
NATIONAL PARTNERSHIP AGREEMENT ON COAL SEAM GAS AND LARGE COAL MINING

DATA IMPROVEMENT PHASE:
IMPROVING THE WETLANDS DATA AND
CLASSIFICATION ATTRIBUTION IN SAWID
– SOUTH EAST, SOUTH AUSTRALIA



Government of South Australia
Department of Environment,
Water and Natural Resources

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Report to South East Natural Resources Management Board

Claire Harding

Department of Environment, Water and Natural Resources
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Australian Government
Department of Sustainability, Environment,
Water, Population and Communities



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Department of Environment, Water and Natural Resources
25 Grenfell Street, Adelaide
GPO Box 1047, Adelaide SA 5001
Telephone National (08) 8463 6946
International +61 8 8463 6946
Fax National (08) 8463 6999
International +61 8 8463 6999
Website www.environment.sa.gov.au

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EXECUTIVE SUMMARY

The majority of wetland information for the South East Natural Resources Management (South East) region resides within the South Australian Wetland Inventory Database (SAWID). SAWID provides detailed mapping and associated biological, hydrological, physical, and chemical data for wetland ecosystems collected during wetland inventories in the South East (Taylor 2006; Harding 2007; Billows 2009) and other regional aquatic ecosystem data. SAWID also sources data from other statewide databases including the Biological Databases of South Australia (BDBSA). A number of the functions of SAWID, particularly the reporting and analysis functions of the Ecological Values Assessment, spatial wetland mapping, typology classifications, and assessment of groundwater dependency, align with and contribute to the delivery of outcomes and strategic priorities in the DEWNR Corporate Plan 2012-2014.

This report documents the update of data within SAWID completed between April - October 2013 for the South East NRM Board as part of the data improvement phase of an agreement with the Commonwealth Office for Water Science under the National Partnership Agreement (NPA) on Coal Seam Gas and Large Coal Mining. The update included: aligning of typology classifications with national frameworks; collation and prioritisation of wetlands data within the South East region which is not currently held within SAWID or any other corporate database; updating wetlands spatial data; and an update of SAWID with current BDBSA and priority datasets. Recommendations are made for the short term and longer term management and maintenance of SAWID.

Appendix A documents the extent and type of the edits made to individual database tables and queries within SAWID as a result of the data update. In total, edits were made to 11 SAWID tables and 7 database queries. Five new tables were added to capture wetland classification data, and 4 new queries were generated to amend the Ecological Value Assessment calculations.

Summary of outcomes of the SAWID Update

Update Wetland Classifications into SAWID

Wetland classification frameworks that had been applied in the South East, identifying wetland typologies and groundwater dependency were uploaded into SAWID including:

- South Australian Aquatic Ecosystems (SAAE) Typology classification (after Fee and Scholz 2008);
- Australian National Aquatic Ecosystems (ANAE) classification (Butcher et al. 2011);
- Wetland Vegetation Component (WVC) models (Ecological Associates 2009 & Aquasave Consultants 2012);
- Classification of Likelihood of Groundwater Dependence (SKM 2009); and
- National GDE Atlas (SKM 2012).

Review and prioritise data that has not been entered into SAWID

A total of 42 individual datasets were collated and reviewed as part of the SAWID update. The majority of datasets were supplied in Microsoft Excel® spreadsheets, or Adobe PDF documents. Few datasets were in a format that was easily and quickly formatted into either SAWID or BDBSA format. Nineteen of the collated datasets were identified as short-term priorities for entering into SAWID.

Update of SAWID wetland mapping

A total of 1010 additional polygons were added to South East SAWID as part of the database update, including dams and natural watercourses including Morambro Creek, Tatiara Creek, Naracoorte Creek, Mosquito Creek, Nalang Creek, Yelloch Creek and Benara Creek. Edits made to the wetlands layer by Herpich (2013) and further edits made prior to October 2013 were also reconciled with SAWID.

For the South East region (including the Mosquito Creek catchment in Victoria), as of October 2013, SAWID contains 17219 individual wetland polygons.

Update of SAWID with BDBSA and priority datasets

SAWID was updated with a bulk upload of data from the Biological Databases of South Australia (BDBSA), which had not occurred since 2008 (Harding 2012a), and priority datasets identified by this report. This update added a total of 8651 new survey records, with 70415 new individual flora and fauna observations. This data relates to 1199 wetlands mapped within SAWID.

The impact of the data update on the wetland Ecological Value Assessment within SAWID resulted in 72 additional wetlands identified as 'Very High' value, 131 additional wetlands identified as 'High' value, 11 less wetlands identified as 'Moderate' value, and 34 additional wetlands identified as 'Low' value. There remained a large proportion of wetlands in the 'Not Assessed' category.

Groundwater dependent wetlands identified as High and Very High Ecological Value within SAWID are subject to policies within the Tatiara, Tintinara-Coonalpyn, Padthaway and Draft Lower Limestone Coast WAPs for the protection of ecosystems dependent on groundwater. A total of 120 additional wetlands of Very High or High value, which were also likely to be groundwater dependent (i.e. with a groundwater interaction likelihood of Very High, High, or Moderate as identified by SKM (2009)) and within the Lower Limestone Coast PWA were identified as a result of this update.

Summary of Recommendations

SAWID is currently not fully corporately supported within DEWNR beyond management of the spatial component, and is managed and used largely within the South East region. Without regular update, and provision of the database on a platform that is stable, functional, and available to users it is at risk of becoming out-dated. Despite the lack of support, the database remains the repository for the majority of wetlands data within the South East, and is widely and actively used for conservation planning, prioritisation, classification and water planning. For these reasons, it was considered important that a protocol for keeping SAWID current be implemented in the short term, and the potential for long term solutions for delivering SAWID, or SAWID functionality in a different format, be investigated.

Short term recommendations

SAWID maintenance and update:

- SAWID is recommended to be reinstated to an MS Access mdb on a shared DEWNR network drive to overcome network and useability issues with the current location on the Citrix server.
- A regular update protocol be put in place for updates of SAWID with BDBSA data of no greater than 6 month intervals, or when required.
- Priority datasets that were not able to be uploaded within the timeframe of this project should continue to be entered into SAWID. The remaining substantial list of datasets should be prioritised and assessed for compatibility for entry into existing corporate databases which can then be updated into SAWID in bulk.
- Updating of wetland classifications to newly mapped and additional wetland polygons to SAWID requires addressing to ensure the maintenance of a region-wide complete dataset of wetland typologies and groundwater dependence.
- Options are to be further investigated for SAWID use and compatibility with ESRI ArcGIS 10.1, as a result of the DEWNR upgrade from ArcGIS 9.3.

Ecological values assessment:

- It is recommended that the Ecological Value Assessment calculations within SAWID, and cut-off points between value categories, be reviewed in regard to implications to the Water Allocation Plans in the South East.
- Butcher et al. (2013) completed a trial of the National High Ecological Value Aquatic Ecosystems (HEVAE) assessment framework using data stored within SAWID prior to this update. It is recommended that the HEVAE framework be re-applied to updated data entered into SAWID.
- Work towards an agreed and transparent wetland Ecological Value assessment within SAWID, with regard to Nationally agreed frameworks, should continue to be further refined for the South East region.

Business Analyst:

- Due to the complexity of the issues between SAWID and its use and purpose in the South East, potential links to existing databases, and the need for corporate support for data management, it is recommended that a Business Analyst be commissioned to document the issues and provide options for a long-term strategy for SAWID.

Long term recommendations

- Future funding for the upgrade of SAWID, or a system which would replace SAWID functionality, in line with the recommendations of a Business Analyst should be targeted.
- Applicability and demand for SAWID functionality for other regions within SA should be investigated as part of the potential upgrade of SAWID.
- In the potential absence of funding to address a long term solution for SAWID, an interim solution to the management of SAWID within DEWNR needs to be agreed upon.
- A process for the identification of data that could be stored in existing corporate databases (including BDBSA) and a process for the backload of data should be pursued.

PROJECT BACKGROUND

The majority of wetland information for the South East region resides within the South Australian Wetland Inventory Database (SAWID). The information is used regularly by the SE NRM Board in management, planning and policy for wetlands in the region. For example, the ecological value assessment data in SAWID informs the protection of environmental water provisions for groundwater dependent wetlands in the South East under the Tatiara, Tintinara-Coonalpyn, Padthaway and the Draft Lower Limestone Coast Water Allocation Plan. It is therefore important that SAWID remains current and functional for the South East region throughout the life of these Plans.

SAWID was initially derived to store data collected by the Fleurieu Peninsula wetland inventory and was expanded by the inclusion of subsequent wetland inventories in the South East region. SAWID for the South East provides detailed mapping of wetland ecosystems completed for wetland inventories in the Lower South East (Taylor 2006) and Upper South East (Harding 2007) regions and additional inventory work undertaken by Billows (2009). The database also sources data from other statewide databases including the Biological Databases of South Australia (BDBSA). Several reporting and analysis functions operate within the SAWID databases, including an assessment of ecological values based on data collected and collated within SAWID.

SAWID, at the time of this report, is a Microsoft Access® database, accessible from DEWNR Citrix data server. The database includes three linked database components:

- SAWIDGdb.mdb: A personal geodatabase which stores a copy of the SDE Corporate wetlands spatial layer which forms the spatial component of SAWID.
- SAWIDAccess_be.mdb: A relational database, with data tables and lookup tables
- PRODSAWIDAccess.mde: A locked database containing all of the queries, reports and forms which run the user front-end, data entry, analysis and reporting functions for SAWID.

The spatial component of SAWID exists within Corporate SDE layers, but limited resourcing is currently allocated to supporting the remaining components. Ongoing maintenance and update of the SAWID database has been infrequent and project based, with the last bulk update of data from the Biological Databases of South Australia (BDBSA) prior to this current update occurring in 2008 (Harding 2012a). SAWID is actively used by the South East region.

Recently, the information in SAWID was used in the development of a database of water assets in the South East region for a project titled *Phase 1 Bioregional Assessment*, which is being delivered by the South East NRM Board as part of an agreement with the Commonwealth Office for Water Science under the National Partnership Agreement (NPA) on Coal Seam Gas and Large Coal Mining. Developing the asset database highlighted the need for updating the data held within SAWID, and inclusion of more recent datasets relevant to wetlands (Harding 2012b).

This report documents an update of data within SAWID, including alignment of typology classifications with national frameworks, and collation of wetlands data within the South East region which is not currently held within SAWID or any other corporate database. Updated data will be provided for inclusion in the NPA Asset Database for use in future bioregional assessments. Additions and changes to SAWID as part of the database update were made to copies of the SAWID databases on the Citrix server.

OBJECTIVES

The objectives of the data improvement phase related to the update of SAWID were specifically to:

1. Align the classifications of typology of aquatic ecosystems in SAWID with the agreed fields and attributes in the Australian National Aquatic Ecosystem (ANAE) and South Australian Aquatic Ecosystem (SAAE) Classification Frameworks.
2. Update information in SAWID with the classification of likelihood of groundwater dependency of wetlands developed by SKM (2009) and GDE Atlas.
3. Review and prioritise existing regional aquatic ecosystems and species data that have not been entered into SAWID.
4. Update SAWID polygons to other aquatic ecosystems with existing mapping (streams).
5. Update data in SAWID from the Biological Survey Database of South Australia, and identified priority datasets.
6. Facilitate discussion in SMK about maintaining linkages of SAWID with corporate datasets and recommend protocols for the ongoing maintenance of data in SAWID from other data sources.

TASK 1 – UPDATE WETLAND CLASSIFICATIONS INTO SAWID

Wetland classifications have been applied in the South East including application of the South Australian Aquatic Ecosystem (SAAE) wetland typology classification developed by Fee and Scholz (2008) and a trial of the Australian National Aquatic Ecosystem (ANAE) classification (Butcher et al. 2011).

The SAAE typology classification framework provided by Fee and Scholz (2008) was used to identify key attribute fields for applying a classification. Spatial population of key fields and application of the framework identified and spatially classified 15 different types of wetlands in the South East (DENR, unpublished data, 2010).

The ANAE Classification is a semi-hierarchically arranged scheme which is based on a series of regional, landscape and aquatic ecosystem attributes (Auricht 2010) which was developed by the National Aquatic Ecosystems Task Group (AETG) in defining a National approach to aquatic ecosystem classification. A trial of the ANAE Classification was completed for surface water features (wetlands) in the South East region (Butcher et al. 2011).

METHOD

Both the SAAE and ANAE classifications were applied at the wetland scale to wetland mapping existing within SAWID, and with use of both SAWID data and regional interpolated or spatial datasets. The outputs were available as individual GIS shapefiles with the associated attributed fields of the applied frameworks and final classification categories outside of the Corporate SDE layers. The shapefiles directly link to information within SAWID through the unique wetland polygon identifier [AUS_WETNR].

As part of the NPA data improvement project for South Australia, work towards developing an authoritative Aquatic Ecosystems dataset for use across and outside DEWNR has progressed (M. Miles pers. com. 2013). This project has consolidated aquatic ecosystem classifications across the State adopting the classification frameworks of the ANAE and SAAE, and provides consistent fields and domains for attributes. The development of the authoritative data schema for aquatic ecosystems included a review of the South East classifications attribution and aligned these within a State-wide consistent fields and domains. This updated data schema and attribution was sourced to create a new table within SAWID containing both the ANAE and SAAE classification attributes. The final classification descriptive categories were not found within the statewide dataset, and were imported from the original South East GIS layers:

- ANAE SE Classification field: [TYPE]
- SAAE SE Classification field: [UPDATE_]

RESULTS

A new table was added into SAWIDAccess_be.mdb with associated field descriptions: Table: [SE_ANAECLASS]. This can be spatially viewed through a JOIN with the unique wetland polygon identifier within the spatial component of SAWID [AUS_WETNR].

Appendix B provides a list of the fields within the new table, and attribute descriptions and explanation of the data sources.

The classification data applies to a total of 15509 wetland polygon features in the South East. Figure 1 shows the output classification categories of both the ANAE and SAAE within SAWID.

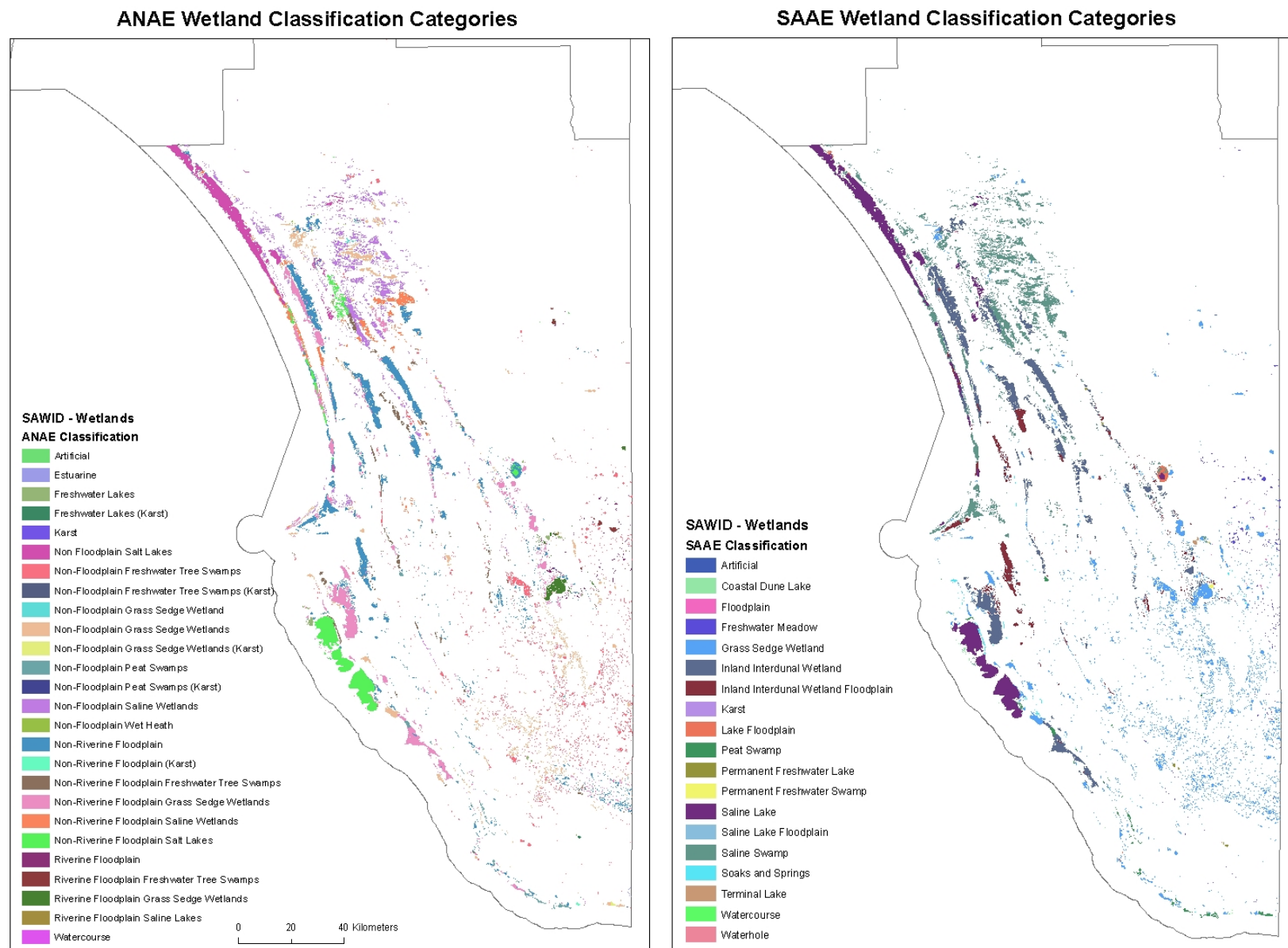


Figure 1. ANAE and SAAE Wetland Classification Category outputs within SAWID

WETLAND VEGETATION COMPONENTS

Conceptual models of Wetland Vegetation Components (WVC) were developed in the South East by de Jong and Harding (2007), and further refined and applied by Ecological Associates (2009) and Aquasave Consultants (2012). WVC models are wetland vegetation types, defined according to floristic composition and structure, water requirements (inundation depth, duration, frequency), salinity, and role as habitat for fauna.

METHOD

WVC conceptual models were attributed to limited wetland polygons mapped within SAWID by Ecological Associates (2009), and ephemeral herbaceous wetlands by Aquasave Consultants (2012). The data existed in the form of tables as appendices to the word document reports.

A new lookup table was created [LKP_WVC] and manually attributed with the environmental water requirement details (Appendix C) as outlined in Ecological Associates (2009). A new table [TBL_WVC] was added into [SAWIDAccess_be.mdb] and manually updated with assigned WVCs from the two reports (Ecological Associates 2009 & Aquasave Consultants 2012). [TBL_WVC] links the WVC data through the [AUS_WETNR] unique wetland polygon identifier within SAWID.

RESULTS

The WVC model data currently applies to a total of 113 wetland polygon features in the South East (Table 1). Figure 2 shows the spatial distribution of WVC model application in the South East.

Table 1. Wetland Vegetation Component Models in SAWID

WVC Model	Description	No. of Wetlands
1.1	<i>Eucalyptus camaldulensis</i> woodland	54
1.11	Seasonal freshwater emergent sedgeland	20
1.12	Samphire low herbland	26
1.13	Semi-permanent Deep/Open Water	3
1.2	Seasonal brackish aquatic bed	21
1.3	<i>Melaleuca brevifolia</i> low shrubland	50
1.4	<i>Melaleuca halmaturorum</i> tall shrubland	65
1.5	<i>Leptospermum continentale</i> shrubland	11
1.6	<i>Leptospermum lanigerum</i> shrubland	14
1.7	<i>Callistemon rugulosus</i> shrubland (under <i>Eucalyptus leucoxylon</i> woodland)	6
1.8	<i>Gahnia filum</i> tussock sedgeland	32
1.9	<i>Gahnia trifida</i> tussock sedgeland	9
2.15	Seasonal saline low aquatic bed	8
2.16	<i>Melaleuca squarrosa</i> mid shrubland	2
2.17	<i>Typha</i> sp., <i>Phragmites australis</i> grassland	7
2.18	Karstic pool with deeply submerged aquatics	2
2.19	Permanent coastal lake	2
2.2	Seasonal freshwater aquatic bed	20
Total		*113
* Multiple records can occur in single wetlands		

Wetland Vegetation Components

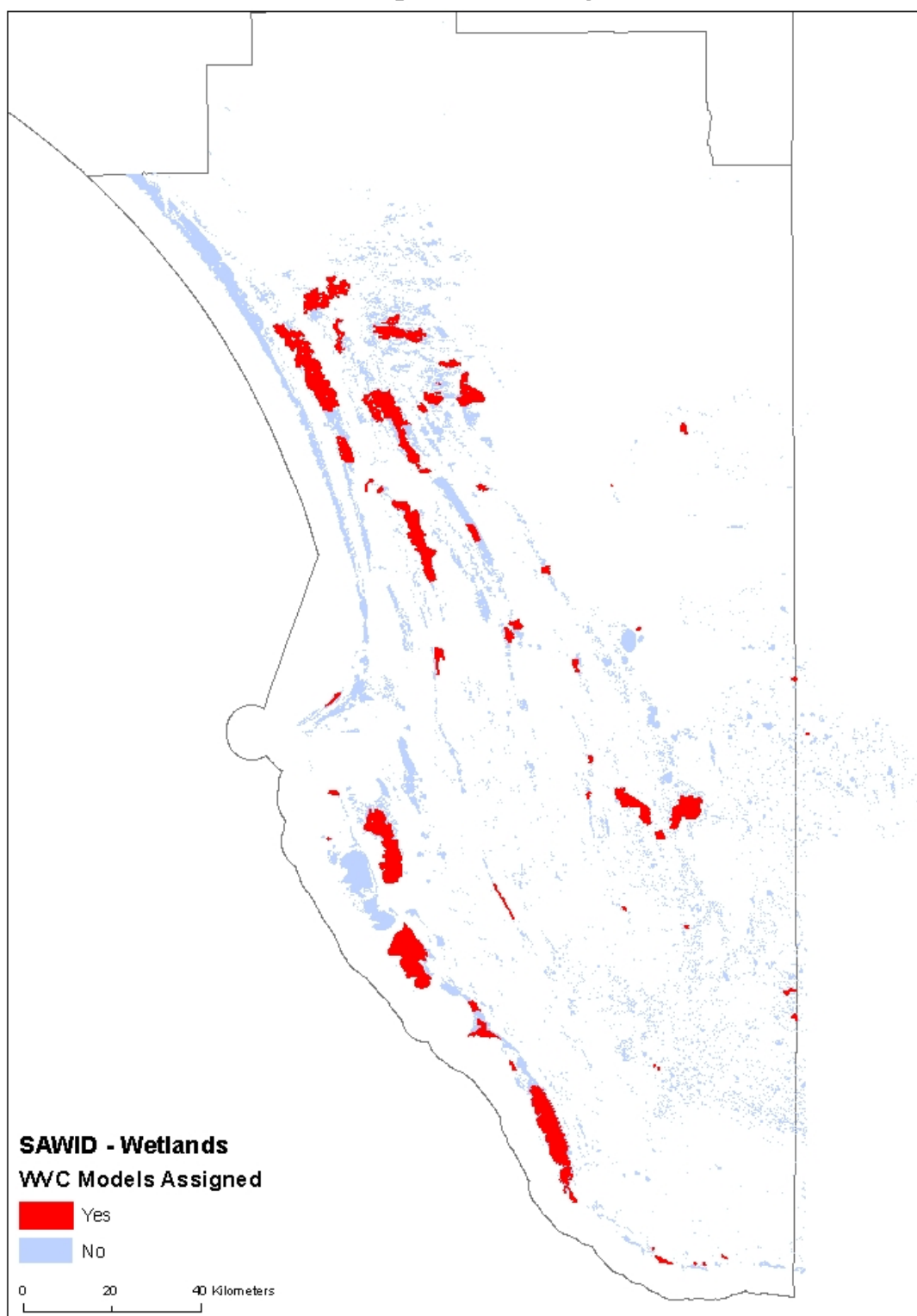


Figure 2. Wetlands with Wetland Vegetation Models (WVC) assigned within SAWID – October 2013

TASK 2 – UPDATE GDE CLASSIFICATIONS INTO SAWID

Two Groundwater Dependent Ecosystem (GDE) classifications have been applied in the South East, the first using a LiDAR derived DEM to determine depth to watertable as an indication of likely groundwater dependence (SKM 2009), and the National scale classification as part of the GDE Atlas (SKM 2012).

Classification of Likelihood of Groundwater Dependence

During work undertaken by SKM (2009), wetlands (sourced from SAWID polygons 2008) were analysed to determine likelihood of groundwater dependency based on depth to groundwater calculated with use of a DEM (LiDAR). Using the polygons of the wetlands dataset, a zonal statistics analysis was run on seasonal watertable depth surfaces (spring and autumn) using each of the wetland polygons as an individual zone. The technique analysed the range of values that occur within each polygon area and reported the minimum, maximum, range and mean of these values. These results were then assigned to each specific wetland and the results were subsequently utilised to classify each of the wetlands using various methods documented in SKM (2009).

GDE Atlas Classification

The South East mapped wetlands were included in the analysis of GDEs that rely on the surface expression of groundwater as part of 'Work Package 3' of the National GDE Atlas (SKM 2012). The methodology identified rules that were considered indicators of potential groundwater interaction including:

- Depth to groundwater <5m
- Waterbodies close to springs
- Type of swamp vegetation
- Permanency of water
- Geological formations
- Proximity to other GDEs

The analysis relied heavily on derived data from the existing GDE classification (SKM 2009), and produced limited new information for the South East region of SA.

METHOD

Classification of Likelihood of Groundwater Dependence (SKM 2009)

The output GDE Classification GIS shapefiles developed by SKM (2009) was imported into [SAWIDAccess_be.mdb] as a database table. The table links the GDE Classification data through the [AUS_WETNR] unique wetland polygon identifier within SAWID. Fields that were identified as duplicates of other fields already within SAWID were removed.

GDE Atlas Classification

The output GIS shapefiles from the National GDE Atlas were sourced for the NPA project for South Australia. The unique wetland polygon identifiers from data supplied by South Australia were not maintained in the output of the GDE Atlas, and spatial wetland boundaries varied, particularly in the South Australia – Victoria border region where both States maintain different wetland topology layers.

In order to link the outputs of the GDE Atlas with SAWID wetland polygon features, it was necessary to reinstate the unique wetland identifier [AUS_WETNR] with the unique identifier of the GDE Atlas [UFI] through spatial analysis.

A spatial join was performed using an intersect between SAWID wetland polygons for the South East region and GDE Atlas Surface GDEs layer. Errors were detected where GDE Atlas mapping did not match SAWID polygons, particularly along the Victorian border, and where the GDE Atlas included waterhole features as

buffered points. Errors in transposing the SAWID unique identifier [AUS_WETNR] and GDE Atlas unique identifier [UFI] were identified and manually corrected.

A table was developed linking the GDE Atlas data through the [AUS_WETNR] wetland polygon identifier within SAWID. Fields that were either duplicates of other fields already within SAWID, or were derived from Statewide/Regional spatial layers were excluded (e.g. Drainage Basin, State, Rainfall Zone, Bioregion, Landuse, Groundwater Management Area).

RESULTS

Two new tables were added into SAWIDAccess_be.mdb with associated field descriptions:

- [SE_GDE]: GDE Likelihood Classification (SKM 2009). The classification data applies to a total of 16694 wetland polygons within SAWID. Appendix D provides a list of the fields within the new table and attribute descriptions.
- [SE_GDEATLAS]: GDE Atlas (SKM 2012). The classification data applies to a total of 16003 wetland polygons within SAWID. Appendix E provides a list of the fields within the new table and attribute descriptions.

Both new tables can be spatially viewed through a JOIN with the unique wetland polygon identifier within the spatial component of SAWID [AUS_WETNR].

Figure 3 shows the output classification categories of both the GDE Likelihood Classification (SKM 2009) and the GDE Atlas (SKM 2012).

