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| The Victorian wetland classification framework 2014 |

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Executive summary

This report outlines a new framework for classifying wetlands in Victoria. It updates the Corrick wetland classification system which was first developed in 1976 (Corrick and Norman 1976) and applied comprehensively to a statewide spatial inventory of wetlands in 1994 known asWETLAND\_1994.

The need for a new wetland classification system in Victoria was highlighted by the extensive, recent work on wetland classification that has occurred in other Australian states and at the national level resulting in the development of the Australian National Aquatic Ecosystem (ANAE) Classification Framework (AETG 2012). The reasons for developing a new wetland classification framework for Victoria include:

* the need for the attribution of key drivers and functional components of wetlands to support frameworks which are now used in Victoria for condition and risk assessment;
* the usefulness of categorising wetlands based on particular functional attributes of wetlands to inform policy development, management and research;
* the need to account for the range of wetlands in Victoria, some of which were not covered under the Corrick system;
* the availability of new data to assist in assigning functional attributes to wetlands across Victoria; and
* the ability to align with the national wetland classification system to facilitate national and cross-border assessment and reporting.

Wetlands, for the purpose of the framework, are defined as surface waters, whether natural, modified or artificial, subject to permanent, periodic or intermittent inundation, which hold static or very slow moving water and support biota adapted to inundation and the aquatic environment. This includes waterbodies such as lakes, swamps, fens, marshes, peatlands, springs and supratidal and intertidal (but not subtidal) areas.

This document:

* describes the development of the new Victorian classification framework;
* details how the Victorian classification framework has been applied to Victorian wetlands; and
* describes a new wetlands typology for use in Victoria.

The 1994 State wetlands inventory was updated in the period 2011 to 2014 based on new information about wetlands. The update resulted in the development of a new geospatial wetland inventory that included updated wetland mapping across Victoria known as WETLAND\_CURRENT. Each wetland in WETLAND\_CURRENT has been attributed and classified in accordance with the framework outlined in this report.

The objectives in developing the framework were to:

* allow naturally-occurring wetlands to be distinguished from human-made wetlands;
* assess the attributes used in the ANAE classification framework for their relevance and applicability to Victorian wetlands;
* categorise relevant attributes to discriminate between the range of possible states in wetlands across Victoria; and
* assign a wetland typology with a manageable number of wetland types for general use in Victoria.

The ANAE classification framework sets out a three level hierarchical classification for aquatic ecosystems (Figure E1). Level 1 of the hierarchy relates to regional attributes, Level 2 to landscape attributes and Level 3 to aquatic ecosystem class, system and habitat attributes. Wetlands are a subset of the aquatic ecosystems to which the framework applies. Wetlands in the Victorian wetlands inventory all fall within the aquatic ecosystem surface water class.



Figure E1. Structure and levels of the Australian National Aquatic Ecosystems Classification Framework (AETG 2012).

The ANAE classification framework regional and landscape attributes were assessed for their suitability for defining a suitable regionalisation for wetlands in Victoria. Based on the examination of how ANAE regional and landscape attributes apply to wetlands in Victoria, options were considered for spatially defining regional and landscape variation in wetlands in Victoria. These included adopting a particular ANAE Level 1 or 2 attribute; a combination of several such attributes; or (the preferred option) developing a unique wetland regionalisation system for use in Victoria based on knowledge of regional variation of Victoria’s wetlands.

Wetland vegetation has been comprehensively described across the full range of Victoria’s wetlands and wetland landscape profiles have been developed to describe the ecological context of wetland EVCs in Victoria as a means of facilitating EVC identification (DSE 2012). Therefore, this project spatially defined wetland landscapes based on the description of wetland landscape profiles (DSE 2012). These were assembled into a geospatial layer known as WETLAND\_LANDSCAPES which can be overlaid with WETLAND\_CURRENT to explore the regional variation in wetlands of the same type and aid the identification of representative wetlands.

The ANAE classification framework Level 3 attributes (with the exception of the class attribute) were reviewed to determine their relevance and applicability to the classification of Victoroa’s wetlands and to assist with the selection of the attributes, categories and structure used in the Victorian wetland classification framework. The need for any additional attributes was considered, resulting in the inclusion of an additional attribute on wetland origin. The availability of existing data sets to support attribute categorisation was assessed and suitable data sources were identified. Categories for each suitable attribute were adopted, refining ANAE classification framework attribute categories as required to meet Victoria’s needs. Attribute categories were assigned to wetlands in WETLAND\_CURRENT. The level of confidence for the assigned category for each attribute was also determined. The resulting Victorian wetland classification attributes and categories are set out in Table E1.

Table E1. Summary of the Victorian classification framework wetland system and habitat attributes, categories and subcategories.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LEVEL 3** | **Wetland system** | **Lacustrine**  (<30% cover of emergent vegetation) | **Palustrine**  (>=30% cover of emergent vegetation) | **Marine**  (intertidal wetlands in embayments) | **Estuarine**  (semi-enclosed tidal wetlands and supratidal wetlands) |
| **Wetland habitat** | Wetland origin   * Naturally occurring * Human-made   + aquaculture pond   + farm dam   + salt works   + water storage   + excavation pond   + sewage treatment pond   + stormwater treatment pond | | Wetland origin   * Naturally occurring * Human-made   + aquaculture pond   + salt works   + excavation pond   + stormwater treatment pond | |
| Dominant vegetation   * Forest/woodland * Shrub/fern * Sedge/grass/forb * Moss/heath * No emergent vegetation | | Dominant vegetation   * Mangrove * Saltmarsh * No emergent vegetation | |
| Water source   * Groundwater * River * Tidal * Artificial | | Water source   * Groundwater * River * Tidal * Artificial | |
| Water regime   * Permanent * Periodically inundated   + seasonal   + intermittent   + episodic | | Water regime   * Supratidal * Intertidal | |
| Salinity regime   * Fresh * Hyposaline * Mesosaline * Hypersaline * Saline | | Salinity regime   * Hyposaline * Mesosaline * Hypersaline * Saline | |

A standard wetland typology was also developed for inclusion in the Victorian wetland classification framework. The primary attribute for distinguishing wetland types is the wetland system attribute. Each of the four wetland system categories was then further subdivided, with the exception of the marine wetland system category which was assigned as a single type.

Estuarine wetlands were divided into two types based on the dominant vegetation attribute. Lacustrine wetlands were subdivided into four types based on the salinity regime and water regime attributes. The distinctions for lacustrine wetlands were between fresh and saline wetlands (combined hyposaline, mesosaline, hypersaline and saline categories) and, within those classes, between permanent and periodically inundated wetlands. Palustrine wetlands were subdivided into 12 types based on the salinity regime, water regime and dominant vegetation attributes with the exception of high country peatlands which were distinguished only by the dominant vegetation type moss/heath, making a total of 13 palustrine wetland types.

The naming convention for inland wetland types in the Victorian classification framework was informed by that used in a recent classification and typology for aquatic ecosystems in the Murray-Darling (Brooks et al. 2013). Lacustrine wetlands were named as lakes. Palustrine wetlands were named as swamps (wetlands dominated by woody vegetation), or marshes/meadows (wetland dominated by non-woody emergent vegetation) or high country peatlands (based on Lawrence et al. 2009). Estuarine wetlands were named as estuary or coastal saltmarsh, while marine wetlands were named as intertidal flats. The results of the application of the typology to the Victorian wetland inventory are presented in Table E2.

Table E2. Results of the wetland typology classification

| Wetland type | Number of wetlands | Approximate % number of wetlands | Area of wetlands  (ha) | Approximate % area of wetlands |
| --- | --- | --- | --- | --- |
| Coastal saltmarsh | 314 | <1% | 53733 | 7% |
| Estuary | 27 | <1% | 4213 | <1% |
| High country peatlands | 3183 | 9% | 4476 | <1% |
| Intertidal flats | 5 | <1% | 72790 | 9% |
| Permanent freshwater lakes | 1016 | 3% | 95596 | 12% |
| Permanent freshwater marshes and meadows | 33 | <1% | 2241 | <1% |
| Permanent freshwater swamps | 192 | <1% | 897 | <1% |
| Permanent freshwater swamps/marshes/meadows | 2 | <1% | 52 | <1% |
| Permanent saline lakes | 101 | <1% | 65998 | 8% |
| Permanent saline marshes and meadows | 11 | <1% | 2887 | <1% |
| Permanent saline swamps | 3 | <1% | 319 | <1% |
| Permanent saline swamps/marshes/meadows | 1 | <1% | 45 | <1% |
| Temporary freshwater lakes | 2542 | 7% | 58314 | 7% |
| Temporary freshwater marshes and meadows | 7383 | 21% | 95107 | 12% |
| Temporary freshwater swamps | 5976 | 17% | 103669 | 13% |
| Temporary freshwater swamps/marshes/meadows | 37 | <1% | 1016 | <1% |
| Temporary saline lakes | 564 | 2% | 36704 | 5% |
| Temporary saline marshes and meadows | 122 | <1% | 8536 | 1% |
| Temporary saline swamps | 87 | <1% | 5430 | <1% |
| Temporary saline swamps/marshes/meadows | 15 | <1% | 1125 | <1% |
| Unknown | 13815 | 39% | 170877 | 22% |
| **Total** | **35429** |  | **784025** |  |

This project developed a wetland regionalisation that built on earlier work that described wetland vegetation in Victoria (DSE 2012). The resulting wetland landscapes were considered to provide a better framework for explaining regional and landscape variation (as expressed through wetland vegetation) in wetlands than any of the ANAE classification framework Level 1 or 2 attributes whether used singly or combined. Wetland landscapes allow for regional variation to be taken into account to explain differences in wetlands with the same wetland system and habitat attributes. This will aid in identifying representative wetlands.

This project resulted in systematic categorisation of system and habitat attributes that relate to most of the key components and processes of wetland function that are recommended for use in Australia (AETG 2012). In this respect, it overcame the limitation of the Corrick classification system previously used in Victoria, in that the Corrick system was not strictly systematic in its classification of wetland attributes. This project introduced discrimination between wetlands of natural and artificial origin which was not explicitly included in the Corrick classification framework and added new water source attributes. It also brought Victoria’s wetland classification generally into line with the national framework (AETG 2012)

The Victorian wetland typology closely followed that used by Brooks et al. (2013) for the classification of aquatic ecosystems in the Murray-Darling Basin. However, there was insufficient reliable data on wetland vegetation to enable marshes to be distinguished from meadows. Information was also lacking on wetland depth which is another characteristic used to distinguish between marshes and meadows.

The assignment of wetland attribute categories from existing datasets has some limitations and resulted in a significant percentage of wetlands being assigned unknown for several attributes. The assignment of the unknown category to attributes that inform the identification of the wetland type contributed to 39% of wetlands being of an unknown type.

The confidence level of the assigned category for each attribute varied but there were a significant percentage of wetlands with low confidence ratings for dominant vegetation attribute. As the latter is used in the classification for the wetland system attribute (to distinguish between lacustrine and palustrine wetlands), this also contributed to 33% of wetlands being assigned low confidence for wetland system classification.

While some data sources are of high quality, improvements to the level of confidence for wetland system and habitat attributes and filling of data gaps relies on:

* development of more accurate datasets for individual wetland attributes;
* ground truthing; and
* further testing of the accuracy of some existing data sources, especially for the water regime, salinity and dominant vegetation attributes.

Comprehensive spatial definition of wetland EVCs would be of significant benefit. It would improve the accuracy of the wetland system and dominant vegetation categories assigned to wetlands and aid in the discrimination between marshes and meadows (allowing for more specificity in wetland type definition). It would also improve the accuracy and confidence in assigning the salinity and water regime categories as expert knowledge exists on the salinity and water regime preferences for each wetland EVC.

Regular updates of attribute data from IWC and other field assessments are also recommended. Further work is also recommended to monitor wetland water regime, for example using LANDSAT data that informs Geoscience Australia’s Water Observations from Space (WOFS) product, and to test the accuracy of this product for wetlands. Due to lack of any other comprehensive, independent dataset on water regime, in this project, the accuracy of the WOFS dataset was not able to be tested.

An online tool to allow natural resource managers and planners to check attributes for individual wetlands has been developed. The tool allows wetland managers to propose updates to wetland attributes based on ground-truthed observations which will be validated and incorporated into future updates of the WETLAND\_CURRENT dataset.

1. Introduction

This report outlines a new framework for classifying wetlands in Victoria. Since the late 1970’s Victoria has used a wetland classification system and typology, commonly referred to as the Corrick system (Corrick and Norman 1976, Corrick and Norman 1980, Corrick 1981, 1982). The need for a new wetland classification system in Victoria was highlighted by the extensive work on wetland classification that has occurred in other Australian states and at the national level. The former national Aquatic Ecosystems Task Group (AETG) on which all Australian jurisdictions were represented, agreed that jurisdictions should move towards a common classification system for aquatic ecosystems (rivers and streams, lentic wetlands, estuaries and shallow marine waters). The former AETG developed the Interim Australian National Aquatic Ecosystems Classification Framework (ANAE classification framework), which included wetlands (AETG 2012). This work highlighted some limitations of the Corrick system. In addition, there is now a greater body of information about wetlands in Victoria. The development of a new framework in Victoria provided an opportunity to use this new information and to align with the national framework.

Wetlands, for the purpose of the framework, are defined as surface waters, whether natural, modified or artificial, subject to permanent, periodic or intermittent inundation, which hold static or very slow moving water and support biota adapted to inundation and the aquatic environment. This includes waterbodies such as lakes, swamps, fens, marshes, peatlands, springs and supratidal and intertidal (but not subtidal) areas. Estuaries have been separately delineated and classified in Victoria (Barton et al. 2008, Pope et al. 2011). However, there is some overlap between estuaries and tidal wetlands. Intertidal waters in Western Port, Port Phillip Bay and Corner Inlet and those in or adjacent to some estuaries are covered by the framework. Subterranean aquatic ecosystems are not covered.

The purpose of this document is to:

* describe the development of the Victorian classification framework;
* detail how the Victorian classification framework has been applied to Victorian wetlands; and
* describe a new wetlands typology for use in Victoria.

The document also provides background information on the Corrick classification system and the ANAE classification framework.

1.1 The Corrick wetland classification system

The Corrick system was developed in the period 1976 to 1980. It covers both natural and artificial wetlands. It defines eight wetland categories, two of which (salt works and sewage ponds) include only artificial or human-made wetlands (Table 1), (Corrick and Norman 1980, Corrick 1981, 1982).

Wetland categories, with the exception of salt works and sewage ponds, are described in terms of the following attributes:

* salinity (fresh or saline);
* permanency (permanent and semi-permanent); and
* depth (with the exception of the semi-permanent saline category).

The two artificial wetland categories and are not further subdivided. The remaining six categories are subdivided into subcategories (Table 1).

Artificial impoundments are included as a subcategory of the permanent open freshwater category. For the other five categories, the subcategories relate to natural wetlands. Wetlands in each of the six categories are mainly differentiated on the basis of dominant vegetation, or the lack thereof. However, permanent open freshwater wetlands are categorised by depth as well as vegetation, permanent saline wetlands are subcategorised by depth or as intertidal wetlands but not by vegetation, while semi-permanent saline wetlands are subcategorised by salinity as well as vegetation or its absence (salt pan).

Table . The Corrick classification system (Corrick and Norman 1980, Corrick 1981, 1982).

| Category | Subcategory | Depth (metres) |
| --- | --- | --- |
| **Sewage ponds** | Undefined | Undefined |
| **Salt works** | Undefined | Undefined |
| **Freshwater meadow**  These include shallow (up to 0.3 m) and temporary (less than four months duration) surface water, although soils are generally waterlogged throughout winter. | Herb-dominated  Sedge-dominated  Red gum-dominated  Lignum dominated  Black Box-dominated  Cane grass-dominated | < 0.3 |
| **Shallow freshwater marsh**  Wetlands that are usually dry by mid-summer and fill again with the onset of winter rains. Soils are waterlogged throughout the year and surface water up to 0.5 m deep may be present for as long as eight months. | Herb-dominated  Sedge-dominated  Cane grass-dominated  Lignum dominated  Red gum-dominated  Black Box-dominated  Dead timber  Rush-dominated  Reed-dominated | < 0.5 |
| **Deep freshwater marsh**  Wetlands that generally remain inundated to a depth of 1 – 2 m throughout the year. | Shrub-dominated  Reed-dominated  Sedge-dominated  Rush-dominated  Open water  Cane grass-dominated  Lignum-dominated  Red gum-dominated  Black Box-dominated  Dead timber | < 2 |
| **Permanent open freshwater**  Wetlands that are usually more than 1 m deep. They can be natural or artificial. Wetlands are described to be permanent if they retain water for longer than 12 months, however they can have periods of drying. | Shallow  Deep  Impoundment  Red gum-dominated  Cane grass-dominated  Dead timber  Black Box-dominated  Rush-dominated  Reed-dominated  Shrub-dominated  Sedge-dominated  Lignum-dominated | < 2  > 2 |
| **Semi permanent saline**  These wetlands may be inundated to a depth of 2 m for as long as eight months each year. Saline wetlands are those in which salinity exceeds 3,000 mg/L throughout the whole year. | Salt pan  Salt meadow  Salt flats  Sea rush  Hypersaline lake  Melaleuca-dominated  Dead timber | < 2 |
| **Permanent saline**  These wetlands include inland, coastal and intertidal wetlands. Saline wetlands are those in which salinity exceeds 3,000 mg/L throughout the whole year. | Shallow  Deep  Intertidal flats  Mangroves | < 2  > 2 |

Since its development, the Corrick system has been widely utilised in natural resource management, wetland policy and science in Victoria. It is a straightforward system that corresponds well to the obvious features of wetlands, as observed in the field. However, it has some limitations.

* The system does not incorporate regional variation related to major landscape drivers of wetland type such as climate, landform, hydrology and topography.
* The system does not explicitly distinguish between major aquatic ecosystem classes (lacustrine, palustrine, estuarine or marine systems).
* The Corrick system provides a wetland typology but is not strictly systematic in classifying wetlands based on their attributes.
* Some wetland types are not included, for example high country peatlands, springs and soaks.
* There is limited discrimination for human-made wetlands.

One hundred and forty five wetland ecological vegetation classes (EVCs[[1]](#footnote-1)) have been described in Victoria since the Corrick system was developed (DSE 2012, DEPI 2013), (Appendix 1). This compares with 13 general wetland vegetation categories used by Corrick (Table 1). The greater level of discrimination using wetland EVCs facilitates more accurate identification of some wetland attributes and provides a basis for wetland regionalisation at the landscape scale (Section 3.1).

1.2 Rationale behind the new Victorian Classification Framework

Taking into account the limitations of the Corrick system, there are several reasons to develop a new framework for wetland classification in Victoria. These include:

* the need for the attribution of key drivers and functional components of wetlands to support frameworks which are now used in Victoria for condition and risk assessment;
* the usefulness of identifying particular functional attributes of wetlands to inform policy development, management and research;
* the need to account for all wetlands; and
* the availability of new data to assist in assigning functional attributes to wetlands across Victoria.

There has been significant development in Australia of wetland classification frameworks in recent years. Queensland developed a wetland classification system in 2005 (EPA 2005) and this system was applied with some modifications in New South Wales (Imgraben 2009) and South Australia (Jones and Miles 2009). This work, informed the ANAE classification framework (AETG 2012) which applies to other aquatic ecosystems such as rivers, estuaries, subterranean aquatic ecosystems and floodplains as well as wetlands. In its development, the ANAE classification framework was trialled in South Australia (Butcher et al. 2011) and has been applied in the Murray-Darling Basin (Brooks et al. 2013), providing further insights into the feasibility of its application for wetlands.

