
S0107335	RIGBY DOWNS
S0107338	PLEASANT PARK
S0107376	ARALUEN
S0107394	TEA TREE GULLY
S0107446	ISLAND SWAMP LF
S0107499	LANDS LF
S0107608	PLEASANT PARK
S0107775	PLEASANT PARK
S0108185	INVERGLEN
S0108261	BALMACARRA
S0108262	WIRREEBILLA
S0108263	ALLAMBI
S0108271	ALLAMBI
S0108276	ALLAMBI
S0108285	ALLAMBI
S0108288	ALLAMBI
S0108322	WIRREEBILLA
S0108539	
S0108726	
S0108737	
S0109485	MONBULLA
S0109731	

Wetland ID	Name
S0109799	COLES
S0109825	PUD LAKE
S0109873	LAKE ELIZA PERIPHERAL WETLANDS
S0109947	ALLAMBI
S0109951	ALLAMBI
S0109978	ALLAMBI
S0109996	ERRINGTON HOLE LAKE
S0110011	DOLLY LAKE
S0110024	NEW-FIELDS
S0110025	
S0110056	KARINYA
S0110559	LAKE ELIZA PERIPHERAL WETLANDS
S0110570	
S0110572	
S0110573	
S0110574	
S0110725	LANDS LF
S0110867	
S0110935	ISLAND SWAMP LF
S0112086	COTTAGE GARDEN SWAMP
S0112087	COTTAGE GARDEN SWAMP
S0112088	COTTAGE GARDEN SWAMP
S0112089	COTTAGE GARDEN SWAMP
S0112090	COTTAGE GARDEN SWAMP
S0112197	NANGWARRY NFR
S0112198	NANGWARRY NFR
S0112199	NANGWARRY NFR
S0112201	NANGWARRY NFR
S0112202	AUSPINE - NANGWARRY NORTH
S0112204	AUSPINE - NANGWARRY NORTH
S0112214	AUSPINE - NANGWARRY NORTH
S0112404	AUSPINE - PENOLA SOUTH_NATIVE VEG
S0112405	AUSPINE - PENOLA SOUTH_NATIVE VEG
S0113560	MCROSTIES NFR
S0113718	3 GATES TRACK LF
S0113997	PENOLA ROAD LF
S0114062	
S0114195	DISMAL DOWNS
S0114196	HACKET HILL NFR
S0114427	PLEASANT PARK
S0114483	THE HEATH NFR
S0114484	THE HEATH NFR
S0114485	THE HEATH NFR
S0114750	YANGERY LF
S0114752	ISLAND SWAMP LF
S0114763	PENOLA FOREST
S0114800	NANGWARRY STATION
S0114900	
S0114942	

Wetland ID	Name
S0114960	
S0114963	NENE VALLEY
S0114992	PENOLA FOREST
S0114994	PENOLA FOREST
S0115031	LACHEN STATION
S0115177	GLENCOE FOREST
S0115198	SKAMIR
S0115209	KEDRON
S0115392	MONTANA
S0115482	SUNNYMEADE
S0115483	SUNNYMEADE
S0115487	THE MARSHES
S0115490	THE MARSHES
S0115500	TARQUA RD FOREST
S0115665	NANGWARRY NFR
S0115669	NANGWARRY NFR
S0115672	NANGWARRY NFR
S0115673	NANGWARRY NFR
S0115674	NANGWARRY NFR
S0115677	NANGWARRY NFR
S0115766	HACKET HILL NFR
S0115779	PENOLA FOREST
S0115786	PENOLA FOREST
S0115787	PENOLA FOREST
S0115794	PENOLA FOREST
S0115801	LOWAN LANE LF
S0115817	LOWAN LANE LF
S0115822	LOWAN LANE LF
S0115824	YEATES LF
S0115833	YEATES LF
S0115972	STILL WATERS
S0116662	BORDER EDGE
S0116834	
S0119385	WEST AVENUE
S0119386	WEST AVENUE
S0119387	WEST AVENUE
S0119456	SCOTGLADE
S0119900	ROUND WATERHOLE NFR
S0120316	
S0120339	OVERLAND NFR
S0120440	OVERLAND NFR
S0120648	KARINYA
S0120659	
S0120805	TEA TREE GULLY