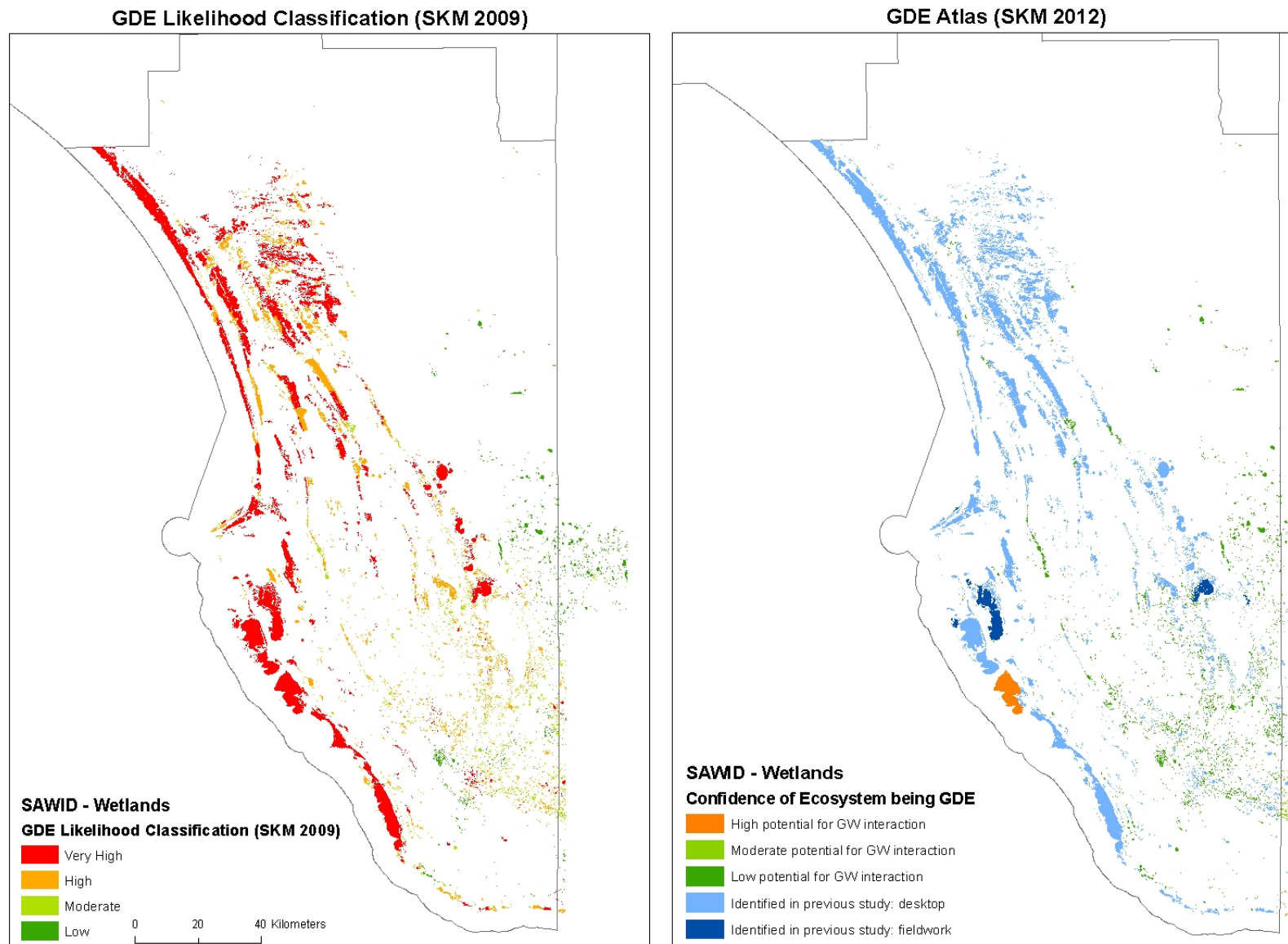


Figure 3. GDE Wetland Classification Category outputs within SAWID

TASK 3 – REVIEW AND PRIORITISE EXISTING AQUATIC ECOSYSTEMS AND SPECIES DATA THAT HAS NOT BEEN ENTERED INTO SAWID

Aquatic ecosystems data, including species lists, threatened species monitoring, aquatic ecosystem monitoring, vegetation mapping, and various water quality and chemistry have been collected in the South East by various agencies and individuals over recent years. Whilst some of this information has been uploaded to Corporate State databases (principally BDBSA), there was known to be several datasets that have not been entered into either BDBSA or SAWID, and are therefore not available for analysis purposes (e.g. for determining wetlands of high value and other prioritisation analyses).

METHOD

The South East Wetlands Working Group, which consists of representatives that work within the aquatic ecosystem field including various branches of DEWNR, ForestrySA, PIRSA and non-government organisations were asked to identify and supply any aquatic ecosystem data sources known not to be entered into either SAWID or BDBSA, and were collated and prioritised as part of the update of SAWID.

Priority datasets were identified as those that contain data which could influence the ecological values assessment analysis within SAWID and/or the High Ecological Value Aquatic Ecosystem (HEVAE) framework which has been trialled in the South East (Butcher et al. 2013). This included:

- Threatened aquatic species data
- Data relating to wetlands that are currently 'not assessed' within SAWID due to data deficiencies
- Abundance data for waders and waterbirds
- Data on critical life stage information (breeding, moulting, flocking, colonial nesting etc.)
- Large datasets relating to many wetlands
- Datasets identifying unmapped aquatic ecosystems

RESULTS

A total of 42 individual datasets were collated and reviewed as part of the SAWID update and are listed in Appendix F. The majority of data were supplied in Microsoft Excel® spreadsheets, or PDF documents. Very few datasets are in a format that is easily and quickly formatted into either SAWID or BDBSA format (refer to Appendix F).

Nineteen of the collated datasets were identified as short-term priorities for entering into SAWID (Table 2). These include those that meet multiple priority criteria, and particularly those datasets which provide either data for previously unsurveyed wetlands or information on the location of un-mapped aquatic ecosystems. All identified short-term priority datasets were entered into SAWID (as described in Task 5), with the exception of datasets that were incomplete and awaiting project finalisation at the time of this data upload (refer to Table 2).

Table 2. Priority datasets for uploading into SAWID

Dataset Name	Format	Difficulty of upload to SAWID	No. of wetlands	Priority
Spiny Cray Monitoring 2012	MS Excel	Medium	10	Threatened aquatic species Critical life-stages New data for un-surveyed wetlands
SAWID Additional Datasets	MS Access	Low	8	Threatened aquatic species Waterbird abundance Critical life-stages New data for un-surveyed wetlands Waterbird abundance
Upper South East Program DSS	MS Access	Medium	>40	Threatened aquatic species Waterbird abundance Critical life-stages Large dataset
Understanding the vegetation communities of temporary wetlands in South East of SA (Aquasave Consultants 2011)	MS Word	High	11	Threatened aquatic species New data for un-surveyed wetlands Large dataset
USE Program Wetland Environmental Monitoring (2012)	MS Excel	High	> 50	Threatened aquatic species Waterbird abundance Critical life-stages Large dataset
Wader Survey of South East Coastal Wetlands (Draft report 2010)	MS Word	High	14	Threatened aquatic species Waterbird abundance Critical life-stages Large dataset
Waterbird survey USE 2011	MS Excel	Medium	14	Waterbird abundance Critical life-stages Large dataset

Brolga Count 2013	MS Excel	Low	2	Threatened aquatic species Critical life-stages
Aquatic Fauna Data – Spiny Cray and Fish Monitoring (2013)	MS Excel	Medium	4	Threatened aquatic species Critical life-stages
Wader Survey of Lake Bonney SE (2008)	PDF	Medium	2	Threatened aquatic species Waterbird abundance
GDE Monitoring 2010	PDF	High	7	Threatened aquatic species Large dataset
USE Aquatic Vegetation and Waterbird counts 2009 (PIRSA)	MS Excel	Medium	>30	Threatened aquatic species Waterbird abundance Critical life-stages Large dataset
Watervalley Wetlands Waterbird Monitoring	MS Excel	Medium	6	Threatened aquatic species Waterbird abundance Critical life-stages
Ancient Greenling Survey	PDF	Low	6-10	Threatened aquatic species Critical life-stages
Shorebird sites of the Lower Limestone Coast (2007)	PDF	Medium	14	Threatened aquatic species Waterbird abundance
*Permanent Pools Mapping and Values (NGT 2013)	MS Access / GIS	High	>50	New data for un-surveyed wetlands New aquatic ecosystems
*South East SA Aquatic Springs Veg Surveys 2013	MS Excel	Medium	5	Threatened aquatic species New aquatic ecosystems New data for un-surveyed wetlands
*Karst Database (NGT 2013)	MS Access / GIS	High	>50	New data for un-surveyed wetlands New aquatic ecosystems
*Seasonal Herbaceous Wetlands survey (NGT 2013)	MS Excel / GIS	High	>50	New data for un-surveyed wetlands Large dataset New aquatic ecosystems Threatened aquatic species

*Dataset not uploaded into SAWID as part of this update

TASK 4 - UPDATE SAWID POLYGONS WITH NEW WETLAND MAPPING

Edits to the DEWNR Corporate Landscape_Wetlands spatial layer were made for the South East region as part of the data improvement phase of the NPA project (Herpich 2013). Edits were made to approximately 600 polygons including:

- Adding natural watercourses, including Morambro Creek, Tatiara Creek, Naracoorte Creek, Mosquito Creek, Nalang Creek, Yelloch Creek and Benara Creek.
- Reviewing boundaries and deleting erroneously mapped wetlands with use of the LiDAR DEM and an analysis of basin bathymetry.

The edited Landscape_Wetlands layer was checked in and reconciled with the Corporate SDE layer. Implications for the update of SAWID from the adjustments to the spatial layer were documented by Herpich (2013).

METHOD

The spatial component of SAWID is stored within the MS Access® database [SAWIDGdb.mdb]. These data are a copy of the Corporate SDE wetlands map. Links between the Corporate dataset and the two components of the SAWID database [SAWIDGdb.mdb] and [SAWIDAccess_be.mdb] require manual update at this point in time. If updates to wetland spatial mapping are likely to be frequent, it may be possible and necessary to write a script to largely automate the spatial update process.

An extract of the Landscape_Wetlands Corporate layer for the South East region ([Region]= S01) was sourced in June 2013 to update the spatial component of the SAWID database with updated mapping from Herpich (2013).

Wetland survey data within SAWID [TBL_Survey] that were affected by changes in the wetland mapping were identified and minor amendments made as suggested by Herpich (2013) including:

- Removing survey sites and associated data for deleted polygons
- Adjusting survey numbers to new wetland polygons

The field [FID_BaseWetlandData2] was repopulated with a unique number, and the new spatial layer was imported into [SAWIDGdb.mdb] and replaced [TBL_BaseWetlandData].

A copy of the data table of the new [TBL_BaseWetlandData] was imported into [SAWIDAccess_be.mdb] and replaced [TBL_BaseWetlandData1].

New polygon features were added to the [AttributeData] table within [SAWIDAccess_be.mdb], and records for deleted polygons removed.

Queries were run to check for any errors (i.e. duplicate wetland IDs), and operation of forms and reports were checked.

RESULTS

The spatial component of the SAWID database [TBL_BaseWetlandData] within the [SAWIDGdb.mdb] database was updated with the latest wetland spatial layer, including natural creeks.

A total of 1010 additional polygons were added to SAWID, including dams which had been assigned [AUS_WETNR] numbers.

For the South East region (including the Mosquito Creek catchment in Victoria), as of June 2013, SAWID contains 17219 individual wetland polygons. Figure 4 shows the current wetland spatial data within SAWID, with revisions highlighted.

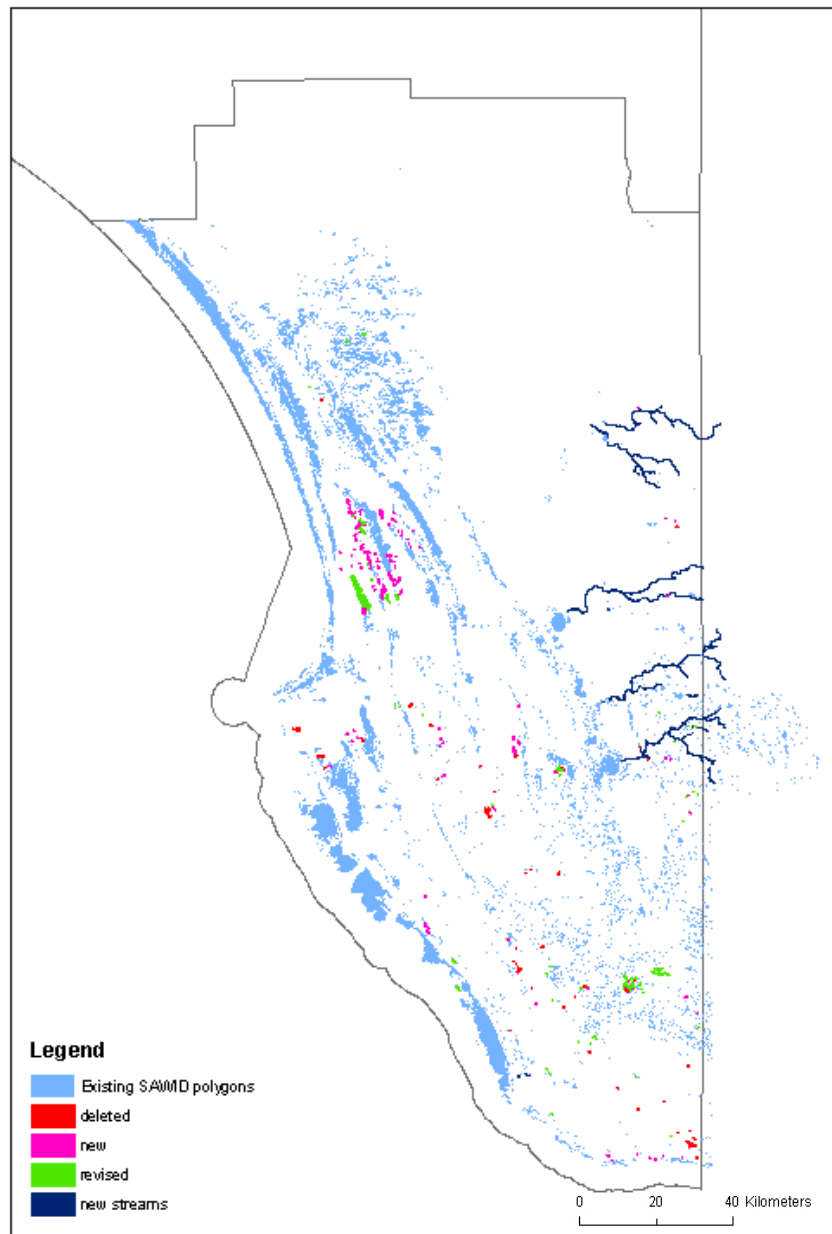


Figure 4. Updates to wetland spatial data within SAWID June 2013

The addition of new wetland polygons, and inconsistencies in the base wetland mapping used for the wetland classifications (ANAE, SAAE, GDE and GDE Atlas) as described in Tasks 1 and 2, has resulted in some wetland polygons within SAWID which have no classification attributes applied. This was unable to be addressed within the timeframes of this update, although is identified as a recommendation to amend.

TASK 5 – UPDATE SAWID WITH BDBSA EXTRACT AND PRIORITY DATASETS

SAWID sources many of the biological records (species records) through a bulk upload of data from South Australia's Corporate Biological databases. The last bulk update of data from the Biological Databases of South Australia (BDBSA) prior to this current update occurred in 2008 (Harding 2012a).

Since 2008 there has been significant data uploaded to the BDBSA, including updating of threatened species status, taxonomy and nomenclature. As a result, the bulk data upload and update of lookup tables within SAWID has provided a substantial upgrade of the information available.

A prioritisation framework within SAWID ranks wetlands on parameters that were identified as useful surrogates for determining ecological-value (Harding 2012a) – known as the Ecological Value Assessment (EVA). Four criteria were used to determine ecological value scores for each wetland:

- Landscape naturalness and connectivity
- Diversity and richness
- Threatened species and ecosystems; and
- Special features.

Flora and fauna species records were a significant component in the calculation of ecological value of wetlands within the SAWID prioritisation framework. The EVA ranking is calculated within SAWID after every entry of data into the database, therefore maintaining the most up-to-date assessment based on the current level of knowledge/data, rather than a fixed assessment calculated at one point in time. As such, the bulk update of large amounts of data from the BDBSA and other sources was likely to have an impact on the ecological value scores and ranking.

METHOD

Update of Flora and Fauna Lookup Tables in SAWID

Flora and Fauna species lookup tables within SAWID [LKP_FaunaSpeciesList] and [LKP_FloraSpeciesList] were updated with current taxonomy and threatened species status through an update query via the species identifier [NSX_CODE]. Additional species records were also added.

Regional threatened status of flora and fauna species was assessed by Gillam and Urban (2011). A new field was added into the species lookup tables in SAWID [SESTATUSCODE] and populated with regional threat codes.

Update of BDBSA Records into SAWID

BDBSA records that intersect wetland polygons in SAWID were uploaded in bulk. The process requires some manipulation of data from the BDBSA super-tables into the format required for SAWID. A separate database [BDBSA_SAWID_UpdateMay2013.mdb] was created for storing and saving the queries and tables used to manipulate the BDBSA data into SAWID format.

Select BDBSA records that intersect wetlands

A 50m buffer was applied to all mapped wetlands within SAWID to allow for inaccuracies in spatial location of species surveys (eg performing waterbird counts from the edge of a wetland).

A spatial intersect query with flora and fauna super-tables, the freshwater fish SDE layer and the 50m buffered polygons of wetlands for the South East region was applied (e.g. Figure 5). Selected features were exported as new layers into [BDBSA_SAWID_UpdateMay2013.mdb] for manipulation.

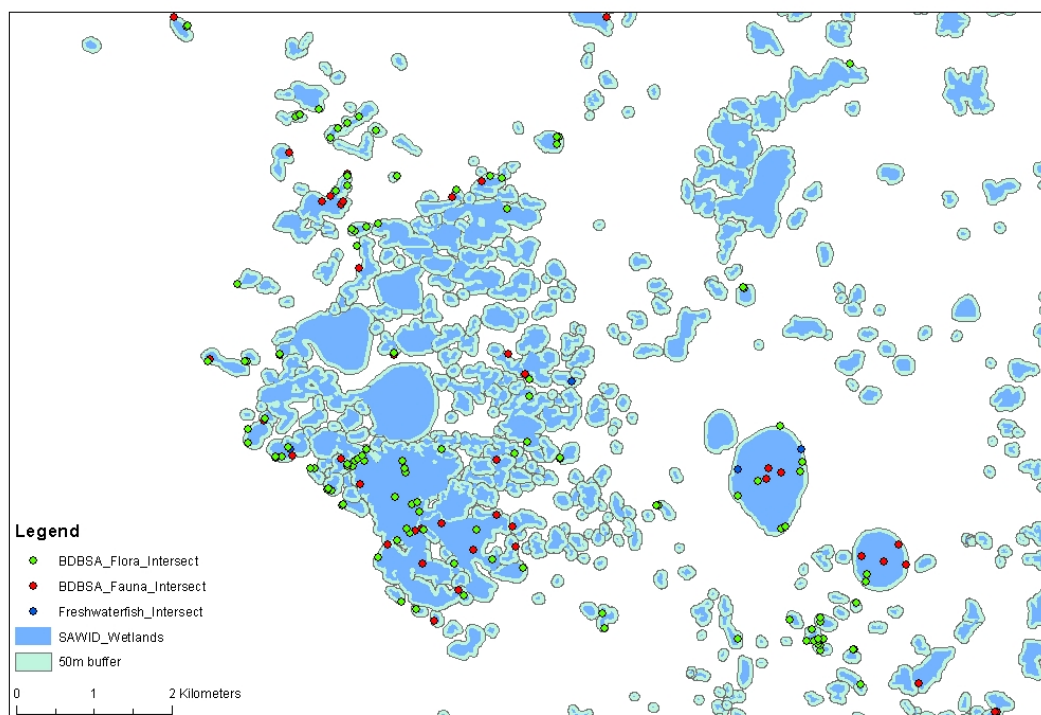


Figure 5. Example selection of BDBSA records that intersect wetlands in SAWID

Species records with spatial reliabilities >1km were filtered out including:

[RELIABNR] = 6 (1-10km); 7 (11-25km); 8 (>25km); 22 (31-125km); 23 (<625km-SA)

An overlay spatial intersect analysis was then applied with the buffered wetland polygon layer to attribute each species record with a corresponding wetland identifier number [AUS_WETNR].

Manipulation of BDBSA Data into SAWID

To streamline update and reduce duplication between databases generic project numbers (Table 3) were applied to all BDBSA data entered into SAWID. Project names and surveyors details were updated into the comment field of [TBL_Survey].

Table 3. New project numbers for bulk uploaded data from BDBSA into SAWID

Project No. (SAWID)	Project Name	Custodians	Publication
136	BDBSA Bulk Upload May 2013 – Freshwater Fish Records	DEWNR	Biological Databases of South Australia.
137	BDBSA Bulk Upload May 2013 – Fauna Records	DEWNR	Biological Databases of South Australia.
138	BDBSA Bulk Upload May 2013 – Flora Records	DEWNR	Biological Databases of South Australia.

The SAWID data structure (Figure 6) requires BDBSA data to be uploaded into three tables within [SAWIDAccess_be.mdb]:

- [TBL_Survey] – stores single attribute site visit information, where a survey is defined as data collected at a specific location (Easting and Northing) on a specific date, time and project.
- [TBL_FloraSpeciesList] – stores multiple flora records collected at a single survey
- [TBL_FaunaSpeciesList] – stores multiple fauna records collected at a single survey

Lookup tables link to both [TBL_FloraSpeciesList] and [TBL_FaunaSpeciesList] through the [NSXCODE] to provide the most current species name and threatened status.

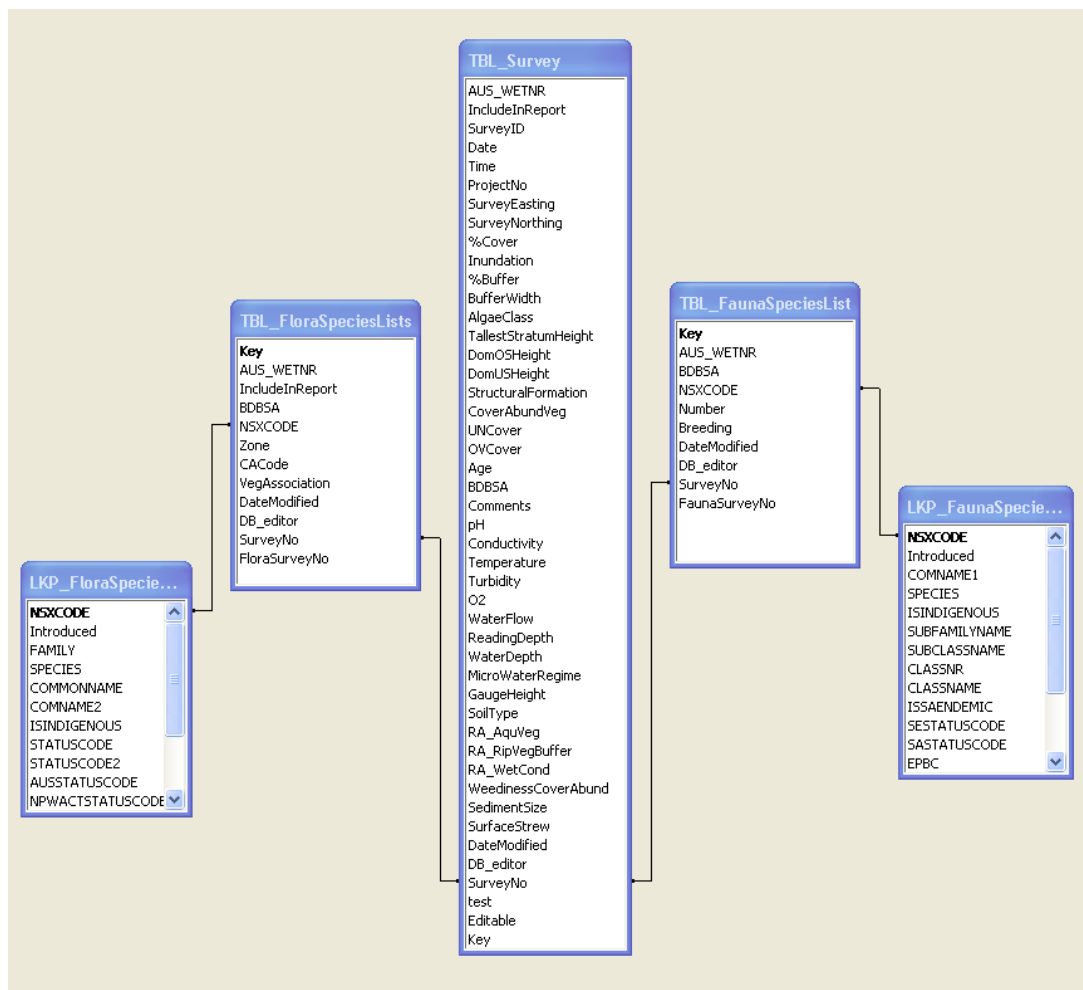


Figure 6. Table structure within SAWID relevant to BDBSA bulk upload

The following steps were followed for each BDBSA dataset (Freshwater fish; Fauna; and Flora) to format and upload into SAWID within [BDBSA_SAWID_UpdateMay2013.mdb]:

1. Remove any duplicates of records already within SAWID: Join between [TBL_Survey] and BDBSA filtered extracts. Query [UPDATE_InSAWID]. Manually delete updated records.
2. Create New Survey No's for BDBSA Extract data: Group data by: [AUS_WETNR]; [EASTING]; [NORTHING]; [SIGHTINGDATE]; [OBSERVER]. Queries: [MTQ_Fauna_CreateSurvey]; [MTQ_Flora_CreateSurvey]; [MTQ_FreshwaterFish_CreateSurvey]

3. Update fields with relevant data into [TBL_Survey] format. Queries: [Update_Fauna_TBLSurvey]; [Update_Flora_TBLSurvey] [Update_FreshwaterFish_TBLSurvey].
4. Update fields with relevant data into [TBL_FaunaSpeciesList] and [TBL_FloraSpeciesList] format: Queries: [Select_Fauna_TBLFaunaSpecies]; [Select_Flora_TBLFaunaSpecies]; [Select_FreshwaterFish_TBLFaunaSpecies]
5. Copy and paste new formatted records into [TBL_Survey], then [TBL_FaunaSpeciesList], and [TBL_FloraSpeciesList] in [SAWIDAccess_be.mdb].

Update of Priority Datasets into SAWID

Fifteen of the 19 priority datasets identified in Table 2 were uploaded into SAWID in addition to the bulk upload of BDBSA data. Data available in MS excel format was either bulk imported after data formatting, or manually entered via the data entry forms within SAWID. A total of 2.5 weeks was spent by a sub-contractor manually entering raw data from hard-copy reports or data in a format non-compatible for importing.

The remaining priority datasets required updates and additions to the wetlands spatial layer within SAWID that were unable to be completed within the project timeframe.

Update of Ecological Value Assessment in SAWID

Several queries run the ecological values assessment calculations within [PRODSAWIDAccess.mde], with the final score and grouping produced in the query [ZZ_Significance_FinalLevels] and updated to the table [UPDATE_SigLevel] within [SAWIDAccess_be.mdb]. The queries that calculate Ecological Value scores within SAWID were re-run following the significant update of spatial and related data. No adjustment to the scoring or weighting of individual parameters or cut-off points between value classes were made, however minor changes to queries calculating scores for threatened flora and fauna were required as a result of the update of species lookup tables [LKP_faunaspecieslists] and [LKP_floraspecieslists].

Changes to the status codes for threatened species within the lookup tables required adjustments to a number of the queries within [PRODSAWIDAccess.mde] which run the ecological value assessment calculations. Adjustments were made to queries which run the threatened species and EPBC species scores: [ZZ_Significance_ThreatenedFauna]; [ZZ_Significance_ThreatenedFlora]; [ZZ_Significance_ThreatenedFlora2]; and [ZZ_Significance_ParametersScored].

New queries were developed to adjust the scoring to the new JAMBA/CAMBA/ROKAMBA ratings for migratory species: [ZZ_Significance_MigratoryFauna]; [ZZ_Significance_MigratoryFaunaScores]; [ZZ_Significance_MigratoryFaunaSum]; and [ZZ_Significance_ThreatFaunaMigratoryScore].

RESULTS – BDBSA AND PRIORITY DATA UPDATE

A total of 8651 new survey records were added to SAWID, with 70415 new individual species records. The data relates to 1199 wetlands mapped within SAWID (Table 4).

Table 4. Summary of data uploaded into SAWID – June to October 2013 update

Data Source	No. Surveys added	No. Species Records added	No. Water Quality Surveys added	No. of Wetlands with additional data added
BDBSA Bulk Upload May 2013 – Freshwater Fish Records	330	686		72
BDBSA Bulk Upload May 2013 – Fauna Records	4594	43750		641
BDBSA Bulk Upload May 2013 – Flora Records	2459	18546		728
Spiny Cray Monitoring 2012	16	42	16	11
SAWID External Databases	11	320	11	8
GDE Monitoring June 2010 - Beacon Ecological	417	1501		7
SE DSS Database extract 2012	140	1234		38
SE Ephemeral Wetland Floristics 2011	10	336		9
SE Wader Survey Counts - Lake Bonney	21	57		2
SE Wader Survey Counts - SE Lakes	105	519		13
Spiny Cray Monitoring 2013	2	7		2
USE aquatic veg and waterbird counts - PIRSA Rural Solutions 2009	143	727	99	31
USE South East Flows Restoration Program - Wetland Environmental Monitoring	315	1997	49	40
USE Waterbird Counts	36	329		21
Watervalley Wetlands Waterbird Monitoring	19	207		6
SE Aust Brolga Counts	2	2		1
Ancient Greenling Survey	16	16		10
Shorebirds – Lower Limestone Coast	15	139		15
Total	8651	70415	175	1199*
* Multiple records can occur in single wetlands				

Figure 7 shows the distribution of new data survey uploaded into SAWID.