Victoria is in the position to draw on this wide body of expertise to develop the new wetland classification framework. There are also advantages in seeking to align with the national wetland classification system to facilitate national and cross-border assessment and reporting. This is not possible with the current Corrick system.

1.3 ANAE classification framework

The ANAE classification framework defines the term classification and typology as follows (AETG 2012).

“Classification is the process of attributing (aquatic ecosystems) with logical datasets that have been identified as being relevant to ecological functioning.

Typology is an extension to classification whereby those classified aquatic ecosystems are assembled into groups for a specific purpose, i.e. a naming convention.”

The ANAE classification framework takes a semi-hierarchical approach to aquatic ecosystem classification based on the systematic application of attributes that relate to the key drivers and components of wetland function. While the current version of the framework includes a classification system, it does not incorporate an aquatic ecosystem typology, although future versions may do so (AETG 2012).

The ANAE classification framework sets out a three level hierarchical classification for aquatic ecosystems (AETG 2012), (Figure 1) which includes a range of attributes relevant to wetlands in Victoria (Table 2). At level 3 of the hierarchy, wetlands in Victoria fall into the palustrine, lacustrine, marine and estuarine system categories. The ANAE classification framework habitat attributes for these systems (Appendix 2) are potentially relevant for Victorian wetlands.



Figure . Structure and levels of the Australian National Aquatic Ecosystems Classification Framework (AETG 2012).

Table . ANAE classification framework attributes potentially relevant to wetlands in Victoria (AETG 2012). Further detail on the metrics for aquatic habitats is provided in Appendix 2.

|  |  |
| --- | --- |
| ANAE classification framework regional scale attributes (Level 1) | |
| **Climate**  Climate groups from the Bureau of Meteorology Climate Classification of Australia | |
| **Landform**  Australian Soil Resources Information System physiographic provinces  Interim Bioregionalisation of Australia (IBRA) bioregions  Integrated Marine and Coastal Regionalisation of Australia (IMCRA) provinces (marine and estuarine wetlands) | |
| **Hydrology - inland surface waters**  Surface water drainage divisions | |
| **ANAE classification framework landscape scale attributes (Level 2**) | |
| **Climate**  Climate classes from the Bureau of Meteorology Australian Climate Classification of Australia | |
| **Landform**  Australian Soil Resources Information System physiographic regions  IBRA sub-regions  IMCRA bioregions (marine and estuarine wetlands) | |
| **Topography**  Upland, slope, lowland | |
| **Water influence (estuarine wetland only)**  Tide, wave or river dominated | |
| **ANAE classification framework systems (Level 3)** | |
| Surface Water  Marine  Estuarine  Lacustrine  Palustrine | |
| **ANAE classification framework habitat attributes (Level 3)** | |
| **Lacustrine/palustrine** | **Marine/estuarine** |
| Landform  Soil/substrate  Dominant vegetation  Dominant water source  Water type  Water regime | Substrate  Structural macrobiota  Water depth  Light availability  Nutrient availability  Exposure |

1.4 Victorian wetland inventories

The Corrick system was applied to inland and intertidal wetlands greater than a hectare across Victoria in the period from 1976 to 1994. This data is stored in a statewide wetlands inventory which consists of a geospatial data layer: WETLAND\_1994. The layer defines the spatial extent of wetlands as well as their categories and subcategories (Table 1). During the development of WETLAND\_1994, wetland categories were also applied to a statewide geospatial layer WETLAND\_1788 that estimates the extent and type of wetlands present at the time of European settlement.

The 1994 State wetlands inventory was updated in the period 2011 to 2014 based on new information about wetlands. This update of the statewide wetland inventory involved:

* a synthesis of regional wetland inventory updates that had been undertaken in Victoria since 1994 (Table 3);
* repositioning of wetlands that were subject to planimetric positioning errors in the WETLAND\_1994 data layer; and
* in-fill mapping of new wetlands in the parts Victoria that had not been mapped during the regional wetland inventory updates since 1994.

The update resulted in the development of a new geospatial wetland inventory that included updated wetland mapping across Victoria: WETLAND\_CURRENT. Each wetland has been attributed and classified in accordance with the framework outlined in this report. WETLAND\_1788 was also updated to form a new layer of pre-European extent: WETLAND\_PRE\_EUROPEAN.

Some of regional wetland inventory updates that had been undertaken in Victoria since 1994 applied the Corrick system (Table 1) to newly delineated wetlands and updated the classification of existing wetlands using the Corrick system categories and subcategories. WETLAND\_CURRENT includes fields specifying the Corrick wetland identifier and category. The most recent Corrick category information was used to populate the category field, where available. That is, the Corrick category from regional updates was used in preference to Corrick category from WETLAND\_1994. As a result, the Corrick category field in the WETLAND\_CURRENT data layer can differ from that in the WETLAND\_1994 data layer.

Table . Regional datasets integrated into the WETLAND\_CURRENT and WETLAND\_PRE\_EUROPEAN datasets

| Description | Abbreviation | Corrick classification |
| --- | --- | --- |
| A layer developed by Department of Environment, Land, Water and Planning (DELWP) which defines high country peatlands as described in Lawrence et al. 2009 | ALPS | None |
| A layer developed by Corangamite Catchment Management Authority (CMA) which updated the WETLAND\_1994 mapping for the Corangamite region | CORANG | Category (and occasional sub-category) |
| Delineation of Broken River floodplain wetlands by Ecology Australia in February 2007 for the Goulburn Broken CMA | GB\_LB | None |
| A layer developed by Goulburn Broken CMA which defines springs as described in Coates et al. 2010 | GB\_SPR | None |
| A layer developed by Goulburn Broken CMA which defines soaks as described in Carr et al. 2006 | GB\_SS | Category and sub-category for 20% of features |
| A layer developed by Mallee CMA which updated the WETLAND\_1994 mapping for the Mallee region | MALLEE2013 | Category and sub-category |
| A layer developed by North Central CMA which updated the WETLAND\_1994 mapping for the North Central dryland region | N\_CENT | Category (no sub-category) |
| A layer developed by West Gippsland CMA which updated the WETLAND\_1994 mapping for the West Gippsland region | W\_GIPP | Category (no sub-category) |
| A layer developed by Wimmera CMA which updated the WETLAND\_1994 mapping for the Wimmera region | WIMM2 | Category, slightly modified (no sub-category) |
| A layer developed by the Winton Wetlands Committee of Management which delineates the Winton wetlands following the decommissioning of Lake Mokoan | WINTON | None |

2. Approach for developing the Victorian wetland classification framework

The Victorian wetland classification framework is designed to be of use to a wide range of stakeholders, including State and regional natural resource management agencies, the Australian Government, wetland managers, scientists and community organisations.

The goal of this project was to design a new framework for classifying naturally occurring and artificial wetlands in Victoria that aligns with the ANAE classification framework and contains the basic information necessary to provide improved support for wetland policy development, management, assessment and general understanding of wetland diversity. The objectives in developing the framework were to:

* allow naturally-occurring wetlands to be distinguished from human-made wetlands;
* assess the attributes used in the ANAE classification framework for their relevance and applicability to Victorian wetlands;
* categorise relevant attributes to discriminate between the range of possible states in wetlands across Victoria; and
* assign a wetland typology with a manageable number of wetland types for general use in Victoria.

The ANAE classification framework was reviewed to assist with the selection of the attributes, categories and structure used in the Victorian framework. Because other wetland classification systems in use in Australia and internationally were considered in the development of these systems, these were not reviewed with the exception of the Ramsar Convention classification system which informed the classification of human made wetlands. Attributes from each level of the ANAE classification framework (Figure 1) (AETG 2012) were assessed to determine their relevance and applicability in developing the Victorian wetland classification framework.

It was decided to include system and habitat attributes in the Victorian statewide wetlands inventory (WETLAND\_CURRENT) but not regional and landscape scale attributes as these can be derived for Victoria’s wetlands, as necessary, by overlaying existing relevant geospatial datasets. The ANAE classification framework Level 1 and 2 regional and landscape scale attributes were assessed for their usefulness in describing variation in wetlands across the state. Based on this assessment, it was decided to define specific wetland landscapes for use in Victoria (see Section 3.1).

The Victorian wetlands inventory (WETLAND\_CURRENT) includes only lentic surface waters. The ANAE classification framework riverine and floodplain systems and the subterranean class, system and habitat attributes (Figure 1) were not applicable to Victorian wetlands and were excluded from the assessment of ANAE classification framework Level 3 attributes.

The steps for assessing relevant and applicable system and habitat attributes and assigning appropriate categories for each adopted attribute to the Victorian wetland inventory (WETLAND\_CURRENT) are described below.

1. Attributes in ANAE classification framework were assessed for their usefulness in describing Victoria’s wetlands.
2. The need for any additional attributes was considered resulting in the inclusion of an additional attribute on wetland origin.
3. The Ramsar Convention classification was reviewed in relation to the classification of human-made wetlands.
4. The availability of existing data sets to support attribute categorisation was assessed and suitable data sources were identified (Appendix 3).
5. Useful attributes where data was available were adopted and ANAE classification framework habitat attribute categories (Appendix 2) were reviewed and refined, if necessary.
6. Attribute categories were assigned to wetlands in WETLAND\_CURRENT.
7. The level of confidence for the assigned category for each attribute was also determined using rules which are described in each of the relevant sections below.

Key attributes for defining wetland types were identified. Using these attributes, wetland types were identified and assigned to wetlands in WETLAND\_CURRENT.

The Victorian wetland inventory includes both the system and habitat attributes selected for the framework and the new wetland types as well as the former WETLAND\_1994 wetland identifier and Corrick category. The WETLAND\_1994 wetland identifier provides links to the former Corrick wetland inventory datasets.

3. Regional and landscape attributes

Regionalisations based on broad-scale attributes such as climate, physiographic patterns, and dispersal barriers and finer scale data related to those attributes are an accepted international tool to assist in the description of ecosystem boundaries for planning, management and policy purposes (AETG 2012). Levels 1 and 2 of the ANAE classification framework (Figure 1**Error! Reference source not found.**)are described as “large scale, national regionalisations for landform, climate, hydrology, topography and water influence intended to provide context relative to both the regional and landscape scales and are based on collated, existing datasets and inferred patterns across a variety of spatial scales” (AETG 2012).

The ANAE classification framework regional and landscape attributes were examined and assessed for their usefulness in defining a suitable regionalisation for wetlands in Victoria.

3.1 ANAE Classification regional and landscape attributes

The relation of the ANAE classification framework regional and landscape attributes to Victoria is described below.

In relation to landform there are, in Victoria:

* two Australian Soil Resources Information System (ASRIS) physiographic provinces and 14 physiographic regions (Pain et al., 2011) (Table 4, Figure 2);
* 11 Interim Bioregionalisation of Australia (IBRA) 6.1 bioregions and 28 IBRA 6.1 subregions (Table 4, Figure 3);
* three Integrated Marine and Coastal Regionalisation of Australia (IMCRA) Provincial Bioregions and four Meso-scale Bioregions in Victorian nearshore waters (Commonwealth of Australia 2006) (Table 4, Figure 4**Error! Reference source not found.**).

With regard to topographic classes, the ANAE classification framework does not provide a definition of the upland, lowland and slope categories but suggests that such a regionalisation should be developed. For this project, the physiographic regions were categorised into the three different classes (Table 4, Figure 5) based on their descriptions in Pain et al. (2011) (Appendix 4).

There are two climate groups and five climate classes in Victoria, based on the classification (Table 5, Figure 6), (BoM 2010). In relation to hydrology there are two drainage divisions and 29 river basins in Victoria (Table 6, Figure 7), (Bureau of Meteorology 2012).

Table . ANAE classification framework region and landscape attributes for landform in Victoria. Levels 2 and 1 refer to the levels used in the ANAE classification framework.

| Attribute | Occurrence in Victoria | | |
| --- | --- | --- | --- |
| **ASRIS physiographic provinces (Level 1) and regions (Level 2)** | **Province** | **Regions (Figure 2)** | |
| Kosciuszkan Uplands | - Hume Slopes - Australian Alps  - Monaro Fall - Monaro Tableland  - East Victorian Uplands - West Victorian Uplands  - West Victorian Plains - South Victorian Uplands  - Gippsland Plain | |
| Murray Lowlands | - Lower Darling Plain - Riverine Plain  - Mallee Dunefield - Wimmera Plain  - Millicent Plain | |
| **Bioregions (Level 1) and sub-regions (Level 2)** | IBRA 6.1 bioregion | IBRA 6.1 subregions (Figure 3) | |
| Australian Alps | - Victorian Alps | |
| Flinders | - Wilsons Promontory | |
| Murray-Darling Depression | - Lowan Mallee  - Murray Mallee  - Wimmera Plain | |
| NSW South Western Slopes | - Northern Inland Slopes | |
| Narracorte Coastal Plain | - Bridgewater  - Glenelg Plain | |
| Riverina | - Victorian Riverina - Murray Fans  - Robinvale Plains - Murray Scroll Belt | |
| South East Coastal Plain | - Gippsland Plain - Otway Plain  - Warrnambool Plain | |
| South East Corner | - East Gippsland Uplands  - East Gippsland Lowlands  - Highlands – Far East | |
| South Eastern Highlands | - Highlands – Northern Fall - Otway Ranges  - Highlands – Southern Fall - Strzelecki Ranges  - Monaro Tablelands | |
| Victorian Volcanic Plain | - Victorian Volcanic Plain | |
| **IMCRA Provincial Bioregion** | | **Meso-scale Bioregion (Figure 4)** |
| - Central Eastern Transition  - Western Bass Strait IMCRA transition  - Southeast IMCRA transition | | - Otway  - Central Victoria  - Victorian Embayments  - Flinders  - Twofold Shelf |
| **Topographic classes (Level 2)** - based on physiographic regions (Figure 5). | Topographic classes | Physiographic regions | |
| Upland | - Australian Alps - Monaro Tableland  - East Victorian Uplands - South Victorian Uplands  - West Victorian Uplands | |
| Slope | - Hume Slopes - Monaro Fall | |
| Lowland | - Gippsland Plain - Lower Darling Plain  - Riverine Plain - Mallee Dunefield  - Wimmera Plain - Millicent Plain  - West Victorian Plains | |

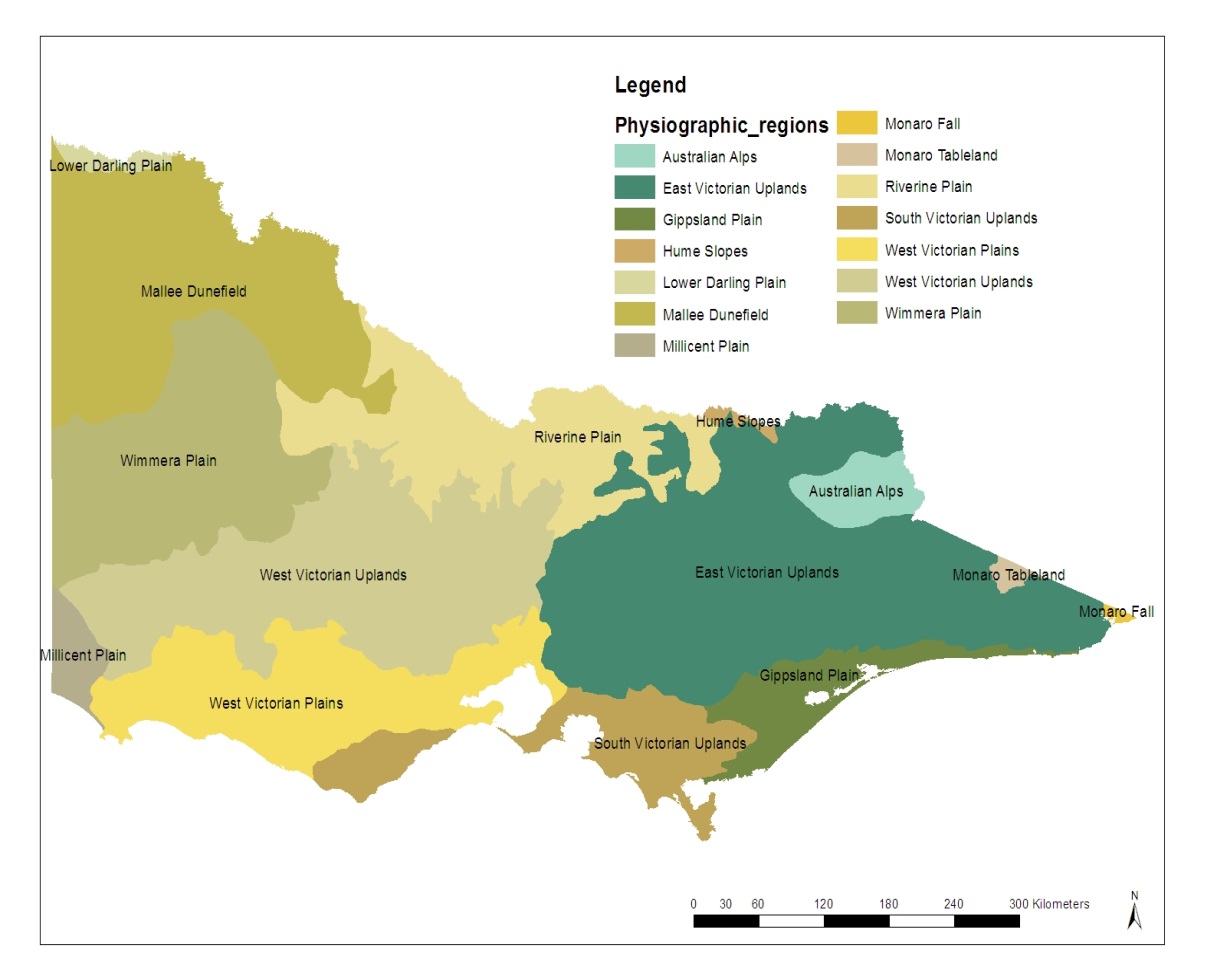


Figure . Australian Soil Resources Information System physiographic regions in Victoria (Pain et al., 2011).