APPENDIX 7 – LSEWI Field Data Sheets

Data sheets completed for each wetland survey site



BASE WETLAND DATA COLLECTION SHEET 1 – Wetland Inventory SA

LOCATION REFERENCE DATA

Habitat Mapping

GENERAL HYDROLOGY & LANDFORM

Wetland System

Landform Element

Origin

Water Regime

Water Source

Av. Water Depth

Max. Water Depth

Watercourse Name

Flow control structures

LAND TENURE & USE

Tenure

Landuse

Management Authority

Site History

Social & Cultural Values

Recreation Facilities

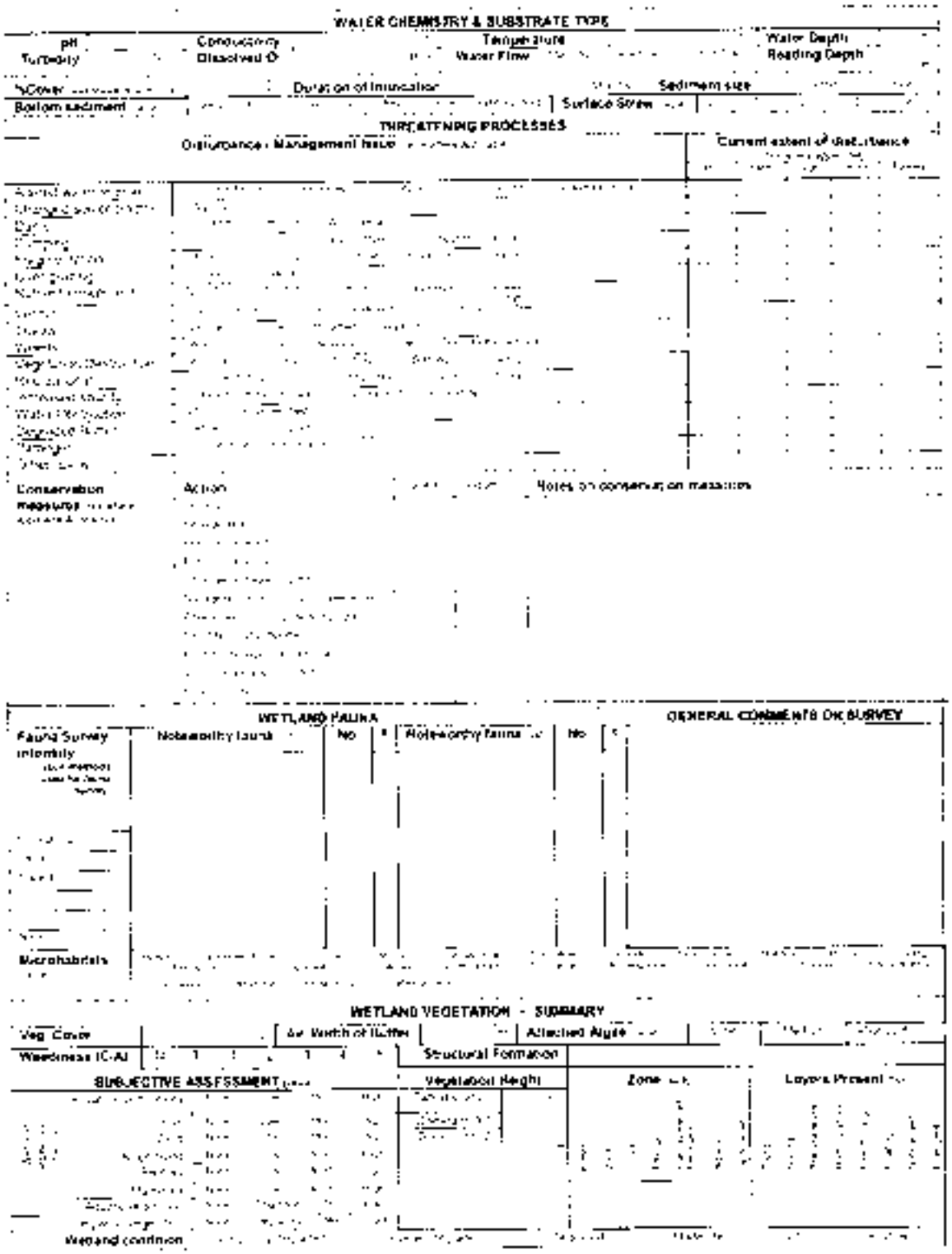
Visit Info

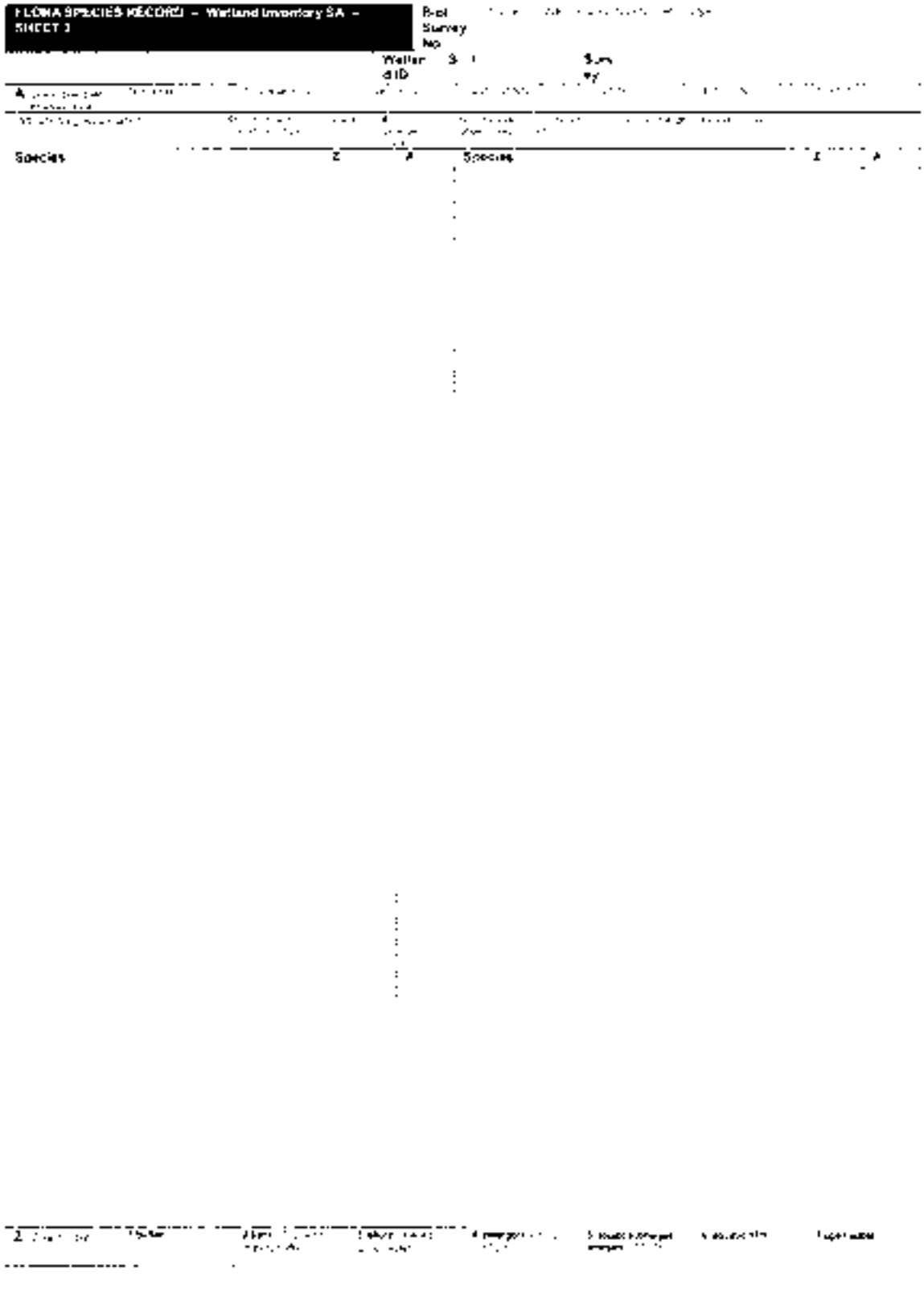
WETLAND CLASSIFICATION

Category (DWA system)