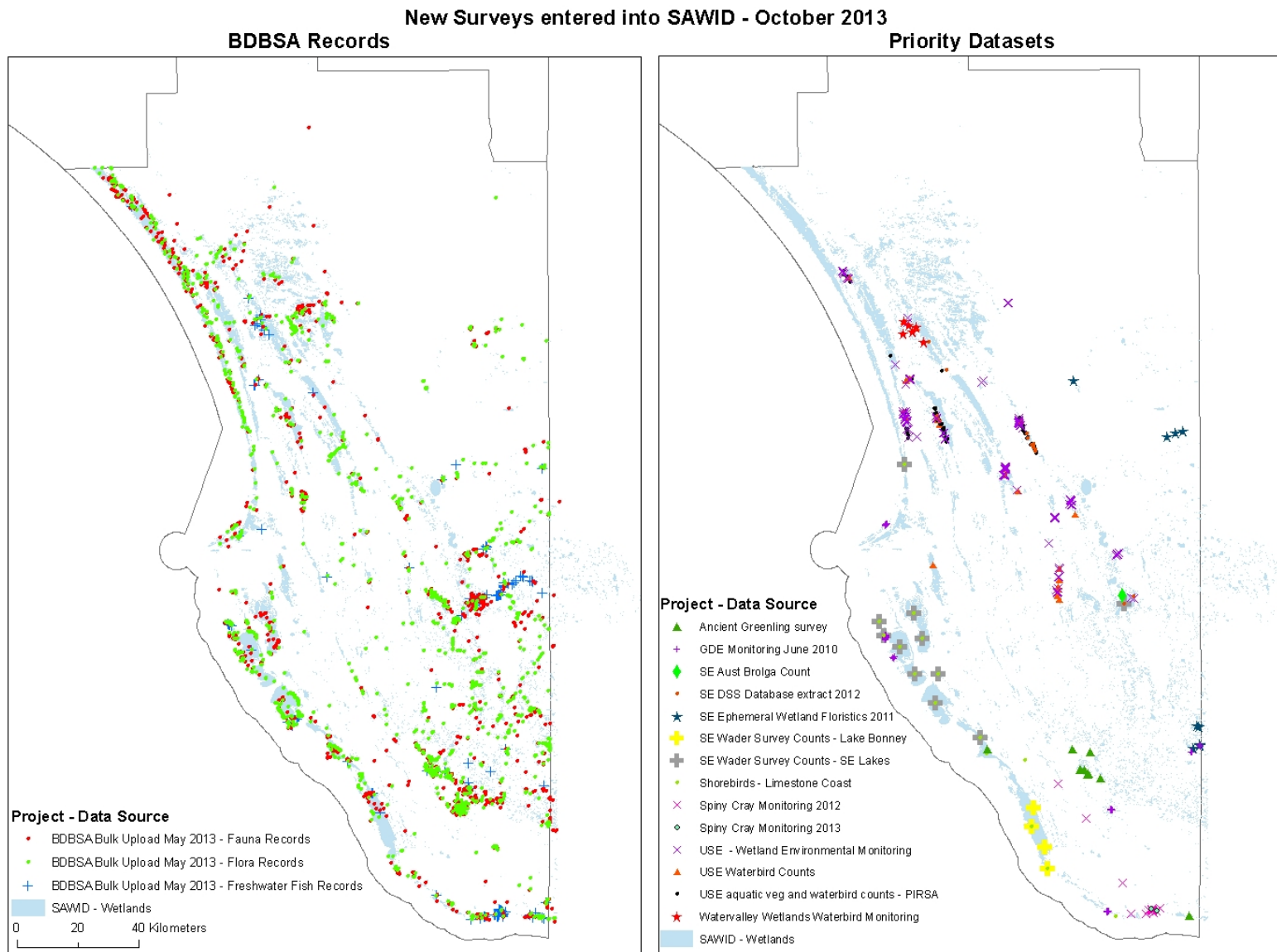


Figure 7. New surveys entered into SAWID – June 2013 update

RESULTS – SAWID ECOLOGICAL VALUES ASSESSMENT

Ranked wetlands were grouped into four descriptive value classes using significant cut-off values as detailed in Harding (2012a): Very High, High, Moderate, and Low. A large group were assigned as 'Not assessed' which included sites that had insufficient data in one or all of the criteria fields and were not able to be attributed to 'Low' value.

Table 5 summarises the difference in the Ecological Value Assessment calculation output since the previous data upload and calculation in 2008 (Harding 2012a). The update has resulted in 72 additional wetlands identified as 'Very High', 131 additional wetlands identified as 'High' value, 11 less wetlands identified as 'Moderate' value, and 34 additional wetlands identified as 'Low' value. There remained a large proportion of wetlands in the 'Not Assessed' category.

Figure 8 shows the mapped comparison of the two assessments, and Appendix G lists those wetland identified as Very High and High Ecological Value, highlighting those that have been newly identified through the SAWID update.

Table 5. Ecological Value Assessment of South East Wetlands - comparison after June 2013 SAWID Update

Ecological Value Assessment Level	Nov 2008	October 2013	Difference Post SAWID Update
Very High	93	165	+72
High	825	956	+131
Moderate	1505	1494	-11
Low	343	377	+34
Not Assessed	13557	14227	+670
Total Number Wetlands	16323	17219	

Implications for Water Allocation Plans for Prescribed Wells Areas in the South East

Groundwater dependent wetlands identified as High and Very High Ecological Value within SAWID are subject to policies within the Tatiara, Tintinara-Coonalpyn, Padthaway, and Draft Lower Limestone Coast Prescribed Wells Areas Water Allocation Plans (WAP) for the protection of GDEs.

Appendix G also identified which of the newly identified high value wetlands as a result of this update are both likely to be groundwater dependent and occur within Prescribed Wells Areas (PWA) in the South East. Table 6 summarises and Figure 9 shows the difference in the identification of high ecological value GDEs within PWAs since the previous data upload and calculation in 2008 (Harding 2012a).

Table 6. Very High and High Ecological Value Groundwater Dependent Wetlands within the Prescribed Wells Areas of the South East - comparison after June 2013 SAWID Update

Prescribed Wells Area	Nov 2008	October 2013	Difference Post SAWID Update
Lower Limestone Coast	301	421	+120
Tintinara-Coonalpyn	0	0	0
Tatiara	1	1	0
Padthaway	1	1	0

A total of 120 additional wetlands of Very High or High value, which were also likely to be groundwater dependent (i.e. with a groundwater interaction likelihood of Very High, High, or Moderate as identified by SKM (2009)) within the Lower Limestone Coast PWA were identified as a result of this update. No changes to the identification of Very High or High value GDEs in Tintinara-Coonalpyn, Tatiara or Padthaway PWAs resulted from the update (Figure 9).

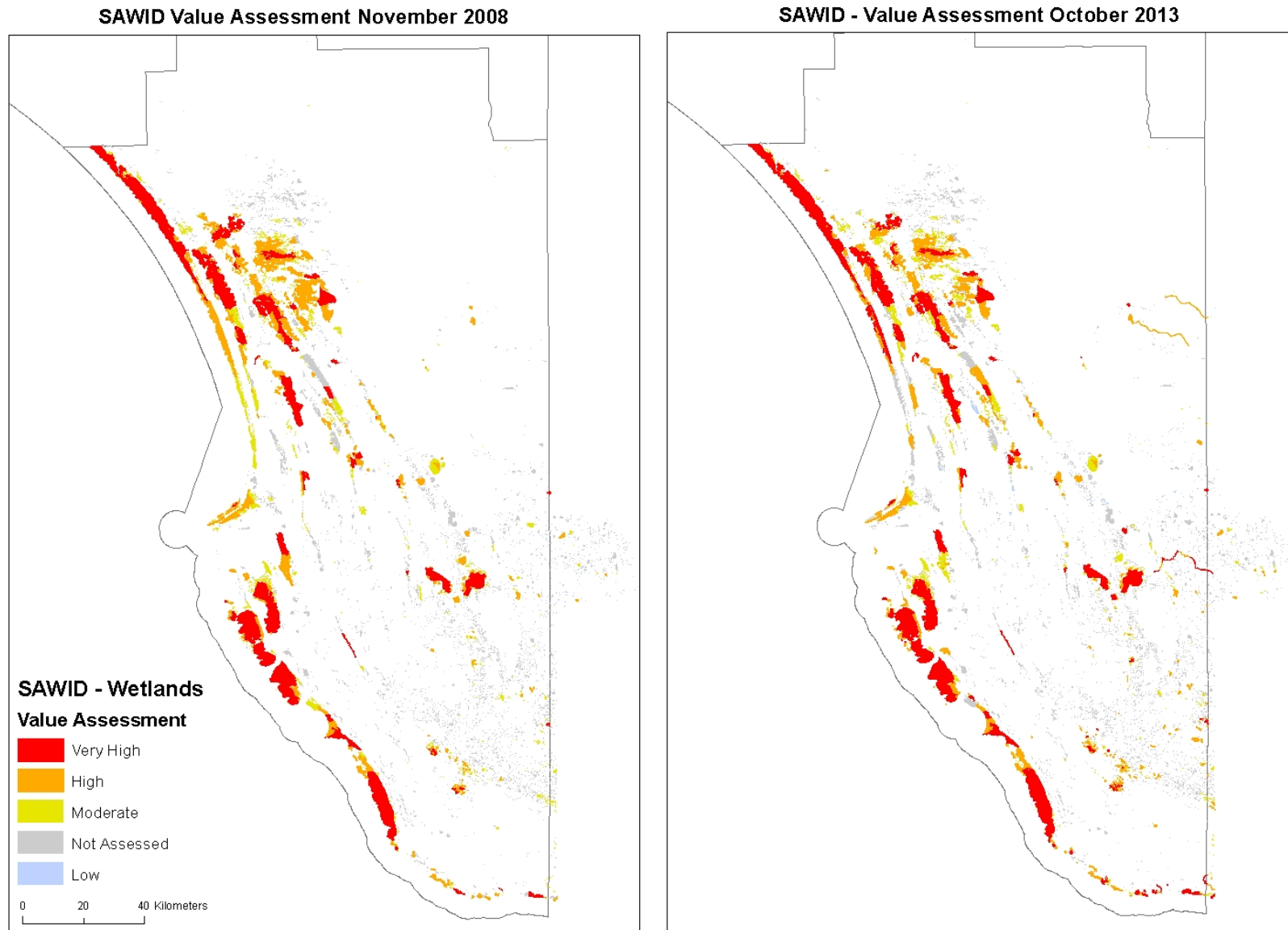


Figure 8. Comparison of Ecological Value Assessment Rankings with SAWID before and after database update.

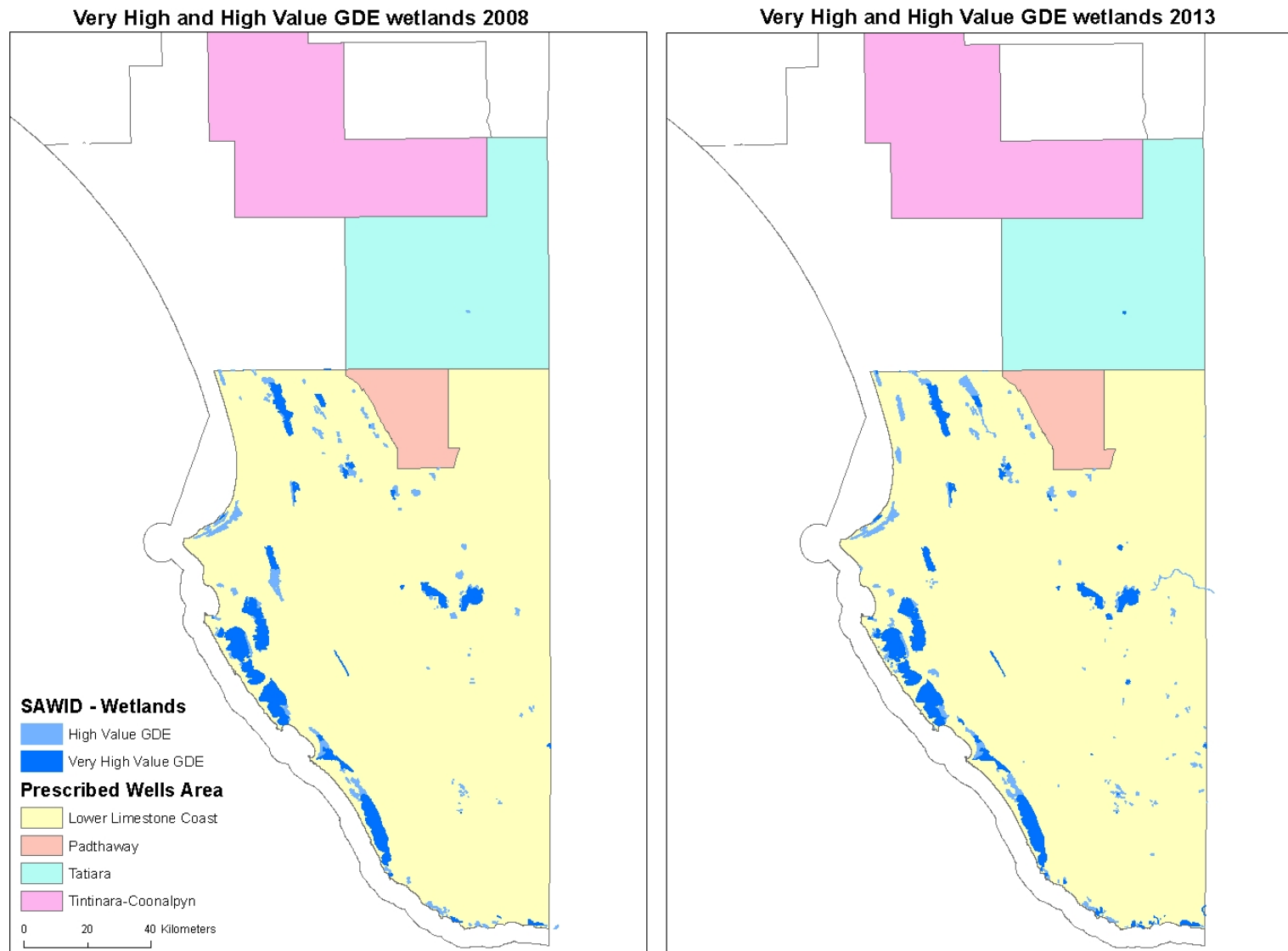


Figure 9. Comparison of High and Very High Ecological Value GDEs identified in SAWID within Prescribed Wells Areas of the South East region before and after database update.

TASK 6 – RECOMMENDATIONS FOR ONGOING MAINTENANCE OF SAWID

A number of the functions of SAWID, particularly the reporting and analysis functions of the Ecological Values Assessment, spatial wetland mapping, typology classifications, and assessment of groundwater dependency, align with and contribute to the delivery of outcomes and strategic priorities in the DEWNR Corporate Plan 2012-2014. The contributions of SAWID to the delivery of several key result areas identified in the DEWNR Strategic Implementation Plan 2013-2014, are detailed in Table 7. SAWID has an integral role in the South East for delivering outcomes related to DEWNR Corporate Plan Outcomes: 1. Resilient landscapes and livelihoods; and 2. Sustainable water resources for all.

Table 7. Contribution of SAWID to the implementation of the DEWNR Corporate Plan 2012-2014

Corporate Plan Outcome	Key Result Area	Contribution of SAWID in delivering Corporate Plan Outcomes
1. Resilient landscapes and livelihoods	Facilitating sustainable and productive use of natural resources	<p>The spatial identification of wetland ecosystems and associated values and condition information within SAWID are used to ensure environmental considerations relevant to conservation and protection of aquatic ecosystems are applied in land use planning and development decisions. In the South East, SAWID data is used within a GIS risk assessment tool (Water-RAT, Harding 2012a) for assessing potential impacts of water affecting activities under various WAP and NRM policies.</p> <p>SAWID houses information that is essential for prioritising on ground management and restoration of wetland assets, this is essential to ensure adequate and representative conservation of wetland diversity and appropriate monitoring and management of the impacts of water use on wetlands.</p>
	Conserving biodiversity	<p>Wetland ecosystems are some of the most biologically diverse ecosystems in South Australia. In the South East, SAWID is used for identifying priority aquatic ecosystems for a range of conservation and restoration activities which result in regionally targeted improvements in ecosystem condition and resilience of landscapes.</p> <p>A number of threatened ecological communities in the South East are aquatic ecosystems spatially identified and classified within SAWID including Seasonal Herbaceous Wetlands (EPBC listed), Karst Rising Springs and Perched Volcanically Derived Swamps. Additionally, wetlands also support many threatened aquatic fauna and flora species. The data and analysis tools within SAWID enable spatial classification and identification of threatened aquatic ecosystems, identification of known threatened aquatic species presence and data to enable the identification of potential habitat. This information provides a basis for developing recovery actions for threatened aquatic species and ecological communities in the region.</p>
	*Enhancing the NRM system	<p>Regional NRM Plans for the South East draw heavily on data, values assessments, and prioritisations within SAWID in the development of the regional description, policy and strategic plan. The Regional NRM Plan outlines a range of Resource Condition and Management action targets. SAWID as a repository of wetland condition information is a key source of data for the evaluation of NRM Plan targets.</p> <p>SAWID, and the values assessments within, facilitates comprehensive regional planning which reflects local and state priorities.</p>

	*Preparing for climate change	The impacts of climate change have been identified as a key risk to aquatic ecosystems in South Australia. SAWID has been used in a pilot regional investigation into potential climate change risks to wetland ecosystems in the South East (Slater 2012). Data within SAWID enabled the spatial identification of vulnerable wetland typologies and potential consequences of impact. Further climate change impact analysis in the South East on case study wetlands used data within SAWID to prioritise case study sites and extrapolate site-scale outputs to a sub-regional scale. The outputs of such assessments inform adaptation and mitigation strategies, can be integrated into planning and increases the capability of communities, industry and government to respond to climate change.
2. Sustainable water resources for all	*Effective water allocation planning	The implementation of the Risk Management Policy Guidelines for Water Allocation Plans (DFW 2012) for the Lower Limestone Coast draft WAP used wetlands data and ecological values assessments within SAWID in the determination of risks to groundwater dependent ecosystems within management areas (SENRM 2012). SAWID enabled the efficient application of a risk management approach to water planning in the South East and has also contributed substantially in the development of environmental water provision policy for GDEs within the LLC WAP. Future potential prescription of surface water in the South East, and the subsequent Water Allocation Planning process would also draw upon SAWID for the identification of aquatic ecosystems values and environmental water provisions.
	*Sustainable use of water resources in the South East	The ecological value assessment and spatial data in SAWID informs the protection of environmental water provisions for groundwater dependent wetlands in the South East under the Draft Lower Limestone Coast Water Allocation Plan. Within the Plan, SAWID is referred to as the source of wetland spatial boundaries and identification of Very High and High value wetlands for which policy relating to set-back distances for groundwater extraction and forestry apply. SAWID therefore is an important tool for sustainably managing water resource impacts of plantation forestry on high value GDEs within the region. SAWID also informs the development of the Draft South East Drainage System Operation and Management (SEDSOM) Bill and would be integral in the preparation of the SE Drainage and Wetland Management Strategy.
	Ensuring water security for South Australia	Through a consistent and transparent prioritisation approach to identifying and assessing the value of aquatic ecosystems in the South East, DEWNR is enabled to demonstrate responsible water management for the management and delivery of environmental water provisions to high value GDEs.
* Identified as a DEWNR Corporate Plan Priority (DEWNR Strategic Implementation Plan 2013-2014)		

SAWID is currently not fully corporately supported within DEWNR beyond management of the spatial component, and is managed and used largely within the South East region. Without regular update, and provision of the database on a platform that is stable, functional, and available to users it is at risk of becoming out-dated. This is evidenced by the amount of aquatic ecosystem data neither entered into SAWID or BDBSA databases over recent years in the South East region (refer to Appendix F) and the almost 5 year interval between BDBSA uploads which has resulted in this substantial data update.

Despite the lack of data entry over recent years, the database remains the repository for the majority of wetlands data within the South East, and is widely and actively used for conservation planning, prioritisation, classification and water planning (see Table 7). For example, the ecological value assessment data in SAWID informs the protection of environmental water provisions for groundwater dependent wetlands in the South East under the Tatiara, Tintinara-Coonally, Padthaway and Draft Lower Limestone Coast Water Allocation

Plans. For these reasons, it is important that a protocol for keeping SAWID current be implemented in the short term, and the potential for long term solutions for delivering SAWID, or SAWID functionality in a different format, be investigated. Unless otherwise specified, responsibility for implementing various tasks associated with the short and long-term recommendations currently resides with the South East region, with support from, and in partnership with, corporate DEWNR. This partnership should aim to ensure compatibility of solutions with corporate databases and best practice data management leading to most effective use and enduring access to data.

SHORT TERM RECOMMENDATIONS

SAWID Maintenance and Update

SAWID currently resides on the ex-DENR Citrix server. There are accessibility issues between DEWNR staff and Citrix, and network speed to practically use SAWID on Citrix is lacking. The implication of these access and functionality issues has likely been the reason for the lack of data entry into SAWID over recent years. Additionally, the current SAWID format (of three linked MS Access databases) does not make supply of the database to external agencies straightforward. It is recommended that in the short-term, SAWID could be reinstated to an MS Access mdb on a shared network drive.

Update and links with BDBSA

Regular updating of BDBSA into SAWID is recommended in the short term at a maximum of 6 month intervals, or when deemed necessary (i.e. after a known update to BDBSA of wetland related data). There is the potential for an automated process to be developed with the use of scripts, however the process has been significantly simplified by establishing a set of queries and a process for upload as documented in this report. It is recommended that an appropriate team within DEWNR be given responsibility for provision of this update. As a result of this recommendation, SAWID would be next due to be updated with BDBSA data by **December 30th 2013**.

Priority datasets that were not able to be uploaded within the timeframe of this project (Table 2) should continue to be entered into SAWID in the short term, including new mapping of permanent pools, karst features and seasonal herbaceous wetlands. The remaining substantial list of datasets neither within SAWID, BDBSA, Hydstra or EPA water quality databases (Appendix F) should be investigated for entry into relevant existing corporate databases which can then be uploaded to SAWID in bulk. A prioritisation and assessment of compatibility of the remaining datasets with existing databases would need to be undertaken. It is estimated that resourcing of this task, and formatting and uploading extraneous datasets, would require approximately 1 month FTE of a suitably skilled person.

Update of Wetland Classifications

A number of aspects of the current data upgrade have not been able to be addressed within the project timeframe. This includes updating the classifications of ANAE, SAAE and GDE likelihood and calculating Landscape Naturalness scores (as part of the Ecological Value Assessment) to new mapped wetlands. These should be addressed in the short term to ensure the maintenance of a region-wide complete dataset of wetland typologies and groundwater dependence which support statewide and regional planning and policy development (e.g. Water Allocation Plans).

Software Upgrade Issues

The upgrade from ArcGIS 9.3 to version 10.1 within DEWNR has implications for the user-form functions of SAWID which run using VBA code which is no longer supported in ArcGIS 10.1. This will result in some loss of the functionality of SAWID (i.e. ease of data-entry, reporting and viewing data through form links with ArcGIS). Although this functionality makes SAWID user-friendly, it is not essential for the maintenance of data

nor use of the database. It is recommended that short term options be further investigated for SAWID use within ArcGIS 10.1.

Ecological Values Assessment

Data held within SAWID is used to determine an Ecological Value Assessment (EVA) score and ranking based on a prioritisation framework which is calculated by queries within the database. As part of the functionality of SAWID, the EVA is applied after every entry of data into the database, therefore maintaining the most up-to-date assessment based on the current level of knowledge/data, rather than a fixed assessment calculated at one point in time. Updates to the Ecological Value Assessment have implications for the protection of ecosystems dependent on groundwater as identified in the Draft Lower Limestone Coast WAP.

Review of the EVA Update

For the update documented within this report, the Ecological Value Assessment was run without any changes to the queries which calculated the 2008 assessment which is currently referred to within the Tatiara, Tintinara-Coonalyphn, Padthaway and Draft Lower Limestone Coast WAPs. It is recommended that this assessment, and cut-off points between values, be reviewed by re-analysing methods such as Jenks Natural Breaks with the new spread of data and outputs assessed in regard to implications for the WAPs.

HEVAE Assessment

Butcher et al. (2013) has completed a trial of the National High Ecological Value Aquatic Ecosystems (HEVAE) assessment framework using the data stored within SAWID prior to this update. This trial highlighted several data deficiencies within SAWID, and made recommendations regarding the application of the framework and scoring of parameters. It is recommended that the HEVAE queries developed for SAWID by Butcher et al. (2013) be re-run with the updated data entered into SAWID. The outputs of the application of the HEVAE framework should be used as a guideline and balanced against the professional judgement of individuals familiar with the study area and its wetlands. If for any reason the scoring of an individual criterion is subsequently altered, the assessors are required to substantiate and document their judgement as far as possible for future reference and revision (Butcher et al. 2013).

An agreed and transparent wetland Ecological Value assessment within SAWID, which may contain aspects of both the current SAWID assessment and the HEVAE trial, should be worked towards for the South East region. This will be of particular importance in administering the policies outlined for the protection of groundwater dependent ecosystems in Water Allocation Plans and in future reporting and risk evaluations.

Business Analyst to assess SAWID requirements

Due to the complexity of the issues between SAWID and its use and purpose in the South East, potential links to existing databases (BDBSA; Hydstra; EPA databases etc.), potential synergies with a new Management Action Database (MAD) developed for the Riverine Recovery Project, and the need for corporate support for data management, it is recommended that a Business Analyst be commissioned to work with SMK and BTI and SENRM Board document the issues and provide options for a long-term strategy for SAWID.

LONGER TERM RECOMMENDATIONS

Upgrade of SAWID

Future funding for the upgrade of SAWID, or a system which would replace SAWID functionality, in line with the recommendations of a Business Analyst should be targeted. This functionality may be applicable to, and desirable for, other regions within South Australia, and the potential for joint regional funding should be investigated.

Interim long term management

In the potential absence of funding to address a long-term solution for SAWID, an interim solution to the management of SAWID needs to be agreed upon within DEWNR and with consultation with the SE NRM Board. Responsibilities for maintenance of SAWID for the purposes of delivering DEWNR business (WAP implementation) in the South East need to be defined within the new organisation structure.

SAWID data backload

SAWID not only sources data from existing corporate databases, but also stores a significant amount of wetland inventory raw data and other non-corporate datasets. A process for the identification of data that could be stored in existing corporate databases (including BDBSA) and a process for the backload of data should be pursued. It is recommended that this task be coordinated by DEWNR corporate.

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APPENDICES

APPENDIX A. SUMMARY OF EDITS AND UPDATES MADE TO SAWID OCTOBER 2013

SAWID Database Component	Table	Edit Type	No. of records added	Comments
[SAWIDAccess_be]	[SE_ANAECLASS]	New Table	15 509	ANAE and SAAE Classification data
[SAWIDAccess_be]	[SE_GDE]	New Table	16694	GDE Classification (SKM 2009)
[SAWIDAccess_be]	[SE_GDEATLAS]	New Table	16003	GDE Atlas Classification (SKM 2012)
[SAWIDGdb.mdb]	[TBL_BaseWetlandData]	Update	1008	Spatial layer linking to SAWID updated to SDE layer version
[SAWIDAccess_be]	[TBL_BaseWetlandData1]	Replace	1008	Replace data table with copy from SAWIDGdb.mdb
[SAWIDAccess_be]	[AttributeData]	Update Add Fields	1008	Update table with new records and remove deleted records. Add field [PWA] for Prescribed Wells Area
[SAWIDAccess_be]	[LKP_FaunaSpeciesList]	Update Add Fields New Records	1582	Update with BDBSA. Add SE Regional Threatened Status [SESTATUSCODE], and [MIGRATORY] fields. Update of [WATERBIRD].
[SAWIDAccess_be]	[LKP_FloraSpeciesList]	Update Add Fields New Records	2218	Update with BDBSA. Add SE Regional Threatened Status [SESTATUSCODE], and [SE_AQUATIC] fields.
[PRODSAWIDAccess.mde]	[ZZ_Significance_ThreatenedFauna] [ZZ_Significance_ThreatenedFlora] [ZZ_Significance_ParametersScored]	Update	N/A	Update queries which run the ecological significance calculations with new threatened status codes from updated Flora and Fauna Lookup tables.