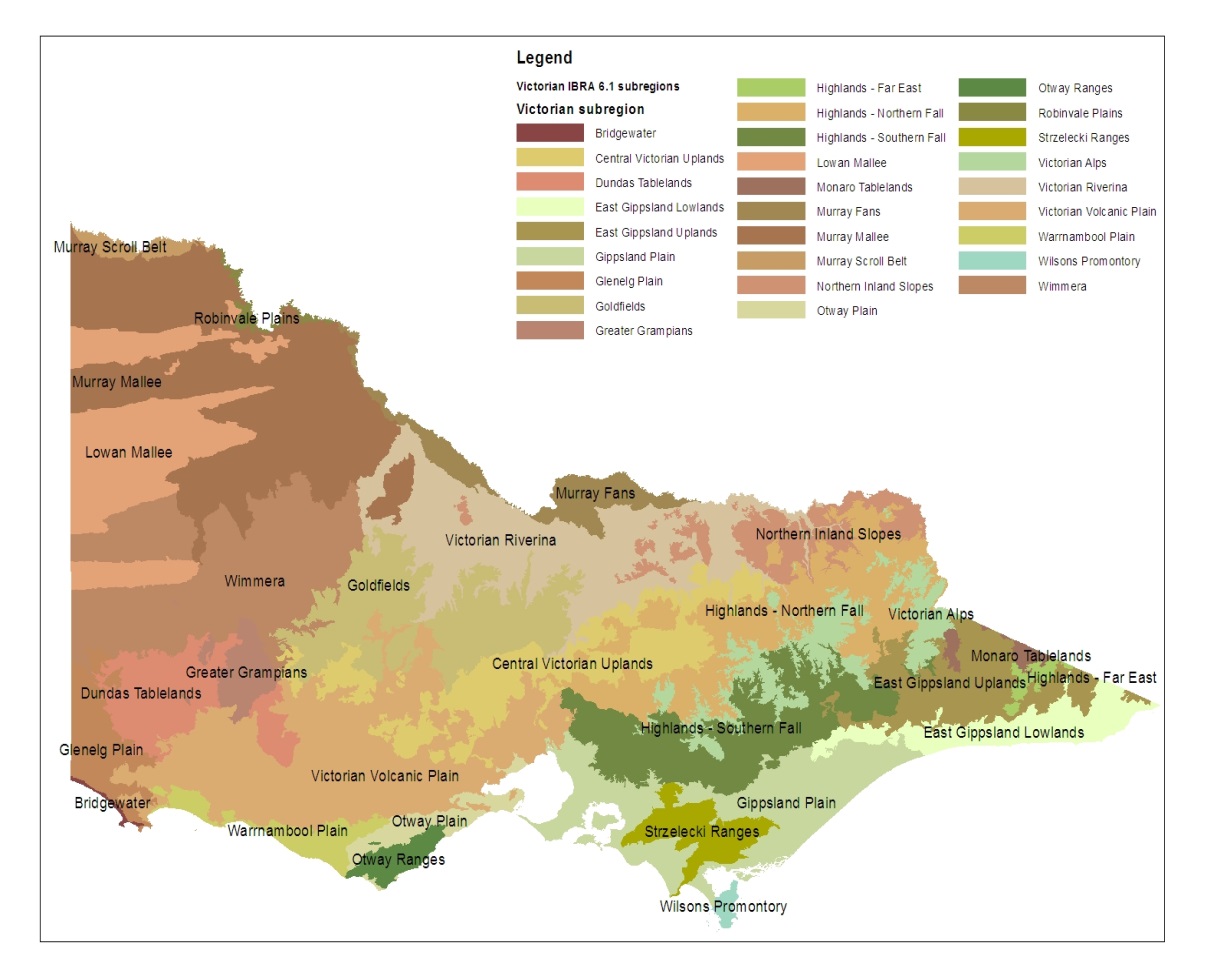


Figure . IBRA subregions (IBRA 6.1) in Victoria.

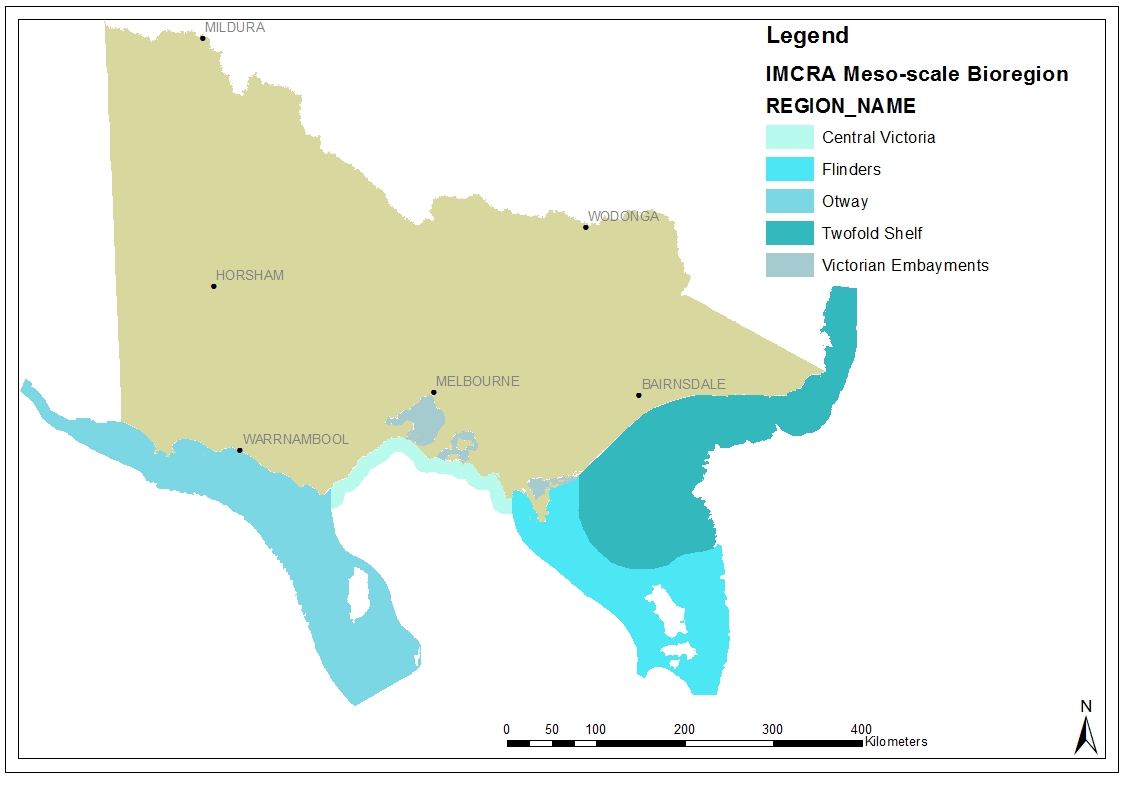


Figure . IMCRA meso-scale bioregions in Victorian waters (IMCRA 4.0) (Commonwealth of Australia 2006).

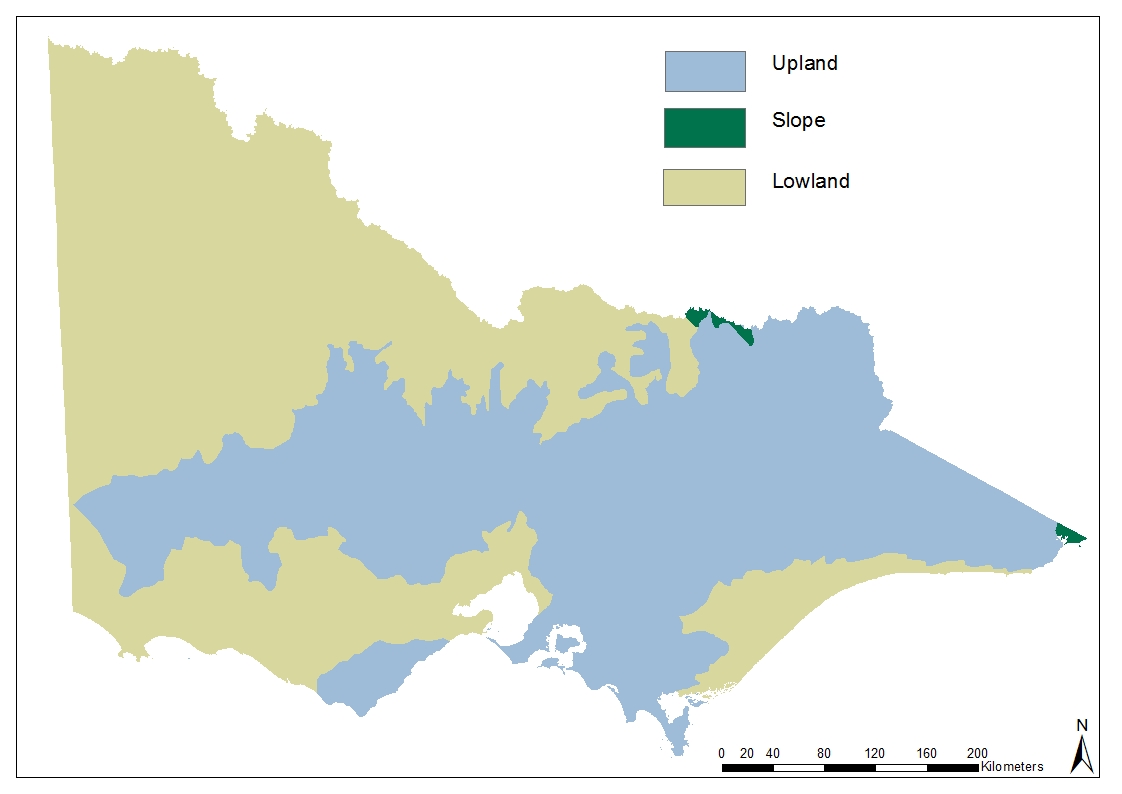


Figure . Topographic classes in Victoria based on grouping of ASIRS physiographic regions.

Table . ANAE classification framework region and landscape attributes for climate in Victoria.

|  |  |  |
| --- | --- | --- |
| Attribute | Occurrence in Victoria | |
| **Climate**  Bureau of Meteorology Climate Classification of Australia climate groups (ANAE Level 1) and climate classes (ANAE Level 2) Victoria (Figure 6) | **Climate group** | **Climate class** |
| Grassland  Temperate | * warm (summer drought) * no dry season (hot summer) * no dry season (warm summer) * distinctly dry (and warm) summer * no dry season (mild summer) |



Figure . Climate groups and classes (Bureau of Meteorology 2010).

Table . ANAE classification framework region and landscape attributes for hydrology in Victoria.

|  |  |  |
| --- | --- | --- |
| Attribute | Occurrence in Victoria | |
| Hydrology - inland surface waters  Drainage divisions (Level 1) and river basins (Level 2), (Figure 7) | **Drainage division** | **River basin** |
| Murray-Darling | - Avoca River - Avon Rivers  - Broken River - Campaspe River  - Goulburn River - Kiewa River  - Loddon River - Mallee  - Ovens River - Upper Murray River  - Wimmera |
| South-East Coast | - Barwon River - Bunyip River  - East Gippsland - Glenelg River  - Hopkins River - Lake Corangamite  - Latrobe River - Maribyrnong River  - Millicent Coast - Mitchell River  - Moorabool River - Otway Coast  - Portland Coast - South Gippsland  - Snowy River - Tambo River  - Thomson River - Werribee River  - Yarra River |

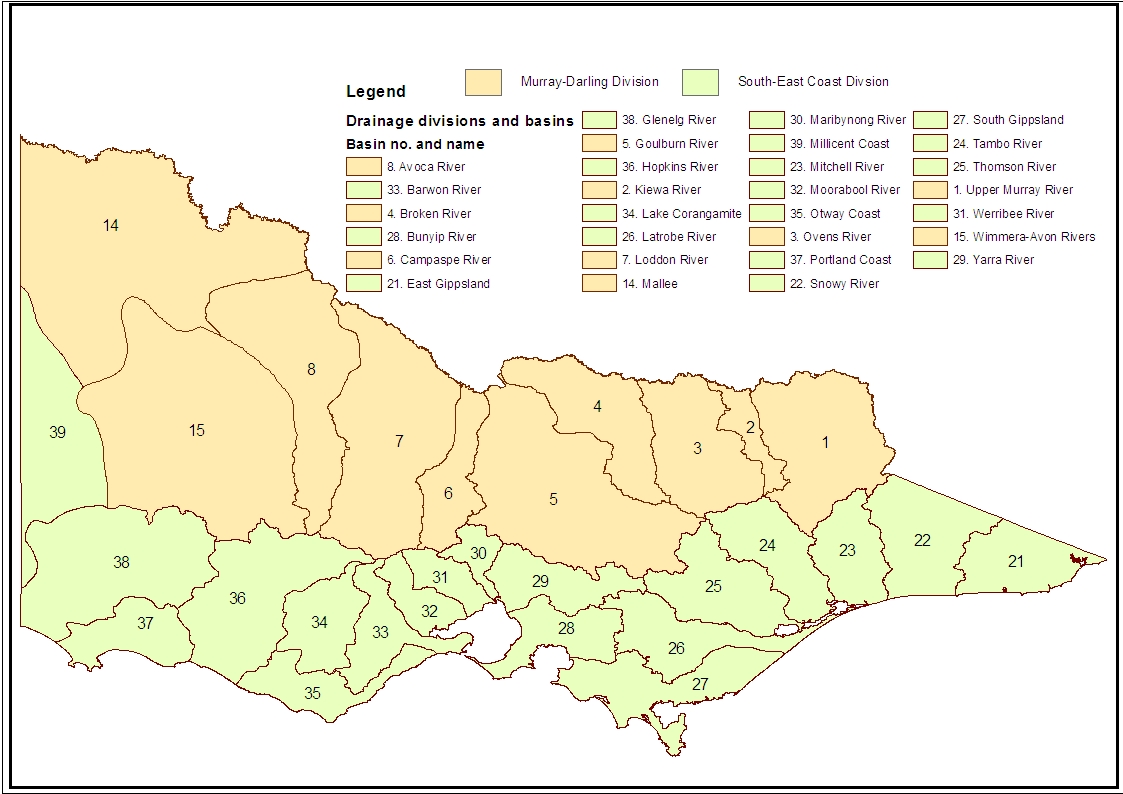


Figure . Drainage divisions and basins in Victoria (Bureau of Meteorology 2012)

3.2 Assessing ANAE regional and landscape attributes for use in Victoria

Based on the examination of how ANAE regional and landscape attributes apply to wetlands in Victoria, four options were considered for spatially defining regional and landscape variation in wetlands in Victoria. These were:

1. adopting the ANAE Level 1 or 2 attribute that best explains regional and landscape wetland variation;
2. systematically combining two or more of the ANAE Level 1 or 2 attributes until units are identified that best explain regional and landscape wetland variation;
3. applying the ANAE region and landscape attributes as required for any particular purpose; or
4. developing a wetland regionalisation system for use in Victoria.

The selection of suitable attributes to spatially define regional and landscape variation in wetlands requires:

* knowledge of the spatial definition of attributes that drive regional wetland variation, for example the ANAE Levels 1 and 2 attributes (Section 3.1);
* a balance in scale and complexity between the level of detail needed to describe variation in wetland drivers meaningfully and that which is required for practical application;
* identification of one or more wetland components through which that regional variation is expressed, given available knowledge and information; and
* knowledge about the spatial distribution of that component or components across the landscape.

Of the various wetland components which could potentially define regional wetland variation, wetland vegetation was considered as the most suitable. Wetland vegetation is a function not only of local factors such as the hydrological and salinity regime of the wetland, but also of the key wetland drivers such as climate, geomorphology and landform. Wetland vegetation that is associated with a particular hydrological and salinity regime can exhibit regional variation based on climate, geomorphology and landform. The regional variation in wetland vegetation is likely to influence and, at least partly, explain some of the regional variation in other wetland biota based on its role in providing habitat.

Wetland vegetation has been comprehensively described across the full range of Victoria’s wetlands using wetland EVCs (DSE 2012, DEPI 2013), (Appendix 1). There is no available, comparable description for other wetland biological, physical or chemical components that are likely to exhibit regional environmental variation. There is information, based on expert advice, about the likely distribution of each EVC in Victoria (DSE 2012). Wetland landscape profiles have been developed to describe the ecological context of wetland EVCs in Victoria as a means of facilitating EVC identification (DSE 2012), (Table 7). Particular EVCs have been associated with particular wetland landscape profiles, noting that certain EVCs may be associated with more than one profile. This potentially provides a useful basis for wetland regionalisation (DSE 2012). There are some spatial data on the distribution of wetland EVCs in Victoria.

Option 1 was not adopted. Examination of the spatial definition of ANAE Level 1 and 2 attributes identified that IBRA subregions were the attribute most closely aligned with wetland landscape profiles. However, IBRA subregions do not distinguish some of the important regional variation associated with less fertile sedimentary soils, floodplains, coastal situations and elevation. Option 2 was not adopted as none of the other ANAE Level 1 and 2 attributes provided the necessary additional information to address the deficiencies of the IBRA subregions for explaining regional wetland variation. With regard to Option 3, each of the region and landscape attributes can be applied to individual wetlands using available geospatial datasets as required for any particular purpose, for example a national wetland inventory.

Option 3 was adopted as the preferred approach.

Table . Victorian wetland landscape profiles (DSE 2012).

| Wetland landscape | Wetlands associated with wetland landscape profile |
| --- | --- |
| 1. Alpine/sub/alpine | Wetlands associated with higher mountain areas of eastern Victoria, within areas subject to sustained winter snow (generally above 1200 m elevation, but sometimes extending lower with cool air drainage). |
| 2. Montane | Wetlands associated with high elevation areas (generally within 700 – 1200 m elevation) of eastern Victoria below sub-alpine zone. Subject to cold air drainage, but below zone of sustained winter snow. |
| 3. Lower montane to foothill/Wet forest | Wetlands of gullies and drainage lines within taller, denser forest country (e.g. East Gippsland, South Gippsland, Central Highlands, Otways). |
| 4. Hills: Foothills, inland slopes and hilly near-coastal | Wetlands associated with drainage lines and wet flats of at least moderate rainfall foothill country (south of divide and moister inland slopes, generally >650 mm rainfall per annum). |
| 5. Drier western hills, tablelands and northern slopes | Wetlands associated with drainage lines, swales and wet flats of lower rainfall hilly areas (specifically north-east hills, drier Midlands of north-central Victoria and the elevated plateau of the Dundas Tablelands, generally <650 mm rainfall per annum). |
| 6. Lowland grassy plains – western volcanics | Wetland systems associated with basaltic terrain of (southern) western to central Victoria. |
| 7. Lowland grassy plains – Riverina Plains (sedimentary) | Wetland systems associated with sedimentary alluvial plains of northern Victoria (within basin of Murray River and tributaries, approximately east of Loddon River). |
| 8. Lowland grassy plains – Wimmera (to southern Mallee) | Wetland systems associated with inland sedimentary alluvial plains of further western to northern-western Victoria (approximately west of Loddon River). |
| 9. Lowland grassy plains – coastal/southern plains | Wetland systems associated with relatively fertile (mostly clay) sedimentary plains south of the Divide. |
| 10. Lowland sandy/heathy | Wetland systems associated with relatively less fertile (mostly acidic sandy) sedimentary soils (e.g. sand sheets and dune swales), mostly south of the Divide but extending inland in south-west Victoria (e.g. Grampians, Little Desert). |
| 11. Mallee non-riverine | Wetlands associated with mallee country of further north-west Victoria. |
| 12. Riverine – mid-Murray | Wetlands associated with the riverine floodplain of Murray River and Tributaries (approximately upstream of Kerang). |
| 13. Riverine - Mallee | Wetlands associated with the riverine floodplain of Murray River and Tributaries (approximately downstream of Kerang). |
| 14. Near coastal | Wetlands associated with near-coastal situations (especially calcareous dune systems and blocked drainage lines) and including those with of tidal or estuarine influences. |
| 15. Lowland riparian floodplain | Wetlands associated with floodplains of major streams outside of Victorian Riverina. |
| 16. Lacustrine | Vegetation associated with lakes. |

3.3 Victorian wetland landscapes

To encapsulate the regional and landscape variation in wetlands, this project identified wetland landscapes in Victoria.

The approach used in this project was to spatially define wetland landscapes in Victoria based on the description of wetland landscape profiles (DSE 2012), (Table 7). The lacustrine wetland landscape profile was excluded from the spatial analysis as lakes are distributed across most wetland regions and by definition are not dominated by emergent vegetation ((Section 4).

The method for spatially defining wetland landscapes in Victoria is summarised below. See Appendix 5 for a full description. IBRA subregions were selected as the base dataset as there was broad similarity between IBRA subregions and several wetland landscapes. Based on the descriptions of wetlands associated with each wetland landscape profile (Table 7), each wetland landscape was defined by refining one or more IBRA subregions using other environmental variables, including vegetation types, geomorphic units, floodplains, elevation and distribution of key species. The resulting wetland landscapes are shown in Figure 8. Wetland landscapes were numbered in accordance with Table 7.