Number

General Description


WATER CHEMISTRY & SUBSTRATE TYPE
pH
Turbidity
Conductivity
Dissolved O
Temperature
Water Flow
Water Depth
Reading Depth
%Cover
Duration of Inundation
Sediment size
Bottom sediment
Surface Stress
THREATENING PROCESSES
Disturbance / Management Issue
Current extent of disturbance
Conservation
Action
Notes on conservation measures
WETLAND FAUNA
GENERAL COMMENTS ON SURVEY
Fauna Survey
Intensity
Notewothy fauna
No
Notewothy fauna
No
Microhabitats
WETLAND VEGETATION - SUMMARY
Veg. Cover
Av. Width of Buffer
Attached Algae
Weediness (C-A)
Structural Formation
SUBJECTIVE ASSESSMENT
Vegetation Height
Zone
Layers Present
Wetland condition


FLORA SPECIES RECORD – Wetland Inventory SA – SHEET 1
Species
Species

APPENDIX 8 – Instructions for LSEWI Field Data Sheets

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.
- Staple all sheets relating to each wetland together and store in a safe dry place.

Wetland data collection

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).
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 *Survey no.* 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 exits, use descriptive qualifiers, landmarks, or ask the landowner to provide a name.
GPS Position	(WGS 84). Geographic location of wetlands 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 wetland. If the wetland is assessed in sectors, the GPS location should reflect the approximate centre of the sector area being assessed. Maps provided will indicate an AMG position for each wetland. This location data can be used on the data sheet if considered accurate enough.
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 no 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 and 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 is 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 inclind 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.
	Breakaway	Steep maximal mid-slope or upper slope, generally comprising both a very short sharp (free face) that is often bare rockland, and a stony scarp-foot slope (debris slope), often standing above a pediment.
	Rock Outcrop (on plain)	Any exposed area of rock that is inferred to be continuous with under-lying bedrock on a large, very gently inclined or level element.
	Inselberg/Tor	Inselberg: Steep-sided, isolated hill that stands above adjacent nearly flat plains. It may have a narrow pediment at its base, generally of granite. Tor: Mass or exposed bedrock standing abruptly above its surroundings and typically byt not exclusively developed on granitic rock.
	Drainage Depression	Level to gently inclinded, long, narrow, shallow open depression with smotthyly concave cross-section, rising to moderately inclined side slopes, eroded or aggraded by sheet wash.
	Dune/Consolidated Dune	Moderately inclinded 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.
	Dune Crest	Crest on moderately inclined to very steep ridge or hillock, built up or eroded by the wind.
	Dune Slope	Slope on a moderately inclined to very steep ridge or hillock, built up or eroded by the wind.
	Dune Footslope	Gently inclined waning lower slope of a moderately inclined to very steep ridge or hillock built up by the wind.
	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 Crest	Very gently inclined to steep crest, smoothly convex, eroded mainly by creep and sheet wash. A typical element of mountains, hills, low hills and rises.
	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.
	Talus	Moderately inclined or steep waning lower slope, consisting of rock fragments aggraded by gravity.
	Alcove	Moderately incline to very steep, short open depression with concave cross-section, eroded by collapse, landslides, creep or surface wash.
	Ridge	Compound landform element comprising a narrow crest and short adjoining slopes, the crest length being greater than the width of the landform element.
	Gully	Open depression with short, precipitous walls and moderatley inclined to very gently inclined floor or small stream channel, eroded by channelled stream flow and consequent collaps and water-aided mass movement.
	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.
	Breakaway	Steep maximal mid-slope or upper slope, generally comprising both a very short sharp (free face) that is often bare rockland, and a stony scarp-foot slope (debris slope), often standing above a pediment.
	Rock Outcrop (on plain)	Any exposed area of rock that is inferred to be continuous with under-lying bedrock on a large, very gently inclined or level element.