[PRODSAWIDAccess.mde]	[ZZ_Significance_MigratoryFauna] [ZZ_Significance_MigratoryFaunaScores] [ZZ_Significance_MigratoryFaunaSum] [ZZ_Significance_ThreatFaunaMigratoryScore]	New Queries	N/A	New queries developed to run the scoring of migratory bird species (JAMBA/CAMBA/ROKAMBA) in ecological significance calculations with new codes from updated Fauna Lookup table.
[SAWIDAccess_be]	[TBL_Survey]	New Records	7410	Add new records from BDBSA and other priority datasets.
[SAWIDAccess_be]	[TBL_FaunaSpeciesList]	New Records	44638	Add new records from BDBSA and other priority datasets.
[SAWIDAccess_be]	[TBL_FloraSpeciesList]	New Records	18706	Add new records from BDBSA and other priority datasets.
[SAWIDAccess_be]	[LKP_WVC]	New Lookup Table	21	Refined WVC models sourced from Ecological Associates 2009
[SAWIDAccess_be]	[TBL_WVC]	New Table	360	WVC models assigned to wetlands. Sourced from Ecological Associates (2009) and Aquasave Consultants (2012)

APPENDIX B. ANAE AND SAAE CLASSIFICATION ATTRIBUTES [SE_ANAECLASS]

	Field Description	Database Reference	Nationwide Dataset Source	Sourced from SE ANAE Classification Field	Sourced from SE SAAE Classification Field
SAWID UPDATE	SAWID Unique Identifier	AUSWET_NR			
	ANAE Classification (SE)	ANAE_CLASS	SE ANAE Classification	TYPE	
	SAAE Classification Code (SE)	SAAE_CODE	SE SAAE Classification		UPDATE_
	SAAE Classification Description (SE)	SAAE_CLASS	Expanded as part of this update.		
ANAE Level 1 – Regional Scale	Marine current SA	AQ_1H_CURRENTS_SA	CSIRO (Commonwealth Scientific & Industrial Research Organisation)		
	Topographic Groundwater province SA	AQ_1H_GWPROV_SA	BOM (Bureau of Meteorology) Australian Hydrological Geospatial Fabric (Geofabric)		
	Hydrogeological Drainage division SA	AQ_1H_HGDRAINDIV_SA	GA (Geosciences Australia)		
	Topographic Surface Water Drainage division SA	AQ_1H_SWDRAINDIV_SA	BOM (Bureau of Meteorology) Australian Hydrological Geospatial Fabric (Geofabric)		
	Climate class	AQ_1C_CLIMCLASS	BOM (Bureau of Meteorology) Australian Climate Zones based on Koeppen Classification System (Koeppen)	CLIMATE	CLIMATE
	Provincial bioregion SA	AQ_1L_BIOPROV_SA	IMCRA (Integrated Marine & Coastal Regionalisation of Australia) Integrated Marine & Coastal Regionalisation of Australia (IMCRA)		
	Biogeographic region SA	AQ_1L_BIOREG_SA	IBRA (Interim Biogeographic Regionalisation for Australia) Interim Biogeographic Regionalisation for Australia (IBRA)		
	Physiographic province SA	AQ_1L_PHYSIOPROV_SA	ASRIS (Australian Soil Resources Information System) The Physiographic Regions of Australia		
ANAE Level 2 – Landscape Scale	Estuary characteristic	AQ_2WI_ESTCHAR			
	Meso-scale bioregion SA	AQ_2L_BIOMESO_SA	IMCRA (Integrated Marine & Coastal Regionalisation of Australia) Integrated Marine & Coastal Regionalisation of Australia (IMCRA)		
	Biogeographic sub-region SA	AQ_2L_BIOSUBREG_SA	IBRA (Interim Biogeographic Regionalisation for Australia) Interim Biogeographic Regionalisation for Australia (IBRA)	IBRASUB_1	IBRASUB_1
	Physiographic region SA	AQ_2L_PHYSIOREG_SA	ASRIS (Australian Soil Resources Information System) The Physiographic Regions of Australia	PHYSIO_1	PHYSIO_1
	Simple Topographic region	AQ_2T_SIMPLETOPOREG			

	Topographic River region SA	AQ_2T_TOPORIVERREG_SA	BOM (Bureau of Meteorology) Australian Hydrological Geospatial Fabric (Geofabric)	DRAINAGE_1	DRAINAGE_1
	Climate sub-class	AQ_2C_CLIMSUBCLASS	BOM (Bureau of Meteorology) Australian Climate Zones based on Koeppen Classification System (Koeppen)		
ANAE Level 3 – Wetland Scale	ANAE Level 3 Landform type	AQ_3LANDFORM_TYPE			
	ANAE Level 3 Wetland Class type	AQ_3WCLASS_TYPE			
	ANAE Level 3 Wetland Group type	AQ_3WGROUPE_TYPE		1.GROUP_2 2.GROUP_1 3.INLAND_COA	1.GROUP_2 2.INLAND_COA
	ANAE Level 3 Wetland System type	AQ_3WSYSTEM_TYPE		1.SYSTEM_4 2.SYSTEM_3 3.SYSTEM_2 4.SYSTEM_1 5.FLOODPLA_1 6.FLOODPLAIN	1.SYSTEM_4 2.SYSTEM_2 3.SYSTEM_1 4.FLOODPLA_1 5.FLOODPLAIN
ANAE Level 3 – Habitat Scale	Coastal Substrate	AQ_3COAST_SUBSTRATE			
	Coastal Structural Macrobiodiversity SMB	AQ_3COAST_SMBIOTA			
	Coastal Water Depth	AQ_3COAST_DEPTH			
	Coastal Light Availability percentage range	AQ_3COAST_LIGHT1			
	Coastal Light Availability photic zone	AQ_3COAST_LIGHT2			
	Coastal Nutrient Availability description	AQ_3COAST_NUTRIENT1			
	Coastal Nutrient Availability trophic type	AQ_3COAST_NUTRIENT2			
	Coastal Exposure	AQ_3COAST_EXPOSURE			
	Coastal Landscape Setting SA	AQ_3COAST_LANDSET_SA			
	Coastal Landform SA	AQ_3COAST_LANDFORM_SA			
	Coastal Size / Scale SA	AQ_3COAST_SIZESCALE_SA			
	Coastal Hydrological Connectivity SA	AQ_3COAST_CONNECT_SA			
	Coastal Water Source SA	AQ_3COAST_SOURCE_SA			
	Inland Landform Transport zone	AQ_3INLAND_LANDFORM			
	Inland Landscape Setting SA	AQ_3INLAND_LANDSET_SA			Landscape
	Inland Landform SA	AQ_3INLAND_LANDFORM_SA			Landform
	Inland Instream Type SA	AQ_3INLAND_INSTREAM_SA			
	Inland Size / Scale SA	AQ_3INLAND_SIZESCALE_SA			Size
	Inland Confinement Riverine	AQ_3INLAND_CONFINERIVER			
	Inland Soil	AQ_3INLAND_SOIL		SOIL_1	SOIL_1
	Inland Substrate	AQ_3INLAND_SUBSTRATE			
	Inland Vegetation	AQ_3INLAND_VEG		VEG	VEG
	Inland Water Source	AQ_3INLAND_SOURCE		WATER_SO_1	1.Water_Sour 2.WATER_SO_1
	Inland Water Source SA	AQ_3INLAND_SOURCE_SA		1.SOURCESA_2 2.SOURCESA_1	1.SOURCESA_2 2.SOURCESA_1
	Inland Salinity	AQ_3INLAND_SALINITY		1.FINAL_SAL 2.SALINITY_1	1.SALINITY_2 2.SALINITY_1
	Inland PH	AQ_3INLAND_PH		PH	PH
	Inland Water Regime ample data	AQ_3INLAND_REGIME1			
	Inland Water Regime limited data	AQ_3INLAND_REGIME2		HYDRO_REGI	HYDRO_REGI

	Inland Water Regime Inflows SA	AQ_3INLAND_INFLOWS_SA			Infl_Reg
	Inland Water Regime Persistence SA	AQ_3INLAND_PERSIST_SA			Persistanc
	Inland Hydrology SA	AQ_3INLAND_HYDROLOGY_SA			Hydrology
	Inland Hydrological Connectivity SA	AQ_3INLAND_CONNECT_SA			
	Underground Confinement	AQ_3UNDER_CONFINE			
	Underground Dominant Porosity Aquifer Type	AQ_3UNDER_DOMPORAQ			
	Underground Salinity	AQ_3UNDER_SALINITY			
	Underground PH	AQ_3UNDER_PH			
	Underground Residence Time	AQ_3UNDER_RESIDENCE			
	Underground Dominant Recharge Source	AQ_3UNDER_DOMSOURCE			
	Underground Saturation Regime	AQ_3UNDER_SATREGIME			
	Underground Hydraulic Conductivity	AQ_3UNDER_HYDCONDUC			
	Underground Groundwater to Surface Water Connectivity Regime	AQ_3UNDER_CONNECT			
	Underground Landscape Setting SA	AQ_3UNDER_LANDSET_SA			
	Underground Landform SA	AQ_3UNDER_LANDFORM_SA			
	Underground Size / Scale SA	AQ_3UNDER_SIZESCALE_SA			
Underground Water Source SA	AQ_3UNDER_SOURCE_SA				
	SAWID Link field and updates				
	Fields sourced from Statewide ANAE Classification				
Adapted from: M Miles (2013) pers. com.					

APPENDIX C. WETLAND VEGETATION COMPONENT (WVC) LOOKUP TABLE IN SAWID [LKP_WVC]

LKP_WVC							
WVC Model	WVC Description	Max Depth	Dry Phase	Max. Inundation	Max. Dry Phase	Target EC Range	Tolerance EC
1.1	Eucalyptus camaldulensis woodland	>2	Y	48 months	36 months	<5000	
1.10	Drier Emergent Macrophytes (Baumea juncea/Letocarpus spp./Lepidosperma spp.) Mixed Sedgeland	0.5	Y	12 Months	4 years	<6500	
1.11	Seasonal freshwater emergent sedgeland	1	N	Indefinite (waterlogged)	4 years	<5000	0 to 15000
1.12	Samphire low herbland	0.5	Y	Indefinite (waterlogged)	5 years	<6000	
1.13	Semi-permanent Deep/Open Water	No upper limit	N	Indefinite (waterlogged)	5 years	<10000	
1.14	Hypersaline Wetlandss	2.5	N	Indefinite	Several years	>58300	
1.2	Seasonal brackish aquatic bed	2	N	several years	2 years	3000 - 16600	
1.3	Melaleuca brevifolia low shrubland	0.5	Y	6 months	2 years	<4000	0 to 6500
1.4	Melaleuca halmaturorum tall shrubland	0.5	Y	24 months	4 years	6000	5000 to 30000
1.5	Leptospermum continentale shrubland	0.5	Y	6 months	2 years	<3000	
1.6	Leptospermum lanigerum shrubland	0.3	N	Indefinite (waterlogged)	8 months	<3000	0 to 10000
1.7	Callistemon rugulosus Shrubland (under Eucalyptus leucoxylon Woodland)	0.2	Y	9 Months		<2000	
1.8	Gahnia filum tussock sedgeland	0.5	Y	9 Months	Several years	8000	3000 to 16600
1.9	Gahnia trifida tussock sedgeland	0.5	Y	Indefinite (waterlogged)	Several years	<5000	
2.15	Seasonal saline low aquatic bed	0.8	Y	9 months	3 years	16600 - 58300	
2.16	Melaleuca squarrosa mid shrubland	0.3	Y	12 months	2 years	<5000	
2.17	Typha sp., Phragmites australis grassland	2	N	Indefinite	4 Years	<8000	
2.18	Karstic pool with deeply submerged aquatics	No upper limit	N	Indefinite	Intolerant of drying	<3000	
2.19	Permanent coastal lake	4.5	N	Indefinite	Intolerant of drying	30000	2500 to 75000
2.2	Seasonal freshwater aquatic bed	2	N	Indefinite	4 years	<3000	0 to 15000
3.21	Eucalyptus ovata woodland						

APPENDIX D. GDE CLASSIFICATION SOUTH EAST ATTRIBUTES

Field Description	Database Reference	Categories	Description
SAWID Unique Identifier	AUSWET_NR		
Spring Minimum DTW	SPR_MIN	Number (m)	Using the polygons of the SAWID wetlands dataset, a zonal statistics analysis was completed on each of the seasonal watertable depth surfaces (average Spring and Autumn 1990 - 2005) using each of the wetland polygons as an individual zone. The technique analysed the range of values that occurred within each polygon area and reported the minimum, maximum, range and mean of these values. These results were then assigned to each specific wetland. If the area of the wetland was too small, or the geometry of the wetland was too thin to return multiple values, the analysis did not return any data. For wetlands that met these criteria, a value for each seasonal surfaces was calculated at the centre of the polygon and adopted for subsequent analysis.
Spring Maximum DTW	SPR_MAX	Number (m)	
Spring Range DTW	SPR_RGE	Number (m)	
Spring Mean DTW	SPR_MEAN	Number (m)	
Spring Standard Deviation DTW	SPR_SD	Number (m)	
Autumn Minimum DTW	AUT_MIN	Number (m)	
Autumn Maximum DTW	AUT_MAX	Number (m)	
Autumn Range DTW	AUT_RGE	Number (m)	
Autumn Mean DTW	AUT_MEAN	Number (m)	
Autumn Standard Deviation DTW	AUT_SD	Number (m)	
Groundwater Interaction Potential	GW_INTERAC	VH – Very High [SPR_MIN<=0] H – High [SPR_MIN>0 and SPR_MIN<=2] M – Moderate [SPR_MIN>2 and SPR_MIN<=5] L – Low [SPR_MIN>5]	Potential for Surface water/Groundwater interaction with the regional unconfined aquifer (TLA)
Groundwater System Type	GW_SYSTYPE	REGIONAL UNCONFINED (TLA)	Groundwater system type. Assumes all DTW records for all wetlands are related to TLA (Tertiary Limestone Aquifer)
TLA Interaction	TLA_INT	HIGH LIKELIHOOD [SPR_MIN<=5] LOW LIKELIHOOD [SPR_MIN>5 and SPR_MIN<=10] NO CONNECTION [SPR_MIN>=10]	Likelihood of connection with the Tertiary Limestone Aquifer (TLA).
Spring Interaction Category	SPRINT_CAT	<=0 0-1	Depth to groundwater in average Spring and Autumn conditions (m).
Autumn Interaction category	AUTINT_CAT	1-2 2-5 >5	
Form of Interaction	INTERACFRM	PermDep H – Permanent GW Dependence (High probability) PermDep M – Permanent GW Dependence (Medium probability) PermDep L – Permanent GW Dependence (Low probability) Seas H – Seasonal GW Dependence (High probability) Seas M – Seasonal GW Dependence (Medium probability) Seas L – Seasonal GW Dependence (Low probability) UNLIKELY – No interaction	Potential permanency of groundwater recharge/discharge with regional aquifer (TLA). Refer to interaction form matrix in SKM (2009).

Groundwater Flow Regime	GW_FLOWREG	GAINING (HIGH CONFIDENCE) POTENTIALLY GAINING (MODERATE CONFIDENCE) LOSING	Groundwater losing and gaining conditions and confidence of assessment. Refer to SKM (2009) for methods.
Spring Confidence Rating	SPRCONFSD	HIGH (SPR_SD<=1) MODERATE (SPR_SD>1 and SPR_SD<=2) LOW (SPR_SD>2)	Confidence in Spring and Autumn groundwater level data (based on SPR_SD)
Autumn Confidence Rating	AUTCONFSD		
Spring Confidence Rating (Bore Density and Residual Difference)	SPCONFBDRD	HIGH MODERATE	Confidence in Spring and Autumn groundwater level data (based on bore density and residual difference)
Autumn Confidence Rating (Bore Density and Residual Difference)	AUCONFBDRD		
	SAWID Link field		
	Fields sourced from GDE Classification SE		
Adapted from: SKM (2009) . <i>Classification of groundwater – surface water interactions for water dependent ecosystems in the South East, South Australia</i> . Report for the Department of Water, Land and Biodiversity Conservation. Sinclair Knight Merz, Hobart.			

APPENDIX E. GDE ATLAS ATTRIBUTES

Field Description	Database Reference	Categories	Dataset used to fulfil attribute
SAWID Unique Identifier	AUSWET_NR		
GDE Atlas Unique Identifier	UFI		
GDE Class	ECOCL_DS	Surface ecosystems dependent on surface expression of groundwater	SA: MOSQCK_PERMPOOLS (STATUS attribute; all 'permanent pool' fields) SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (FLOWREG field; 'Gaining', 'Potentiallygaining' attributes) SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' &'SeasDep' attributes)
Ecosystem Type	ECOTYPE_DS	Wetland Waterhole River Saline Lake Saline wetland Spring Spring fed wetland	SA: Gazeteer_AquaticEcosystems (SPRG & WTRH features) SA: Wetlands_GDE_Classification_v1 (WETLANDTYP field; All features)
Ecosystem Type	S_ETYPE_DS	NA	SA: Gazeteer_AquaticEcosystems (SPRG & WTRH features) SA: Wetlands_GDE_Classification_v1 (WETLANDTYP field; All features)
Eco-hydrogeological Zones	EHZ_DS	Murray Mallee Lucindale	
Physiography	GMORH_DS		
Landscape assessment	LSCAPE_DS	Plateau Slope Low lying	DEM Analysis
Broad hydrogeological setting / Groundwater flow system	GWFLOW_DS	Intermediate Regional	
Inflow Dependent Ecosystem Number	IDE_N	1 – IDE (derived for GDE Atlas 2 – Derived – low confidence 3 – Derived – high confidence 4 – Derived – identified by third party 5 – Known/Established (by field validation)	SA: Gazeteer_AquaticEcosystems (SPRG features) SA: MOSQCK_PERMPOOLS (STATUS attribute; all 'permanent pool' fields) SA: Wetlands_GDE_Classification_v1 (WETLANDTYP field; All features)
Confidence of ecosystem being a GDE	GWDEP_DS	High potential for GW interaction Identified in previous study: desktop Low potential for GW interaction	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (FLOWREG field; 'Gaining', 'Potentially gaining' attributes)

		Moderate potential for GW interaction	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' &'SeasDep' attributes)
Spatial connectivity between GDE and groundwater	SP_CONN_DS	Connected, Gaining Connected, Losing Connected, Variable Gaining/Losing Unknown	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (FLOWREG field; 'Gaining', 'Potentially gaining' attributes) SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' &'SeasDep' attributes)
Temporal nature of groundwater connectivity/use	PERMCON_DS	Seasonal (annual, regular) Permanent, near permanent	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' attributes)
Source Aquifer Confinement	AQ_SRCT_DS	Unconfined (watertable aquifer)	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' and 'SeasDep' attributes)
Source Aquifer Name	AQ_NAME_DS	Tertiary Limestone Aquifer	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (where INTERACFRM field = 'PermDep' and 'SeasDep' attributes, 'Tertiary Limestone Aquifer' entered)
Broad geology type of source aquifer	AQ_GEOL_DS	Cavernous (includes karstic) Cavernous & consolidated sedimentary	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' and 'SeasDep' attributes)
Porosity of source aquifer	AQ_POR_DS	Tertiary Primary & Secondary	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' and 'SeasDep' attributes)
Groundwater Flow System of source aquifer	AQ_GWFL_DS	Basin, Regional No data	SA: Wetlands_SAWID_Classified_MIN_Apr109_V4 (INTERACFRM field; All 'PermDep' and 'SeasDep' attributes)
Creation Date (Feature and Attribute Reliability)	CR_DATE		
	SAWID Link field		
	Fields sourced from GDE Atlas		
Adapted from: SKM (2012) Atlas of Groundwater Dependent Ecosystems (GDE Atlas), Phase 2: Task 5 Report: Identifying and mapping GDEs. Report to National Water Commission, Sinclair Knight Merz.			

APPENDIX F. INVENTORY OF WETLAND DATA AVAILABLE IN THE SE AND STATUS IN RELATION TO SAWID AND OTHER CORPORATE DATABASES

Wetland Data Sources

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Spiny Cray Monitoring 2012	Excel spreadsheet Format compatible for upload into SAWID with minor manipulation.	Fauna species monitoring including presence of Spiny Cray and native fish. Surface water chemistry	10 (Ewens Ponds; Eight Mile Creek; Blacks Pond*; Snuggery; Cress Creek; Stratmans Pond; Spencers Pond; The Pines*; Bones Pond; Gouldens Waterhole)	Spiny Cray Monitoring	DEWNR Oisin Sweeney	SAWID Project No: 135
Aquatic Fauna Data – Spiny Cray Monitoring (2013)	Excel spreadsheet Format compatible for upload into SAWID with minor manipulation.	Fauna species monitoring including presence of Spiny Cray and native fish.	4 (Ewens Ponds; Eight Mile Creek; Cress Creek; Spencer Pond; Pretty Pond*)	Spiny Cray Monitoring	DEWNR Oisin Sweeney	SAWID Project No: 146
Wader Survey of South East Coastal Wetlands (Draft report 2010)	Word Document Requires manual transposing and entry into SAWID	Text site descriptions. Bird species (waders) lists and counts in Tables in word document	14 (Lake Eliza; Lake St Clair; Lake George; Lake Fox; ThePub Lake; Legoes Swamp; Lake Robe; Lake Hawdon Nth & Sth; Tolderol; Paranki Lagoon; Bool Lagoon; Mullins Swamp)	SE Wader Studies Group – Wader Counts	Wader Studies Group Maureen Christie	SAWID Project No: 143
Wader Survey Lake Bonney SE January 2008	Document (pdf) Requires manual entry into SAWID	Bird species (waders) lists and counts from ground and aerial surveys. Includes historic count data for Lake Bonney in Appendix.	2 (Lake Bonney; Bucks Lake)	SE Wader Studies Group – Wader Counts	Wader Studies Group Maureen Christie	SAWID Project No: 144

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Wader Survey Lake Bonney SE July 2008	Document (pdf) Requires manual entry into SAWID	Bird species (waders) lists and counts from ground and boat surveys. Includes historic count data for Lake Bonney in Appendix.	2 (Lake Bonney; Bucks Lake)	SE Wader Studies Group – Wader Counts	Wader Studies Group Maureen Christie	SAWID Project No: 144
GDE Monitoring (Beacon Ecological 2010)	Word document Requires manual entry into SAWID	Dominant flora species, and indicator species lists.	7 (Trail Waterhole; Topperwein; Honan Scrub; Middlepoint Swamp; Butcher Gap; Lake Robe; Big Dip)	GDE Monitoring	DEWNR	SAWID Project No: 141
Upper South East Program DSS	Data extract from DSS MDB to excel Format compatible for upload into SAWID with minor manipulation	Bird, Frog, Fish species presence, counts, breeding activity.	~40 wetlands Upper South East	USE Program Environmental Monitoring	DEWNR USE Program	SAWID Project No: 148
Understanding the vegetation communities of temporary wetlands in South East of SA (Aquasave Consultants 2011)	Document Requires manual entry into SAWID	Vegetation transects data (flora species lists); WVCs	11 (Freshwater marshes: Nangwarry area; Swede Flat; Geelgeela; Topperwein)	SE Ephemeral Wetland Floristics 2011	DEWNR	SAWID Project No: 142
USE Aquatic Vegetation and waterbird counts (PIRSA Rural Solutions 2009)	Excel spreadsheet Data format not compatible for direct upload into SAWID. Requires transposing data into SAWID format	Aquatic flora and waterbird lists, waterbird counts, Water quality	~40 Upper South East	USE Aquatic Vegetation and waterbird counts	DEWNR USE Program	SAWID Project No: 147
SAWID Additional Datasets	Wetland Inventory data entered into standalone versions of SAWID Simple upload to SAWID database	Flora / fauna / water chem. Inventory survey	6	Various / Opportune	DEWNR Claire Harding Mark DeJong	Various

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Brolga Count 2013	Excel spreadsheet	Counts of Brolga's at known flocking sites on count day. Juvenile and Adult counts.	2 (Little Bool; Magpie Swamp)	South West Vic Brolga Count	DSE Richard Hill	SAWID Project No: 152
Waterbird survey USE 2011 (file: 2011 SE waterbird data_Mdj.xls)	Excel spreadsheet Data format not compatible for direct upload into SAWID. Requires transposing data into SAWID format	Waterbird species counts; opportune frogs; Water chem. (EC, temp, pH)	14 (Southern Bakers Range; Morella; Tatiara Swamp; Rushy Swamp; USE)	USE Aquatic Vegetation and waterbird counts	DEWNR USE Program	SAWID Project No: 145
Waterbird survey USE 2008-2009 MDJ (file:Waterbirds recorded USE.xls)	Excel spreadsheet Requires transposing data into SAWID format	Bird species lists, counts, breeding activity. No coordinates.	11 (Morella; Mandina; Cortina; Henry Creek; Big Telowie; Taratap; Snuggery; Rocky Swamp; Smith Swamp; Big Reedy; Schofield Swamp)	USE Aquatic Vegetation and waterbird counts	DEWNR USE Program	SAWID Project No: 145
USE Program Wetland Environmental Monitoring (2012)	Excel spreadsheets Requires transposing data into SAWID format	Vegetation transects, quadrats, fish, waterbirds, frogs, water quality.	~50	USE Program Wetland Environmental Monitoring	DEWNR USE Program	SAWID Project No: 149
Watervalley Wetlands Waterbirds Monitoring 2007 - 2013	Excel spreadsheets Requires transposing data into SAWID format. Missing coordinates.	Waterbird species and count.	6 (Mandina Lakes; Mandina Marshes; Cortina Lakes; Mrs Whites; Cortina North; Wrong Way)	Watervalley Wetlands Monitoring	Uni SA / Wetlands & Wildlife	SAWID Project No: 150
Ancient Greenling survey (Haywood & Richter 2013)	Document (pdf) Requires manual data entry into SAWID	Locations of regionally significant Ancient Greenling populations.	6-10 (Piccaninnie Ponds; Perched Volcanic Swamps; Lake Frome)	Ancient Greenling Survey	Private / FSA	SAWID Project No: 153
Shorebird sites of the Lower Limestone Coast (Christe & Jessop 2007)	Document (pdf) Requires manual data entry into SAWID	Shorebird species and abundance data for coastal wetlands.	14 Lower South East Coastal Lakes	Shorebirds – Limestone Coast	WWF	SAWID Project No: 154

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Permanent Pools Mapping and Values (NGT 2013)	Personal Geodatabase Format compatible for upload into SAWID.	Flora and fauna dominant species, environmental values, water quality	Permanent pools in drains (would need to be added to SAWID wetland mapping)	Permanent Pools Mapping and Values	DEWNR	High Priority
Karst Database (NGT 2013)	Personal Geodatabase Format compatible for upload into SAWID. Location information distorted.	Limited flora and fauna, Water Quality	Karst features	Karst Database	DEWNR	High Priority
NGT Seasonal Herbaceous Wetland survey (2013)	Excel – SAWID compatible (being completed by NGT Consulting November 2013)	Flora and fauna, threats, water quality, condition	~60 seasonal swamps	Seasonal Herbaceous Wetland survey 2013	DEWNR	High Priority
South East SA Aquatic Springs Veg Surveys (Quadrats and Transects) 2013 (NGT)	Excel spreadsheets Data format not compatible for direct upload into SAWID. Requires transposing data into SAWID format manually.	Quadrat and transect aquatic flora species lists, Cover Abundance, Health Score, water depth, and substrate.	5 (Ewens Ponds; Eight Mile Creek; Piccaninnie Ponds; Stratmans Pond; Spencer Pond and channels)	Kart Rising Springs Monitoring 2013	DEWNR	High Priority
Water Quality West Avenue 2011 (file: acu10283.xls)	Excel spreadsheet Requires coordinates of sample sites	Water quality data (pH, EC, Alkalinity, Full chem)	5 (West Avenue Floodplain; Smith Swamp; Rocky Swamp; Parkhill; Snuggery)	USE Water Quality	DEWNR USE Program	
Water Quality USE 2012 (file: AWQC WQ Sample Result Totals_2012 alkalinity study.xls)	Excel spreadsheet Requires coordinates of sample sites	Water quality data (pH, Alkalinity; EC; Chloride; Mg; Ca; S DO C etc.)	~30 (USE wetlands, Bool & Hacks Lagoon; Mosquito and Morambro Creeks)	USE Water Quality	DEWNR USE Program	
Lake Frome Vegetation Monitoring (Beacon Ecological 2010)	Document (pdf)	Vegetation transect data (flora). 9 transects.	1 Lake Frome	Lake Frome Vegetation Monitoring	DEWNR	
Avifauna inventory – West Avenue & Taratap Watercourses (file: Bird Inventory – Taratap & West Ave	Excel spreadsheet Data format not compatible for direct upload into SAWID.	Waterbird presence. Compiled data from Uni SA (1990-2004); Paul Wainwright (Oct 2004); Mark deJong (2003-	8 (West Avenue and Taratap Watercourse)	Bird inventory – West Avenue and Taratap Watercourse	DEWNR Uni SA USE Program	

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Watercourse PW.xls)	Requires transposing data into SAWID format	2004)				
Bonneys Camp Vegetation Monitoring (May 2003)	Excel spreadsheets Data format not compatible for direct upload into SAWID. Requires transposing data into SAWID format	Vegetation monitoring transects (dominant species only). Groundwater level and salinity (from peizos).	1 Bonneys Camp	Bonneys Camp Vegetation Monitoring	DEWNR USE Program	
Soil Analysis – USE Program (file: DWLBC ZZS08 055-093.xls)	Excel spreadsheets Soils data not in SAWID	Soil sample analysis	13 (USE wetlands)	Soil Analysis – USE Program	DEWNR USE Program	
Water Quality Survey – Lower Coorong Morella Release 2004-2005 AWE (file: WQ Survey 290903_110204.xls)	Excel spreadsheets Requires transposing data into SAWID format	Water depth and chem. (pH, Turbidity, TDS, Temp, EC, DO)	2 (Coorong; Salt Creek)	USE Water Quality	DEWNR USE Program	
Water Quality Survey – Coorong 2000-2005 (file: CoorongMay05.xls)	Excel spreadsheets Requires transposing data into SAWID format	Water chem. monitoring (full chem. analysis)	1 (Salt Creek footbridge)	USE Water Quality	DEWNR USE Program	
Henry Creek Salinity monitoring 2000 – 2002 (file: Henry Creek Salinities.xls)	Excel spreadsheet Requires transposing data into SAWID format	Salinity monitoring at Henry Creek rd and regulator	1 (Henry Creek)	USE Water Quality	DEWNR USE Program	
Lake Frome Water and Sediment Analysis	Excel spreadsheet Requires transposing data into SAWID format Sediment analysis not in SAWID	Water chem. (full chem..)	1 (Lake Frome)	USE Water Quality	DEWNR USE Program	
Morella Basin Water Quality 2000-2005 (file: Morella Basin_May05.xls)	Excel spreadsheet Requires transposing data into SAWID format Sediment analysis not in SAWID	Water chem. (Temp, pH, TDS, DO, Turbidity) + full chem.	1 (Morella Basin)	USE Water Quality	DEWNR USE Program	
Morella Waterbird	Excel spreadsheet	Bird species lists and	1	USE Aquatic	DEWNR	

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Survey 2001 – 2008 (file: Morella birds_.xls)	Requires transposing data into SAWID format	counts. Water level and salinity.	(Morella Basin)	Vegetation and waterbird counts	USE Program	
Fish Survey 2004 (file:Taratap West Ave Biosurvey Draft 20&22Oct04.xls)	Excel spreadsheet Requires transposing data into SAWID format	Fish presence and counts.	9 (West Avenue and Taratap Watercourse)	USE Fish Survey	DEWNR USE Program	
Lake George Wader Counts (file: waterbird data LGeorge.pdf)	Document (pdf) Requires manual entry into SAWID	Waders species presence and counts (1981 – 2012)	1 (Lake George)	SE Wader Studies Group – Wader Counts	Wader Studies Group Maureen Christie	
Lake George waterbird counts 2001-2003	Excel spreadsheets Requires transposing data into SAWID format	Bird species lists and counts (recorded in map sheet squares, requires a coordinate)	1 (Lake George)	Lake George Waterbird Counts	DEWNR	
Lake George water quality (2001-2009)	Excel spreadsheets Requires transposing data into SAWID format	Water quality analysis (full chem.)	1 (Lake George)	Lake George Water Quality Monitoring	DEWNR	
SE Fish Inventory	Excel spreadsheets Requires transposing data into SAWID format	Fish presence, abundance. Opportune other animals	~60+ sites (includes wetlands and streams)	SE Fish Inventory	Aquasave Michael Hammer	
SEWCDB Water Quality data 2009-2013 (collation)	Excel spreadsheet Format compatible for upload into SAWID with minor manipulation Remove data in this table sourced from SAWID.	Water quality (field EC, pH, Temp) and depth. Some with full chem.	103 Surface water quality data collated from a variety of sources.	SEWCDB Water Quality Monitoring	DEWNR	
Watervalley Wetlands Veg Monitoring 2007-2008 (file: 2007-08	Excel spreadsheet Requires transposing data into SAWID	Vegetation transect data. Species and cover abundance	15 Watervalley Wetlands	Watervalley Wetlands Monitoring	Uni SA / Wetlands & Wildlife	

Data Source	Format	Data Type	Approx. number of wetlands	Project	Custodian	SAWID Update
Vegetation Results.xls)	format. Missing coordinates for transect locations.					
Snapshot wetland pH survey 2011	Excel spreadsheet Format compatible for upload into SAWID with minor manipulation	Water quality (salinity, pH), water depth and dominant veg structure.	~30		DEWNR Abigail Goodman	
Water Quality GDE IWRM Project	Excel spreadsheets Requires transposing data into SAWID format.	Water quality and hydrochemistry; photos	9 (Piccaninnie Ponds; Pick Swamp; Ewens Ponds; Eight Mile Creek; Cress Creek; Little Piccaninnie; Jerusalem Creek; Spencer Pond)	IWRM GDE Project	DEWNR Cameron Wood	
Reconnaissance Survey of GDEs 2004	Document (pdf) Appendices with table data Requires manual data entry into SAWID	Water quality and hydrochemistry	38 Lower South East	Reconnaissance Survey of GDEs 2004	Fass & Cook (2004)	
	Entered into SAWID as part of the SAWID update					
	Identified as a priority dataset					