The ANAE classification framework suggests that “when lacustrine, palustrine or riverine systems occur on a floodplain (identified through Level 2 classification), they should each be associated with the active floodplain which is defined as that area with an average recurrence interval (ARI) of 10 years (AETG 2012). This definition was used guide the delineation of wetland landscapes 12, 13 and 15.

Defined wetland landscapes for Victoria were assembled into a geospatial layer: WETLAND\_LANDSCAPES. The wetland landscape is not assigned as an attribute in the Victorian wetland inventory WETLAND\_CURRENT. However, the WETLAND\_LANDSCAPES layer can be overlaid with WETLAND\_CURRENT to explore the regional variation in wetlands of the same type and aid the identification of representative wetlands.

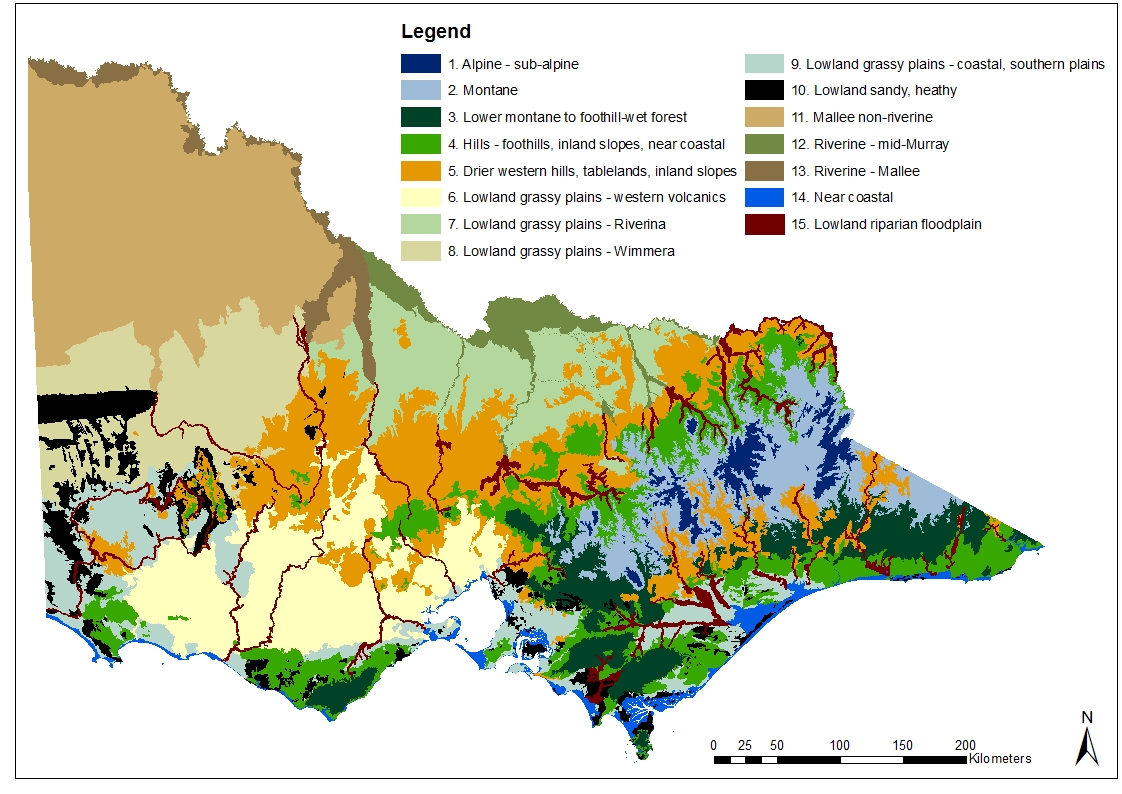


Figure . Victorian wetland landscapes derived from the WETLAND\_LANDSCAPES layer created for this project.

4. Assigning the wetland system attribute to Victorian wetlands

Systems are used as the highest hierarchical level of a classification of wetlands and deepwater habitats in the United States (Cowardin et al. 1979) and have been adopted within Level 3 of the ANAE classification framework (AETG 2012).

4.1 Wetland system classification categories

In the ANAE classification framework (AETG 2012), the following aquatic system categories are relevant to wetlands in Victoria: lacustrine, palustrine, estuarine and marine.

Lacustrine aquatic systems are defined by Cowardin (1979) as aquatic environments with all the following characteristics.

1. They are situated in a topographic depression or a naturally dammed river channel.
2. They are lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30 percent areal coverage.
3. The total area exceeds eight hectares. Similar aquatic environments totalling less than eight hectares are also included if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin exceeds two metres at low water.
4. Lacustrine habitats can be either tidal or non-tidal provided water salinity due to sea derived salts is always less than 500 mg/L.

Palustrine aquatic systems are defined by Cowardin (1979) as including all non-tidal aquatic habitats dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such habitats that occur in tidal areas where salinity due to ocean-derived salts is below 500 mg/L. It also includes habitats lacking such vegetation which have the following four characteristics:

1. area less than eight hectares;
2. where active wave formed or bedrock shoreline features are lacking;
3. where the water depth in the deepest part of basin is less than two metres at low water; and
4. the salinity due to ocean-derived salts is less than 0.5 parts per thousand.

The ANAE definition for marine aquatic ecosystems includes shallow coastal indentations or bays (or parts thereof) without appreciable freshwater inflows (AETG 2012). The ANAE defines estuarine aquatic ecosystems as those areas that are semi-enclosed by land with a permanently or intermittently open connection with the ocean, and where ocean water can be diluted by freshwater runoff from the land.

In Victoria, the decision was made to assign aquatic system attributes to whole wetlands rather than to habitats within wetlands.

The system definitions used in the ANAE were refined for the Victorian classification framework and the attribute renamed as “wetland system” (Table 8).

In Victoria, the definition of wetlands includes supratidal and intertidal areas which under the ANAE classification system would fall into the marine or estuarine system categories (AETG 2012). Some intertidal wetlands overlap with areas identified as estuaries on the DELWP estuary geospatial layer: ESTURAIES (Appendix 3). Supratidal wetlands and wetlands that are semi-enclosed by land with a permanently or intermittently open connection with the ocean (referred to in this report as estuaries) were classed as estuarine. Intertidal wetlands in embayments, which are not semi-enclosed, were classed as marine.

Palustrine and lacustrine wetlands were distinguished from marine and estuarine systems by the lack of tidal influence. For Victorian wetlands less than eight hectares in area, there is no comprehensive data on the nature of the shoreline and data on depth is not available for most wetlands. Therefore, the assignment of wetlands to the lacustrine or palustrine category is based solely on the percentage of vegetation cover, regardless of area. An additional category, Palustrine or Lacustrine (unknown specifics), was adopted where emergent vegetation cover could not be determined.

Table . Wetland system categories for the Victorian classification framework.

|  |  |  |
| --- | --- | --- |
| Category | Description | Examples |
| Lacustrine | Non-tidal wetlands with less than 30% emergent vegetation cover | Lake Corangamite, Lake Charm, Waranga Basin, Lake Hattah, Lake Hindmarsh, Albert Park Lake |
| Palustrine | Non-tidal wetlands with 30% or more emergent vegetation cover | Mount William Swamp, Tragowel Swamp, Dowd Morass, Cabbage Tree Lagoon, Third Marsh (Koorangie), Barmah Forest |
| Marine | Intertidal wetlands in embayments | Corner Inlet, Western Port, Mud Islands |
| Estuarine | Estuaries, coastal saltmarshes and semi-permanent supratidal wetlands adjoining estuaries | Anderson Inlet, Shallow Inlet, Swan Bay, Lake King, Glenelg Estuary, Lake Connewarre |
| Palustrine or Lacustrine (unknown specifics) | Non-tidal wetlands where the proportion of emergent vegetation could not be determined | - |

4.2 Assigning wetland system categories to coastal wetlands

The classification of wetland system categories was applied to the WETLAND\_CURRENT dataset.

In a manual desktop assessment, several data sources were visually examined on screen to identify the wetland system category for wetlands located close to the Victorian coast. These included recent aerial photography (1990s and 2000-14), the Corrick classification recorded in WETLAND\_CURRENT, the EVCs present in the modelled 2005 EVCs (updated) dataset, the ESTUARIES dataset, the watercourse network 1:25,000 dataset and the Victorian Coastal Saltmarsh and Estuarine EVCs (Table 9) dataset (Appendix 3). In some cases, online documents were reviewed to confirm further details of specific wetlands.

Table . Victorian coastal saltmarsh and estuarine EVCs (Boon et al. 2011)

|  |  |  |  |
| --- | --- | --- | --- |
| EVC number | EVC name | EVC number | EVC name |
| 538  947  A110  A111  A109  9  A112  914 | Brackish Herbland  Brackish Lignum Swamp  Coastal Dry Saltmarsh  Coastal Hypersaline Saltmarsh  Coastal Saline Grassland  Coastal Saltmarsh Aggregate  Coastal Tussock Saltmarsh  Estuarine Flats Grassland | 10  140  842  A113  196  A107  A108 | Estuarine Wetland  Mangrove Shrubland  Saline Aquatic Meadow  Saltmarsh-grass Swamp  Seasonally Inundated Sub-saline Herbland  Wet Saltmarsh Herbland  Wet Saltmarsh Shrubland |

Wetlands with tidal influence were located in estuaries and marine embayments or had a hydrological connection to an estuary or embayment and supported EVCs tolerant of at least hyposaline conditions. Information on the preferred salinity regimes of EVCs is available for wetland EVCs in a DELWP database (Appendix 6). Wetlands without a tidal influence were assigned as lacustrine if emergent EVCs covered <30% of the wetland or palustrine, if this was not the case.

Wetlands subject to tidal influence were identified and categorised as either marine or estuarine. Intertidal wetlands in the marine embayments of Corner Inlet, Nooramunga, Western Port and Port Phillip Bay were classed as marine while tidal wetlands semi-enclosed by land or adjacent to mapped estuaries were classed as estuarine. Lake Wellington and Lake Victoria in the Gippsland Lakes system were classed as non-tidal as tides are not perceptible in these two wetlands (Bird 1994).

Three hundred and seventy two coastal wetlands were assigned a wetland system through the manual desktop assessment (Appendix 7). Approximately 85% were estuarine, 5% were lacustrine, 9% were palustrine and only 1% were classified as marine (Table A7.2, Appendix 7). These wetlands were all assigned a high level of confidence for the assigned wetland system category. This confidence level was based on the fact that the information visually examined on screen came from a number of sources which were of a high level of consistency.

4.3 Assigning wetland system categories to non-coastal wetlands

Following the manual review of coastal wetlands, all remaining wetlands in the WETLAND\_CURRENT data layer were analysed to determine if they were palustrine or lacustrine systems. The wetland system category for non‑coastal wetlands was derived through separate analysis of the geospatial datasets in Table 10. For each dataset, wetlands were classed as having either emergent or non-emergent vegetation, using the rules in Table 10. The results from each of the derived datasets were then compared. The rules in Table 11 outline how the six datasets were compared.

Table . Datasets (Appendix 3) and rules for determining the emergent vegetation category for non-coastal wetlands from independent data sources.

| Dataset name | Rule for assigning emergent vegetation category |
| --- | --- |
| ALPS | Emergent vegetation is present in all wetlands derived from this source |
| GB\_SPR | Emergent vegetation is present in all wetlands derived from this source |
| GB\_SS | Emergent vegetation is present in all wetlands derived from this source |
| IWC Data Management System (IWCDMS) | For wetlands where Index of Wetland Condition (IWC) assessments have been undertaken, the percent cover of emergent and non-emergent (Appendix 1) wetland EVCs was determined. Wetlands were classed as supporting emergent vegetation if EVCs classed as emergent occupied 30% or more of the wetland area. If they occupied <30% the category was non-emergent. |
| Corrick classification  (Table 1) | * The wetland vegetation was classed as non-emergent if the wetland category was permanent saline, sewage pond or salt works, or if the following sub-categories occupied more than70% of the wetland area:   + dead timber; open water; deep; hypersaline lake; impoundment; salt pan;or shallow. * Wetlands with any other (known) Corrick category/sub-category were considered to have emergent vegetation if that vegetation covered >=30% of the wetland. * Wetlands without a Corrick category/sub-category were not assigned an emergent vegetation category for this data source. |
| Modelled 2005 EVCs (updated) | All EVCs identified in the statewide EVC data layer were classed as emergent or non-emergent (Appendix 1). Wetlands were classed as supporting emergent vegetation if EVCs classed as emergent occupied 30% or more of the wetland area. If they occupied <30% the category was unknown. An unknown category is assigned rather than a non-emergent category because an absence of emergent vegetation types in the modelled 2005 EVC layer is often due to data gaps and inaccurate vegetation modelling, rather than a true on-ground lack of emergent vegetation. |

Table . The rules for assigning wetland system and confidence levels to non-coastal wetlands

| Wetland system category  assigned | Confidence of classificat-ion | Derived from ALPS, GB\_SPR or GB\_SS dataset | | Emergent vegetation category derived from dataset | | | | | | Approximate percentage of wetlands |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IWCDMS | | Corrick classification | | Modelled 2005 EVCs (updated) | |
| Lacustrine | High | | No | | Non-emergent | | Non-emergent | | Unknown | <1 |
| Non-emergent | | Non-emergent | | Emergent | <1 |
| Moderate | | No | | Non-emergent | | Emergent or unknown | | Emergent or unknown | <1 |
| Low | | No | | Unknown | | Non-emergent | | Unknown | 6 |
| Palustrine | High | | Yes | | Not applicable | | | | | 13 |
| No | | Emergent | | Emergent | | Emergent | 1 |
| Emergent | | Emergent | | Unknown | <1 |
| Moderate | | No | | Emergent | | Non-emergent or unknown | | Unknown | <1 |
| Unknown | | Emergent | | Emergent | 18 |
| Emergent | | Non-emergent or unknown | | Emergent | <1 |
| Low | | No | | Unknown | | Emergent | | Unknown | 11 |
| Unknown | | Unknown | | Emergent | 17 |
| Palustrine or Lacustrine (unknown specifics) | Not applicable | | No | | Unknown | | Unknown | | Unknown | 20 |
| Unknown | | Non-emergent | | Emergent | 12 |

The rules in Table 11 are based on the reliability of the datasets. The first four datasets in Table 10 were considered the most reliable. The first three datasets were recently developed as a result of detailed study of particular wetland types (Lawrence et al. 2009, Coates et al. 2010 and Carr et al. 2006). The fourth was based on field visits where IWC assessments were undertaken (including identification and assessment of wetland EVCs) from 2009 onwards. Data was recorded in and available from the IWCDMS.

The last two datasets in Table 10 were considered less reliable. The Corrick classification (derived from WETLAND\_1994 and more recent regional updates) is mostly based on vegetation information pre-1994 which may no longer be accurate. Vegetation information from the Modelled 2005 EVCs (updated) spatial dataset is considered the least reliable as it is based on modelled information and is at a scale which is generally too small to accurately define EVCs in wetlands.

Where application of the rules in Table 11 resulted in an interim wetland system category of Palustrine or Lacustrine (unknown specifics), further processing was undertaken using the All Victorian Dam Boundaries dataset. Of these wetlands, those with greater than 70% overlap with the All Victorian Dam Boundaries dataset were assigned a lacustrine wetland system and a moderate confidence level. All other wetlands maintained their classification as Palustrine or Lacustrine (unknown specifics) and were not assigned a confidence level.

4.4 Wetland system classification results

The wetland system classification process identified that the majority of Victoria’s wetlands are palustrine systems (Table 12).

Table . Results of the wetland system classification

| Wetland system | Confidence level | Approximate percentage of wetlands |
| --- | --- | --- |
| Marine | High | <1 |
| Estuarine | High | 1 |
| Lacustrine | High | <1 |
| Moderate | 8 |
| Low | 4 |
| Palustrine | High | 15 |
| Moderate | 18 |
| Low | 29 |
| Palustrine or Lacustrine (unknown specifics) | N/A | 25 |

5. Assigning wetland habitat attributes to Victorian wetlands

Each of the ANAE aquatic ecosystem habitat attributes (AETG 2012, Table 2, Appendix 2) was assessed to determine suitability for inclusion in the Victorian wetland classification framework. An additional attribute of wetland origin was also included.

5.1 Wetland origin

Wetland origin is considered to be an important attribute as it assists in identifying management objectives for individual wetlands.

5.1.1 Wetland origin classification categories

Wetland origin distinguishes naturally occurring wetlands from those that are human-made. Human-made or artificial wetlands are constructed for specific purposes such as water storage or result from human activities such as quarrying or drainage.

For the purposes of the framework two broad types of wetlands are recognised as described below.

1. Naturally-occurring wetlands. These are defined as wetlands of natural origin which essentially retain their natural form, even if their hydrology has been altered from the natural regime for a utilitarian purpose such as salt harvesting, water storage or saline water disposal. Examples of naturally occurring wetlands where the water regime has been altered for a utilitarian purpose are Lake Tutchewop which is used as a salinity disposal basin and Kow Swamp which is used as a water storage.
2. Human-made wetlands. These are defined as wetlands which have been largely drained and occupy a significantly reduced area or purpose built wetlands which occupy areas of land which were not originally wetlands. Purpose built wetlands may have displaced naturally-occurring wetlands but are quite different in form and area to the wetlands displaced. Examples are Waranga Basin and Lake Hume. They may occupy other natural features such as former river channels, for example, Loddon Weir.

The Corrick system includes three human-made wetland types: salt works, sewage treatment ponds and impoundments (Table 1). The system does not, however, differentiate the different types of impoundments. For example, it does not distinguish between farm dams and large urban and agricultural water storages. Nor does it include other human made wetlands such as those constructed for stormwater treatment and/or amenity.

The Ramsar Convention classification system for human-made wetlands was reviewed. It includes a category for human-made wetlands (Ramsar Convention Secretariat 2006) which are classified into the following types[[2]](#footnote-2):

1. aquaculture (e.g. fish/shrimp) ponds;

2. ponds - includes farm ponds, stock ponds, small tanks (generally below eight hectares);

3. irrigated land (includes irrigation channels and rice fields);

4. seasonally flooded agricultural land (including intensively managed or grazed wet meadow or pasture);

5. salt exploitation sites (salt pans, salines, etc.);

6. water storage areas; reservoirs/barrages/dams/impoundments (generally over eight hectares);

7. excavations (gravel/brick/clay pits; borrow pits, mining pools);

8. wastewater treatment areas (sewage farms, settling ponds, oxidation basins, etc.);

9. canals and drainage channels, ditches; and

Zk(c). karst and other subterranean hydrological systems, human-made.

Of these, types 3, 4, 9 and Zk(c) are not classed as wetlands under the definition of wetlands used in Victoria.

As constructed wetlands for stormwater treatment and/or amenity are relatively common in urban areas, these were included as a category of human-made wetlands in the framework, in addition to the relevant Ramsar Convention classification system categories. The framework adopts ten categories of wetland origin, including “unknown” (Table 13).

Table . Categories for the wetland origin attribute.

| Wetland type | Wetland origin category | Examples |
| --- | --- | --- |
| Naturally occurring | Naturally occurring | Lakes, swamps, springs, soaks and tidal wetlands of natural origin |
| Human-made | Aquaculture pond | Fish/shrimp ponds |
| Dam/Storage < 8 ha | Farm ponds, stock ponds, small tanks less than eight hectares in area |
| Dam/Storage ≥ 8 ha | Water storages (reservoirs, barrages, dams, impoundments) over eight hectares in area |
| Salt works | Salt exploitation sites (e.g. salt pans) |
| Excavation pond | Gravel, brick or clay pits, borrow pits, mining pools |
| Sewage treatment pond | Sewage farms, settling ponds, oxidation basins |
| Stormwater treatment pond | Constructed wetlands for stormwater treatment, sediment retention and/or amenity |
| Artificial (type unknown) | Human-made wetland where the wetland origin category is unable to be determined |
| Unknown | Unknown | Wetland origin category is unable to be determined |

5.1.2 Assigning wetland origin categories

The classification of wetland origin categories was applied to the WETLAND\_CURRENT dataset.