	Inselberg/Tor	Inselberg: Steep-sided, isolated hill that stands above adjacent nearly flat plains. It may have a narrow pediment at its base, generally of granite. Tor: Mass or exposed bedrock standing abruptly above its surroundings and typically byt not exclusively developed on granitic rock.
	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.
	Gorge	A narrow passage, with precipitous, rocky sides, enclosed among mountains.
	Cliff	Very wide cliffed (>72 degrees) maximal slope usually eroded by gravitational fall as a result of erosion of the base by various agents: sometimes built up by marine organisms.
	Cliff Footslope	Slope situated below a cliff, with its contours generally parallel to the line of the cliff, eroded by sheet wash or water-aided mass movement, and aggraded locally by collapsed material from above.
	Scarp	Very wide steep to precipitous maximal slope eroded by gravity, water-aided mass movement or sheet flow.
	Scarp Foothill	Waning or minimal slope situated below a scarp, with its contours generally parallel tot eh line of the scarp.
	Pediment	Large gently inclined to level (less than 1%) waning lower slope, with slope lines inclined in a single direction, or somewhat convergent or divergent, eroded or sometimes slightly aggraded by sheet flow. It is underlain by bedrock.
	Rock Outcrop (on hill)	An exposed area of rock that is inferred to be continuous with underlying bedrock and is on either a mountain, hill, low hill or rise/
	Stream Channel	Linear, generally sinuous open depression, in parts eroded, excavated, built up and aggraded by channelled stream flow. This element comprises stream bed and banks.
	Stream Bed	Linear, generally sinuous open depression forming the bottom of a stream channel eroded and locally excavated, aggraded or built up by channelled stream flow.
	Stream Bank	Very short, very wide slope, moderately inclined to precipitous, forming the marginal upper parts of a stream channel and resulting from erosion or aggradation by channelled stream flow.
	Stream Bar	Elongated, gently to moderately inclined low ridge built up by channelled steam flow: part of a stream bed.
	Levee	Very long, very low, nearly level sinuous ridge immediately adjacent to a stream channel, built up by over-bank flow. Levees are built, usually in pairs bounding the two sides of a stream channel, at the level reached by frequent floods. This element is part of a covered plain landform pattern.
	Channel Bench	Flat at the margin of a stream channel aggraded and in part eroded by over-bank and channelled stream flow - an incipient flood plain.
	Terrace Flat	Small flat aggraded or eroded by channelled or over-bank stream flow, standing above a scarp and no longer frequently inundated: a former valley flat or part of a former flood plain.
	Terrace Plain	Large or very large flat aggraded by channelled or over-bank stream flow, standing above a scarp and no longer frequently inundated: part of a former flood plain.
	Flood Out	Flat inclined radially away form a point on the margin or at the end of a stream channel, aggraded by over-bank stream flow, or by channelled stream flow associated with channels developed within the over-bank flow: part of a covered plain landform pattern.
	Back Plain	Large flat resulting from aggradation by over-bank stream flow at some distance from the stream channel and in some cases biological (peat) accumulation: often characterised by a high water table and the presence of swamps or lakes: part of a covered plain landform pattern.
	Gorge	A narrow passage, with precipitous, rocky sides, enclosed among mountains.
	Cliff	Very wide cliffed (>72 degrees) maximal slope usually eroded by gravitational fall as a result of erosion of the base by various agents: sometimes built up by marine organisms.
	Cliff Footslope	Slope situated below a cliff, with its contours generally parallel to the line of the cliff, eroded by sheet wash or water-aided mass movement, and aggraded locally by collapsed material from above.
	Scarp	Very wide steep to precipitous maximal slope eroded by gravity, water-aided mass movement or sheet flow.
	Scarp Foothill	Waning or minimal slope situated below a scarp, with its contours generally parallel tot eh line of the scarp.
	Pediment	Large gently inclined to level (less than 1%) waning lower slope, with slope lines inclined in a single direction, or somewhat convergent or divergent, eroded or sometimes slightly aggraded by sheet flow. It is underlain by bedrock.
	Rock Outcrop (on hill)	An exposed area of rock that is inferred to be continuous with underlying bedrock and is on either a mountain, hill, low hill or rise/