APPENDIX G. SAWID HIGH-VALUE WETLAND ASSESSMENT - COMPARISON OF RANKINGS BEFORE AND AFTER DATABASE UPDATE

AUS_WETNR	NAME	COMPLEX	SAWID Ecological Value Score (Nov 2008)	SAWID Ecological Value Score (Oct 2013)	SAWID Ecological Value Level (Nov 2008)	SAWID Ecological Value Level (Oct 2013)	PWA	GDE Likelihood (SKM 2009)
S0110446	BOOL LAGOON	BOOL LAGOON - COONAWARRA	54.0233271428	66.523327097022	Very High	Very High	LLC	VH
S0105943	LAKE FROME	SOUTH EAST COASTAL LAKES	40.5541169103	64.4064041868327	Very High	Very High	LLC	VH
S0101060	PICCANINNIE PONDS	NENE VALLEY	35.7685639184	59.2665369796746	Very High	Very High	LLC	VH
S0100001	THE COORONG	COORONG	39.1392965048	58.4200171217987	Very High	Very High		VH
S0101818	LAKE GEORGE	SOUTH EAST COASTAL LAKES	30.4130289887	56.6630290378738	Very High	Very High	LLC	VH
S0109071	HACKS LAGOON	BOOL LAGOON - COONAWARRA	33.7041790118	56.2041790523759	Very High	Very High	LLC	VH
S0106227	LAKE WOOLEY	SOUTH EAST COASTAL LAKES	15.672221464	56.1722212088647	High	Very High	LLC	H
S0108314	LAKE HAWDON SOUTH	SOUTH EAST COASTAL LAKES	35.2410455425	55.7410455023402	Very High	Very High	LLC	VH
S0120855	BIG HEATH CP	BOOL LAGOON - COONAWARRA	56.4118412524	53.6618411707845	Very High	Very High	LLC	H
S0113806		SOUTH EAST COASTAL LAKES	40.9575240837	51.2075240916346	Very High	Very High	LLC	VH
S0110343	PICK SWAMP	NENE VALLEY	26.2895341012	50.7895342378523	Very High	Very High	LLC	H
S0121483	Lake Bonney S.E.		39.0382511132	50.2434334321617	Very High	Very High	LLC	VH
S0110443	LITTLE BOOL LAGOON	BOOL LAGOON - COONAWARRA	32.2468831274	46.2468831003549	Very High	Very High	LLC	VH
S0108474	LAKE ELIZA	SOUTH EAST COASTAL LAKES	23.3031348854	44.803135096603	Very High	Very High	LLC	VH
S0100038	MORELLA BASIN	MORELLA BASIN	27.0882327289	44.3382327466398	Very High	Very High		VH
S0110563	LAKE ST. CLAIR	SOUTH EAST COASTAL LAKES	21.5230203515	43.2730203538356	Very High	Very High	LLC	VH
S0100090	MANDINA MARSHES	MANDINA MARSHES	38.3300194893	42.5935710843337	Very High	Very High		VH
S0110764	HONAN NFR	DISMAL SWAMP	31.1360516364	42.1360516033705	Very High	Very High	LLC	L
S0100217	ROCKYS SWAMP	PARAKIE	41.8688965089	41.8688961208954	Very High	Very High	LLC	H
S0100020	MESSENT FLOODPLAIN	MESSENT	40.451033339	41.2010333031231	Very High	Very High		VH
S0101959	RUSHY SWAMP	SOUTH EAST COASTAL LAKES	37.3980535689	40.898053514692	Very High	Very High	LLC	VH
S0111474	MANDINA MARSHES	MANDINA MARSHES	27.936094619	38.9360946014165	Very High	Very High		VH
S0100146	TILLEY SWAMP	TILLEY SWAMP	31.7070724913	38.4570724983185	Very High	Very High		VH
S0109028	LAKE HAWDON NORTH	SOUTH EAST COASTAL LAKES	27.7629825325	38.2629824703925	Very High	Very High	LLC	VH
S0108357	LAKE ROBE	SOUTH EAST COASTAL LAKES	24.3536624101	38.1036622846779	Very High	Very High	LLC	VH
S0100307	SCHOFIELDS SWAMP	DEEP SWAMP	26.7556671831	37.7556673129056	Very High	Very High	LLC	H
S0100052	MARTINS WASHPOOL	MARTINS WASHPOOL	21.0925761095	37.092576120376	Very High	Very High		H
S0100047	BONNEYS CAMP SOUTH	WATERVALLEY	33.5137594905	36.5137592815434	Very High	Very High		VH
S0100037	BONNEYS CAMP NORTH	WATERVALLEY	29.3279443988	36.3279443665101	Very High	Very High		H
S0110750	HONAN NFR	DISMAL SWAMP	29.0940733476	35.5940732513095	Very High	Very High	LLC	L
S0100075	TILLEY SWAMP	TILLEY SWAMP	28.4852349272	34.9852350285536	Very High	Very High		VH
S0107023	EIGHT MILE CREEK	EIGHT MILE CREEK	6.63771433136	34.8877148961617	Moderate	Very High	LLC	H
S0120854	EWENS PONDS	EIGHT MILE CREEK	24.8505108422	34.850511142901	Very High	Very High	LLC	VH
S0111028	WEST AVENUE FLOODPLAIN	PARAKIE	40.0786152089	34.828615171845	Very High	Very High	LLC	VH
S0110548	THE MARSHES	DISMAL SWAMP	28.9270593554	34.6770593797715	Very High	Very High	LLC	L
S0120440	OVERLAND NFR	SOUTH EAST VOLCANIC	0.505650280641	34.5565030354455	Not Assessed	Very High	LLC	L
S0100231	PARK HILL	PARK HILL	23.2103484938	34.2103485037645	Very High	Very High	LLC	VH
S0105592	MULLINS SWAMP	SOUTH EAST COASTAL LAKES	21.6950820355	34.1950820173136	Very High	Very High	LLC	VH
S0123388				33.7894866138911		Very High	LLC	
S0100240	JAFFRAY SWAMP	JAFFRAY	28.0503835591	33.5503834836249	Very High	Very High	LLC	VH
S0110749	HONAN NFR	DISMAL SWAMP	15.2192957268	33.4692945035751	High	Very High	LLC	H
S0111133	MOUNT SCOTT FLOODPLAIN		27.8451311859	32.8451311949405	Very High	Very High	LLC	H
S0105053		MARTINS WASHPOOL	23.8938344261	32.1438345518372	Very High	Very High		H
S0107060	BUCKS LAKE	SOUTH EAST COASTAL LAKES	24.6085748637	31.8585746054912	Very High	Very High	LLC	VH
S0100177	JIP JIP	JIP JIP	28.0281217415	31.7781218516383	Very High	Very High	LLC	VH
S0100212	DOUBLE SWAMP	DOUBLE SWAMP	27.4850666708	31.7350669331694	Very High	Very High	LLC	H
S0114989	JERUSALEM CREEK SPRING	NENE VALLEY	4.79063363993	31.5406338110765	Not Assessed	Very High	LLC	M
S0114982	CRESS CREEK SPRING	NENE VALLEY	5.62854793665	31.378547366621	Moderate	Very High	LLC	H
S0100098	BUTCHERS LAKE	SOUTH EAST COASTAL LAKES	19.688584754	31.1885845304586	Very High	Very High	LLC	VH
S0100042	BUNBURY SWAMP	BUNBURY	34.0840369421	30.8340370361639	Very High	Very High		VH
S0100167	PRETTY JOHNNYS	WATERVALLEY	23.8270865708	30.8270863254193	Very High	Very High		H
S0100117	MANDINA LAKE	MANDINA LAKES	27.706213574	30.7062137433	Very High	Very High		H
S0109691	TWO LAKES	SOUTH EAST COASTAL LAKES	22.0164586072	30.5164601791763	Very High	Very High	LLC	H
S0111052	DEEP SWAMP FLOODPLAIN	DEEP SWAMP	29.8403757437	30.0903759324984	Very High	Very High	LLC	H
S0100210	DOUBLE SWAMP	DOUBLE SWAMP	28.5289340386	30.028933678415	Very High	Very High	LLC	H
S0105797	TOPPERWEIN NFR	FOLLETT	24.6532715979	29.903272073271	Very High	Very High	LLC	M
S0101302	CANTARA LAKES FLAT	COORONG	10.2633505089	29.763350386087	High	Very High		H
S0101105	LEECH LAKE	MANDINA MARSHES	25.2443296431	29.7443301225249	Very High	Very High		VH
S0100492	COOLATOO FLAT	COORONG	9.12448998306	29.6244900477777	High	Very High		VH
S0120800	HONAN NFR	DISMAL SWAMP	22.7658466217	29.5158458310515	Very High	Very High	LLC	L

AUS_WETNR	NAME	COMPLEX	SAWID Ecological Value Score (Nov 2008)	SAWID Ecological Value Score (Oct 2013)	SAWID Ecological Value Level (Nov 2008)	SAWID Ecological Value Level (Oct 2013)	PWA	GDE Likelihood (SKM 2009)
S0100118	THE FLOODWAYS (GUM LAGOON)	COOLA COOLA	24.0250427449	29.275042803809	Very High	Very High		VH
S0110809	HONAN NFR	DISMAL SWAMP	5.99804574744	28.9980465101046	Moderate	Very High	LLC	H
S0100340	KANGOORA LAGOON	FAIRVIEW	23.2901741225	28.7901739469003	Very High	Very High	LLC	VH
S0100099	CORTINA LAKE	CORTINA LAKES	27.6539162061	28.4039164612434	Very High	Very High		H
S0107299	THE MARSHES	DISMAL SWAMP	21.8331483035	28.3331483610597	Very High	Very High	LLC	L
S0110759	DIAGONAL ROAD	DISMAL SWAMP	22.5491356433	28.299135639752	Very High	Very High	LLC	M
S0108578	BROADLANDS	SOUTHERN BAKERS RANGE	19.2885066751	28.2885066532013	Very High	Very High	LLC	VH
S0100211	DOUBLE SWAMP	DOUBLE SWAMP	20.1398414016	27.6398416097524	Very High	Very High	LLC	H
S0120846	SALT LAKE	SOUTH EAST COASTAL LAKES	8.82976514034	27.3297660585043	Moderate	Very High	LLC	H
S0100091	NAEN NAEN SWAMP		27.0703180325	27.3203183602694	Very High	Very High		VH
S0110621	THE MARSHES	DISMAL SWAMP	9.71735213911	27.2173521784037	High	Very High	LLC	L
S0120241	PENOLA CONSERVATION PARK	BOOL LAGOON - COONAWARRA	7.38831068287	27.1383107357827	Moderate	Very High	LLC	H
S0107027		NENE VALLEY	4.10930289279	26.8593039476467	Not Assessed	Very High	LLC	H
S0100173	BIG TELOWIE	TELOWIE	8.71801153707	26.7180114016853	Moderate	Very High		M
S0120253	GLENELG RIVER	CAROLINE	7.21251119136	26.7125110749149	Moderate	Very High	LLC	VH
S0111890	SALT CREEK	COORONG	21.9140513243	26.4140510619215	Very High	Very High		VH
S0100027		MESSENT	24.6817480425	26.1817480239056	Very High	Very High		H
S0110497	LAKE FELLMONGERY	SOUTH EAST COASTAL LAKES	20.6045715657	26.1045713943698	Very High	Very High	LLC	VH
S0107373	THE MARSHES	DISMAL SWAMP	23.4234741319	25.4234739995244	Very High	Very High	LLC	L
S0110625	MT LYON LF	SOUTH EAST VOLCANIC	8.34792027458	25.3479203753616	Moderate	Very High	LLC	L
S0108706	STRATMAN POND	NENE VALLEY	11.0930370841	25.093037145304	High	Very High	LLC	H
S0107033	GREEN POINT	NENE VALLEY	4.38543192216	24.8854316807431	Not Assessed	Very High	LLC	H
S0110507	THE SALT SWAMP	BOOL LAGOON - COONAWARRA	22.2154212976	24.7154212399605	Very High	Very High	LLC	H
S0110622	THE MARSHES	DISMAL SWAMP	15.9980771383	24.4980771383	High	Very High	LLC	H
S0110765	HONAN NFR	DISMAL SWAMP	17.4787584937	24.4787585257627	High	Very High	LLC	H
S0111743			23.4284300965	24.4284301555212	Very High	Very High		VH
S0100228	SPOONBILL SWAMP	PARK HILL	13.3754943377	24.375494680441	High	Very High	LLC	H
S0102176	LAKE ORMEROD	BOOL LAGOON - COONAWARRA	14.8366255691	24.0866255825176	High	Very High	LLC	VH
S0100353	MULLINGER SWAMP		22.0679868443	24.0679866192673	Very High	Very High	LLC	L
S0111507	TILLEY SWAMP FLOODPLAIN	TILLEY SWAMP	25.7948295668	24.0448295975928	Very High	Very High		VH
S0120856	REEDY CREEK LF	MT SCOTT - TARATAP DISTRICT	30.4748217316	23.9748213878677	Very High	Very High	LLC	H
S0123676	MOSQUITO CREEK			23.659446367881		Very High	LLC	H
S0107036		NENE VALLEY	15.5687207884	23.5687207023113	High	Very High	LLC	VH
S0120864	THE MARSHES	DISMAL SWAMP	7.96606573794	23.4660657379419	Moderate	Very High	LLC	H
S0110814	HONAN NFR	DISMAL SWAMP	8.44946544305	23.4494656660212	Moderate	Very High	LLC	H
S0100205	VARCOE WETLAND		13.7537737617	23.2537736501975	High	Very High	LLC	H
S0103592	The Coorong	COORONG	11.2489951617	23.2489954799034	High	Very High		VH
S0100030		MESSENT	20.4557252633	22.9557254249684	Very High	Very High		VH
S0120859	MARY SEYMOUR CONSERVATION PARK	BOOL LAGOON - COONAWARRA	14.3795669753	22.8795671741847	High	Very High	LLC	M
S0123674	MOSQUITO CREEK			22.8194999889295		Very High	LLC	H
S0110773	HONAN NFR	DISMAL SWAMP	13.4535353506	22.4535352298922	High	Very High	LLC	H
S0100120	THE FLOODWAYS (GUM LAGOON)	COOLA COOLA	22.1802808306	22.4302810414789	Very High	Very High		H
S0120486	HACKET HILL NFR	DISMAL SWAMP	7.53579767001	22.2857979558994	Moderate	Very High	LLC	VH
S0100140	POOCHER SWAMP		11.2345837348	22.2345761211657	High	Very High	TAT	M
S0101217		GUM LAGOON	16.2256143337	22.2256143917149	High	Very High		VH
S0120280	BUTCHERS LAKE	SOUTH EAST COASTAL LAKES	18.123987215	22.123987050767	High	Very High	LLC	H
S0111829		GUM LAGOON	21.0841961504	22.0841961880651	Very High	Very High		VH
S0110767	HONAN NFR	DISMAL SWAMP	16.5797605108	21.8297602024232	High	Very High	LLC	H
S0101493		CORTINA LAKES	19.0127663773	21.7627662616151	Very High	Very High		VH
S0108171	THE PUB LAKE	SOUTH EAST COASTAL LAKES	11.9638553095	21.7138547484716	High	Very High	LLC	VH
S0100220	SMITH SWAMP	PARAKIE	23.1479640933	21.6479638774818	Very High	Very High	LLC	H
S0111080	HANSON SCRUB FLOODPLAIN	HANSON SCRUB	22.0632430317	21.5632430522491	Very High	Very High	LLC	VH
S0121513	SPENCERS POND		5.03786536853	21.5378653685331	Not Assessed	Very High	LLC	H
S0114959	WINTERFIELD CREEK	NENE VALLEY	18.2159909724	21.4659906739185	High	Very High	LLC	H
S0101480		GUM LAGOON	15.4629582311	21.4629585019087	High	Very High		VH
S0107079	BLACKFELLOWS CAVE WETLAND	NENE VALLEY	14.1821054374	21.432105348943	High	Very High	LLC	H
S0100327	TATIARA SWAMP		13.2874113555	21.287412192884	High	Very High	LLC	H
S0111907	DEEP SWAMP FLOODPLAIN	DEEP SWAMP	23.0143913456	21.2643913348837	Very High	Very High	LLC	H
S0100026		MESSENT	20.5169183347	21.0169180446393	Very High	Very High		VH
S0100172	HENRY CREEK	TELOWIE	22.93804229	20.9380419161897	Very High	Very High	LLC	VH
S0101056	MANDINA MARSHES	MANDINA MARSHES	18.6843842641	20.9343843311684	High	Very High		VH
S0111033	WEST AVENUE FLOODPLAIN		19.6325988254	20.882598754193	Very High	Very High	LLC	H
S0100021		MESSENT	19.8457405405	20.8457404380674	Very High	Very High		VH
S0100131	LAKE CANTARA NORTH	COORONG	16.3267361425	20.8267360515765	High	Very High		VH

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S0108734	MARIA CREEK SWAMP	SOUTH EAST COASTAL LAKES	10.2871242617	20.7871243955109	High	Very High	LLC	VH
S0108154	LAKE FOX	SOUTH EAST COASTAL LAKES	11.7371652696	20.7371650254849	High	Very High	LLC	H
S0101545	Coola Coola Swamp	MANDINA MARSHES	20.7224723793	20.7224727846457	Very High	Very High		VH
S0111509	Tilley Swamp	TILLEY SWAMP	24.4639720004	20.7139721075846	Very High	Very High		H
S0111827		GUM LAGOON	14.1368611507	20.6368613589573	High	Very High		VH
S0100139	LAKE CANTARA SOUTH	COORONG	12.4854763781	20.4854763413904	High	Very High		VH
S0100051	FRESHWATER WELL & WATERHOLE	BUNBURY	23.4428946171	20.4428944844418	Very High	Very High		VH
S0110581	GREEN SWAMP	BOOL LAGOON - COONAWARRA	12.3904121208	20.3904118294243	High	Very High	LLC	H
S0114987	JERUSALEM CREEK WETLAND	NENE VALLEY	10.388646032	20.3886462958279	High	Very High	LLC	H
S0100320	COCKATOO LAKE		18.1030918747	20.3530918984797	High	Very High	LLC	VH
S0110287	TOPPERWEIN NFR	DISMAL SWAMP	5.27687556412	20.2768757484977	Not Assessed	Very High	LLC	H
S0104859	Tilley Swamp	TILLEY SWAMP	20.2307235076	20.2307234964975	Very High	Very High		VH
S0100203	DOUBLE SWAMP	DOUBLE SWAMP	17.9788220097	20.2288216113632	High	Very High	LLC	H
S0100198	DIRTY JOES	WATERVALLEY	13.7287683243	20.2287685897221	High	Very High	LLC	VH
S0101079		GUM LAGOON	17.8870210069	20.1370203687105	High	Very High		VH
S0114882	TOPPERWEIN NFR	DISMAL SWAMP	5.11298751514	20.1129871207184	Not Assessed	Very High	LLC	H
S0110014	HONAN NFR	DISMAL SWAMP	14.3116938128	20.0616927111343	High	Very High	LLC	H
S0101491	Tilley Swamp	TILLEY SWAMP	20.0291487828	20.0291488490096	Very High	Very High		VH
S0101509	Tilley Swamp	TILLEY SWAMP	20.0218262368	20.0218266632099	Very High	Very High		VH
S0101265	Tilley Swamp	TILLEY SWAMP	20.016692939	20.0166926553637	Very High	Very High		H
S0110559	LAKE ELIZA PERIPHERAL WETLANDS	SOUTH EAST COASTAL LAKES	6.40738157233	19.9073812864964	Moderate	Very High	LLC	VH
S0110817	HONAN NFR	DISMAL SWAMP	19.1152884152	19.8652881864174	Very High	Very High	LLC	L
S0100055		BUNBURY	18.85836953	19.8583694448717	High	Very High		VH
S0121514	BONES POND		1.26208518212	19.7620852994604	Not Assessed	Very High	LLC	H
S0100385	The Coorong	COORONG	12.7427256284	19.7427259378546	High	Very High		VH
S0107240	THE MARSHES	DISMAL SWAMP	14.2354787096	19.7354785442868	High	Very High	LLC	H
S0109825	PUD LAKE	SOUTH EAST COASTAL LAKES	6.14108356296	19.6410832034281	Moderate	Very High	LLC	VH
S0103609	HELLS GATE	COORONG	7.09349772143	19.582210553529	Moderate	Very High		VH
S0107321		SOUTH EAST COASTAL LAKES	11.2928125667	19.542812425947	High	Very High	LLC	VH
S0105337	BONNEYS CAMP NORTH	WATERVALLEY	18.0375321269	19.537531902608	High	Very High		H
S0111511		MARTINS WASHPOOL	13.0363317453	19.5363314172401	High	Very High		H
S0107062		SOUTH EAST COASTAL LAKES	16.7172514343	19.4672519287476	High	Very High	LLC	H
S0105159		BUNBURY	19.4149552114	19.4149567878058	Very High	Very High		VH
S0111888		COORONG	10.3621233715	19.3621233989111	High	Very High	LLC	VH
S0100338	FAIRVIEW SWAMP	FAIRVIEW	21.7762871935	19.2762872331387	Very High	Very High	LLC	H
S0100199		WESTSLOPES	19.228612125	19.2286121679862	Very High	Very High	LLC	H
S0100175		COORONG	15.2088125822	19.2088124783111	High	Very High	LLC	VH
S0100054	TILLEY SWAMP	TILLEY SWAMP	21.6718759314	19.1718758344342	Very High	Very High		VH
S0104731	Tilley Swamp	TILLEY SWAMP	20.1262547696	19.1262548026666	Very High	Very High		VH
S0100266	PARANKI LAGOON	PARANKI	7.86505980251	19.1150596931727	Moderate	Very High	LLC	VH
S0113560	MCROSTIES NFR	SOUTH EAST VOLCANIC	8.01887112891	19.0188711951317	Moderate	Very High	LLC	M
S0105650	DISCOVERY BAY	DISCOVERY BAY	12.9792591678	18.9792596055298	High	High		H
S0107273	BLUE TEA TREE SWAMP	THE MARSHES	13.7264781425	18.9764780793779	High	High	LLC	L
S0107937	LAKE BATTYE	SOUTH EAST COASTAL LAKES	13.2252525014	18.9752521780043	High	High	LLC	VH
S0110731	KANGAROO FLAT	DISMAL SWAMP	12.4445078191	18.9445076712898	High	High	LLC	L
S0121482	THE MARSHES	DISMAL SWAMP	14.4501555209	18.7001565427727	High	High	LLC	L
S0100022		MESSENT	18.6799543976	18.6799545790547	High	High		VH
S0107479	THE MARSHES	DISMAL SWAMP	16.3591502265	18.60914990769	High	High	LLC	L
S0100154	MUNDULLA SWAMP	MUNDULLA SWAMP	18.0041618	18.5041616916573	High	High	TAT	L
S0110620	BURKS ISLAND	SOUTH EAST COASTAL LAKES	6.97343394135	18.4734336823557	Moderate	High	LLC	VH
S0107281	THE MARSHES	DISMAL SWAMP	13.222917063	18.4729173126924	High	High	LLC	L
S0100102		GUM LAGOON	17.6451207107	18.3951206605687	High	High		VH
S0100305	CAVE SWAMP	DEEP SWAMP	13.8856287494	18.3856281359369	High	High	LLC	H
S0111826			17.3447417811	18.3447417714742	High	High		VH
S0104207		TILLEY SWAMP	18.286043184	18.2860425184808	High	High		H
S0100294	CHIMNEY POT SWAMP		11.0345820289	18.2845818855883	High	High	LLC	VH
S0110011	DOLLY LAKE	SOUTH EAST COASTAL LAKES	5.76401357606	18.264014616121	Moderate	High	LLC	VH
S0106808	TELFORD SCRUB CP	DISMAL SWAMP	15.4590828506	18.2090827987808	High	High	LLC	M
S0111773		COORONG	11.1645726719	18.1645730972254	High	High		VH
S0123670	MOSQUITO CREEK			18.0944591066742		High	LLC	H
S0110787	HONAN NFR	DISMAL SWAMP	13.5821247009	18.082125276373	High	High	LLC	H
S0110802	HONAN NFR	DISMAL SWAMP	8.15510558285	17.905105582851	Moderate	High	LLC	H
S0100039		BUNBURY	17.8968580516	17.8968580787488	High	High		VH
S0110844	KANGAROO FLAT	DISMAL SWAMP	6.37158875226	17.8715887522595	Moderate	High	LLC	M
S0101532		WATERVALLEY	17.7610831518	17.7610839413383	High	High		H
S0107004	MIDDLE POINT WETLAND	NENE VALLEY	21.7583432629	17.7583432139395	Very High	High	LLC	VH

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S0111856		GUM LAGOON	14.7569755289	17.7569741849753	High	High		VH
S0100178	LAKE NEWRY	DOUBLE SWAMP	17.4982867652	17.7482861827218	High	High	LLC	M
S0104320	BONNEYS CAMP SOUTH	WATERVALLEY	17.7142642164	17.714264062438	High	High		H
S0111276	MOOT-YANG GUNNYA SWAMP	MUNDULLA SWAMP	17.1776987577	17.6776989448841	High	High	TAT	L
S0105894		SOUTH EAST COASTAL LAKES	10.1499983367	17.6499984986016	High	High	LLC	VH
S0109067		BOOL LAGOON - COONAWARRA	18.6123107764	17.6123103290237	High	High	LLC	H
S0107026	PICCANINIE PONDS EASTERN WETLAND	NENE VALLEY	12.8576940025	17.60769450148	High	High	LLC	M
S0100208	DOUBLE SWAMP	DOUBLE SWAMP	17.5409759435	17.5409756662056	High	High	LLC	H
S0111741		GUM LAGOON	16.0072326778	17.5072326581529	High	High		VH
S0110338	MARY SEYMOUR CONSERVATION PARK	BOOL LAGOON - COONAWARRA	5.41244955616	17.4124493392748	Not Assessed	High	LLC	M
S0100040		BUNBURY	17.3615308183	17.3615306413782	High	High		VH
S0101202		GUM LAGOON	14.3085595508	17.3085592934432	High	High		VH
S0110629	PENOLA CONSERVATION PARK	BOOL LAGOON - COONAWARRA	17.9675724821	17.2175735899221	High	High	LLC	M
S0110595	THE MARSHES	DISMAL SWAMP	17.1751864102	17.1751869130077	High	High	LLC	L
S0111841		GUM LAGOON	17.1255494815	17.1255496990893	High	High		VH
S0101523			17.0872698167	17.0872700925917	High	High		VH
S0110744	HONAN NFR	DISMAL SWAMP	11.5545083312	17.0545093043029	High	High	LLC	L
S0120842	TWIG RUSH LAGOONS	BOOL LAGOON - COONAWARRA	17.0033545034	17.0033546353808	High	High	LLC	H
S0100152	COOLATOO LAKE	COORONG	14.9895654116	16.9895656921495	High	High		VH
S0121519	THE GILGAIS	SWEDE FLAT	12.7080985919	16.9580985367882	High	High	TAT	L
S0104158	BONNEYS CAMP SOUTH	WATERVALLEY	16.8910614367	16.8910613350826	High	High		H
S0110668	HACKET HILL NFR	DISMAL SWAMP	11.1194982053	16.8694982637206	High	High	LLC	VH
S0101504			16.863744582	16.863745988659	High	High		VH
S0110775	HONAN NFR	DISMAL SWAMP	11.5997921905	16.8497927322566	High	High	LLC	L
S0100242	TOOPS GAP	TOOPS GAP	15.8340917243	16.8340916769492	High	High	LLC	VH
S0103308		MESSENT	16.8172527383	16.8172513183181	High	High		VH
S0107015		NENE VALLEY	3.31579207068	16.8157914805994	Not Assessed	High	LLC	M
S0104352	BONNEYS CAMP SOUTH	WATERVALLEY	16.8029839307	16.8029839307302	High	High		H
S0120240	BUTCHERS LAKE	SOUTH EAST COASTAL LAKES	16.7515699435	16.7515699435104	High	High	LLC	H
S0100348	BLOOMFIELD SWAMP		13.6971684793	16.6971686846257	High	High	LLC	VH
S0116900		BOOL LAGOON - COONAWARRA	15.4271721771	16.6771723501348	High	High	LLC	M
S0110573	LAKE ST CLAIR	SOUTH EAST COASTAL LAKES	7.15865627059	16.6586573098426	Moderate	High	LLC	VH
S0100043	PIPE CLAY LAKE	COORONG	14.9005241234	16.6505240987644	High	High		VH
S0110659	HACKET HILL NFR	DISMAL SWAMP	11.3618347139	16.6118341569144	High	High	LLC	VH
S0113839	CANUNDA FLAT	SOUTH EAST COASTAL LAKES	7.31463331112	16.5646330929721	Moderate	High	LLC	VH
S0101046		GUM LAGOON	16.563107485	16.5631075622809	High	High		VH
S0100005		COORONG	9.55148298052	16.5514841970053	High	High		VH
S0100071	LOG CROSSING/ WELL AND BRIDGE	WATERVALLEY	12.2932809243	16.5432808460364	High	High		VH
S0100127	MRS WHITES LAGOON	MANDINA MARSHES	16.0273494034	16.5273493451423	High	High		H
S0115665	NANGWARRY NFR	DISMAL SWAMP	9.02420336983	16.5242033190194	High	High	LLC	M
S0107540	THE MARSHES	DISMAL SWAMP	7.21593692436	16.4659358791224	Moderate	High	LLC	H
S0109996	ERRINGTON HOLE LAKE	SOUTH EAST COASTAL LAKES	5.96251313675	16.4625136839795	Moderate	High	LLC	VH
S0105086			16.4533353479	16.4533355243776	High	High		VH
S0100250	BLACK COCKY LAGOON	JAFFRAY	11.4375029568	16.4375034039181	High	High	LLC	H
S0111865		GUM LAGOON	12.9340937245	16.4340936105699	High	High		VH
S0109696	DEADMAN SWAMP	BOOL LAGOON - COONAWARRA	7.41271522954	16.4127147375656	Moderate	High	LLC	H
S0111864		GUM LAGOON	16.3935884488	16.3935901945993	High	High		H
S0100222	LITTLE REEDY	WILLALOOKA	11.3886020881	16.3886022536787	High	High	LLC	VH
S0100023		MESSENT	16.3855869521	16.3855866778311	High	High		VH
S0101778	POOL OF SILOAM	SOUTH EAST COASTAL LAKES	5.3673711954	16.3673707319898	Not Assessed	High	LLC	H
S0100907			12.7292630931	16.3383561643248	High	High	LLC	H
S0120212	HONAN NFR	DISMAL SWAMP	15.8378104571	16.3378103794327	High	High	LLC	L
S0111026		DOUBLE SWAMP	16.331694546	16.3316950883265	High	High	LLC	H
S0123704	TATIARA CREEK			16.3295755582901		High	TAT	L
S0105038		MESSENT	16.3258173256	16.3258173255891	High	High		M
S0111510			13.3127046656	16.3127050057622	High	High		H
S0104981	The Coorong	COORONG	9.3121703954	16.312170139861	High	High		VH
S0111840		GUM LAGOON	16.3117075472	16.3117082397599	High	High		H
S0113849	LAKE MCINTYRE	WOAKWINE RANGE	2.422647636	16.1726475152789	Not Assessed	High	LLC	VH
S0120290	KANGAROO FLAT	DISMAL SWAMP	6.15275313978	16.1527529780381	Moderate	High	LLC	M
S0110661	HACKET HILL NFR	DISMAL SWAMP	17.1455513075	16.1455551316662	High	High	LLC	VH
S0110075		SOUTH EAST COASTAL LAKES	6.09151006838	16.0915119213713	Moderate	High	LLC	VH
S0100206	DOUBLE SWAMP	DOUBLE SWAMP	16.0814167179	16.0814166328748	High	High	LLC	H
S0113718	3 GATES TRACK LF	SOUTH EAST VOLCANIC	3.0716717405	16.0716723386155	Not Assessed	High	LLC	L
S0105177		BUNBURY	16.06257296	16.0625725764513	High	High		VH