Step 1. Assign wetland origin through manual desktop examination

The first step in the classification of wetland origin involved determination of the wetland origin for several large wetlands, assessed through a manual desktop examination of aerial photography, Corrick classification and WETLAND\_1788. This manual desktop process identified the wetland origin for:

* 343 wetlands that had a known artificial water source and for which wetland origin had also been determined based on visual, on-screen examination, expert knowledge and online information (Appendix 8) which were assigned a high confidence level;
* 79 wetlands that were considered to be human-made based on an individual manual assessment of each wetland which were assigned moderate or high confidence levels based on interpretation of aerial imagery;
* 1,330 wetlands that were considered to be naturally-occurring based on examination of the Corrick class which were assigned a moderate confidence level; and
* 329 wetlands that were considered to be naturally-occurring based on their overlap with WETLAND\_1788 which were assigned a moderate confidence level.

Step 2. Assign wetland origin to high country peatlands, springs and soaks

In step 2, following the manual desktop process, all wetlands in WETLAND\_CURRENT that were sourced from the ALPS, GB\_SPR or GB\_SS geospatial layers (see Section 1.3) were classified as naturally occurring as these wetlands are known to be of natural origin based on the descriptions of these wetlands in Lawrence et al. (2009), Coates et al. (2010) and Carr et al. (2006). The confidence rating assigned for these wetlands was high.

At this stage, any wetland classified with a wetland origin attribute through steps 1 and 2 above were excluded from subsequent analysis. For those that remained, the following process was used to infer wetland origin.

Step 3. Assign wetland origin by examining changes in wetland extent since European settlement

Step 3 involved identifying whether the WETLAND\_1994 feature was also present in the original WETLAND\_1788 dataset . Wetlands in the WETLAND\_1994 dataset that are not present on the WETLAND\_1788 dataset are assumed to be human-made unless they are of a type not mapped in the WETLAND-1994 dataset (for example, high country peatlands, springs and soaks). *C*hanges to the extent of the wetland are likely to reflect human modification. A significant increase in wetland area often reflects conversion of a naturally-occurring wetland to an human-made water storage. A decrease in area is likely to indicate that the wetland has been drained or converted into a smaller water storage or sewage treatment pond. A figure of 40% was arbitrarily chosen to indicate significant change in area. Wetlands that were present in both datasets and did not vary by more than 40% of their original (WETLAND\_1788) area were assumed to be naturally occurring.

Step 4. Assign wetland origin according to Corrick category

In step 4, any features in WETLAND\_CURRENT that were derived from WETLAND\_1994 with a Corrick class of 20 - Sewage treatment pond were classified as human-made, sewage treatment pond.

Step 5. Assign wetland origin from other datasets

Step 5 comprised spatial overlay analysis of four independent datasets (Appendix 3):

* All Victorian Dam Boundaries;
* DRWaterbodies;
* Water area 1:25,000; and
* Features of interest.

These datasets each have one or more attributes that provides some information on whether a given wetland was likely to be naturally occurring or human made (Table 14). The intent of the spatial overlay analysis was to infer the wetland origin based on the existing attribute information in the four datasets. This relied upon the features in each of the four datasets having been classified as either naturally occurring, or human made, and if possible distinguishing what form of human made wetland they comprised.

Table . Relevant wetland origin attribute information in four independent data sources.

| Dataset name | Relevant attribute | Feature type | Feature type description | Wetland origin |
| --- | --- | --- | --- | --- |
| All Victorian Dam Boundaries | Feature\_type | Aquaculture area | e.g. fish hatcheries | Aquaculture pond |
| Industrial storage | Dams intersecting industrial or mining land uses | Excavation ponds OR Dam/Storage |
| Rural irrigation storage | Dams intersecting irrigated land uses | Farm dams OR Dam/Storage |
| Settling ponds | Ponds used for water treatment | Sewage treatment ponds |
| Town rural storage | Named storages and storages > 250ML | Dam/Storage |
| Waste water | Not described | Sewage treatment pond |
| Flood irrigation storage | Dams used to harvest stormwater runoff | Stormwater treatment ponds |
| Rural licensed storage | Dams that are likely to be linked to licences | Dam/Storage |
| Rural storage | Likely to be stock and domestic dams | Dam/Storage |
| DRWater-bodies | Desc | Bio-retention system | No description | Stormwater treatment ponds |
| Sediment trap | No description | Naturally occurring |
| Natural body of water | No description | Stormwater treatment ponds |
| Wetlands | No description | Stormwater treatment ponds |
| Water area 1:25,000 | Origin | 1 | Natural | Naturally occurring |
| 2 | Man-made | Artificial (type unknown) |
| Water area 1:25,000 | Ftype\_code | wb\_lake | Lake/dam | Unknown |
| wb\_lake\_salt | Salt lake | Salt works |
| Waterbody | Waterbody | Unknown |
| wb\_void | Waterbody void (island) | Unknown |
| flat\_sti | Area subject to inundation | Unknown |
| pondage | Pondage | Unknown |
| pondage\_saltpan | Salt pan / evaporator | Salt works |
| pondage\_sewage | Sewage filtration beds | Sewage treatment pond |
| wetland\_swamp | Swamp | Naturally occurring |
| wetland\_mangrove | Mangroves | Naturally occurring |
| watercourse\_area | Not described | Naturally occurring |
| watercourse\_area\_river | Watercourse area | Naturally occurring |
| watercourse\_area\_  channel | Large man-made channel | Unknown |
| watercourse\_area\_  drain | Large man-made drain | Unknown |
| Water area 1:25,000 | Wtr\_use\_fn | 1 | Water Supply | Farm dams or Dam/Storage |
| 2 | Flood Control | Unknown |
| 3 | Salt Evaporation | Salt works |
| 4 | Sewage | Sewage treatment ponds |
| 5 | Tailing Dam | Excavation pond |
| 6 | Cooling Ponds | Unknown |
| 7 | Drainage | Unknown |
| 8 | Irrigation | Farm dams or Dam/Storage |
| 9 | Recreation | Dam/Storage |
| Features of interest | Feature\_  subtype | Abandoned quarry | No description | Excavation pond |
| Landfill | No description | Excavation pond |
| Mine | No description | Excavation pond |
| Quarry | No description | Excavation pond |

Based on the examination of changes in wetland extent since European settlement and spatial overlay analysis of the four datasets in Step 5, each wetland was classified into one of the wetland origin categories, with a confidence rating assigned depending on whether the results provided consistent or conflicting classifications for each wetland (Table 15). Confidence ratings were also applied to wetlands analysed in steps 3-5 (Table 15).

The Dam/Storage features were subsequently classified into those that were less than or greater than eight hectares, to distinguish between farm dams and water storages over eight hectares.

Table . Wetland origin categories and confidence levels for wetlands analysed in steps 2-5 above.

| Wetland origin category | Confidence | Basis for classification |
| --- | --- | --- |
| Naturally occurring | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Area of the WETLAND\_1994 feature did not vary by more than 40% compared to the original WETLAND\_1788 feature  or  Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Spatial overlay analysis suggested the wetland was generally of this origin, although there were significant conflicting classification results between the four datasets in Table 14 |
| Aquaculture ponds | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Dam/Storage | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Dam/Storage | Moderate | Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Spatial overlay analysis suggested the wetland was generally of this origin, although there were significant conflicting classification results between the four datasets in Table 14 |
| Excavation ponds | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Spatial overlay analysis suggested the wetland was generally of this origin, although there were significant conflicting classification results between the four datasets in Table 14 |
| Salt works | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Sewage treatment ponds | High | Wetland classified as a sewage treatment pond in Wetland 1994  or  Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Spatial overlay analysis suggested the wetland was generally of this origin, although there were significant conflicting classification results between the four datasets in Table 14 |
| Stormwater treatment ponds | High | Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Spatial overlay analysis suggested the wetland was generally of this origin, although there were significant conflicting classification results between the four datasets in Table 14 |
| Artificial (type unknown) | High | Feature occurs in WETLAND\_1994 only (not in WETLAND\_1788), while the datasets in Table 14 did not provide a definitive origin  or  Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets in Table 14 |
| Moderate | Spatial overlay analysis suggested the wetland was generally of this origin with only minor conflicting classification results between the four datasets in Table 14 |
| Low | Area of the WETLAND\_1994 feature varied by more than 40% compared to the original WETLAND\_1788 feature, while other spatial overlay analysis did not provide a definitive classification of origin |
| Unknown | n/a | Wetland does not occur in WETLAND\_1994 or WETLAND\_1788  No wetland origin could be determined from the datasets in Table 14 or the wetland does not overlap with any of the datasets in Table 14 |

5.1.3 Wetland origin classification results

The wetland origin classification process identified that the majority of Victoria’s wetlands are naturally occurring and the most common type of human-made wetlands are dam/storages less than eight hectares in size (Table 16).

Table . Results of the wetland origin classification

| **Wetland system** | **Approximate percentage of wetlands** |
| --- | --- |
| Naturally occurring | 72 |
| Aquaculture ponds | <1 |
| Artificial (type unknown) | 4 |
| Dam/Storage <8ha | 22 |
| Dam/Storage =>8ha | 1 |
| Excavation ponds | <1 |
| Salt works | <1 |
| Sewage treatment ponds | 1 |
| Stormwater treatment ponds | <1 |
| Unknown | <1 |

5.2 Landform habitat attributes

The ANAE classification framework adopts the following landform categories for aquatic ecosystems (AETG 2012):

* high energy (upland, slope)
* low energy (upland–plateau, lowland)

AETG (2012) suggests that these categories are more applicable to riverine systems but may have application to describe lacustrine and palustrine systems as well.

The landform habitat attribute was not included in the Victorian classification framework. Palustrine and lacustrine wetlands are not high energy systems and their landform setting is better captured at the regional level through the wetland landscapes described in Section 3.1 which incorporate the regional influence of landform on wetland type, as well as other regional and landscape wetland drivers.

5.3 Soil attributes

For lacustrine and palustrine wetlands, the ANAE classification framework adopts the following soil categories (AETG 2012):

* Porous
  + Peat (organic)
  + Mineral (soil)
* Sand (non-soil)
  + Non-porous
  + Rock (non-soil)

For marine and estuarine systems, the following substrate categories are adopted:

* Unbroken rock
* Broken rock/Boulder/Cobble
* Pebble/Gravel
* Sand
* Silt

There are no suitable data at the individual wetland scale available to assign soil categories to wetlands in Victoria. Soil categories were not used in the Victorian classification framework.

5.4 Dominant wetland vegetation

Wetland vegetation is an important wetland characteristic and is fundamental to wetland function (Mitsch and Gosselink 2000). There is a detailed description of the wetland vegetation types that occur in Victoria. The Victorian wetland vegetation typology (DSE 2012) classifies wetland vegetation into 145 EVCs (Appendix 1). These are used in IWC assessments at individual wetlands (DSE 2005, DEPI 2013) and data is stored in the DELWP IWCDMS. However, the spatial distribution of these EVCs has not been comprehensively mapped. Moreover, there are too many categories in this typology to be useful in the classification of dominant vegetation. Therefore, it was decided to group wetland EVCs into larger categories analogous to the ANAE dominant vegetation categories.

5.4.1 Dominant vegetation classification categories

The ANAE classification framework (AETG 2012) adopts dominant vegetation categories for lacustrine and palustrine systems and structural macrobiota categories for marine and estuarine systems (Appendix 2), (Table 17).

Table . ANAE classification framework dominant vegetation and structural macrobiota categories (AETG 2012).

| Dominant vegetation categories  (lacustrine and palustrine systems) | Structural macrobiota vegetation categories  (marine and estuarine systems) |
| --- | --- |
| Forested  Shrub  Sedge/grass/forb  No emergent vegetation | Mangroves  Saltmarsh  Seagrass  Macroalgae |

Although some data are available for seagrass and macroalgae, these categories were not included in the classification as data were not available for all marine and estuarine wetlands. In addition, the data for seagrass that exist for some wetlands date from 1999 and seagrass is known to vary in distribution over relatively short time periods.

Benchmark descriptions have been developed for each of Victoria’s 145 wetland vegetation EVCs (DEPI 2013). A review of these descriptions resulted in the following changes being made to the ANAE classification framework categories.

* An additional category of moss/heath was included to account for vegetation of high country peatlands.
* The forested category was expanded to cover woodland as well.
* A coastal saltmarsh category was included to cover coastal saltmarsh and estuarine EVCs (Table 9). Some EVCs in Table 9 also occur in inland settings. These are classified as shrub or sedge/grass/forb for inland occurrences (Appendix 1).

The new Victorian Wetland Classification Framework adopts seven categories of dominant vegetation which are variously applicable to different wetland system categories, and an unknown category (Table 18).

Each wetland EVC was assigned to a dominant vegetation category in Table 18 (Appendix 1). EVCs in the Modelled 2005 EVCs (updated) dataset were also used in the analysis as, for the majority of wetlands, these was the only geospatial data on wetland vegetation available, even though there are inaccuracies related to the modelling process and scale of mapping. Those EVCs in the Modelled 2005 EVCs (updated) dataset which are not listed as wetland EVCs, were a assigned dominant vegetation category as outlined in Appendix 1.

It should be noted that palustrine wetlands may be assigned the dominant vegetation category of no emergent vegetation if this category covers the greatest proportion of the wetland but emergent vegetation covers at least 30% of the wetland.

Table . Dominant vegetation categories adopted for the Victorian wetland classification framework. Coastal saltmarsh includes both coastal saltmarsh and estuarine EVCs mapped by Boon et al. (2011) (Table 9).

| Dominant vegetation categories | Applicability to wetland system categories |
| --- | --- |
| Forest/woodland | Applicable for palustrine systems |
| Shrub | Applicable for palustrine systems |
| Sedge/grass/forb | Applicable for palustrine systems |
| Moss/heath | Applicable for palustrine systems |
| Mangrove | Applicable for marine or estuarine systems |
| Coastal saltmarsh | Applicable for marine or estuarine systems |
| No emergent vegetation | Applicable for lacustrine, palustrine, marine or estuarine systems |
| Unknown | Applicable to all wetland systems (applied where no dominant vegetation category could be determined) |

5.4.2 Assigning dominant vegetation categories

The classification of dominant wetland vegetation categories was applied to the WETLAND\_CURRENT dataset and a confidence category assigned. The process involved five steps which are described in further detail below.

Step 1. Assign dominant vegetation categories to lacustrine wetlands, high country peatlands, springs and soaks

By definition, >70% of the area of lacustrine wetlands has no vegetation or non-emergent vegetation (Section 4.3). Thus, lacustrine wetlands were assigned to the no emergent vegetation category . These wetlands were assigned a confidence level of high.

Wetland features in WETLAND\_CURRENT that were sourced from the ALPS dataset (Appendix 3) were categorised as moss/heath as they are likely to support this category of vegetation (Lawrence et al. 2009). However, Lawrence et al. (2009) state that, while *Sphagnum* species are present in of southeastern Australian high country peatlands, the dominant taxa are typically graminoid species in the Restionaceae and Cyperaceae and shrubs in the Epacridaceae and Myrtaceae families. More work is required to spatially define dominant vegetation categories for these wetlands more accurately.

For wetlands in the GB\_SS dataset, there was no information on the spatial distribution of EVCs present in the geospatial layer. All spring-soak wetlands were classed as moss/heath, although, based on the description of the EVCs present in these wetlands (Carr et al. 2006), other dominant vegetation categories are also present (Appendix 9). More work is required to spatially define dominant vegetation categories for these wetlands.

Wetlands in WETLAND\_CURRENT that were sourced from the GB\_SPR dataset (Appendix 3) were assigned as either forest/woodland, shrub or sedge/grass/forb dominant vegetation categories based on the broad vegetation type assigned during the original mapping and the information in Coates et al. (2010), (Appendix 9). These wetlands from the ALPS, GB\_SS and GB\_SPR datasets were assigned a confidence level of high as data were derived from recent mapping, although the confidence level for wetlands that were sourced from the GB\_SS dataset should be further reviewed.

Step 2. Assign dominant vegetation categories to wetlands covered by IWC assessments

This step of the analysis applied only to wetlands not covered in the first step. The EVCs recorded for individual wetlands in the IWCDMS are those recorded in on-ground IWC assessments. The IWCDMS records the wetland EVCs present (using the list of EVCs in Table A1.1, Appendix 1) and the proportion of the wetland occupied by each EVC.

For wetlands where EVC data is available in the IWCDMS, each EVC was assigned to one of the vegetation categories in Table 18 based on the information in Appendix 1. Note that for EVCs in Table 9 which may occur in either coastal or non-coastal settings (e.g. Brackish Lignum Swamp), the coastal saltmarsh dominant vegetation category was assigned to the EVC when the wetland was within 1 km of either the coastline or within a mapped estuary. Otherwise the non-coastal dominant vegetation category was assigned to the EVC. For each wetland, the proportions were summed for each dominant vegetation category and wetland was assigned to the dominant vegetation category that covered the greatest proportion of the wetland. These wetlands were assigned a confidence level of high.

Step 3. Independently determine the dominant vegetation for remaining wetlands from different data sources

This and step 4 of the analysis applied only to wetlands not covered in Steps 1 and 2.

Three different datasets were used to independently assign the dominant vegetation category to the remaining wetlands.

Firstly, the wetlands on WETLAND\_CURRENT that were intersected by the Victorian Saltmarsh Study (2010) dataset were identified. Areas within these wetlands were assigned to one of mangrove shrubland, coastal saltmarsh or unknown. For each wetland, the areas of each category were summed and the category that occupied the greatest proportion of the area was assigned to the wetland.

Secondly, wetlands on WETLAND\_CURRENT dataset with Corrick category or subcategory information were assigned vegetation categories as outlined in Table 19. The dominant vegetation category assigned to the wetland was that which occupied the greatest proportion of the area of the wetland. Islands within wetlands were excluded from the analysis.

Thirdly, the WETLAND\_CURRENT dataset was overlaid with the Modelled 2005 EVCs (updated) dataset and vegetation categories assigned to areas within wetlands as indicated in Appendix 1. A dominant vegetation class was only assigned for wetlands that had at least 30% of their area intersecting a known dominant vegetation category from the Modelled 2005 EVCs (updated) dataset. Wetlands with less than 30% intersect with EVCs were classed as unknown.

Table . Assignment of dominant vegetation categories to remaining wetland areas in WETLAND\_CURRENT using the WETLAND\_1994 dataset.

| Dominant vegetation category | Corrick category | Corrick subcategory |
| --- | --- | --- |
| Forest/Woodland | n/a | Melaleuca-dominated  Black Box-dominated  Red gum-dominated |
| Shrub | n/a | Lignum dominated  Shrub-dominated |
| Sedge/grass/forb | n/a | Herb-dominated  Sedge-dominated  Cane grass-dominated  Rush-dominated  Reed-dominated  Salt meadow (in non-coastal settings)  Salt flats  Sea rush |
| Moss/heath | n/a | n/a |
| No emergent vegetation | 20 - Sewage oxidation basin  21 - Salt evaporation basin | Open water  Dead timber  Deep  Hypersaline lake  Impoundment  Salt pan  Shallow  Intertidal flats |
| Mangrove | n/a | Mangroves |
| Coastal saltmarsh | n/a | Salt meadow (in coastal settings) |
| Unknown | n/a | No subcategory |

Step 4. Compare the results obtained in Step 3 and assign the dominant vegetation category and level of confidence to the wetlands covered in Step 3

The results from the three datasets used in Step 3 were compared and final dominant vegetation category was assigned along with data confidence levels based on the consistency of the results and the reliability of the datasets (Table 20).