	Fan-alluvial	Large gently inclined to level element with radial slope lines inclined away from a point, resulting from aggradation, or occasionally from erosion by channelled, often braided stream flow or possibly by sheet flow.
	Oxbow	Long, curved, commonly water-filled closed depression eroded by channelled stream flow but closed as a result of aggradation by channelled or over-bank stream flow, during the formation of a meander plain landform patter.
	Scroll Complex	Long, curved very low ridge built up by channelled stream flow and left relict by channel migration. Part of a meander plain landform pattern.
	Estuary	Stream channel close to its junction with a sea or lake, where the action of channelled stream flow is modified by tide and waves. The width typically increases downstream.
	Lake	Large water-filled closed depression.
	Salt Lake	Lake which contains a concentration of meral salts (predominantly sodium chloride in solution as well as magnesium and calcium sulphate)
	Swamp	Almost level closed, or almos closed depression with a seasonal or permanent water table at or above the surface, commonly aggraded by over-bank stream flow and sometimes biological (peat) accumulation.
	Perched Swamp	A tract of land which is permanently saturated with moisture and is positioned on an elevated landform.
	Terminal Lake	Large water-filled closed depression at the end of a drainage area.
	Salt Crust	Extensive flat surface found in hot deserts consisting of salts that have accumulated in a shallow saline lake or playa. Evaporation then produces a crust of varying hardness.
	Beach	Short, low, very wide slope, gently or moderately inclined, built up or eroded by waves, forming the shore of a lake or sea.
	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 fien grained material formed as a result of volcanic explosions.
	Tumulus	Hillock heaved up by volcanism (or, elsewhere, built up by human activity at a burial site).
	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, chamer 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 above.

Origin codes	**Shallow or Deep Basin**	
	OXB 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 crescentic 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 and 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).
Landuse	Indicate the on-site use and surrounding use of the wetland by ticking appropriate landuse. Specify other landuse if appropriate description is not listed. (note that more than one landuse 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. *Juncus* spp. Brackish Creekline Floodplain; Spring-fed Peat Bog etc.	

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 and 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.

	Measured using a TPS™ pH electrode attached to a TPS™ WP-81 meter.
	Measured using a tube nephelometer.
	Measured using a TPS™ k=1 conductivity sensor attached to a TPS™ WP-81 meter.
	Measured using a YSI™ 5739 field probe attached to a TPS™ WP-82Y dissolved oxygen meter.
	Measured using a YSI™ 5739 field probe attached to a TPS™ WP-82Y dissolved oxygen meter.
	Record the flow of water at the site where water chemistry readings are taken. Circle appropriate description of flow: Standing / Slow flow / Rapid flow.
	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.

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

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	**Juv**	Juvenile:
	Mat	Mature:
	Sen	Senescent:
Av. Width of Buffer	Indicate the average width of fringing native vegetation based on visual estimates (record in meters).	
% Buffer	Indicate the approximate percentage of the wetland body surrounded by native vegetation buffer.	
Attached algae	An indication of the amount of macroalgae present should be recorded as little, medium or abundant.	
Attached algae descriptions	**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.

Water dependent fauna	Subjective score according to the abundance and diversity and relative condition of invertebrates, fish and birds located within or on the water body determined by observation.	
Water dependent fauna descriptions	**None**	No habitat present to support
	Low	Very few or no species present.
	Moderate	Moderate species diversity and abundance, usually more common species.
	High	High species diversity and abundance, presence of more sensitive species.
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	**Completely degraded**	
	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.

Flora Species Record

Flora species present at the site are to be identified on Sheet 2 of the survey form. 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 (wetland 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. Baumea tetragona [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 9 – Criteria for the International and National Importance of Wetlands

International Recognition

The Ramsar Convention on Wetlands

A wetland must meet at least one of the following criteria to be Ramsar listed:
Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.
Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.
Criterion 7: A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
Criterion 8: A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
Criterion 9: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

East Asian-Australasian Flyway Network

A wetland must meet at least one of the following criteria to be listed on the East Asian-Australasian Flyway Network:
Criterion 1: The regularly supports 20,000 or more waterbirds.
Criterion 2: The wetland regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

National Recognition

Directory of Important Wetlands in Australia

A wetland may be considered nationally important if it meets at least one of the following 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 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.

APPENDIX 10 – Inventory of LSE Wetland Literature

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Anon. (1869). Report on South-East Drainage Works. (Parliamentary Paper No. 88/1869: Adelaide, South Australia.)

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Ashby, E. (1927). Notes on birds observed during a motor trip to the South-East of South Australia and coastal western Victoria. *South Australian Ornithologist* **9**, 131-141.

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Austin, C. (1951). Birds of the southern end of the Victoria-South Australian border. *South Australian Ornithologist* **20**, 14-15.

Australian Nature Conservation Agency (1996). A Directory of Important Wetlands in Australia. (ANCA: Canberra, ACT.)

Bachmann, M. R. (2002). Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project 1999-2002. (Nature Conservation Society of South Australia: Adelaide.)

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For further information please contact:

Phone Information Line (08)8204 1910,
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