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S0120246	DEADMANS SWAMP NFR	NARACORTE RANGE	16.557720383	16.0577205746109	High	High	LLC	H
S0110504	THE MARSHES	DISMAL SWAMP	6.21234782446	15.9623469381255	Moderate	High	LLC	H
S0100196	TELECOM ISLAND	WESTSLOPES	15.9477981281	15.9477981126445	High	High	LLC	VH
S0104728	The Coorong	COORONG	10.442296525	15.9422967867172	High	High		VH
S0111132			14.9419066183	15.9419065299052	High	High	LLC	VH
S0100252	TEA TREE	HOOK BANKS	9.17188777897	15.9165027058962	High	High	LLC	H
S0110074		SOUTH EAST COASTAL LAKES	10.415468049	15.9154680329952	High	High	LLC	VH
S0104161	BONNEYS CAMP SOUTH	WATERVALLEY	15.9037186663	15.9037186914128	High	High		H
S0101505			15.8868672634	15.8868669545062	High	High		VH
S0104166	BONNEYS CAMP SOUTH	WATERVALLEY	15.8594964458	15.8594964458486	High	High		H
S0111837		GUM LAGOON	15.8454347679	15.8454338853972	High	High		VH
S0111804	SANDERS SCRUB		15.3446580436	15.8446583735339	High	High		VH
S0101507		GUM LAGOON	15.8234604739	15.8234603083801	High	High		H
S0111847		GUM LAGOON	15.8230966118	15.8230974353939	High	High		H
S0106160	DEADMAN SWAMP	BOOL LAGOON - COONAWARRA	2.77349016891	15.7734888682507	Not Assessed	High	LLC	M
S0107267	THE MARSHES	DISMAL SWAMP	13.2681672244	15.7681672924671	High	High	LLC	L
S0100660	ROCKYS SWAMP	PARAKIE	14.747942898	15.7479425787012	High	High	LLC	H
S0107045	BLACKFELLOWS CAVE WETLAND	NENE VALLEY	17.4541230644	15.7041230358131	High	High	LLC	M
S0110742	HONAN NFR	DISMAL SWAMP	13.6792796957	15.6792798057327	High	High	LLC	L
S0110657	HACKET HILL NFR	DISMAL SWAMP	10.4250511423	15.6750511422597	High	High	LLC	VH
S0110760	HONAN NFR	DISMAL SWAMP	15.4110276394	15.6610278576963	High	High	LLC	L
S0114986	JERUSALEM CREEK WETLAND	NENE VALLEY	4.65664258596	15.6566428723261	Not Assessed	High	LLC	H
S0111854		GUM LAGOON	11.8969356002	15.6469357193867	High	High		VH
S0116933	MARY SEYMOUR CONSERVATION PARK	BOOL LAGOON - COONAWARRA	10.6456674742	15.6456691003724	High	High	LLC	M
S0101502		GUM LAGOON	15.6197932107	15.6197950537565	High	High		H
S0101452			15.6132502123	15.6132500787829	High	High		VH
S0110630	MT LYON LF	SOUTH EAST VOLCANIC	9.59107951485	15.5910795148469	High	High	LLC	L
S0100455		COORONG	8.07993285785	15.5799328763577	Moderate	High	LLC	VH
S0104955		MESSENT	15.5492092894	15.5492068686921	High	High		VH
S0100057	BONNEYS CAMP SOUTH	WATERVALLEY	15.5335250837	15.5335239993254	High	High		H
S0120851	HORSESHOE PADDOCK	DISMAL SWAMP	11.0186517602	15.5186516381165	High	High	LLC	M
S0110562	HONAN NFR	DISMAL SWAMP	14.9238238608	15.4238235458872	High	High	LLC	L
S0101475		GUM LAGOON	15.4230977054	15.4230977053917	High	High		VH
S0107313		SOUTH EAST COASTAL LAKES	7.65611330338	15.406113508194	Moderate	High	LLC	VH
S0101999	KATANI PARK WETLAND	SOUTHERN BAKERS RANGE	8.38541107112	15.3854110215905	Moderate	High	LLC	H
S0100017		MESSENT	15.3674913497	15.367492537489	High	High		H
S0100309	TILLEY SWAMP	DEEP SWAMP	15.3620117325	15.3620114523315	High	High	LLC	H
S0100221	BIG REEDY	WILLALOOKA	13.8378769473	15.337876990253	High	High	LLC	VH
S0123711	NALANG CREEK			15.336929889057		High	TAT	L
S0100100	DUCK ISLAND		15.3283270262	15.3283288721816	High	High		VH
S0105749	TOPPERWEIN NFR	STRATHDOWNIE	3.73894925363	15.2389490644779	Not Assessed	High	LLC	L
S0111742		GUM LAGOON	15.2361307747	15.2361325709083	High	High		H
S0100666		PARAKIE	15.2237286691	15.2237283060288	High	High	LLC	H
S0101124			11.7124808044	15.212480783342	High	High		VH
S0110572		SOUTH EAST COASTAL LAKES	5.20752558259	15.2075259120609	Not Assessed	High	LLC	VH
S0110737	KANGAROO FLAT	DISMAL SWAMP	13.6914399324	15.1914405030083	High	High	LLC	M
S0110586	WHITES FLAT	SOUTH EAST COASTAL LAKES	7.68300787528	15.183007837602	Moderate	High	LLC	VH
S0107304	THE MARSHES	DISMAL SWAMP	14.6796579527	15.179657649647	High	High	LLC	L
S0104314		BUNBURY	15.1702364517	15.1702365725071	High	High		H
S0100928		SWEDE FLAT	12.4078305458	15.1578307781771	High	High	PAD	L
S0111027			15.1557707943	15.1557701045477	High	High	LLC	H
S0110639	HACKET HILL NFR	DISMAL SWAMP	10.8706846069	15.1206845998653	High	High	LLC	VH
S0108130	LAKE NUNAN	SOUTH EAST COASTAL LAKES	13.364475122	15.1144748177086	High	High	LLC	VH
S0104324		BUNBURY	15.1077477289	15.1077477288743	High	High		H
S0110746	HONAN NFR	DISMAL SWAMP	14.8387853821	15.0887845099593	High	High	LLC	L
S0111493		MANDINA MARSHES	15.0733996602	15.0733995373819	High	High		H
S0108794	MOYHALL SWAMP	MOYHALL	10.0243370108	15.0243369718693	High	High	LLC	VH
S0105094			14.9805074131	14.9805072519751	High	High		VH
S0111863		GUM LAGOON	14.9679688377	14.9679695153095	High	High		H
S0110533	GORDON LAGOON	KYBYBOLITE	13.9205562717	14.9205557296183	High	High	LLC	L
S0110879		DISMAL SWAMP	5.0265641874	14.9184200562695	Not Assessed	High	LLC	L
S0103528	The Coorong	COORONG	7.39071004224	14.8786388959311	Moderate	High		VH
S0120339	OVERLAND NFR	SOUTH EAST VOLCANIC	4.11584958513	14.8658484501508	Not Assessed	High	LLC	L
S0111053	DEEP SWAMP FLOODPLAIN	DEEP SWAMP	13.6098216358	14.859821940371	High	High	LLC	VH
S0100663		PARAKIE	14.7935322978	14.7935293986448	High	High	LLC	H
S0123672	MOSQUITO CREEK			14.7717162006456		High	LLC	H

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S0110056	KARINYA	SOUTH EAST COASTAL LAKES	7.75074397846	14.7507439996896	Moderate	High	LLC	VH
S0100061	BONNEYS CAMP SOUTH	WATERVALLEY	14.7426964542	14.7426992466457	High	High		H
S0110632	MT LYON LF	SOUTH EAST VOLCANIC	9.23803369384	14.7380336938444	High	High	LLC	L
S0103253		MESSENT	14.7321222416	14.7321222415973	High	High		M
S0115817	LOWAN LANE LF	DISMAL SWAMP	3.93234999964	14.6823502110887	Not Assessed	High	LLC	L
S0111714			13.8960059442	14.6460058708898	High	High		VH
S0100060	BONNEYS CAMP SOUTH	WATERVALLEY	14.6455867371	14.645586737083	High	High		H
S0104611		TILLEY SWAMP	14.6371557725	14.6371565363953	High	High		VH
S0114968		NENE VALLEY	14.8718959949	14.6218968703305	High	High	LLC	H
S0100226	SOUTH REEDY	WILLALOOKA	15.6012450978	14.601245004656	High	High	LLC	VH
S0111845		GUM LAGOON	14.1007579234	14.6007579382024	High	High		H
S0100194	BRINE SHRIMP LAKE	COORONG	12.593686973	14.5936869301619	High	High	LLC	VH
S0104224		TILLEY SWAMP	14.5870998994	14.5871004945933	High	High		H
S0110945	CLAYPANS	DISMAL SWAMP	15.0797856656	14.5797864683322	High	High	LLC	H
S0110763	HONAN NFR	DISMAL SWAMP	14.0767142617	14.5767142617362	High	High	LLC	L
S0101332		GUM LAGOON	14.5727239898	14.5727271950456	High	High		H
S0100655	ROCKYS SWAMP SOUTH	PARAKIE	13.5621475225	14.5621473504274	High	High	LLC	H
S0104286	BONNEYS CAMP SOUTH	WATERVALLEY	14.556968887	14.5569687029659	High	High		H
S0104305	BONNEYS CAMP FLOODPLAIN	WATERVALLEY	14.5331849149	14.5331849987149	High	High		H
S0121478	MT LYON LF	SOUTH EAST VOLCANIC	6.27582573073	14.5258257814699	Moderate	High	LLC	L
S0103280		MESSENT	14.5236122306	14.5236120307541	High	High		M
S0123972	PICCANINNIE PONDS	NENE VALLEY		14.5		High	LLC	H
S0100341	LOCHABER SWAMP	LOCHABER	11.9946590756	14.4946589885689	High	High	LLC	VH
S0106778	OLD WOOLWASH	SOUTH EAST VOLCANIC	2.7382247693	14.4882248545906	Not Assessed	High	LLC	L
S0100082			14.4833923119	14.4833925647369	High	High		VH
S0106346		SOUTH EAST COASTAL LAKES	11.9684864818	14.4684863091416	High	High	LLC	VH
S0107533	THE MARSHES	DISMAL SWAMP	6.9477635161	14.447763004976	Moderate	High	LLC	H
S0104134	BONNEYS CAMP SOUTH	WATERVALLEY	14.4438841621	14.4438848592688	High	High		H
S0110203	CAT SWAMP	DISMAL SWAMP	8.41929663593	14.4192966200277	Moderate	High	LLC	VH
S0108264	FRESH DIP LAKE	SOUTH EAST COASTAL LAKES	8.3824746385	14.3824740810785	Moderate	High	LLC	VH
S0105111			14.3710766326	14.3710766325773	High	High		H
S0101029		GUM LAGOON	14.3700241943	14.370024194306	High	High		H
S0101443			14.3611115341	14.3611115341073	High	High		H
S0110771	HONAN NFR	DISMAL SWAMP	13.566174527	14.3161735043051	High	High	LLC	L
S0104959		MESSENT	14.2882567938	14.2882567937515	High	High		VH
S0108133	LAKE LING	SOUTH EAST COASTAL LAKES	13.7864996835	14.2864985340097	High	High	LLC	VH
S0104820		MESSENT	14.2858743612	14.2858765156575	High	High		H
S0107013		NENE VALLEY	15.769033974	14.269033875163	High	High	LLC	L
S0111834		GUM LAGOON	14.2484451415	14.2484442767388	High	High		VH
S0111838		GUM LAGOON	14.2334048122	14.2334051042737	High	High		VH
S0101004		GUM LAGOON	13.4557831459	14.2057832690542	High	High		VH
S0102531		DEEP SWAMP	14.1834829265	14.1834824880533	High	High	LLC	H
S0102496	TILLEY SWAMP	DEEP SWAMP	14.1665093856	14.1665092121405	High	High	LLC	H
S0108136	DAWSON SWAMP SOUTH	SOUTH EAST COASTAL LAKES	6.66243508257	14.1624351670473	Moderate	High	LLC	VH
S0103460	MESSENT CONSERVATION PARK	MESSENT	14.161022003	14.1610217582821	High	High		H
S0100019		MESSENT	14.1523108102	14.1523114134835	High	High		VH
S0107052		SOUTH EAST COASTAL LAKES	14.1347135042	14.1347130174767	High	High	LLC	VH
S0111492		MANDINA MARSHES	14.1297523559	14.1297522141908	High	High		VH
S0100029	The Coorong	COORONG	7.1157251514	14.1157254406558	Moderate	High		VH
S0100058	BONNEYS CAMP SOUTH	WATERVALLEY	14.0945922289	14.0945922289299	High	High		H
S0110523	THE MARSHES	DISMAL SWAMP	8.09210333496	14.0921030927992	Moderate	High	LLC	H
S0101081	MANDINA MARSHES	WATERVALLEY	13.5875578192	14.0875571881242	High	High		VH
S0111584		BUNBURY	14.0737766858	14.0737755393423	High	High		H
S0110651	HACKET HILL NFR	DISMAL SWAMP	8.79472029237	14.0447230747381	Moderate	High	LLC	VH
S0101463		GUM LAGOON	14.0436582853	14.0436584873253	High	High		H
S0100016	MESSENT CONSERVATION PARK	MESSENT	14.0365246787	14.0365239139511	High	High		H
S0110076		SOUTH EAST COASTAL LAKES	6.7591065694	14.009107180161	Moderate	High	LLC	VH
S0111850		GUM LAGOON	13.9917026886	13.9917027797235	High	High		VH
S0110734	HONAN NFR	DISMAL SWAMP	13.2254566443	13.9754546489399	High	High	LLC	L
S0111862		GUM LAGOON	13.9745656871	13.9745637026698	High	High		VH
S0101451			13.96909432	13.969095105987	High	High		VH
S0122079	LEAH SWAMP		12.4672154736	13.9672154442227	High	High		L
S0111849		GUM LAGOON	13.9629694113	13.9629676934633	High	High		VH
S0100081			13.7105590927	13.9605585750913	High	High		VH
S0100066	BONNEYS CAMP SOUTH	WATERVALLEY	13.9211922862	13.9211927308549	High	High		VH
S0111713	NAPPERS SCRUB		10.6545171712	13.9045170524191	High	High		H

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S0107056		SOUTH EAST COASTAL LAKES	14.8993663506	13.8993664716241	High	High	LLC	H
S0110522	THE MARSHES	DISMAL SWAMP	11.8735251777	13.8735240498571	High	High	LLC	L
S0107833		SOUTH EAST COASTAL LAKES	9.372748682	13.8727487315526	High	High	LLC	H
S0100426	PRETTY JOHNNYS	WATERVALLEY	12.3559150981	13.8559150474439	High	High		H
S0111836		GUM LAGOON	13.8465310977	13.846532356385	High	High		VH
S0100024		MESSENT	13.8462348451	13.8462351368583	High	High		VH
S0111199	DUCK ISLAND		13.833371495	13.8333710653433	High	High		H
S0101019		GUM LAGOON	13.8304630118	13.8304645429577	High	High		VH
S0110648	HACKET HILL NFR	DISMAL SWAMP	13.0516778919	13.8016778918659	High	High	LLC	VH
S0104262		BUNBURY	13.80075177	13.800750775293	High	High		H
S0111577		BUNBURY	13.7954677354	13.7954677353673	High	High		H
S0108610	WEST OF LAKE HAWDON NORTH	SOUTH EAST COASTAL LAKES	13.5443672783	13.7943672579255	High	High	LLC	VH
S0101026		GUM LAGOON	13.7822443542	13.7822443542247	High	High		M
S0105059	BONNEYS CAMP NORTH	WATERVALLEY	13.7780394775	13.778039671718	High	High		H
S0110627	MT LYON LF	SOUTH EAST VOLCANIC	9.26355396805	13.7635545188422	High	High	LLC	L
S0111143			6.7620431946	13.7620430840973	Moderate	High	LLC	H
S0111579			13.7491231762	13.749123677518	High	High		VH
S0111611		BUNBURY	12.9972563842	13.7472563842444	High	High		M
S0100112		COORONG	11.7352531119	13.735253008044	High	High		H
S0101269		GUM LAGOON	13.6704112322	13.6704135432106	High	High		VH
S0100018		MESSENT	13.6635497004	13.6635498995463	High	High		VH
S0100065	THE DEEP WATERHOLE	WATERVALLEY	13.6470552473	13.6470577723335	High	High		VH
S0111848		GUM LAGOON	13.6386661634	13.6386674221339	High	High		H
S0111833		GUM LAGOON	13.6335167642	13.6335163431704	High	High		H
S0107024	RIDDOCH BAY	NENE VALLEY	7.11676485383	13.6167632702284	Moderate	High	LLC	H
S0106771	MILROY	STRATHDOWNIE	3.10192383559	13.6019232938148	Not Assessed	High	LLC	H
S0110735	HONAN NFR	DISMAL SWAMP	13.0865147377	13.5865147376655	High	High	LLC	L
S0111024	WESTSLOPES FLOODPLAIN SOUTH	WESTSLOPES	17.5804588972	13.5804588477448	High	High	LLC	VH
S0110761	HONAN NFR	DISMAL SWAMP	13.3236351051	13.5736351050571	High	High	LLC	L
S0111839		GUM LAGOON	13.5643713994	13.5643680108077	High	High		VH
S0101485		GUM LAGOON	13.5607858999	13.5607873052202	High	High		VH
S0100132			13.558136495	13.5581373617226	High	High		VH
S0108176		BOOL LAGOON - COONAWARRA	13.5209399913	13.5209407470892	High	High	LLC	H
S0111583			13.517778845	13.5177797200728	High	High		H
S0109883	KARINYA	SOUTH EAST COASTAL LAKES	9.01613630755	13.5161366910725	High	High	LLC	VH
S0111835		GUM LAGOON	13.5070357556	13.5070351691776	High	High		VH
S0104385		BUNBURY	13.5058621983	13.5058621982919	High	High		H
S0105080			13.4793923215	13.4793924474013	High	High		VH
S0111855		GUM LAGOON	13.469803058	13.4698024863468	High	High		H
S0103168		MESSENT	13.4657505408	13.4657516042818	High	High		L
S0100050	KENDAL WETLANDS	BUNBURY	13.4622209648	13.4622211014107	High	High		VH
S0109873	LAKE ELIZA PERIPHERAL WETLANDS	SOUTH EAST COASTAL LAKES	5.45805976911	13.4580594843638	Not Assessed	High	LLC	VH
S0100084			13.1865556678	13.4365555600319	High	High		VH
S0109874	LAKE ST CLAIR	SOUTH EAST COASTAL LAKES	13.1664788329	13.4164787656843	High	High	LLC	VH
S0110251	WANDILO NFR	DISMAL SWAMP	8.13607506393	13.3860737178558	Moderate	High	LLC	M
S0100251	DEL FABBROS SWAMP		12.8721399077	13.3721403636196	High	High	LLC	M
S0100129	MANDINA MARSHES	MANDINA MARSHES	13.3701582338	13.3701582290464	High	High		H
S0111681		GUM LAGOON	13.3432690613	13.3432711621227	High	High		H
S0116936	SALT LAKE	SOUTH EAST COASTAL LAKES	14.3431199039	13.3431202108559	High	High	LLC	H
S0120648	KARINYA	SOUTH EAST COASTAL LAKES	7.33284813507	13.3328467782927	Moderate	High	LLC	VH
S0111680		GUM LAGOON	13.3295332962	13.3295332962446	High	High		H
S0116904		BOOL LAGOON - COONAWARRA	13.3289576573	13.3289584154765	High	High	LLC	H
S0111599		BUNBURY	13.3232683533	13.3232683533024	High	High		H
S0104396		BUNBURY	13.2746534271	13.2746534271324	High	High		H
S0110208	HACKET HILL NFR	DISMAL SWAMP	8.26577300861	13.2657762076734	Moderate	High	LLC	VH
S0100113	MANDINA MARSHES	MANDINA MARSHES	13.25123042	13.2512305320488	High	High		H
S0104363		BUNBURY	13.2461424254	13.2461413594324	High	High		H
S0110726	HONAN NFR	DISMAL SWAMP	9.71539311053	13.215393110526	High	High	LLC	L
S0123675	MOSQUITO CREEK			13.2119167218814		High	LLC	H
S0101069		MANDINA MARSHES	13.2025182988	13.2025180324438	High	High		VH
S0120659		WOAKWINE RANGE	13.1875305799	13.1875305872058	High	High	LLC	M
S0110556	WATERHOUSE	SOUTH EAST COASTAL LAKES	15.6835895448	13.1835896589018	High	High	LLC	VH
S0101141	NAE NAE SWAMP	GUM LAGOON	12.6832062222	13.183206291077	High	High		VH
S0110825	HONAN NFR	DISMAL SWAMP	12.9312940555	13.1812940555153	High	High	LLC	L
S0110529	THE MARSHES	DISMAL SWAMP	8.91877788047	13.1687778804744	Moderate	High	LLC	H
S0111428	BONNEYS CAMP NORTH	WATERVALLEY	13.1561577544	13.156157101627	High	High		H

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S0105172			13.146604187	13.1466044653816	High	High		VH
S0110531	THE MARSHES	DISMAL SWAMP	8.14645370303	13.1464538122265	Moderate	High	LLC	H
S0108290		SOUTH EAST COASTAL LAKES	13.1280499378	13.128051784752	High	High	LLC	VH
S0105335		BUNBURY	13.1229415896	13.1229421801604	High	High		VH
S0101458	PETER AND JACK WATERHOLE	MANDINA MARSHES	13.121813277	13.1218130165419	High	High		VH
S0107493	THE MARSHES	DISMAL SWAMP	8.86464598007	13.1146456162618	Moderate	High	LLC	H
S0107160	RENNICK	FOLLETT	7.61077326019	13.1107735138657	Moderate	High		M
S0103238		MESSENT	13.103152273	13.1031539113891	High	High		M
S0110546	THE MARSHES	DISMAL SWAMP	7.09236016343	13.0923603779913	Moderate	High	LLC	H
S0115487	THE MARSHES	DISMAL SWAMP	5.09187369648	13.0918736964847	Not Assessed	High	LLC	H
S0110935	ISLAND SWAMP LF	DISMAL SWAMP	3.5800582426	13.0800581979609	Not Assessed	High	LLC	M
S0106954	BLUE LAKE	SOUTH EAST VOLCANIC	7.81866768125	13.0686676495982	Moderate	High	LLC	VH
S0110600	MT MCINTYRE NFR	SOUTH EAST VOLCANIC	11.0678089284	13.0678088872615	High	High	LLC	L
S0115228	DONEGAL	DISMAL SWAMP	14.5525728122	13.0525728121773	High	High	LLC	M
S0110612	THE MARSHES	DISMAL SWAMP	8.04159280001	13.0415927262408	Moderate	High	LLC	H
S0110988	HACKET HILL NFR	DISMAL SWAMP	7.04130839757	13.0413083975701	Moderate	High	LLC	VH
S0105100			13.0392559685	13.0392572705667	High	High		VH
S0115667	NANGWARRY NFR	DISMAL SWAMP	8.03116641428	13.0311664142825	Moderate	High	LLC	L
S0111578			13.0296050977	13.029605097652	High	High		VH
S0103625			2.02726173168	13.0272624413172	Not Assessed	High		VH
S0111867		GUM LAGOON	12.9945122756	12.9945122755886	High	High		H
S0105068			12.9856784695	12.9856773565144	High	High		H
S0101030		GUM LAGOON	12.9648587842	12.964858784246	High	High		H
S0111582			12.9443574293	12.94436030565	High	High		VH
S0111467			12.9346643822	12.9346643822417	High	High		H
S0122456	CARANTA SWAMP		9.92982796969	12.929828025343	High	High		L
S0108280	LITTLE DIP LAKE	SOUTH EAST COASTAL LAKES	9.13291196121	12.8829135281761	High	High	LLC	VH
S0111682		GUM LAGOON	12.8510505528	12.851051626459	High	High		H
S0111685		GUM LAGOON	12.8505893681	12.8505900526187	High	High		H
S0104338			12.8202469984	12.8202469983601	High	High		M
S0110991	TWIG RUSH LAGOONS	BOOL LAGOON - COONAWARRA	12.8071750111	12.8071745447379	High	High	LLC	H
S0105298			12.795941714	12.7959430483846	High	High		VH
S0103235		MESSENT	12.7810559739	12.7810559739109	High	High		M
S0104772	BONNEYS CAMP SOUTH FLOODPLAIN	WATERVALLEY	12.7616516385	12.7616516952949	High	High		H
S0111021	ROBERTSON SWAMP	PARK HILL	12.7605012578	12.7605012804708	High	High	LLC	H
S0104296		BUNBURY	12.7577470096	12.757746965605	High	High		VH
S0100083			12.7509027795	12.7509029778862	High	High		VH
S0111475		MESSENT	12.7502024219	12.7502029320322	High	High		M
S0111866		GUM LAGOON	12.7466675706	12.7466675705527	High	High		H
S0103421		MESSENT	12.7323896206	12.7323893440225	High	High		M
S0113840		SOUTH EAST COASTAL LAKES	13.2181289985	12.7181289341627	High	High	LLC	H
S0111429	BONNEYS CAMP NORTH	WATERVALLEY	12.6905156185	12.6905161058241	High	High		H
S0110664	HACKET HILL NFR	DISMAL SWAMP	12.4400959351	12.6900961920757	High	High	LLC	H
S0108755	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	11.6813135068	12.6813139583167	High	High	LLC	H
S0111802	GRASSMERE DOWNS		11.172539246	12.6725392372179	High	High		VH
S0110568	HACKET HILL NFR	DISMAL SWAMP	7.41921346234	12.669213235062	Moderate	High	LLC	H
S0103206		MESSENT	12.6683947795	12.6683947794978	High	High		M
S0111679		GUM LAGOON	12.66135835	12.6613565306862	High	High		H
S0103660		MESSENT	12.6591898969	12.6591912237905	High	High		VH
S0111746		GUM LAGOON	12.6584099715	12.6584102694148	High	High		VH
S0105970	Lake Frome	SOUTH EAST COASTAL LAKES	11.4010711821	12.6510713668477	High	High	LLC	VH
S0103431		MESSENT	12.6481022822	12.6481037163727	High	High		H
S0100193		WESTSLOPES	12.6476035383	12.6476035602358	High	High	LLC	H
S0109740	DEADMAN SWAMP	BOOL LAGOON - COONAWARRA	3.1334142232	12.6334135035989	Not Assessed	High	LLC	M
S0114274	HACKET HILL NFR	DISMAL SWAMP	6.63233253444	12.6323337898129	Moderate	High	LLC	VH
S0105194			12.6247804075	12.6247803600087	High	High		VH
S0110944	THE EVERGLADES	DISMAL SWAMP	10.1206689897	12.6206686741331	High	High	LLC	VH
S0111869		GUM LAGOON	12.6195390854	12.6195391112445	High	High		H
S0101513		MANDINA MARSHES	12.5690810826	12.5690810825653	High	High		H
S0111586			12.5686040199	12.5686040198531	High	High		H
S0110592	THE MARSHES	DISMAL SWAMP	7.5345710545	12.5345698774032	Moderate	High	LLC	H
S0110534	LAKE ROBE GAME RESERVE	SOUTH EAST COASTAL LAKES	12.5232784968	12.5232786737743	High	High	LLC	VH
S0100243	JAFFRAY SWAMP FLOODPLAIN	JAFFRAY	10.0228795659	12.5228796106353	High	High	LLC	H
S0111069	DEL FABBROS FLOODPLAIN		15.7726673343	12.5226677716049	High	High	LLC	M
S0111075			12.5215371044	12.5215368321709	High	High	LLC	VH
S0105305			12.5171724635	12.5171722721969	High	High		H