The coastal saltmarsh dataset is considered to have a high degree of reliability because it is based on recent detailed mapping. The Corrick categories and subcategories are considered moderately reliable. They were mapped as part of a detailed investigation but vegetation distribution may have changed since this mapping occurred. Vegetation information from the Modelled 2005 EVC spatial dataset is considered the least reliable as it is based on modelled information and is at a scale which is generally too small to accurately define EVCs in wetlands. Thus, the results from the saltmarsh mapping were given precedence over those of WETLAND\_1994 and those from WETLAND\_1994 were given precedence over the results from the Modelled 2005 EVCs (updated) dataset.

Table . Rules to assign vegetation categories to remaining wetland areas in WETLAND\_CURRENT.

| Dominant vegetation category | Confidence | Dominant vegetation category in input dataset | | | | Approximate percentage of wetlands |
| --- | --- | --- | --- | --- | --- | --- |
| Coastal saltmarsh mapping | | Corrick classification | Modelled 2005 EVCs (updated) |
| Forest/ woodland | High | Not applicable | | Forest/woodland | Forest/woodland | 2 |
| Moderate | Forest/woodland | Unknown | <1 |
| Low | Unknown | Forest/woodland | 13 |
| Shrub | High | Not applicable | | Shrub | Shrub | <1 |
| Moderate | Shrub | Unknown | <1 |
| Low | Unknown | Shrub | 2 |
| Sedge/ grass/ forb | High | Not applicable | | Sedge/grass/forb | Sedge/grass/forb | 3 |
| Moderate | Sedge/grass/forb | Unknown | 8 |
| Low | Unknown | Sedge/grass/forb | 2 |
| Moss/heath | Low | Not applicable | | Not applicable | Moss/heath | 3 |
| No emergent vegetation | High | Unknown | | No emergent vegetation | No emergent vegetation | <1 |
| Moderate | Unknown | | No emergent vegetation | Unknown | 11 |
| Low | Unknown | | Unknown | No emergent vegetation | <1 |
| Mangrove | High | Mangrove | | Any category | Any category | 1 |
| Coastal saltmarsh | High | Coastal saltmarsh | | Any category | Any category | 2 |
| Moderate | Unknown | | Coastal saltmarsh | Coastal saltmarsh or Unknown | <1 |
| Low | Unknown | | Unknown | Coastal saltmarsh | <1 |
| Unknown | Not applicable | Unknown | | Unknown | Unknown | 17 |
| Unknown | Any two conflicting categories (not including unknown) | | | 35 |

Step 5. Ensure consistency with wetland system classification

At the completion of Steps 1 to 4 there were less than 10 wetlands where the dominant vegetation classification was inconsistent with the wetland system classification (Table 18). These wetlands were manually reviewed and the dominant vegetation corrected.

5.4.3 Dominant vegetation classification results

The dominant vegetation classification process identified that the majority of Victoria’s wetlands with known vegetation category are sedge/grass/forb, with forest/woodland the second most common category (Table 21). Dominant vegetation was unable to be determined for a third of wetlands.

Table . Results of the dominant vegetation classification.

| Wetland system | Approximate percentage of wetlands |
| --- | --- |
| Forest/woodland | 17 |
| Shrub | 3 |
| Sedge/grass/forb | 22 |
| Moss/heath | 9 |
| Coastal saltmarsh | 1 |
| Mangrove | <1 |
| No emergent vegetation | 13 |
| Unknown | 34 |

5.5 Water regime

Wetland water regime is likely to be the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes (Mitsch and Gosselink 2000, DSE 2005). A wetland’s hydrology both modifies and determines wetland characteristics (such as soil and biota) and, in turn, is affected by these characteristics (i.e. through a build-up of materials which leads to a change in wetland morphology) (Breen 1989, Mitsch and Gosselink 2000).

Wetland hydrology influences the chemical and physical aspects of the wetland, which affect the biotic components. Hydrology affects the oxygen concentration in the soil, redox potential and availability of nutrients and toxicants (McKnight et al. 1981). Drying affects the rate of organic matter breakdown and alters the chemical composition of organic matter (Boon 2006). Longer flooding periods will lead to the development of hydric soil properties and an accumulation of organic material (Tiner 1993). Depth influences the duration of flooding, light attenuation and wetland vegetation types.

5.5.1 Water regime classification categories

The ANAE classification system adopts two sets of alternative water regime categories for lacustrine and palustrine aquatic ecosystems but does not propose a water regime category for marine or estuarine aquatic ecosystems (Appendix 2).

The Victorian wetland inventory includes marine and estuarine as well as lacustrine and palustrine wetland systems. Therefore, water regime categories were designed to cover the full range of wetland system types. For lacustrine and palustrine wetlands the categorisation related to the level of permanency. For non-permanent (periodically inundated) lacustrine and palustrine wetlands, subcategories were defined (Table 22). These categories were the same as those adopted previously in a study by Cant et al. (2012). Estuarine and marine wetlands in Victoria were categorised by tidal regime (Table 22).

Table . Water regime categories adopted in the Victorian wetland classification framework.

| Wetland system | Water regime category | Category description | Water regime subcategory | | Subcategory description | |
| --- | --- | --- | --- | --- | --- | --- |
| Frequency of inundation | Duration of inundation |
| Lacustrine and palustrine | Permanent | Inundated constantly, rarely drying completely | - | | Constant, annual or less frequently but before usually wetland dries. | Never dries or dries rarely (i.e. holds water at least 8 years in every 10), but levels may fluctuate within or between years. |
| Periodically inundated | Inundated annually to infrequently, holding water for at least 1 month to more than 1 year before drying | Seasonal | | Annual or near annual inundation (i.e. holds water at least 8 years in every 10) | Holds water 1-8 months, then dries |
| Intermittent | | Infrequent – holds water, on average, 3-<8 years in every 10 | Holds water > 1 month to > 1 year, then dries |
| Episodic | | Infrequent – holds water, on average, less than 3 years in every 10 | Holds water > 1 month to >1 year, then dries |
| Unknown | Water regime category unable to be determined | | | | |
| Marine and estuarine | Intertidal | Inundated twice daily, with inundation lasting hours | - | - | | - |
| Supratidal | Inundated several times per year, with inundation lasting hours | - | - | | - |
| Unknown | Water regime category unable to be determined | | | | |

5.5.2 Assigning water regime categories

Assigning water regime categories to coastal wetlands through desktop interpretation

The classification of water regime for coastal wetlands was undertaken during the manual desktop assessment of coastal wetlands (Section 4.2). Marine wetlands were classed as intertidal. Information on the water regime preferences of wetland EVCs is held in an unpublished DELWP database. This information was used, in addition to the other data sources described in Section 4.2 to assign coastal estuarine, lacustrine or palustrine wetlands to water regime categories. Estuarine wetlands were classed as intertidal or supratidal. Coastal lacustrine and palustrine wetlands were assigned to one of the relevant categories or subcategories in Table 22.

Three hundred and seventy two coastal wetlands were assigned a water regime through the manual desktop assessment (Appendix 7). Approximately 33% of those classified through the manual desktop assessment were assigned as intertidal, 9% as periodically inundated, 5% as permanent and 53% as supratidal (Table A7.2, Appendix 7). These wetlands were all assigned a high level of confidence for the water regime classification.

Assigning categories and subcategories to non-coastal wetlands

Wetlands that were not classified through the manual assessment of coastal wetlands were assigned a water regime category through a separate process.

All wetlands in the WETLAND\_CURRENT dataset that were derived from the ALPS geospatial layer (Appendix 3) were classed as having a permanent water regime category. This dataset was considered to have a high degree of reliability based on the description in Lawrence et al. (2009). The level of confidence was assigned as high.

For remaining wetlands, the water regime classification was derived from analysis of Geoscience Australia’s *Water Observations From Space (WOFS)* dataset, the wetland system category (Section 4.2) and area of the wetland.

The WFOS dataset is a satellite imagery product , derived from Landsat images over the period 1987 to the present time that depicts observed surface water across Australia (<http://www.ga.gov.au/scientific-topics/hazards/flood/wofs>)). The Landsat images were taken approximately once every 16 days. Water presence is calculated for every available Landsat observation in the archive of Landsat images.

For this project, only data over the period 2000 to 2013 were available. The dataset supplied by Geoscience Australia data contained a field providing the percentage of clear observations in which water was detected in each 25 metre by 25 metre grid cell in Victoria over this period. The period 2000-2013 included the last ten years of the 1997-2009 Millennium drought when rainfall in south-eastern Australia was 12.4% below the twentieth century mean for the years 1997-2009 inclusive (CSIRO 2011). This drought was followed by floods in 2010/11 in which south-eastern Australia recorded its fourth highest annual rainfall (CSIRO 2011).

The distribution of WFOS percentage detection within each wetland was examined through spatial analysis. For each wetland this provided statistics on the minimum, maximum, mean and standard deviation of percentage detection for the group of cells that intersected the wetland. Water does not need to cover the full extent of a wetland for the wetland to be classed as holding water using the category definitions in Table 22. It need only be present. Therefore, a single arbitrary figure that represents the water frequency at each wetland was adopted equal to the mean value plus two times the standard deviation (µ + 2σ ) of the WFOS percentage detection data.

This WFOS data was used to assign the water regime using the rules outlined in Table 23. It was assumed that lacustrine wetlands were not seasonally inundated and these were assigned only to the permanent, periodically inundated – intermittent or periodically inundated – episodic categories. However, it was assumed that palustrine wetlands could possibly be seasonal. Based on the water regime category definitions in Table 22, seasonal wetlands may hold water from between approximately 67% of the time (if they hold water for eight months in every year) to 7% of the time (if they hold water for only one month in eight years out of ten). It was assumed that palustrine wetlands that held water 30 – <67% of the time were either seasonal or intermittent, while those that held water 7 – <30% of the time were assumed to be either seasonal or episodic.

If a wetland on WETLAND\_CURRENT covered an area greater than nine 25 X 25 metre grid cells (0.5625 hectares) and water was not detected in a clear Landsat image during the 14 years of WOFS data, it was assumed that water was present at a very low frequency and the episodic category was assigned, although it is possible that the non-detection of water may have been due to vegetation cover. However, if the wetland was <= 0.5625 hectares, it was assumed that water was present at an unknown frequency but it the wetland was too small or too thickly covered with emergent vegetation for water to have been detected and it was classed as periodically inundated – unknown.

A number of wetlands were located beyond the extent of the WFOS dataset and were therefore assigned an unknown water regime.

Table . Rules used to assign water regime based on WFOS values, Corrick classification, wetland system and wetland size. Corrick category 20 is sewage pond (Table 1). It was assumed that lacustrine wetlands

| Wetland system | WOFS value  (µ + 2σ) | Area  (Ha) | Regime | Confidence |
| --- | --- | --- | --- | --- |
| Lacustrine | ≥ 80 | any | Permanent | Moderate |
| 30 – 80 | any | Periodically inundated - Intermittent | Moderate |
| 0 - <30 | any | Periodically inundated - Episodic | Moderate |
| Palustrine or  Palustrine or Lacustrine (unknown specifics) | ≥ 80 | any | Permanent | Moderate |
| 67 – 80 | any | Periodically inundated - Intermittent | Moderate |
| 30 – <67 | any | Periodically inundated - Seasonal or Intermittent | Moderate |
| 7 – <30 | any | Periodically inundated - Seasonal or Episodic | Moderate |
| >0 – 7 | any | Periodically inundated - Episodic | Moderate |
| 0 | > 0.5625 | Periodically inundated - Episodic | Moderate |
| 0 | ≤ 0.5625 | Periodically inundated - Unknown | Moderate |

5.5.3 Water regime classification results

The water regime classification identified that the majority of Victoria’s wetlands with a known water regime category are periodically inundated , most of these being in the episodic subcategory (Table 24). This is likely to reflect the significant number of dry years in the 2000-2013 period covered by the WOFS dataset which was used to calculate the water regime for all non-tidal wetlands except those mapped in the ALPS dataset.

Table . Results of the water regime classification

| Water regime | Approximate percentage of wetlands |
| --- | --- |
| Permanent | 14 |
| Periodically Inundated - Intermittent | 4 |
| Periodically Inundated - Episodic | 52 |
| Periodically Inundated - Seasonal Or Intermittent | 5 |
| Periodically Inundated - Seasonal Or Episodic | 11 |
| Periodically Inundated - Unknown | 12 |
| Supratidal | 1 |
| Intertidal | <1 |
| Unknown | 2 |

5.6 Water source

Knowledge of the source (or sources) of water for a wetland is important for managing wetlands. It indicates which wetlands could be affected by decisions and activities to allocate and manage water such as river regulation, groundwater licensing, storage management and environmental watering.

5.6.1 Classification categories

For lacustrine and palustrine aquatic ecosystems in the surface waters class, the ANAE classification system includes a dominant water source attribute with the following categories (Appendix 2):

* surface water;
* groundwater;
* both surface and groundwater (where there is temporal dominance by one or the other); and
* localised rainfall.

For estuarine and marine aquatic ecosystems, there are no relevant water source attributes.

An individual wetland may have more than one water source. In Victoria, data are not available for the majority of wetlands to identify the relative volumetric contribution of each water source. Rather than assign a dominant water source in accordance with the ANAE classification framework, the Victorian wetland classification framework adopted a separate attribute for surface, groundwater and artificial water sources. An attribute was not adopted for localised rainfall and runoff (Table 25) as it was assumed that all wetlands have some input from localised rainfall and runoff. The categories for each water resource attribute relate to the probability of that water source occurring (Table 25). This allows a user to understand the likely presence of each water source, but does not attempt to assign a single dominant water source to an individual wetland.

The river water source attribute is used to identify those wetlands which receive inflows from in-channel or overbank river flows. The groundwater water source is used for wetlands which have a surface expression of groundwater. The tidal water source attribute applies to marine and estuarine systems. The artificial water source is included to allow identification of wetlands which receive inflows from managed delivery of water.

Table . Water source attributes and categories used in the Victorian wetland classification framework.

| Water source attribute | Attribute description | Attribute categories |
| --- | --- | --- |
| Groundwater | Wetlands which have a surface expression of groundwater | Very high (probability of groundwater inflows)  High (probability of groundwater inflows)  Moderate (probability of groundwater inflows)  Low (probability of groundwater inflows)  Unknown |
| River | Wetlands that receive water from in-channel or overbank river flows | Very high (probability of river inflows)  High (probability of river inflows)  Moderate (probability of river inflows)  Low (probability of river inflows)  Very low (probability of river inflows)  Unknown |
| Tidal | Wetlands which are inundated by regular or spring tides | Intertidal  Supratidal  Non-tidal |
| Artificial | Wetlands which receive an artificial water source e.g. direct discharges from agriculture or industry, sewage and wastewater discharges, urban run-off that is directed to the wetland, environmental, recreational or consumptive water that is pumped into the wetland or supplied through channels and regulating structures | Artificial  Not artificial  Unknown |

The approach utilised multiple lines of evidence and classified the likelihood for each water source independently of other water sources. The method is outlined below for each water source.

5.6.2 Assigning groundwater source categories

All wetlands On WETLAND\_CURRENT that were sourced from the ALPS, GB\_SPR and GB\_SS geospatial layers (Table 3) were classified as having a very high probability of receiving groundwater inflows, with a high level of confidence based on information in Lawrence et al. (2009), Coates et al. (2010) and Carr (2006).

The groundwater classification for remaining wetlands was based on the National Atlas of Groundwater Dependent Ecosystems (GDE Atlas), recently released by the Australian Government (Appendix 3). The GDE Atlas is a spatial database that describes the likelihood that a mapped wetland interacts with groundwater. The database also provides an estimate of the relative contribution of groundwater versus surface water at each mapped wetland.

The wetland polygons in the GDE Atlas were derived from WETLAND\_1994. WETLAND\_CURRENT includes additional wetland polygons for which no information is provided in the GDE Atlas. For these, the groundwater category of unknown was assigned and the level of confidence was not applicable. For some wetlands in WETLAND\_CURRENT, the mapped extent has changed from that depicted in WETLAND\_1994, based on the input datasets (Table 3). For these wetlands, the wetland was assigned the same groundwater classification and confidence rating as that assigned to the feature in the GDE Atlas.

The information in the GDE Atlas was applied to WETLAND\_CURRENT by using spatial overlay analysis to extract the GDE Atlas information for each corresponding WETLAND\_CURRENT wetland. Only the GDE Atlas features described as ecosystems that rely upon the surface expression of groundwater were used in the spatial overlay analysis. The descriptions used in the GDE Atlas were translated to describe the probability that a wetland mapped on WETLAND\_CURRENT receives groundwater and separately describe the confidence in this assessment (Table 26).

Table . Assignment of probability and confidence categories for the groundwater water source attribute for wetlands not sourced from the ALPS, GB\_SPR and GB\_SS geospatial layers based on the GDE Atlas descriptions.

| GDE Atlas terminology | WETLAND\_CURRENT groundwater categories  (probability of groundwater inflows) | WETLAND\_CURRENT groundwater confidence |
| --- | --- | --- |
| Identified in previous study: desktop  Identified in previous study: fieldwork | Very high | High |
| High potential for GW interaction | High | Moderate |
| Moderate potential for GW interaction | Moderate | Moderate |
| Low potential for GW interaction | Low | Moderate |
| No data available to infer probability of groundwater inflows (wetland not mapped in the GDE Atlas) | Unknown | n/a |

5.6.3 Assigning river water source categories

The wetland landscapes dataset (Section 3.1) identifies the following wetland landscapes as floodplains: Riverine mid-Murray (12), Riverine – Mallee (13) and Lowland Riparian Floodplain (15), (Table 7, Figure 8). These wetland landscapes are based on the regularly wetted areas of major river floodplains and were combined to form a floodplain extent layer. However, estuaries, wetlands on coastal floodplains and in less frequently flooded inland floodplains also receive river inflows, albeit less often. For this reason, additional datasets were used to derive probability categories for the river water source attribute. The river water source categorisation was based on spatial overlay analysis of WETLAND\_CURRENT with the following five independent data sources. All datasets, except floodplain extent, are described in Appendix 3.

1. Watercourse network 1:250,000 to 1:5,000,000;
2. floodplain extent (wetland landscapes 12, 13 and 15);
3. 1 in 100 year flood extent;
4. Floodway; and
5. Watercourse network 1:25,000.

Major rivers on the watercourse network 1:250,000 to 1 :5,000,000 layer, were distinguished from minor watercourses (minor rivers, streams and other watercourses) which are identified on the watercourse network 1:25,000 layer.

Spatial overlay analysis was used to determine if each wetland intersected each of the five datasets. Wetlands intersecting a major river were assigned a very high probability of receiving river flows, while those on a minor watercourse were assumed not to receive significant river inflows. Based on this logic each wetland was assigned a probability category for the river water source attribute (Table 27).

Some wetlands in the Mallee CMA were omitted from the analysis as updated wetland mapping from the CMA was received after this analysis had been undertaken. Wetlands in the updated dataset which did not match previously recorded wetlands were assigned to the unknown category.

In addition to classifying the like probability of riverine flows, a description of the relative confidence in the classification was provided based on the alignment or conflicts between the five independent data sources. Wetlands that had a high degree of alignment for this attribute were assign high confidence, while those that had conflicting information from the various data sources were assigned low or moderate confidence, depending on the degree of alignment.

Table . Assignment of probability categories for the river water source attribute.

| Wetland 2013 river classification | | Basis for classification |
| --- | --- | --- |
| Very high (probability of river inflows) | The wetland intersects the Watercourse network 1:250,000 to 1:5,000,000 layer, i.e. a major river runs through the wetland itself  The wetland intersects the Floodplain extent, Floodway and 1 in 100 year flood extent layers, i.e. the wetland is always mapped as within an inundation area | |
| High (probability of river inflows) | The wetland intersects the Floodplain extent, and either Floodway or 1 in 100 year flood extent layers, i.e. the wetland is often mapped as within an inundation area  The wetland intersects the Floodway and 1 in 100 year flood extent layers, but not the Floodplain extent layer, i.e. the wetland is often mapped as within an inundation area | |
| Moderate (probability of river inflows) | The wetland intersects the Floodplain extent layer, but not the Floodway or 1 in 100 year flood extent layers, i.e. predicted floodplain but outside existing inundation mapping | |
| Low (probability of river inflows) | The wetland intersects only the Floodway layer or the 1 in 100 year flood extent layer and does not intersect the Floodplain extent layer, i.e. the wetland is rarely mapped as within an inundation area  The wetland intersects only the Watercourse network 1:25,000 layer but not any other layer, i.e. the wetland is outside of mapped inundation area and only intersects a very minor waterway, which is probably too small to provide significant riverine flows | |
| Very low (probability of river inflows) | The wetland does not intersect any of the riverine inundation layers, i.e. the wetland is outside of mapped inundation or riverine area | |

5.6.4 Assigning tidal water source categories

The wetland system and water regime attribute was used to assign wetlands to the appropriate tidal water source attribute (see Sections 4.2 and 5.5.2).

5.6.5 Assigning artificial water source categories

Artificial inflows are those that are purposely directed to a wetland for a specific reason. For the purposes of this classification, inundation of floodplain wetlands incidentally related to river regulation or to the maintenance of weir pool levels is not classed as artificial. The following types of wetlands are likely to receive at least some of their inflows from artificially provided flows:

* instream storages where inflows are manipulated to increase storage volumes by release of water from upstream storages;
* water storages to which water is actively directed through channels;
* stormwater wetlands;
* sewage treatment ponds;
* wetlands to which industrial or agricultural effluent is directed;
* salt works;
* wetlands to which environmental water is or has been be directed;
* salinity disposal basins;
* aquaculture ponds; and
* wetlands to which water is directed for recreational purposes.

The artificial water source category is not necessarily related to the wetland origin category (see Section 5.1.1). Wetlands of natural origin may be managed by artificially supplementing natural flows. For example, Kow Swamp, a naturally occurring wetland in northern Victoria, is used as a water storage by artificially diverting flows into the wetland from the Murray River. Environmental water is artificially pumped to the naturally occurring Hattah Lakes from the Murray River on occasions to enable the lakes to be inundated at river levels below the threshold required for natural flooding, while releases of environmental water from upstream storages are used to artificially inundate wetlands such as Barmah Forest. Conversely, artificial wetlands such as farm dams generally receive water from natural surface runoff, while headwater water storages such as Dartmouth Dam receive only natural river inflows.

The wetlands receiving artificial inflows may also derive water from natural sources. Information is not available to determine if the artificial water source, where present, is dominant over inflows derived from natural water sources. The categories were selected to identify whether or not the wetland received at least some artificial inflows or whether the presence of artificial inflows was unknown (Table 28). An additional attribute was included to identify the level of confidence with which the category is likely to occur.

Table . Description of artificial water source categories.

| WETLAND\_CURRENT artificial water source category | Description |
| --- | --- |
| Artificial | Wetlands where at least some of the inflows are artificially directed to the wetland for a specific purpose. |
| Not artificial | Wetlands where all water inflows are of natural origin or are an indirect result of river regulation. |
| Unknown | Wetlands for which there is no information on whether the water source is artificial or not |

The assignment of the artificial water source category to wetlands in WETLAND\_CURRENT was undertaken in two steps. In the first step, the category and level of confidence was assigned from a single data source with no comparison of results from other data sources. In the second step, the category and level of confidence was assigned to the remaining wetlands based on a comparison of results from three independent data sources.

Step 1. Assign category based on a single data source

Wetland features in WETLAND\_CURRENT that were sourced from the ALPS, GB\_SPR or GB\_SS geospatial layers (see Section 1.3) were assigned the category not artificial with a high level of confidence as these wetlands are known to have a natural water source (Lawrence et al. 2009 , Coates et al. 2010 and Carr et al. 2006).

In addition, a list of specific wetlands that are known to have an artificial water source was compiled based on the information sources outlined in Appendix 8. These wetlands were assigned to the artificial category with a high level of confidence, although, as discussed in Appendix 8, wetlands that were identified as having received environmental water may not necessarily receive it in the future.

Step 2. Assign category based on the results from three independent data sources

For the remaining wetlands, the artificial water source classification was based on spatial overlay analysis and comparison of results from the following three independent data sources (described in Appendix 3):

* All Victorian Dam Boundaries;
* DRWaterbodies; and
* Water area 1:25,000.

These datasets provide some attributes that assist in identifying the wetland water source (Table 29). The table also indicates the type of features that were likely or unlikely to receive water artificially.

Table . Independent data sources used to assign artificial water source categories in Step 2.

| Dataset name | Relevant attribute | Feature type | Description/examples | Likely supply of water |
| --- | --- | --- | --- | --- |
| All Victorian Dam Boundaries  All Victorian Dam Boundaries | Feature\_type  Feature\_type | Aquaculture area | e.g. fish hatcheries | Artificial |
| Industrial storage | Dams intersecting industrial or mining land uses | Artificial |
| Rural irrigation storage | Dams intersecting irrigated land uses | Artificial |
| Settling ponds | Ponds used for water treatment | Artificial |
| Town rural storage | Named storages and storages > 250ML | Artificial |
| Waste water | Not described | Artificial |
| Flood irrigation storage | Dams used to harvest stormwater runoff | Not artificial |
| Rural licensed storage | Dams that are likely to be linked to licences | Not artificial |
| Rural storage | Likely to be stock and domestic dams | Not artificial |
| DRWater-bodies | Desc | Bio-retention system | No description | Artificial |
| Sediment trap | No description | Artificial |
| Natural body of water | No description | Not artificial |
| Wetlands | No description | Not artificial |
| Water area 1:25,000 | Wtr\_use\_fn | 1 | Water Supply | Unknown |
| 2 | Flood Control | Artificial |
| 3 | Salt Evaporation | Artificial |
| 4 | Sewage | Artificial |
| 5 | Tailing Dam | Artificial |
| 6 | Cooling Ponds | Artificial |
| 7 | Drainage | Unknown |
| 8 | Irrigation | Artificial |
| 9 | Recreation | Artificial |

Spatial overlay analysis was used to determine the percentage of each wetland that intersected each of the three datasets. Using this information, the features in each dataset were classified as either receiving artificial water or not depending on whether the percentage of the wetland intersected was insignificant (less than five percent). The level of five percent was arbitrarily chosen.

Based on this logic, each wetland was classified as either receiving water from artificial or not artificial sources as follows.

* Wetlands where 5% or more of the wetland overlapping with artificial water supply features in one or more of the three datasets were classified as artificial.
* Wetlands with less than 5% of the wetland overlapping with artificial water supply features in each of the three datasets were classified as not artificial.

Where no data was available to support this classification, the wetland was classified as unknown.

Wetlands that intersect a larger area of an artificially-supplied feature on one of the three datasets were considered to have a higher probability of actually receiving artificial deliveries. Conversely, wetlands where the percentage overlap was insignificant for each of the three datasets, are more likely to be not artificial. The level of confidence in the artificial classification (Table 30) was based on percentage of the wetland intersected by artificial features in the three datasets

Table . Confidence levels for artificial water source categories assigned in Step 2.

| WETLAND\_CURRENT artificial confidence | Category | Basis for classification |
| --- | --- | --- |
| High | Artificial | More than 50% of the wetland overlaps with artificial water supply features in one or more of the three datasets, i.e. the majority of the wetland is mapped as a type of feature that receives artificial water supplies |
| Moderate | Artificial | Between 20-49% of the wetland overlaps with artificial water supply features in one or more of the three datasets, i.e. much of wetland is mapped as a type of feature that receives artificial water supplies |
| No artificial | Less than 5% of the wetland overlaps with artificial water supply features in each of the three datasets, i.e. none or an insignificant amount of the wetland is mapped as a type of feature that receives artificial water supplies |
| Low | Artificial | Between 5-19% of the wetland overlaps with artificial water supply features in one or more of the three datasets, i.e. some of wetland is mapped as a type of feature that receives artificial water supplies |

5.6.5 Water source classification results

The water source classification process identified that a similar frequency of wetlands receiving groundwater and riverine water supplies across Victoria (Table 31).

Table . Results of the water source classification showing approximate percentage of wetlands with different water sources with varying degrees of probability for groundwater and river water sources.

|  | Approximate percentage of wetlands | | | |
| --- | --- | --- | --- | --- |
| Classification | Groundwater | River | Tidal | Artificial |
| Very high probability | 18 | 17 |  |  |
| High probability | 8 | 5 |  |  |
| Moderate probability | 15 | 3 |  |  |
| Low probability | 10 | 27 |  |  |
| Very low probability |  | 49 |  |  |
| Intertidal |  |  | <1 |  |
| Supratidal |  |  | <1 |  |
| Non-tidal |  |  | 99 |  |
| Artificial |  |  |  | 6 |
| Not artificial |  |  |  | 82 |
| Unknown | 49 | <1 |  | 12 |

5.7 Salinity regime

Salinity concentrations have a strong effect on wetland biota (invertebrates, fish, amphibians, waterbirds and plants). Thresholds of salinity tolerance have been observed for many organisms in Victoria (e.g. Clunie et al. 2002, James et al. 2003, Smith et al. 2009). Generally the number of aquatic wetland fauna species decreases abruptly above 3,000 mg/L and continues to decline with increasing salinity. Hypersaline wetlands can have unique zooplankton and phytoplankton communities (Marchant and Williams 1977, Radke et al. 2003, Cant et al. 2010).

Similarly, aquatic plants more commonly associated with freshwater habitats tend to be absent when salinities exceed 4,000 mg/L (James et al. 2003), although some species are absent at considerably lower salinities (Brock 1981, Brock and Shiel 1983, Brock and Lane 1983, James et al. 2003). Once salinities reach 10,000 mg/L only halophytic species such as *Ruppia* spp. and *Lepilaena* spp. will be present (Brock and Lane 1983). Sim et al. (2006) found that the survival of adult plants of three *Ruppia* spp.in Western Australia declined markedly at salinities above 45,000 mg/L.

Based on the examination of a range of wetland datasets, Davis et al. (2003) proposed the following interim salinity categories:

* Fresh - <1,000 mg/L
* Hyposaline - 1,000 – 10,000 mg/L
* Saline - 10,000 – 100,000 mg/L
* Hypersaline - >100,000 mg/L.

The salinity concentration of a wetland may change significantly as the wetland fills and dries. For the purpose of the framework, the salinity category assigned is that which characterises the wetland when it is greater than 75% full.

5.7.1 Classification categories

The ANAE classification system adopts two sets of alternative water type categories for lacustrine and palustrine aquatic ecosystems (salinity or pH) but does not propose any water type category for marine or estuarine aquatic ecosystems (Appendix 2). There is almost no data available to assign pH categories to wetlands in Victoria and this attribute is not used in the Victorian wetland classification framework. However, data exists to assign the majority of Victoria’s wetlands to salinity categories.

The Victorian wetland inventory includes marine and estuarine as well as lacustrine and palustrine systems. Therefore, salinity categories were designed to cover the full range of wetland system types.

Categories adopted for the Victorian wetland classification framework consider the effects of salinity on wetland biodiversity, the commonly accepted salinity thresholds and the concentration at which salt becomes saturated in solution as outlined below.

* Plankton species composition changes between 1,000 mg/L to 2,000 mg/L.
* 3,000 mg/L is widely recognised as the upper limit for fresh and the lower limit for saline waters (e.g. Nielsen et al. 2003).
* 10,000 mg/L is a recognised threshold for effects of salinity on some aquatic biota in Australia (Brock and Lane 1983, Brock et al. 2003).
* Above 10,000 mg/L only halophytic plant species are present (Smith et al. 2009).
* There is a marked decline in *Ruppia* spp. at salinities above 45,000 mg/L (Sim et al. 2006).
* There is little change in aquatic species richness above 50,000 mg/L (Kalff 2002).
* Salt becomes saturated in solution above 350,000 mg/L.

Research on the effects of salinity on biota supports the use of different thresholds for the salinity attribute than those used in the ANAE classification framework which recognises three salinity categories (fresh: <3000 mg/L, brackish: 3000 – 5000 mg/L and saline: > 5000 mg/L) or in the Corrick classification system. The Corrick classification system recognises three salinity categories: fresh, saline and hypersaline (Table 1). Saline wetlands exceed 3000 mg/L throughout the year but no threshold is provided for the hypersaline lake subcategory (Corrick and Norman 1980, Corrick 1981, 1982). The salinity categories in Table 32 have been adopted for the framework. A category of saline has been included for saline wetlands where a more specific saline category cannot be reliably identified.

Table . Salinity categories for the Victorian wetland classification framework.

| Salinity regime category | Lower salinity (mg/L) | Upper salinity (mg/L) |
| --- | --- | --- |
| Fresh | 0 | 3,000 |
| Hyposaline | 3,000 | 10,000 |
| Mesosaline | 10,000 | 50,000 |
| Hypersaline | 50,000 | 350,000 |
| Saline | 3,000 | 350,000 |
| Unknown | - | - |

5.7.2 Assigning categories

The assignment of wetlands to the salinity regime categories in Table 32 proceeded in four steps.

Step 1. Assign category based on manual desktop assessment or a single data source

Three hundred and seventy two coastal wetlands were assigned a salinity regime category through the manual desktop assessment described in Section 4.2 (Appendix 7). Salinity categories were assigned based on Information on the preferred salinity regimes of EVCs held in a DELWP database (Appendix 6).

For each wetland, the salinity category or categories for the EVCs in the wetland were compared and a salinity category assigned to the wetland. If the wetland EVCs had the same preferences, one of the first four categories in Table 32 was assigned. In some wetlands, saltmarsh EVCs which have a preferred salinity category of hyposaline occurred in conjunction with EVCs that had a preferred salinity regime of fresh. If the latter covered most of the wetland, the fresh category was assigned, otherwise hyposaline category was assigned. If the EVCs were different but all fell into the broad saline category, the saline category was assigned.

Approximately 2% of those classified through the manual desktop assessment were fresh, <1% were hypersaline, 3% were hyposaline and 35% were mesosaline (Table A7.2, Appendix 7). Fifty nine percent of wetlands were saline but the subcategory could not be determined.

All marine wetlands were assigned a salinity regime category of mesosaline based on the salinity levels of seawater of around 35,000 mg/L. These wetlands were all assigned a high level of confidence in their salinity regime classification.

In addition, all wetlands in the WETLAND\_CURRENT dataset that were derived from the ALPS, GB\_SPR and GB\_SS geospatial layers (Appendix 3) were classed as fresh.

All wetlands classified through Step 1 were assigned a high confidence level and excluded from further analysis.

Step 2. Assign category for remaining wetlands based on the results from independent data sources

The classification of remaining wetlands used multiple lines of evidence to classify the most likely salinity regime category, based on the following three relatively independent datasets (Appendix 3):

1. IWC Data Management System;
2. Corrick category and subcategory in WETLAND\_1994; and
3. ESTUARIES.

The salinity regimes assigned to EVCs in Appendix 6 were used to assign salinity categories to wetlands where IWC assessments had been undertaken using the IWC using data derived from the IWCDMS. This was done by comparing the salinity category or categories for the EVCs in the wetland using expert judgement. If the wetland EVCs had the same preferences, one of the first four categories in Table 32 was assigned. If the EVCs were different but all fell into the broad saline category, the saline category was assigned. Otherwise the salinity regime was classed as unknown.

For wetlands with Corrick category and/or subcategory information, wetlands were classified into one of three salinity regime categories (fresh, saline or hypersaline, based on the rules outlined in Table 33. If a wetland did not have a Corrick category assigned it was classified as unknown for this information source.

Wetlands in WETLAND\_CURRENT that intersected with estuaries were classified as saline. There was insufficient information to classify them into the hyposaline, mesosaline or hypersaline categories. Those that did not intersect with estuaries were classed as unknown for this information source.

Table . Assignment of salinity regime based on Corrick category and subcategory (Table 1).

| **Salinity regime** | **Corrick category / subcategory** |
| --- | --- |
| Fresh | Corrick category is either flooded river flats, freshwater meadow, shallow freshwater marsh, deep freshwater marsh, permanent open freshwater or sewage oxidation basin |
| Saline | Corrick category is either semi-permanent saline (provided that subcategory is not hypersaline lake), permanent saline or salt evaporation basin |
| Hypersaline | Corrick category is semi-permanent saline and subcategory is hypersaline lake |

Step 3. Compare the results from independent data sources and assign the salinity regime category to the wetlands covered in Step 2

The results from these three overlay analyses were then compared and final salinity regime category was assigned based on the consistency of the results and the reliability of the datasets (Table 34).

The derived datasets were considered moderately reliable where the three overlay analyses were not substantially inconsistent from each other, but where the three overlays were inconsistent, the classification was considered to be of low confidence (Table 34). The moderate confidence assigned for consistent overlay analyses was based on the following factors.

* IWC EVCs are considered reliable as they are based on field assessments, however, the confidence in assigning the salinity regime was considered lower because some EVCs have a range of salinity regime preferences (Appendix 6).
* The salinity regime dataset derived from Corrick information was considered to be only moderately reliable. Most Corrick information is for wetlands derived from the WETLAND\_1994 dataset. Most of these have not had their Corrick classification updated since 1994. It is possible the salinity categories may have changed. In addition, the threshold for the hypersaline category is different to that used in this framework.
* The estuaries dataset was considered to be moderately reliable as the mapping of estuaries is considered accurate. However, the discrimination between different saline categories is not possible.

Table . Assignment of final salinity regime categories to remaining wetlands in WETLAND\_CURRENT based on comparison of results from three datasets.

| Assigned salinity regime category | Salinity regime category from analysis of dataset | | |  | |
| --- | --- | --- | --- | --- | --- |
| IWCDMS | Corrick classification | Estuaries | | Confidence |
| Fresh | Fresh | Fresh | Unknown | | Moderate |
| Fresh | Unknown | Unknown | | Moderate |
| Unknown | Fresh | Unknown | | Moderate |
| Fresh | Fresh | Saline | | Low |
| Unknown | Fresh | Saline | | Low |
| Hyposaline | Hyposaline | Saline | Unknown | | Moderate |
| Hyposaline | Hypersaline | Saline or Unknown | | Moderate |
| Hyposaline | Unknown | Unknown | | Moderate |
| Hyposaline | Fresh | Saline or Unknown | | Low |
| Mesosaline | Mesosaline | Saline | Unknown | | Moderate |
| Mesosaline | Hypersaline | Unknown | | Moderate |
| Hypersaline | Hypersaline | Hypersaline | Unknown | | Moderate |
| Hypersaline | Saline | Unknown | | Moderate |
| Unknown | Hypersaline | Unknown | | Moderate |
| Saline | Saline | Saline | Unknown | | Moderate |
| Saline | Hypersaline | Unknown | | Moderate |
| Saline | Unknown | Unknown | | Moderate |
| Unknown | Saline | Saline | | Moderate |
| Unknown | Saline | Unknown | | Moderate |
| Unknown | Unknown | Saline | | Low |
| Unknown | Any combination of results other than those above | | | | |

Step 4. Amend salinity regime for riverine influenced wetlands with unknown salinity regime

Wetlands which were assigned an unknown salinity regime through steps 1 to 3, were then examined against the river water source classification (Section 5.6.3). Wetlands with an otherwise unknown salinity regime but with a high or very high probability of receiving riverine water sources were updated to be classified as fresh, with a moderate confidence level.