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S0103229		MESSENT	12.5026386691	12.502638669129	High	High		L
S0111884		GUM LAGOON	12.4966670661	12.4966668893347	High	High		H
S0104718		TILLEY SWAMP	12.4850118844	12.4850118535824	High	High		H
S0101354			4.98307878699	12.4830787801674	Not Assessed	High		H
S0101520			12.4594638877	12.4594638877083	High	High		H
S0111846		GUM LAGOON	12.4563622461	12.4563620118944	High	High		H
S0110634	MT LYON LF	SOUTH EAST VOLCANIC	10.9557045337	12.4557055587674	High	High	LLC	L
S0107434	MT MCINTYRE NFR	DISMAL SWAMP	3.69888547299	12.4488869600609	Not Assessed	High	LLC	L
S0110739	HONAN NFR	DISMAL SWAMP	12.4464157855	12.4464157854809	High	High	LLC	L
S0109310	WINDAMERE	BOOL LAGOON - COONAWARRA	12.4466701598	12.4466701543115	High	High	LLC	H
S0103186		MESSENT	12.4315380023	12.4315380022801	High	High		VH
S0107599	KEARNEY LAKE	DISMAL SWAMP	7.89441802818	12.3944180220986	Moderate	High	LLC	VH
S0121498		SOUTH EAST COASTAL LAKES	12.1431754243	12.3931753400014	High	High	LLC	VH
S0104285		BUNBURY	12.3314911289	12.3314911288669	High	High		VH
S0111683		GUM LAGOON	12.3304419019	12.3304419019005	High	High		H
S0100235	THE SISTERS	WILLALOOKA	13.2876458186	12.2876457060394	High	High	LLC	VH
S0111678		GUM LAGOON	12.2857963353	12.285796335331	High	High		H
S0120244	BIG DIP LAKE	SOUTH EAST COASTAL LAKES	11.2834873813	12.2836821527572	High	High	LLC	VH
S0104379			12.280473781	12.2804734960836	High	High		VH
S0105233			12.0222826292	12.2722827305675	High	High		H
S0104231	BONNEYS CAMP SOUTH	WATERVALLEY	12.242600539	12.2426006734873	High	High		H
S0103672		MESSENT	12.2187923584	12.2187923584451	High	High		H
S0100036	ALFRED FLAT	MESSENT	12.2037499085	12.2037498840067	High	High		H
S0104129		COORONG	9.19971389232	12.1997138862119	High	High		H
S0111868		GUM LAGOON	12.195097023	12.1950970373228	High	High		H
S0110788	HONAN NFR	DISMAL SWAMP	12.1834838674	12.1834843977024	High	High	LLC	L
S0101490		TILLEY SWAMP	12.1731785321	12.1731785321259	High	High		H
S0105296			12.1652874597	12.1652869150648	High	High		H
S0104319			12.1636741122	12.1636741841086	High	High		M
S0104387		BUNBURY	12.1572898665	12.1572898664729	High	High		H
S0110740	KANGAROO FLAT	DISMAL SWAMP	11.6556224531	12.1556222773402	High	High	LLC	M
S0110569	HACKET HILL NFR	DISMAL SWAMP	7.15517595669	12.1551759566864	Moderate	High	LLC	VH
S0104225	BONNEYS CAMP SOUTH	WATERVALLEY	12.1356772275	12.1356761968506	High	High		H
S0100041	BONNEYS CAMP NORTH	WATERVALLEY	12.1332230957	12.1332232664544	High	High		H
S0100080			11.8548853403	12.1048851712642	High	High		VH
S0104349			12.1036724324	12.1036725240729	High	High		H
S0108262	WIRREEBILLA	KYBYBOLITE	3.09487746146	12.094877225528	Not Assessed	High	LLC	L
S0104496		GUM LAGOON	12.0625621595	12.0625618462622	High	High		H
S0110561	HONAN NFR	DISMAL SWAMP	7.05683916892	12.056839168918	Moderate	High	LLC	H
S0107022	PIC PONDS EXTENSION	NENE VALLEY	2.50284888013	12.002848880132	Not Assessed	High	LLC	M
S0114271	DISMAL DOWNS	DISMAL SWAMP	7.00233388164	12.0023372419905	Moderate	High	LLC	VH
S0100224	IBIS SWAMP	PARK HILL	11.9970550399	11.9970550217317	High	High	LLC	H
S0110565	HONAN NFR	DISMAL SWAMP	9.49181817919	11.9918163575544	High	High	LLC	L
S0100059	BUNBURY MAIN LAGOON	BUNBURY	11.9906049901	11.9906048040268	High	High		H
S0100547			11.9833493546	11.9833489162736	High	High		VH
S0109485	MONBULLA	BOOL LAGOON - COONAWARRA	4.97680464111	11.9768051050249	Not Assessed	High	LLC	H
S0107011	NENE VALLEY	NENE VALLEY	11.9527737711	11.9527735997594	High	High	LLC	H
S0120824	KANGAROO FLAT	DISMAL SWAMP	11.2016398062	11.9516402309784	High	High	LLC	L
S0100044		COORONG	11.4335631132	11.9335633115834	High	High		VH
S0110738	HONAN NFR	DISMAL SWAMP	11.9289979109	11.9289980262955	High	High	LLC	L
S0111431	BONNEYS CAMP SOUTH	WATERVALLEY	11.9227608068	11.9227609359808	High	High		H
S0104412			11.9204482714	11.9204482714357	High	High		VH
S0100249	BLACK COCKY FLOODPLAIN	HOOK BANKS	8.16900549279	11.9190063648552	Moderate	High	LLC	H
S0111585			11.9044180916	11.9044180915653	High	High		H
S0114945		SOUTH EAST COASTAL LAKES	5.65137572083	11.9013758413303	Moderate	High	LLC	H
S0104950		MESSENT	11.896266288	11.8962669687555	High	High		VH
S0100116		COORONG	11.8845196518	11.8845178749295	High	High		H
S0100063		BUNBURY	11.873120251	11.873120209768	High	High		H
S0116859		BOOL LAGOON - COONAWARRA	11.8631832862	11.8631832861803	High	High	LLC	M
S0110719	GRUNDY LANE NFR	DISMAL SWAMP	6.60241284631	11.8524118934179	Moderate	High	LLC	M
S0110912	GRUNDY LANE NFR	DISMAL SWAMP	6.84560546956	11.845601739617	Moderate	High	LLC	L
S0100247	JIMMY PREECE	HOOK BANKS	7.59448116575	11.8444815692741	Moderate	High	LLC	H
S0110476		BOOL LAGOON - COONAWARRA	11.8402481023	11.8402487717835	High	High	LLC	H
S0104154	BONNEYS CAMP SOUTH	WATERVALLEY	11.8151953161	11.8151950049965	High	High		H
S0109954		SOUTH EAST COASTAL LAKES	11.8124609179	11.8124600649816	High	High	LLC	VH
S0100110		COORONG	11.8117265401	11.8117267518379	High	High		H
S0100124		COORONG	11.7998056996	11.7998056426408	High	High		H
S0104144			11.7960376176	11.7960374630937	High	High		H
S0108185	INVERGLEN	BOOL LAGOON - COONAWARRA	3.29480778647	11.794808682859	Not Assessed	High	LLC	H

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S0100195		WESTSLOPES	11.7922409614	11.7922426670556	High	High	LLC	H
S0109796	LAKE ELIZA PERIPHERAL WETLANDS	SOUTH EAST COASTAL LAKES	7.25534026806	11.7553394898374	Moderate	High	LLC	VH
S0111581			11.7520972227	11.752095208287	High	High		VH
S0114971		NENE VALLEY	9.5006307129	11.7506302179145	High	High	LLC	H
S0125071	GEEGEELA			11.75	High	High	LLC	L
S0110579	THE MARSHES	DISMAL SWAMP	9.491242220505	11.7412410334345	High	High	LLC	L
S0105182			11.7368769962	11.7368774326124	High	High		H
S0108822		BOOL LAGOON - COONAWARRA	11.7304780155	11.7304789344434	High	High	LLC	M
S0101210			11.7292329879	11.7292328951079	High	High		VH
S0102541	CADARA SWAMP	WOAKWINE RANGE	2.22830143837	11.728300346442	Not Assessed	High	LLC	H
S0110901	CLAYPANS EAST	SOUTH EAST VOLCANIC	8.22483742574	11.7248378298543	Moderate	High	LLC	H
S0104289			11.718192301	11.7181928613413	High	High		H
S0104388		BUNBURY	11.7151637884	11.7151637883822	High	High		H
S0111502		TILLEY SWAMP	11.702533033	11.7025331763892	High	High		M
S0113997	PENOLA ROAD LF	DISMAL SWAMP	5.94474770479	11.6947480788157	Moderate	High	LLC	M
S0113828	PETER BEGGS SWAMP	SOUTH EAST COASTAL LAKES	11.1932438785	11.6932443648068	High	High	LLC	H
S0120847	HOG LAKE	SOUTH EAST COASTAL LAKES	11.1920022938	11.692002153823	High	High	LLC	VH
S0105067			11.6882688446	11.6882680470906	High	High		H
S0103358		MESSENT	11.686993352	11.6869919140498	High	High		H
S0107607	WHITE HAWK LAGOON	DISMAL SWAMP	5.78189949977	11.6782716103454	Moderate	High	LLC	VH
S0110676	HACKET HILL NFR	DISMAL SWAMP	11.6776269867	11.6776272492984	High	High	LLC	VH
S0120227		SOUTH EAST COASTAL LAKES	11.1413358061	11.6413358578501	High	High	LLC	H
S0114317	MT GAMBIER FOREST	DISMAL SWAMP	8.12000170404	11.6200017040387	Moderate	High	LLC	L
S0100233	KALANDRA SWAMP		11.6082302438	11.6082303674981	High	High	LLC	VH
S0110679	WANDILO NFR	DISMAL SWAMP	10.8526822069	11.6026819259658	High	High	LLC	M
S0100015		MESSENT	11.6023267361	11.6023256061606	High	High		VH
S0111150	REEDY CREEK FLOODPLAIN		8.59957189666	11.5995718973765	Moderate	High	LLC	H
S0111078			11.5970045468	11.5970045467742	High	High	LLC	VH
S0110587		SOUTH EAST COASTAL LAKES	10.0922344511	11.592234603847	High	High	LLC	VH
S0114763	PENOLA FOREST	DISMAL SWAMP	6.58838588349	11.5883859224138	Moderate	High	LLC	M
S0103403		MESSENT	11.5873880638	11.5873865771336	High	High		VH
S0104375		BUNBURY	11.5837343565	11.5837343565367	High	High		H
S0120494	HACKET HILL NFR	DISMAL SWAMP	6.57251144215	11.5725114421541	Moderate	High	LLC	H
S0111886		GUM LAGOON	11.5545496766	11.5545508132255	High	High		H
S0111494		MANDINA MARSHES	11.5503033863	11.5503033863494	High	High		H
S0110666	HACKET HILL NFR	DISMAL SWAMP	11.0449840477	11.5449840476919	High	High	LLC	VH
S0107021	LIONS PARK	NENE VALLEY	4.27294600565	11.529460295939	Not Assessed	High	LLC	VH
S0104381			11.521949137	11.5219496972796	High	High		H
S0110585		SOUTH EAST COASTAL LAKES	13.7607951539	11.5107949999802	High	High	LLC	VH
S0101288		GUM LAGOON	11.5103053379	11.5103061508388	High	High		H
S0110674	LYNWOOD	DISMAL SWAMP	8.00840071024	11.5084009488015	Moderate	High	LLC	M
S0111885		GUM LAGOON	11.5075036197	11.5075018990477	High	High		H
S0105345			11.5860992361	11.5070878233069	High	High		VH
S0111744		GUM LAGOON	11.5016980718	11.5016980963043	High	High		H
S0101309		GUM LAGOON	10.4996496832	11.4996489352909	High	High		H
S0102800		SOUTH EAST COASTAL LAKES	10.7493318955	11.4993320359646	High	High	LLC	VH
S0110574	LAKE ST CLAIR	SOUTH EAST COASTAL LAKES	4.99552126116	11.4955219456515	Not Assessed	High	LLC	VH
S0108809		SOUTH EAST COASTAL LAKES	11.4927071844	11.4927068695614	High	High	LLC	VH
S0111851		GUM LAGOON	11.4876125317	11.4876113616857	High	High		VH
S0105847	TILLAR SWAMP	DISMAL SWAMP	6.48398769337	11.4839874167394	Moderate	High	LLC	H
S0116905		BOOL LAGOON - COONAWARRA	11.4785045375	11.478505241669	High	High	LLC	H
S0107485	THE HEATH	DISMAL SWAMP	6.46964514577	11.4696453274154	Moderate	High	LLC	H
S0110663	HACKET HILL NFR	DISMAL SWAMP	6.45975939622	11.4597593962157	Moderate	High	LLC	H
S0110647	HACKET HILL NFR	DISMAL SWAMP	10.9486294104	11.4486283053676	High	High	LLC	VH
S0100070			12.4269851399	11.4269850663275	High	High		VH
S0104310			11.4255398741	11.4255398730317	High	High		M
S0110867		SOUTH EAST COASTAL LAKES	4.4203108591	11.4203108591046	Not Assessed	High	LLC	H
S0104115			11.4184080526	11.4184080526092	High	High		H
S0103402		MESSENT	11.4152748164	11.4152732717888	High	High		VH
S0111635			11.4145974366	11.4145986481148	High	High		VH
S0105196			11.4060246636	11.40602465002	High	High		VH
S0105772	MCGLLEN	SOUTH EAST VOLCANIC	2.9006719443	11.4006717222891	Not Assessed	High	LLC	L
S0105184			11.3765606213	11.3765606472987	High	High		VH
S0113808		SOUTH EAST COASTAL LAKES	11.3721315344	11.3721313502641	High	High	LLC	VH
S0100119		COORONG	11.368998563	11.3689985572372	High	High		H
S0104240		WATERVALLEY	11.3689971816	11.3689966213867	High	High		VH
S0110553	HACKET HILL NFR	DISMAL SWAMP	6.35804209853	11.3580420985324	Moderate	High	LLC	H
S0103432		MESSENT	11.3566769276	11.3566769276257	High	High		VH

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S0110850	KANGAROO FLAT	DISMAL SWAMP	6.35143427081	11.3514342708068	Moderate	High	LLC	H
S0111636			11.3484849683	11.3484849682591	High	High		VH
S0100103		CORTINA LAKES	7.8439689662	11.343968402038	Moderate	High		H
S0104299			11.3258141135	11.325814404154	High	High		H
S0104365			11.3186532173	11.3186532172768	High	High		M
S0100239	THE MUDDIES	WILLALOOKA	6.31368065953	11.3136805686048	Moderate	High	LLC	VH
S0103458		MESSENT	11.2990029322	11.2990029322269	High	High		VH
S0104376		BUNBURY	11.2926435071	11.292643230239	High	High		VH
S0105087	BONNEYS CAMP NORTH	WATERVALLEY	11.2890196214	11.2890196214213	High	High		H
S0111852		GUM LAGOON	11.2724036909	11.2724030086055	High	High		VH
S0104410			11.2672657892	11.2672657891692	High	High		M
S0100164		COORONG	11.2611771696	11.2611771780455	High	High		VH
S0104764		GUM LAGOON	11.2603947665	11.2603929899776	High	High		VH
S0100159		TILLEY SWAMP	11.2483810201	11.2483810393266	High	High		VH
S0104276			11.2462230394	11.246224228489	High	High		M
S0110654	HACKET HILL NFR	DISMAL SWAMP	10.7458595102	11.2458591191477	High	High	LLC	H
S0100232	LEVER SWAMP	WILLALOOKA	13.2341576727	11.2341574706245	High	High	LLC	VH
S0111633			11.2297249695	11.2297249472864	High	High		VH
S0120652	Lake Eliza	SOUTH EAST COASTAL LAKES	9.97841258531	11.228412432378	High	High	LLC	VH
S0104351			11.2271246729	11.2271237392913	High	High		VH
S0100096		COORONG	11.2222726048	11.2222742397587	High	High		H
S0110729	HONAN NFR	DISMAL SWAMP	10.7191793826	11.219178367505	High	High	LLC	L
S0103369		MESSENT	11.2161212352	11.2161208233199	High	High		H
S0105193			11.2116811782	11.2116815469515	High	High		VH
S0100130		COORONG	11.2075049566	11.2075070325692	High	High		H
S0111430			11.1701600311	11.1701600310688	High	High		H
S0110435	COPPINGS SWAMP	BOOL LAGOON - COONAWARRA	11.1570598736	11.1570599959766	High	High	LLC	H
S0100156		COORONG	11.1533960927	11.1533945635221	High	High		VH
S0103469		MESSENT	11.1409856823	11.1409856822904	High	High		VH
S0111535			7.13646609384	11.1364660938385	Moderate	High		VH
S0100792	NIDDS SWAMP NORTH		11.1294859339	11.1294857845899	High	High		VH
S0103462		MESSENT	11.1215960008	11.1215960007661	High	High		VH
S0110776	HONAN NFR	DISMAL SWAMP	9.62017721165	11.120176603229	High	High	LLC	L
S0110842	KANGAROO FLAT	DISMAL SWAMP	6.10781157769	11.1078115776925	Moderate	High	LLC	H
S0111495			11.1002703941	11.1002687805966	High	High		H
S0111476		MESSENT	11.0971686933	11.097167136621	High	High		L
S0107869		SOUTH EAST COASTAL LAKES	11.0968610124	11.096861649727	High	High	LLC	VH
S0104197			11.087422001	11.0874216179137	High	High		H
S0111434		WATERVALLEY	11.0872065066	11.0872065066339	High	High		M
S0111188		CLAY LAKE	11.0868777455	11.0868802989265	High	High	LLC	VH
S0100157		COORONG	11.0764409902	11.0764413770694	High	High		VH
S0107275	RUSTS	DISMAL SWAMP	3.64671871328	11.0763877201953	Not Assessed	High	LLC	L
S0111887		GUM LAGOON	11.0744790043	11.0744790043173	High	High		H
S0105285			11.073182529	11.0731819095088	High	High		H
S0100160		COORONG	11.0709056579	11.0709070282462	High	High		VH
S0100163		COORONG	11.0649550556	11.0649546516008	High	High		VH
S0105050			11.0626903383	11.0626906676867	High	High		VH
S0103254		MESSENT	11.0531303875	11.0531326917971	High	High		VH
S0104406			11.0480763068	11.048076306795	High	High		M
S0100271	FISHER SWAMP	FISHER	11.7845609545	11.0344993078406	High	High	LLC	M
S0100192		WESTSLOPES	11.0328393167	11.0328391860104	High	High	LLC	H
S0104148		WATERVALLEY	11.0305092394	11.0305099034386	High	High		H
S0103298		MESSENT	11.0257766562	11.0257766562038	High	High		VH
S0104504		GUM LAGOON	11.0202827179	11.020285040815	High	High		H
S0104992			11.0145469287	11.0145467426582	High	High		M
S0100267	FISHER SWAMP NORTH	FISHER	10.7620461604	11.01204563133	High	High	LLC	M
S0111861			11.0049544146	11.0049536053973	High	High		H
S0100161		COORONG	11.0002883716	11.0002885486767	High	High		VH
S0100691			9.88639856173	10.9904500061325	High	High	LLC	H
S0100465		MANDINA MARSHES	10.9798312414	10.9798312075571	High	High		VH
S0110261	THE MARSHES	SOUTH EAST VOLCANIC	3.64191809096	10.9793692471943	Not Assessed	High	LLC	H
S0103449		MESSENT	10.9784452835	10.9784444835125	High	High		VH
S0100310	LAKE CADNITE		4.45919344509	10.9592120411702	Not Assessed	High	LLC	L
S0101222			10.9565116493	10.9565126282055	High	High		H
S0110599	MT MCINTYRE NFR	SOUTH EAST VOLCANIC	10.1987352194	10.9487352193677	High	High	LLC	L
S0111479		WATERVALLEY	10.9483681395	10.9483681395437	High	High		M
S0108732	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	10.9455149214	10.9455137561816	High	High	LLC	H
S0105134			10.9453053385	10.9453053385309	High	High		M
S0105026		MESSENT	10.9344652427	10.9344463232748	High	High		M

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S0104347			10.931503174	10.931504472981	High	High		VH
S0100988			10.9302649826	10.9302652343798	High	High		VH
S0101087			10.9229876913	10.9229910469245	High	High		H
S0111684		GUM LAGOON	10.9217711477	10.9217714867217	High	High		H
S0101091		TILLEY SWAMP	10.9178266444	10.9178263082481	High	High		H
S0100909			10.8181813758	10.9107907999176	High	High	LLC	H
S0105062		MARTINS WASHPOOL	10.9054873262	10.9054869756994	High	High		H
S0100046		COORONG	10.901434141	10.901434593803	High	High		VH
S0100311	SAMPHIRE SWAMP	DEEP SWAMP	10.890155456	10.890155222157	High	High	LLC	H
S0110671	HACKET HILL NFR	DISMAL SWAMP	10.8855673443	10.8855673442578	High	High	LLC	VH
S0119823	BIG HEATH CP	BOOL LAGOON - COONAWARRA	10.8772349603	10.8772342372703	High	High	LLC	M
S0100014		MESSENT	10.8670157425	10.8670146703587	High	High		VH
S0100093	MANDINA MARSHES	MANDINA MARSHES	10.8647594723	10.8647597780423	High	High		VH
S0110997	HORSESHOE PADDOCK	DISMAL SWAMP	10.8640452422	10.8640452880961	High	High	LLC	M
S0111589		BUNBURY	10.8624641895	10.8624641326315	High	High		VH
S0119822	BIG HEATH CP	BOOL LAGOON - COONAWARRA	10.8494275546	10.8494273073148	High	High	LLC	M
S0121477	LAKE FROME	SOUTH EAST COASTAL LAKES	10.836825404	10.8368252427108	High	High	LLC	VH
S0108075	TAYLORS LF	NARACOORTE RANGE	5.834870464	10.8348700665019	Moderate	High	LLC	VH
S0103447		MESSENT	10.8322326359	10.8322319555352	High	High		VH
S0104328			10.8309955232	10.8309939061672	High	High		VH
S0104177		WATERVALLEY	10.82163974	10.821639089105	High	High		H
S0100013		MESSENT	10.8000717318	10.8000706710672	High	High		VH
S0111588		BUNBURY	10.7953056923	10.7953064733446	High	High		VH
S0120653		SOUTH EAST COASTAL LAKES	10.778147598	10.7781466447392	High	High	LLC	VH
S0110646	HACKET HILL NFR	DISMAL SWAMP	13.2718027316	10.7718027315662	High	High	LLC	H
S0101365			10.7684449448	10.7684462537787	High	High		H
S0110554	HACKET HILL NFR	DISMAL SWAMP	10.5064619153	10.7564619152822	High	High	LLC	H
S0108786	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	10.7504303853	10.7504301268679	High	High	LLC	H
S0100187		WESTSLOPES	10.7455879044	10.7455877576114	High	High	LLC	H
S0110108	SHEEPWASH SWAMP	BOOL LAGOON - COONAWARRA	10.4908062385	10.7408060686694	High	High	LLC	H
S0100202	BIMBIMBI SWAMP	KYEEMA	14.7322584037	10.7322582917112	High	High	LLC	VH
S0110509	BOOL LAGOON	BOOL LAGOON - COONAWARRA	10.7316112211	10.7316113903083	High	High	LLC	H
S0120502	HACKET HILL NFR	DISMAL SWAMP	5.72759842638	10.7275984263779	Moderate	High	LLC	VH
S0100234	LITTLE SISTER	WILLALOOKA	10.7214389716	10.7214390415078	High	High	LLC	H
S0103439		MESSENT	10.7193691925	10.7193712072323	High	High		VH
S0108880		BOOL LAGOON - COONAWARRA	10.7078423005	10.7078427268594	High	High	LLC	H
S0100209			6.70649273895	10.7064926812073	Moderate	High	LLC	H
S0100969			10.70466732	10.7046672720097	High	High		VH
S0111798	GRASSMERE DOWNS		10.6975133069	10.6975128150516	High	High		H
S0120264	LEGOES SWAMP	SOUTH EAST COASTAL LAKES	5.19543259516	10.6954327043582	Not Assessed	High	LLC	VH
S0111637			10.6933639057	10.6933639056729	High	High		VH
S0108613		BOOL LAGOON - COONAWARRA	6.68819420006	10.6881941122288	Moderate	High	LLC	H
S0110580	THE MARSHES	DISMAL SWAMP	7.42425793445	10.6742595992565	Moderate	High	LLC	H
S0116892		BOOL LAGOON - COONAWARRA	10.6736452897	10.6736476858627	High	High	LLC	M
S0103638		MESSENT	10.6653475822	10.6653475821613	High	High		VH
S0111145			6.66170180544	10.6617015451041	Moderate	High	LLC	H
S0108757	MCINNIS WETLAND	WOAKWINE RANGE	10.6487265608	10.6487265423754	High	High	LLC	VH
S0104315			10.6462901741	10.646290601361	High	High		H
S0111844		GUM LAGOON	10.6375177939	10.637517793871	High	High		H
S0100389		TILLEY SWAMP	10.6353943149	10.6353951317387	High	High		M
S0101173		GUM LAGOON	10.6319929436	10.6319946924998	High	High		H
S0101512		COORONG	10.6318950104	10.6318915591472	High	High		VH
S0111503		TILLEY SWAMP	10.6291065352	10.629105864219	High	High		M
S0115683	NANGWARRY NFR	DISMAL SWAMP	2.87714896815	10.6271489681538	Not Assessed	High	LLC	L
S0100538			10.6203178129	10.6203172489453	High	High		VH
S0104987			10.6194038179	10.6194060625159	High	High		VH
S0110792	KANGAROO FLAT	DISMAL SWAMP	9.35167970409	10.6016799680326	High	High	LLC	L
S0105156			10.6006924122	10.6006938051998	High	High		VH
S0100229	BULLOCKY SWAMP	WILLALOOKA	13.3427250793	10.5927249269812	High	High	LLC	VH
S0114197	DISMAL DOWNS	DISMAL SWAMP	5.58851097098	10.5885093423649	Moderate	High	LLC	H
S0120251	OLD WOOLWASH	SOUTH EAST VOLCANIC	9.58502123065	10.5850198737985	High	High	LLC	L
S0100272	KEILIRA SWAMP	KEILIRA	11.5761627148	10.5761624323664	High	High	LLC	H
S0104938		MESSENT	10.5720162761	10.5720147140472	High	High		VH
S0104521		GUM LAGOON	10.5683936914	10.5683939047878	High	High		H
S0107498	THE MARSHES	DISMAL SWAMP	4.81568567315	10.5656860550006	Not Assessed	High	LLC	H
S0120708	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	10.55551079	10.5555109197141	High	High	LLC	H
S0110584		SOUTH EAST COASTAL LAKES	10.5543531449	10.5543532359653	High	High	LLC	VH
S0104370		WATERVALLEY	10.5540870987	10.5540861860837	High	High		H
S0111000			10.5297556731	10.5297558203788	High	High		M

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S0105164			10.5286565888	10.5286565631786	High	High		VH
S0111735			10.5196866912	10.5196866309047	High	High		VH
S0104334		TILLEY SWAMP	10.5187689728	10.5187689728159	High	High		M
S0104266			10.5067028543	10.5067051577098	High	High		H
S0101306		GUM LAGOON	10.5049926046	10.504992535105	High	High		H
S0100153		COORONG	10.5043555436	10.5043555168417	High	High		H
S0121493		ORMEROD	2.50184375249	10.501844322021	Not Assessed	High	LLC	VH
S0110536	LAKE AMY	SOUTH EAST COASTAL LAKES	10.496017066	10.4960169728948	High	High	LLC	VH
S0110656	HACKET HILL NFR	DISMAL SWAMP	10.2424779464	10.4924774808652	High	High	LLC	VH
S0110732	HONAN NFR	DISMAL SWAMP	7.24018208286	10.4901812675832	Moderate	High	LLC	H
S0107320	SNUGGERY DRAIN SPRING	SOUTH EAST COASTAL LAKES	5.60903954267	10.4868480137863	Moderate	High	LLC	VH
S0104173			10.4827700747	10.4827706345261	High	High		H
S0104271		TILLEY SWAMP	10.4804119549	10.4804105918237	High	High		H
S0110539	GHOST LAKE	SOUTH EAST COASTAL LAKES	11.4403712595	10.4403719824108	High	High	LLC	VH
S0116935	Bool Lagoon	BOOL LAGOON - COONAWARRA	6.93679677242	10.4367966270289	Moderate	High	LLC	H
S0104642	BARNET FLAT WATERHOLE	WATERVALLEY	10.4333599302	10.433359539715	High	High		VH
S0105315		MARTINS WASHPOOL	10.4254386078	10.4254384915582	High	High		VH
S0111436			10.4227797478	10.4227783922375	High	High		H
S0110667	HACKET HILL NFR	DISMAL SWAMP	10.1715077026	10.421507702579	High	High	LLC	VH
S0100122		COORONG	10.4148996221	10.4148996221499	High	High		H
S0105778		SOUTH EAST COASTAL LAKES	9.41358544132	10.4135856786475	High	High	LLC	VH
S0101113		GUM LAGOON	10.4091951071	10.4091942050554	High	High		VH
S0104403			10.403634639	10.4036346389552	High	High		M
S0100068	BONNEYS CAMP SOUTH	WATERVALLEY	10.3918668236	10.391867493905	High	High		VH
S0111153			10.3903455263	10.3903458201479	High	High	LLC	VH
S0110521	DEADMANS SWAMP NFR	NARACOORTE RANGE	11.3867392635	10.3867403986813	High	High	LLC	VH
S0101114		WATERVALLEY	10.3769161109	10.3769161109478	High	High		VH
S0111462	MONDAY WATERHOLE	MANDINA MARSHES	10.3766901851	10.3766901850769	High	High		H
S0104560	LOG CROSSING/ WELL AND BRIDGE	WATERVALLEY	10.3725108203	10.3725108554258	High	High		H
S0108020		SOUTH EAST COASTAL LAKES	9.12110784522	10.371107409034	High	High	LLC	VH
S0104300			10.3628613427	10.3628613427191	High	High		VH
S0111843		GUM LAGOON	10.3572360044	10.3572360044215	High	High		H
S0101044		MANDINA MARSHES	10.3495144976	10.3495148710942	High	High		VH
S0106829	OLD WASHPOOL SWAMP	DISMAL SWAMP	10.3460881128	10.3460873598334	High	High	LLC	M
S0108304		SOUTH EAST COASTAL LAKES	5.3454018236	10.3454014771778	Not Assessed	High	LLC	VH
S0104555		GUM LAGOON	10.3439010211	10.3439003669462	High	High		VH
S0107949		SOUTH EAST COASTAL LAKES	7.84287280739	10.342872801323	Moderate	High	LLC	VH
S0109090		BOOL LAGOON - COONAWARRA	10.3371411543	10.3371413474723	High	High	LLC	H
S0105161			10.3336191218	10.3336191218255	High	High		VH
S0100115	Tilley Swamp	TILLEY SWAMP	9.83045022417	10.3304500856064	High	High		H
S0100049		COORONG	10.3278092958	10.327809508713	High	High		VH
S0104333		COORONG	10.3276825296	10.3276825296217	High	High		VH
S0110766	HONAN NFR	DISMAL SWAMP	5.32675383359	10.3267527094865	Not Assessed	High	LLC	H
S0101140		GUM LAGOON	10.3194585784	10.319458390283	High	High		H
S0105102		BUNBURY	10.3131354786	10.3131341851687	High	High		VH
S0108158		BOOL LAGOON - COONAWARRA	9.06058240338	10.3105822614959	High	High	LLC	M
S0104103			10.3071458511	10.3071456869789	High	High		H
S0111506		TILLEY SWAMP	10.3007625728	10.3007626369054	High	High		H
S0105791	TOPPERWEIN NFR	FOLLETT	5.29716408423	10.2971642137916	Not Assessed	High	LLC	M
S0100012		MESSENT	10.2931108927	10.2931112819753	High	High		VH
S0100487		COORONG	10.2910706659	10.2910706658575	High	High		VH
S0111842		GUM LAGOON	10.2909684614	10.2909671447593	High	High		H
S0115681	NANGWARRY NFR	DISMAL SWAMP	2.78337011863	10.2833717758762	Not Assessed	High	LLC	L
S0103182		MESSENT	10.2803970404	10.2803970403605	High	High		VH
S0111803			10.2591489636	10.2591488600271	High	High		VH
S0100148		COORONG	10.249186313	10.2491867610472	High	High		H
S0111171		CLAY LAKE	10.2488764139	10.2488777214605	High	High	LLC	VH
S0105154		COORONG	10.2466236221	10.2466236220567	High	High		VH
S0111076	WATER VALLEY RD WINPINMERIT SWAMP		10.244829692	10.2448291504531	High	High	LLC	VH
S0107367	THE MARSHES	DISMAL SWAMP	5.24350576281	10.2435057628105	Not Assessed	High	LLC	H
S0109980		BOOL LAGOON - COONAWARRA	4.73474185845	10.23474229956	Not Assessed	High	LLC	H
S0105447	COTTAGE GARDEN SWAMP	STRATHDOWNIE	4.233623043	10.2336227295234	Not Assessed	High	LLC	M
S0111186		CLAY LAKE	10.225758619	10.2257588199574	High	High	LLC	VH
S0115682	NANGWARRY NFR	DISMAL SWAMP	2.71938962365	10.2193896236463	Not Assessed	High	LLC	L
S0100011	MESSENT CONSERVATION PARK	MESSENT	10.2132043618	10.2132044902809	High	High		VH
S0108753	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	10.2006028025	10.2006027849134	High	High	LLC	H

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S0119824	BIG HEATH CP	BOOL LAGOON - COONAWARRA	10.197120872	10.1971219781414	High	High	LLC	M
S0100179		WESTSLOPES	10.190880904	10.1908803776891	High	High	LLC	M
S0104143			10.187545605	10.18754560499	High	High		H
S0111187		CLAY LAKE	10.1825806443	10.1825811918095	High	High	LLC	VH
S0108971		SOUTH EAST COASTAL LAKES	10.1797138563	10.1797140114192	High	High	LLC	VH
S0111023	WESTSLOPES FLOODPLAIN NORTH	WESTSLOPES	7.67711925894	10.1771196331882	Moderate	High	LLC	H
S0104312		COORONG	10.1740288255	10.1740288255039	High	High		H
S0100166	The Coorong	COORONG	10.1639216811	10.1639216755814	High	High		VH
S0101102		MANDINA MARSHES	10.1626220089	10.1626209118918	High	High		H
S0110344	SALT LAKE	SOUTH EAST COASTAL LAKES	11.1582273821	10.1582287627345	High	High	LLC	H
S0101336		GUM LAGOON	10.1557296826	10.1557298263764	High	High		H
S0110677	HACKET HILL NFR	DISMAL SWAMP	9.90565879285	10.1556610100637	High	High	LLC	VH
S0110473	BOOL LAGOON	BOOL LAGOON - COONAWARRA	10.1554582229	10.155458357273	High	High	LLC	H
S0110672	HACKET HILL NFR	DISMAL SWAMP	9.89851120791	10.148510609272	High	High	LLC	VH
S0100121		COORONG	10.140561871	10.1405618710102	High	High		H
S0110724	HONAN NFR	DISMAL SWAMP	9.61812305477	10.118123054769	High	High	LLC	L
S0113827		SOUTH EAST COASTAL LAKES	10.1167805676	10.116781435853	High	High	LLC	H
S0108823		BOOL LAGOON - COONAWARRA	10.1137265448	10.1137265448099	High	High	LLC	H
S0111736			10.1129909426	10.1129903029274	High	High		H
S0110813	HONAN NFR	DISMAL SWAMP	8.10976163192	10.1097616399895	Moderate	High	LLC	H
S0101478		COORONG	9.1026683373	10.1026692930457	High	High		H
S0110833	KANGAROO FLAT	DISMAL SWAMP	7.85265913297	10.102659132971	Moderate	High	LLC	H
S0108211	RULE SWAMP	KYBYBOLITE	8.59257538716	10.0925754636619	Moderate	High	LLC	L
S0111435			10.0910518096	10.0910523833307	High	High		H
S0108479	WOAKWINE CR	NARACORTE RANGE	11.5879280462	10.0879281068608	High	High	LLC	H
S0104446		WATERVALLEY	10.0868947216	10.0868946572743	High	High		H
S0100577		TILLEY SWAMP	10.0853276585	10.0853274493147	High	High		M
S0104309			10.0837054056	10.0837039781737	High	High		H
S0101071			10.0795125546	10.0795124308506	High	High		VH
S0108347	LAKE ROBE GAME RESERVE PERIPHERAL	SOUTH EAST COASTAL LAKES	9.82101824372	10.0710176676186	High	High	LLC	VH
S0111071			10.0675496247	10.067549570354	High	High	LLC	VH
S0100107		COORONG	10.0626475603	10.0626473662992	High	High		H
S0110566	HONAN NFR	DISMAL SWAMP	10.0597815214	10.0597802154839	High	High	LLC	L
S0111222		COORONG	10.0536812322	10.0536785169435	High	High		H
S0111597			10.0456455564	10.0456455563535	High	High		H
S0100109		COORONG	10.0404958089	10.0404958089431	High	High		H
S0111631			10.0318454909	10.0318454152227	High	High		H
S0100236	YEULBA SWAMP	YEULBA	9.2714114726	10.0214120501104	High	High	LLC	H
S0100123		COORONG	10.0129173509	10.0129173508926	High	High		H
S0100045		COORONG	10.0097520511	10.0097549041429	High	High		VH
S0110564	HONAN NFR	DISMAL SWAMP	10.0086735944	10.008673594388	High	High	LLC	L
S0111491		MANDINA MARSHES	10.0081060665	10.0081074659125	High	High		VH
S0107918		SOUTH EAST COASTAL LAKES	10.001819501	10.001819328445	High	High	LLC	VH
S0105268			9.99225145389	9.99225148025685	High	High		H
S0111454		MANDINA MARSHES	9.99081352146	9.99081284596362	High	High		H
S0111740			9.73265900383	9.9826589174112	High	High		VH
S0108872		SOUTH EAST COASTAL LAKES	9.97965976747	9.97965949279779	High	High	LLC	VH
S0101100			9.97913445431	9.97913451306574	High	High		VH
S0116890		BOOL LAGOON - COONAWARRA	17.4630152819	9.97849416341046	High	High	LLC	M
S0114254	HACKET HILL NFR	DISMAL SWAMP	6.47554407046	9.97554396066836	Moderate	High	LLC	VH
S0101051		GUM LAGOON	9.97553946957	9.97553969594203	High	High		H
S0115490	THE MARSHES	DISMAL SWAMP	4.22451915412	9.97451915411887	Not Assessed	High	LLC	H
S0110073		SOUTH EAST COASTAL LAKES	9.47449154837	9.97449070075645	High	High	LLC	VH
S0123671	MOSQUITO CREEK			9.97448158845713		High	LLC	H
S0104241			9.9656998333	9.96569948120768	High	High		H
S0100494		COORONG	9.96330596789	9.96330596788959	High	High		VH
S0114974		NENE VALLEY	9.95295924849	9.95295892513053	High	High	LLC	H
S0110601	TRIAL WATERHOLE	DISMAL SWAMP	8.45283749584	9.95283749211605	Moderate	High	LLC	M
S0102004	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.949688758	9.94968896140527	High	High	LLC	H
S0111151	TILLEY SWAMP FLOODPLAIN	TILLEY SWAMP	8.69537377873	9.94537382282952	Moderate	High		VH
S0115224	HERM_AN_HEATHERS	DISMAL SWAMP	4.93313572204	9.93313612150516	Not Assessed	High	LLC	M
S0104331			9.92833970287	9.92833905810529	High	High		M
S0108862		SOUTH EAST COASTAL LAKES	9.92781283522	9.92781265407815	High	High	LLC	VH
S0111458	SOUTH FLAGSTAFF	MANDINA MARSHES	9.42295456661	9.92295483321961	High	High		VH
S0120660		SOUTH EAST COASTAL LAKES	9.91075870129	9.91075621715307	High	High	LLC	VH
S0111801			9.90770637329	9.90770637328604	High	High		H
S0109053		SOUTH EAST COASTAL LAKES	9.90146249248	9.90146251325715	High	High	LLC	VH

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S0110733	HONAN NFR	DISMAL SWAMP	9.65071306376	9.9007130637589	High	High	LLC	L
S0104806			9.89935517748	9.89935526114699	High	High		VH
S0103639		COORONG	9.89828560169	9.8982864870306	High	High		VH
S0111634			9.89684738465	9.89684780298048	High	High		H
S0104366			9.88834277161	9.88834218836015	High	High		H
S0120750	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.88356627058	9.88356619549501	High	High	LLC	VH
S0100126			9.87838956543	9.87838991968845	High	High		VH
S0107049		NENE VALLEY	7.37263355146	9.87263176723701	Moderate	High	LLC	H
S0100308	DEEP SWAMP	DEEP SWAMP	9.86521848061	9.8652183799248	High	High	LLC	H
S0110655	HACKET HILL NFR	DISMAL SWAMP	9.61181682889	9.8618159985536	High	High	LLC	H
S0104798			9.85900598506	9.85900598506324	High	High		H
S0114896	TOPPERWEIN NFR	DISMAL SWAMP	4.60384493163	9.85384493163317	Not Assessed	High	LLC	L
S0111185		CLAY LAKE	9.85147811689	9.85148135508317	High	High	LLC	VH
S0104533		GUM LAGOON	9.8502473485	9.85024750086025	High	High		VH
S0114984	JERUSALEM CREEK WETLAND	NENE VALLEY	5.34249472336	9.84249545835581	Not Assessed	High	LLC	H
S0100111		COORONG	9.83182330641	9.83182226296158	High	High		H
S0104707	BONNEYS CAMP SOUTH	WATERVALLEY	9.82749037937	9.82749037936912	High	High		VH
S0109063		BOOL LAGOON - COONAWARRA	9.82539902093	9.82539866547515	High	High	LLC	VH
S0103311		MESSENT	9.82273949961	9.82273949961069	High	High		VH
S0120457	WANDILLO	DISMAL SWAMP	4.81086587737	9.81086830300237	Not Assessed	High	LLC	VH
S0111853		GUM LAGOON	9.81005520626	9.8100544793944	High	High		VH
S0108505		SOUTH EAST COASTAL LAKES	7.79540762043	9.79540760597567	Moderate	High	LLC	H
S0107894	GOOSE NECK SWAMP	BOOL LAGOON - COONAWARRA	9.79537354937	9.79537109777598	High	High	LLC	M
S0101065			9.79389628272	9.79389510897963	High	High		VH
S0111883			9.79220832937	9.79220824967475	High	High		VH
S0104253			9.78427433971	9.7842743397064	High	High		H
S0102956		MESSENT	9.77238222801	9.77238154286855	High	High		VH
S0120278	WANDILO NFR	DISMAL SWAMP	4.7689948452	9.7689960970596	Not Assessed	High	LLC	M
S0101174	LOG CROSSING/ WELL AND BRIDGE	WATERVALLEY	9.76868108644	9.76867949113524	High	High		H
S0100138		COORONG	9.76797655375	9.76797677661084	High	High		VH
S0108991		BOOL LAGOON - COONAWARRA	9.76557728387	9.76557784502505	High	High	LLC	VH
S0120644	WESTVALE	BOOL LAGOON - COONAWARRA	9.76332410337	9.763324029629	High	High	LLC	H
S0103356		MESSENT	9.75767570243	9.75767570243158	High	High		M
S0110453	BOOL LAGOON / HACKS LAGOON	BOOL LAGOON - COONAWARRA	9.74485756967	9.7448585386149	High	High	LLC	VH
S0120693	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.74070574436	9.74070546595141	High	High	LLC	H
S0103667		MESSENT	9.73305179023	9.73305179023106	High	High		VH
S0116882		BOOL LAGOON - COONAWARRA	9.72622992914	9.72622927882048	High	High	LLC	H
S0104544		WATERVALLEY	9.72270170878	9.72270170877881	High	High		M
S0104361			9.71929057785	9.71929057785243	High	High		VH
S0108727	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.71577917629	9.71577931694195	High	High	LLC	VH
S0100133	COOLA COOLA	COOLA COOLA	9.45928429023	9.70928429497186	High	High		H
S0110930	LAKE GEORGE GAME RESERVE PERIPHERAL	SOUTH EAST COASTAL LAKES	9.45347238955	9.70347423489303	High	High	LLC	VH
S0111081	JOPAANKA SWAMP		4.19303165189	9.69303150966002	Not Assessed	High	LLC	VH
S0111064	SCHOFIELDS SWAMP FLOODPLAIN	DEEP SWAMP	9.69277493709	9.6927743550852	High	High	LLC	H
S0110803	HONAN NFR	DISMAL SWAMP	9.68958662329	9.68958662328636	High	High	LLC	L
S0110919	WOOLWASH C	SOUTH EAST VOLCANIC	8.93216809871	9.6821684863929	Moderate	High	LLC	L
S0110702	KANGAROO FLAT	DISMAL SWAMP	9.17288116078	9.67288042987977	High	High	LLC	M
S0100145		COORONG	9.67203650102	9.67203663965152	High	High		VH
S0108576	Lake Hawdon North	SOUTH EAST COASTAL LAKES	9.66539990437	9.66539955200616	High	High	LLC	VH
S0116834		MT SCOTT - TARATAP DISTRICT	4.66536656723	9.66536617412564	Not Assessed	High	LLC	H
S0114956		NENE VALLEY	4.66147559846	9.66147553416176	Not Assessed	High	LLC	M
S0110291	WHENNAN NFR	SOUTH EAST VOLCANIC	7.90734278362	9.65734290720562	Moderate	High	LLC	H
S0119826	BIG HEATH CP	BOOL LAGOON - COONAWARRA	9.65497786354	9.6549777686623	High	High	LLC	M
S0110797	HONAN NFR	DISMAL SWAMP	9.65388141881	9.65388141881394	High	High	LLC	L
S0100077			9.65166049294	9.65166045248271	High	High		VH
S0107542	THE MARSHES	DISMAL SWAMP	9.64706692664	9.64706701283976	High	High	LLC	L
S0109194	SAWPIT SWAMP	BOOL LAGOON - COONAWARRA	4.64652753054	9.64652754108436	Not Assessed	High	LLC	VH
S0104531		GUM LAGOON	9.64581520274	9.64581491110709	High	High		H
S0110635	MT LYON LF	SOUTH EAST VOLCANIC	8.89545718757	9.64545666418747	Moderate	High	LLC	L
S0110641	HACKET HILL NFR	DISMAL SWAMP	9.39303885436	9.64303885435584	High	High	LLC	H
S0105116		WATERVALLEY	9.6280599576	9.62805995760169	High	High		L
S0108751		SOUTH EAST COASTAL LAKES	9.61857709903	9.61857694048382	High	High	LLC	VH
S0104714		WATERVALLEY	9.61286121828	9.61286085507432	High	High		H
S0100149		COORONG	9.60924532845	9.60924719224259	High	High		H
S0116861		BOOL LAGOON - COONAWARRA	9.60501958529	9.60501978836343	High	High	LLC	M

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S0107077		NENE VALLEY	3.10252486707	9.60252500851179	Not Assessed	High	LLC	H
S0108949		BOOL LAGOON - COONAWARRA	9.38009049191	9.6004893125599	High	High	LLC	M
S0101316		GUM LAGOON	9.59286664914	9.59286600905771	High	High		H
S0104995			9.591190286	9.59118867287344	High	High		VH
S0104246		BUNBURY	9.58027490329	9.58027398983357	High	High		H
S0104426		TILLEY SWAMP	9.57873193493	9.57873178390985	High	High		VH
S0104440			9.57469573257	9.57469573256729	High	High		H
S0100150		COORONG	9.57330597131	9.57330581348987	High	High		H
S0110628	MT LYON PERCHED SWAMP	SOUTH EAST VOLCANIC	8.56976364837	9.56976364837025	Moderate	High	LLC	L
S0105175			9.56692045113	9.56692006631242	High	High		VH
S0111772		COORONG	9.5475287588	9.5475298856155	High	High		H
S0105253		MESSENT	9.54278685148	9.54278883771476	High	High		M
S0106202	BURKS ISLAND - WEST	SOUTH EAST COASTAL LAKES	8.29034830797	9.54034721834668	Moderate	High	LLC	VH
S0100997			9.53419941467	9.53419940950802	High	High		VH
S0102926		MESSENT	9.5118654012	9.51186531267627	High	High		VH
S0109731		SOUTH EAST COASTAL LAKES	7.50950086696	9.50950088205574	Moderate	High	LLC	H
S0111427		WATERVALLEY	9.50861209332	9.5086120933236	High	High		H
S0111624		BUNBURY	9.50844963908	9.50844973277965	High	High		H
S0120276	HACKET HILL NFR	DISMAL SWAMP	9.2576461581	9.50764615809883	High	High	LLC	VH
S0101582		PARK HILL	9.50273740526	9.50273778996129	High	High	LLC	VH
S0105136			9.50167703164	9.50167753492631	High	High		VH
S0111179		CLAY LAKE	9.50082216978	9.50082305907454	High	High	LLC	VH
S0101111		MANDINA MARSHES	9.49518661961	9.49518622923634	High	High		VH
S0104393		COORONG	9.49289209374	9.49289111559609	High	High		H
S0116862		BOOL LAGOON - COONAWARRA	9.48853130529	9.48853080182014	High	High	LLC	M
S0111183		CLAY LAKE	9.48401614219	9.48401435091706	High	High	LLC	VH
S0110848	KANGAROO FLAT	DISMAL SWAMP	8.72756934352	9.47756909094512	Moderate	High	LLC	M
S0105143			9.47331161205	9.4733113639154	High	High		VH
S0105703		DISMAL SWAMP	9.47122511669	9.47122498606371	High	High	LLC	VH
S0101351			9.46722815291	9.46722878888023	High	High		H
S0100987		GUM LAGOON	9.45183257798	9.45183248293597	High	High		VH
S0104256			9.44878931615	9.44878957727245	High	High		H
S0109119		SOUTH EAST COASTAL LAKES	9.44539342371	9.44539370353599	High	High	LLC	VH
S0110544	THE MARSHES	DISMAL SWAMP	6.18295076775	9.43295076774923	Moderate	High	LLC	H
S0104513			9.41675995753	9.41676097508858	High	High		VH
S0104944		MESSENT	9.41506162137	9.41506049744395	High	High		VH
S0120858	TOPPERWEIN NFR	DISMAL SWAMP	9.15772450193	9.40772504663568	High	High	LLC	L
S0111172		CLAY LAKE	9.38367889616	9.38367893021362	High	High	LLC	VH
S0100424		COORONG	9.37830918892	9.37830918892191	High	High		VH
S0111181		CLAY LAKE	9.37252626935	9.37252584137665	High	High	LLC	VH
S0105780	ISLAND SWAMP LF	DISMAL SWAMP	3.61381003142	9.36381065729572	Not Assessed	High	LLC	M
S0106799	OLD WOOLWASH	SOUTH EAST VOLCANIC	8.86342554683	9.36342539345643	Moderate	High	LLC	L
S0101097			9.35756462905	9.35756425444593	High	High		VH
S0111580			9.35435906648	9.35435926460731	High	High		VH
S0113825		SOUTH EAST COASTAL LAKES	9.35381167833	9.35381104434581	High	High	LLC	H
S0111173		CLAY LAKE	9.34827740202	9.34827946491714	High	High	LLC	VH
S0108246	LIMESTONE RIDGE	NARACOORTE RANGE	4.34714410079	9.3471432852921	Not Assessed	High	LLC	H
S0100533		COORONG	9.33715590789	9.33715762255627	High	High		VH
S0101642		SOUTH EAST COASTAL LAKES	9.32741698508	9.32741717904281	High	High	LLC	H
S0111421			9.3256951685	9.32569531421284	High	High		M
S0111423	BONNEYS CAMP NORTH	WATERVALLEY	9.3235675538	9.32356731870359	High	High		H
S0101454			9.32150870835	9.32150870834779	High	High		M
S0113833		SOUTH EAST COASTAL LAKES	9.32092952456	9.32092860616237	High	High	LLC	H
S0100575		COORONG	9.31708570666	9.3170836642891	High	High		H
S0104486	LOG CROSSING/ WELL AND BRIDGE	WATERVALLEY	9.30536913915	9.30536913914589	High	High		H
S0104763			9.30324193074	9.30324184065895	High	High		H
S0122561			8.79990178517	9.29990313906249	Moderate	High		L
S0106830	WANDILO NFR	DISMAL SWAMP	4.29491509046	9.29491350577959	Not Assessed	High	LLC	M
S0110555	HACKET HILL NFR	DISMAL SWAMP	6.29079190349	9.2907919034949	Moderate	High	LLC	H
S0100073		COORONG	9.28489849577	9.28489882185109	High	High		H
S0114260	DISMAL DOWNS	DISMAL SWAMP	4.2845392601	9.28453926010317	Not Assessed	High	LLC	H
S0119825	BIG HEATH CP	BOOL LAGOON - COONAWARRA	9.27988537725	9.27988537724795	High	High	LLC	M
S0110558	GRANTS SWAMP	BOOL LAGOON - COONAWARRA	9.27903229385	9.27903295841199	High	High	LLC	H
S0105198			9.27710197626	9.27710185377267	High	High		VH
S0111668			9.27292727126	9.2729274360367	High	High		VH
S0115276	PENOLA STATION	BOOL LAGOON - COONAWARRA	8.26996911723	9.26996911723457	Moderate	High	LLC	M
S0108743	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.26645303422	9.26645258772586	High	High	LLC	H
S0104615		BUNBURY	9.26048137494	9.26048137493902	High	High		M

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S0111113	FAIRVIEW FLOODPLAIN	FAIRVIEW	10.0099204564	9.25992035187387	High	High	LLC	H
S0101465		GUM LAGOON	9.25939602253	9.25939623533235	High	High		H
S0109619		SOUTH EAST COASTAL LAKES	9.25188258953	9.25188259168852	High	High	LLC	VH
S0104468		WATERVALLEY	9.24559272118	9.24559338911248	High	High		H
S0111457			9.24415301498	9.24415301498468	High	High		H
S0111752		COORONG	9.22514341429	9.22514345285238	High	High		H
S0100543		COORONG	9.2219492306	9.22194923060373	High	High		H
S0111606	BUNBURY PADDOCK UNIT	BUNBURY	13.2122197096	9.21221969968876	High	High		H
S0111182		CLAY LAKE	9.19159732583	9.19159715539555	High	High	LLC	VH
S0110673	HACKET HILL NFR	DISMAL SWAMP	8.93211387121	9.18211387120989	Moderate	High	LLC	VH
S0111603			9.17227386397	9.17227577024987	High	High		H
S0110526	THE MARSHES	DISMAL SWAMP	9.1645791587	9.1645791587047	High	High	LLC	L
S0108957		BOOL LAGOON - COONAWARRA	9.16333188565	9.16333263935397	High	High	LLC	M
S0103671			4.16288869737	9.16288859573721	Not Assessed	High		H
S0120853	BIG HEATH CP	BOOL LAGOON - COONAWARRA	9.15238589827	9.15238590547383	High	High	LLC	M
S0108657	KAY SWAMP	NARACOORTE RANGE	8.15097506954	9.15097544821176	Moderate	High	LLC	L
S0104282			9.15001523767	9.15001509251634	High	High		VH
S0117807	HILLVIEW	MT SCOTT - TARATAP DISTRICT	6.89807309037	9.14807258721631	Moderate	High	LLC	H
S0105279			9.14469697905	9.14469695741982	High	High		VH
S0110525	THE MARSHES	DISMAL SWAMP	9.12553099738	9.12553099738336	High	High	LLC	L
S0116889		BOOL LAGOON - COONAWARRA	9.12533016764	9.12532921469032	High	High	LLC	H
S0100493		TILLEY SWAMP	9.11820577537	9.11820538042792	High	High		M
S0100258	SEAGULL SWAMP	HOOK BANKS	8.11412482136	9.1141248270375	Moderate	High	LLC	H
S0111433		WATERVALLEY	9.11262251827	9.11262237968223	High	High		VH
S0107035	GERMEIN RESERVE	NENE VALLEY	10.6085855796	9.10858566433594	High	High	LLC	VH
S0110068		SOUTH EAST COASTAL LAKES	8.85754124737	9.10754180243048	Moderate	High	LLC	VH
S0100056		COORONG	9.10612398748	9.10612248060373	High	High		VH
S0107295	LAKE LEAKE	SOUTH EAST VOLCANIC	9.8541339423	9.10413320773364	High	High	LLC	L
S0101398		GUM LAGOON	8.10297834898	9.10297840091346	Moderate	High		H
S0111170		CLAY LAKE	9.09170147699	9.09170191153905	High	High	LLC	VH
S0100971			9.09154056102	9.09154056102452	High	High		VH
S0100108		COORONG	9.08984218993	9.08984070484275	High	High		H
S0100010		COORONG	9.08885909939	9.08885923301988	High	High		H
S0111602	THE DEEP WATERHOLE	BUNBURY	9.0887968775	9.08879687750031	High	High		M
S0111425	BONNEYS CAMP NORTH	WATERVALLEY	9.07651685721	9.07651382777419	High	High		M
S0110631	MT LYON LF	SOUTH EAST VOLCANIC	7.06825707366	9.0682570736551	Moderate	High	LLC	L
S0104195	BONNEYS CAMP SOUTH	WATERVALLEY	9.06761253764	9.06761373539932	High	High		H
S0100245	PENNYS SWAMP	JAFFRAY	8.565792542	9.06579266694127	Moderate	High	LLC	H
S0104700	LOG CROSSING/ WELL AND BRIDGE	WATERVALLEY	9.06339437741	9.0633940224338	High	High		H
S0101441			9.05379067756	9.05379067755615	High	High		M
S0110617	THE MARSHES	DISMAL SWAMP	9.04429689877	9.04429689877303	High	High	LLC	L
S0121474	THE MARSHES	DISMAL SWAMP	9.04103194486	9.04103194485613	High	High	LLC	L
S0108778	BARNETT ROAD SWAMP	SOUTH EAST COASTAL LAKES	9.04069170557	9.04069062887421	High	High	LLC	H
S0111630			9.04021784291	9.04021765843299	High	High		H
S0111814			9.03965010015	9.03965015268164	High	High		VH
S0110748	KANGAROO FLAT	DISMAL SWAMP	8.78936979827	9.03936832470964	Moderate	High	LLC	VH
S0101498			9.03927711388	9.03927698894238	High	High		H
S0101407		GUM LAGOON	9.03810506089	9.03810351450364	High	High		H
S0100165		COORONG	9.03761780174	9.03761711794434	High	High		VH
S0110524	THE MARSHES	DISMAL SWAMP	9.03568043522	9.03568043522236	High	High	LLC	L
S0113807		SOUTH EAST COASTAL LAKES	9.0314341442	9.03143363069591	High	High	LLC	VH
S0100259	FISH FARM	FISH FARM	9.02956326949	9.02956331812996	High	High	LLC	H
S0111576			9.02541328203	9.02541309435221	High	High		VH
S0121475	THE MARSHES	DISMAL SWAMP	9.02069901007	9.0206990100689	High	High	LLC	L
S0109100		BOOL LAGOON - COONAWARRA	9.01645444186	9.01645415513854	High	High	LLC	H
S0111424	BONNEYS CAMP NORTH	WATERVALLEY	9.01161786956	9.01161800898984	High	High		M
S0110796	HONAN NFR	DISMAL SWAMP	9.01082625908	9.01082625907818	High	High	LLC	L
S0111083	WATERVALLEY FLOODPLAIN	WATERVALLEY	4.01002533522	9.01002529891093	Not Assessed	High	LLC	H
S0104237		COORONG	9.00965135506	9.00965100496259	High	High		H
S0105127		COORONG	9.00684627292	9.00684686838611	High	High		VH
S0122578		DISMAL SWAMP		9		High	LLC	
Ecological Value Level upgraded from High to Very High								
Ecological Value Level upgraded from Moderate or Not Assessed to High or Very High								
Additions to the High/Very High list which are not likely to be groundwater dependent and/or not within a PWA								
PWA: Prescribed Wells Area LLC - Lower Limestone Coast TAT - Tatiana PAD - Padthaway		GDE Likelihood: VH - Very High H - High M - Moderate L - Low						