5.7.3 Classification results

The salinity regime classification process identified that the vast majority of wetlands in Victoria are fresh (Table 35).

Table . Results of the salinity regime classification

| Classification | Approximate percentage of wetlands |
| --- | --- |
| Fresh | 86 |
| Saline | 4 |
| Hyposaline | <1 |
| Mesosaline | 1 |
| Hypersaline | <1 |
| Unknown | 9 |

5.8 Summary of Victorian wetland classification attributes

The attributes at each level of the Victorian wetland classification framework are summarised in Table 36.

Table . Summary of the Victorian classification framework attributes, categories and subcategories.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LEVELS**  **1 & 2** | **National region**  **and landscape** | 1. National landform, climate and hydrology regions 2. Landscape groupings within national landform, climate and hydrology regions   (can be attributed as required from existing geospatial coverages) | | | |
| **Victoria** | Victorian wetland landscapes  (can be attributed as required from the wetland landscapes dataset) | | | |
| **LEVEL 3** | **Wetland system** | **Lacustrine**  (<30% cover of emergent vegetation) | **Palustrine**  (>=30% cover of emergent vegetation) | **Marine**  (intertidal wetlands in embayments) | **Estuarine**  (semi-enclosed tidal wetlands and supratidal wetlands) |
| **Wetland habitat** | Wetland origin   * Naturally occurring * Human-made   + aquaculture pond   + farm dam   + salt works   + water storage   + excavation pond   + sewage treatment pond   + stormwater treatment pond | | Wetland origin   * Naturally occurring * Human-made   + aquaculture pond   + salt works   + excavation pond   + stormwater treatment pond | |
| Dominant vegetation   * Forest/woodland * Shrub/fern * Sedge/grass/forb * Moss/heath * No emergent vegetation | | Dominant vegetation   * Mangrove * Saltmarsh * No emergent vegetation | |
| Water source   * Groundwater * River * Tidal * Artificial | | Water source   * Groundwater * River * Tidal * Artificial | |
| Water regime   * Permanent * Periodically inundated   + seasonal   + intermittent   + episodic | | Water regime   * Supratidal * Intertidal | |
| Salinity regime   * Fresh * Hyposaline * Mesosaline * Hypersaline * Saline | | Salinity regime   * Hyposaline * Mesosaline * Hypersaline * Saline | |

6. Victorian wetland typology

A standard wetland typology was developed for inclusion in the Victorian wetland classification framework. However, the attributes assigned to wetlands in the framework also allow the flexibility to develop specific wetland typologies for individual projects with attributes selected according to project objectives.

6.1 Wetland typologies

In a recent classification of wetlands in the Murray-Darling Basin, Brooks et al. (2013) suggest that a wetland typology should be ecologically meaningful, comparable with other typologies, particularly the Ramsar and other jurisdictional typologies and should reflect the key drivers of wetland ecology using clear wetland type definitions.

The ANAE classification framework does not outline a wetland typology. Therefore, other wetland typologies that are based on the ANAE classification framework attributes were examined for relevance to Victoria. The following summaries of wetland typologies are adapted from Brooks et al. (2013) who reviewed a number of example wetland typologies to illustrate attributes that are commonly included.

* The Ramsar Convention wetland classification system groups wetlands into three major types: inland, marine/coastal and human-made wetlands. Further classification is not systematically derived from wetland attributes. The main attributes used to define wetland types are water regime, water type, dominant vegetation but other attributes are also variously used, including substrate, altitude, area and ecosystem type (e.g. tundra, coral reefs).
* The South Australian (SA) classification uses a two-level typology (Jones and Miles 2009). The wetland system attribute is used to group wetlands into major groups. Wetland types at the next level are not grouped systematically by attribute, but it is obvious from the type names that a variety of attributes have been variously used to identify wetland types, for example, water regime, water type, water source and vegetation.
* The Queensland (Qld) wetland typology (EPA 2005) uses a range of ANAE attributes (Table 37) to systematically derive wetland types. The wetland system attribute was used to group wetlands at the highest level into two groups:
  + estuarine; and
  + lacustrine and palustrine.

Estuarine wetlands were further classified by vegetation, while lacustrine and palustrine wetlands were grouped by climate and further classified by other attributes (Table 37).

Brooks et al. (2013) also used a systematic wetland typology based on ANAE attributes as does New South Wales (NSW), (Imgraben 2009). Brooks et al. (2013) selected attributes by wetland system class (Table 37). The NSW wetland typology used the climate attribute to group wetlands at the highest level (Table 37).

The attributes used in the Victorian wetland classification framework allow for a typology to be systematically derived. The typologies used in Qld and NSW use mainly ANAE Level 3 attributes but also include Level 1 and 2 attributes (Figure 1). In Victoria, ANAE level 1 and 2 attributes are captured in the wetland landscapes regionalisation (Section 3) and are mapped in a separate geospatial dataset. Therefore, only ANAE level 3 attributes are used in the Victorian wetland typology. As with other comparable wetland typologies, Level 3 attributes of wetland system, salinity regime, water regime and dominant vegetation were considered to be the most useful for discriminating between wetlands.

Table . Attributes used in various systematically-derived wetland classification typologies in Australia.

| Wetland attribute | Level used in typology | | | | |
| --- | --- | --- | --- | --- | --- |
| Qld  Estuarine | Qld  Lacustrine and palustrine | NSW | MDBA  Lacustrine and palustrine | MDBA  Estuarine |
| Wetland system | 1 | 2 | 4 | 1 | 1 |
| Climatic | - | 1 | 1 | - |  |
| Wetland substrate | - | 3 | - | - |  |
| Water type  (salinity) | - | 4 | 5 | 2 |  |
| Water regime | - | 5 | Yes | - |  |
| Landscape geomorphology or topography | - | 6 | 2 (Landscape)  3 (Landform) | - |  |
| Vegetation | 2 | 7 | 6 | 3 (Dominant vegetation)  4 (Finer-scale vegetation) |  |
| Water influence | - | - | - | - | 1 |
| Water depth | - | - | - | - | 2 |
| Substrate | - | - | - | - | 3 |
| Structural macrobiota | - | - | - | - | 4 |

6.2. Wetland type names

The naming convention for wetlands used by Brooks et al. (2013) informed the some of the wetland type names used in the Victorian wetland typology. These names refer to commonly used terms in wetland typologies. The definitions set out in Brooks et al. (2013) were adopted as outlined below.

* Swamp – a wetland dominated by woody vegetation, either shrubs and or trees.
* Marsh – a wetland dominated by non-woody emergent vegetation such as sedges, reeds and rushes. Marshes can be shallow or deep with a combination of emergent and submergent vegetation types. They may also have areas of open water in deeper systems, up to 70 per cent of wetland area. Marshes are typically between 0.5 to 2 metres depth, but depth can be highly variable.
* Meadow – a wetland dominated by grasses (excluding Phragmites which is typically found in deeper marsh environments) and forbs. Meadows typically have shallow depths in the order of 10 to 50 centimetres. They are rarely permanent, often being filled on a seasonal basis.

It should be noted that there is no depth attribute in the Victorian wetland classification framework and the naming convention relied on the dominant vegetation category alone. Because the sedge/grass/forb dominant vegetation category covers sedges reeds, rushes, grasses and forbs, a distinction was not able to be made in the Victorian wetland typology between meadows and marshes. Although the wetland EVC benchmark descriptions in DEPI (2013) can be used to distinguish between marshes and meadows based on EVCs identified at individual wetlands, accurate and comprehensive geospatial data is not available to allow attribution for wetlands generally.

The term lakes was used for lacustrine wetlands in Victoria, noting that in the Victorian wetland classification framework the assignment of wetlands to the lacustrine wetland system category is based solely on the percentage of emergent vegetation cover (<30%) regardless of area (Section 4.1).

The wetland type high country peatlands was adopted for the Victorian wetland typology as these have been incorporated into the WETLAND\_CURRENT dataset from the ALPS dataset developed by Lawrence et al. (2009). Lawrence et al. (2009) adopt the definition of peatlands proposed by Whinam & Hope (2005) and use the term peatlands: “to incorporate all Australian vegetation complexes that other authors have labelled bogs, fens, or mosslands, as well as environments where soil properties have been defined as having a large peaty component”. They apply the term high country peatlands to those peatlands that occur over 1000 metres in Victoria. This wetland type was also applied to wetlands derived from the GB\_SS dataset. Wetlands derived from both the ALPS and GB\_SS datasets were assigned the dominant vegetation category of moss/heath.

Coastal saltmarshes, for the purpose of the Victorian wetland typology, are coastal wetlands dominated by the EVCs in (Table 9). Mapping of coastal saltmarsh and estuarine EVCs (Boon et al. 2011) enabled coastal saltmarshes to be identified as a separate type. The name intertidal wetlands, adopted for marine wetlands, is based on the definition in Table 8. Estuaries are those areas which overlap the Victorian ESTUARIES layer (Appendix 3).and are not dominated by coastal saltmarsh or estuarine EVCs (Table 9).

Springs and soaks that were mapped in the Goulburn-Broken catchment region have been incorporated into the WETLAND\_CURRENT dataset. However, these were not assigned as a separate type because it was not known which of the wetlands in the rest of the state might also fall into this type. Springs and soaks in the Goulburn-Broken catchment region can be identified in the WETLAND\_CURRENT dataset using the ex\_dataset attribute which specifies the origin of each wetland polygon.

6.3 Typology structure

The attributes used to derive the Victorian wetland typology are set out in Table 38. The primary attribute for distinguishing wetland types is the wetland system attribute. Each of the four wetland system categories was then further subdivided, with the exception of the marine wetland system category which was assigned as a single type.

Estuarine wetlands were divided into two types based on whether or not the dominant vegetation type was coastal saltmarsh. Lacustrine wetlands were subdivided into four types based on the salinity regime and water regime attributes. The distinctions were between fresh wetlands and saline wetlands (combined hyposaline, mesosaline, hypersaline and saline categories) and, within those classes, between permanent and periodically inundated wetlands.

Palustrine wetlands were subdivided based on the salinity regime, water regime and dominant vegetation attributes with the exception of high country peatlands which were distinguished only by the dominant vegetation type moss/heath. High country peatlands all have a salinity regime of fresh and a water regime of permanent. Apart from high country peatlands, a further 12 palustrine wetland types were identified. The distinctions were between:

* firstly, fresh and saline wetlands where the following categories were classed as saline: hyposaline, mesosaline, hypersaline and saline;
* secondly, permanent and periodically inundated wetlands with no distinction between the four subcategories of the periodically inundated category (Table 22); and
* thirdly, the types of dominant vegetation:
  + combined forest/woodland and shrub categories;
  + sedge/grass/forb category; and
  + no emergent vegetation category.

The dominant vegetation category of no emergent vegetation is due to the fact that, although at least 30% of the wetland was covered by vegetation, the no emergent vegetation category occupied more of the wetland area than any other dominant vegetation category. It was not possible to determine if these wetlands were swamps, marshes or meadows. Only 0.2% (55) of wetlands fell into this category (Table 39).

Approximately 40% of wetlands could not be assigned to a type due to one or more of the relevant attributes being unknown. The results of the wetland typology classification is set out in Table 39.

Table . Wetland types and attributes used to derive wetland types in the Victorian wetland typology.

| Wetland system | Salinity regime | Water regime | Dominant vegetation | Wetland type |
| --- | --- | --- | --- | --- |
| Estuarine | - | - | Not coastal saltmarsh | Estuary |
| Estuarine | - | - | Coastal saltmarsh | Coastal saltmarsh |
| Marine | - | - | - | Intertidal flats |
| Lacustrine | Fresh | Permanent | - | Permanent freshwater lakes |
| Lacustrine | Fresh | Periodically Inundated | - | Temporary freshwater lakes |
| Lacustrine | Saline | Permanent | - | Permanent saline lakes |
| Lacustrine | Saline | Periodically Inundated | - | Temporary saline lakes |
| Palustrine | - | - | Moss/heath | High country peatlands |
| Palustrine | Fresh | Permanent | Sedge/grass/forb | Permanent freshwater marshes and meadows |
| Palustrine | Fresh | Permanent | Forest/woodland or Shrub | Permanent freshwater swamps |
| Palustrine | Fresh | Permanent | No emergent vegetation | Permanent freshwater swamps/marshes/meadows |
| Palustrine | Saline | Permanent | Sedge/grass/forb | Permanent saline marshes and meadows |
| Palustrine | Saline | Permanent | Forest/woodland or Shrub | Permanent saline swamps |
| Palustrine | Saline | Permanent | No emergent vegetation | Permanent saline swamps/marshes/meadows |
| Palustrine | Fresh | Periodically Inundated | Sedge/grass/forb | Temporary freshwater marshes and meadows |
| Palustrine | Fresh | Periodically Inundated | Forest/woodland or Shrub | Temporary freshwater swamps |
| Palustrine | Fresh | Periodically Inundated | No emergent vegetation | Temporary freshwater swamps/marshes/meadows |
| Palustrine | Saline | Periodically Inundated | Sedge/grass/forb | Temporary saline marshes and meadows |
| Palustrine | Saline | Periodically Inundated | Forest/woodland or Shrub | Temporary saline swamps |
| Palustrine | Saline | Periodically Inundated | No emergent vegetation | Temporary saline swamps/marshes/meadows |
|  |  |  |  |  |

Table . Results of the wetland typology classification

| Wetland type | Number of wetlands | Percentage number of wetlands | Area of wetlands  (ha) | Percentage area of wetlands |
| --- | --- | --- | --- | --- |
| Coastal saltmarsh | 314 | <1% | 53733 | 7% |
| Estuary | 27 | <1% | 4213 | <1% |
| High country peatlands | 3183 | 9% | 4476 | <1% |
| Intertidal flats | 5 | <1% | 72790 | 9% |
| Permanent freshwater lakes | 1016 | 3% | 95596 | 12% |
| Permanent freshwater marshes and meadows | 33 | <1% | 2241 | <1% |
| Permanent freshwater swamps | 192 | <1% | 897 | <1% |
| Permanent freshwater swamps/marshes/meadows | 2 | <1% | 52 | <1% |
| Permanent saline lakes | 101 | <1% | 65998 | 8% |
| Permanent saline marshes and meadows | 11 | <1% | 2887 | <1% |
| Permanent saline swamps | 3 | <1% | 319 | <1% |
| Permanent saline swamps/marshes/meadows | 1 | <1% | 45 | <1% |
| Temporary freshwater lakes | 2542 | 7% | 58314 | 7% |
| Temporary freshwater marshes and meadows | 7383 | 21% | 95107 | 12% |
| Temporary freshwater swamps | 5976 | 17% | 103669 | 13% |
| Temporary freshwater swamps/marshes/meadows | 37 | <1% | 1016 | <1% |
| Temporary saline lakes | 564 | 2% | 36704 | 5% |
| Temporary saline marshes and meadows | 122 | <1% | 8536 | 1% |
| Temporary saline swamps | 87 | <1% | 5430 | <1% |
| Temporary saline swamps/marshes/meadows | 15 | <1% | 1125 | <1% |
| Unknown | 13815 | 39% | 170877 | 22% |
| **Total** | **35429** |  | **784025** |  |

7. Discussion

This project developed a wetland regionalisation that built on earlier work that described wetland vegetation in Victoria (DSE 2012). The resulting wetland landscapes were considered to provide a better framework for explaining regional and landscape variation (as expressed through wetland vegetation) in wetlands than any of the ANAE classification framework Level 1 or 2 attributes whether used singly or combined. The key regional and landscape wetland drivers vary in their influence on wetland vegetation variation across the state as illustrated in the wetland landscape profile descriptions in Table 7. Identifying the dominant wetland drivers in in different parts of Victoria allowed unique combinations of drivers to be used to identify wetland landscapes. Wetland landscapes allow for regional variation to be taken into account to explain differences in wetlands with the same wetland system and habitat attributes. This will aid in identifying representative wetlands.

This project resulted in systematic categorisation of system and habitat attributes that relate to most of the key components and processes of wetland function that are recommended for use in Australia (AETG 2012). In this respect, it overcame the limitation of the Corrick classification system previously used in Victoria, in that the Corrick system was not strictly systematic in its classification of wetland attributes. This project introduced discrimination between wetlands of natural and artificial origin which was not explicitly included in the Corrick classification framework and added new water source attributes. It also brought Victoria’s wetland classification generally into line with the national framework (AETG 2012) and with recent classification frameworks for Queensland (EPA 2005) and the Murray-Darling Basin (Brooks et al. 2013). However, there are some differences to the national framework (AETG 2012), as summarised below.

* For non-marine and non- estuarine wetlands less than eight hectares in area, data on the nature of the shoreline and depth was not available. Thus lacustrine wetlands were distinguished from palustrine wetlands solely on the percentage cover of emergent vegetation.
* An additional wetland origin attribute was used in the Victorian framework.
* The landform habitat attribute was not used in the Victorian framework as it was not considered as an important distinguishing feature for lotic environments.
* The soil attribute was not used in the Victorian framework as there was no suitable data source at an appropriate scale to assign soil categories.
* For the dominant vegetation attribute, the ANAE classification framework forested category was expanded to include woodland. Two additional categories were adopted (moss/heath and coastal saltmarsh) as vegetation studies and mapping for specific projects provided data sources for these categories in Victoria.
* In the Victorian framework, water regime categories were designed to cover the full range of wetland system types covered in the Victorian wetland inventory, WETLAND\_CURRENT. Water regime categories for lacustrine and palustrine wetlands In the Victorian framework provided more discrimination than those recommended in the national framework. As no marine and estuarine Victorian wetlands were subtidal, this attribute was not included.
* Wetland water source was characterised in three separate attributes for groundwater, river water and an artificial water source in the Victorian framework, as opposed to a single attribute in the national framework. This was due to the fact that data existed to assign probabilities of wetlands receiving different water sources but did not exist to enable the dominant water source to be determined. As all wetlands receive some input from localised rainfall, this attribute was not included.
* The salinity ANAE classification framework regime categories were also refined based on the work of several authors (Section 5.7).

The Victorian wetland typology closely followed that used by Brooks et al. (2013) for the classification of aquatic ecosystems in the Murray-Darling Basin. For palustrine wetlands, the dominant vegetation category sedge/grass/forb did not provide the basis for distinguishing between meadows and marshes. No comprehensive, available vegetation dataset was considered sufficiently reliable to identify finer scale vegetation (dominant species) as used by Brooks et al (2013).

The wetland types adopted in the Victorian classification framework resolve some of the issues with the Corrick categories. For example, marine and estuarine wetlands can now be distinguished from lacustrine and palustrine wetlands. High country peatlands, which were not included in the wetland inventory and in the classification developed by Corrick can now be distinguished from other palustrine wetland types used by Corrick such as freshwater meadows and shallow and deep freshwater marshes. However, some discrimination that existed in the Corrick classification has been lost, for example the distinction between marshes and meadows and the distinction between deep and shallow freshwater marshes. Data on wetland depth is not available at the 20 – 50 cm level of resolution needed to distinguish these depth categories for most wetlands.

The assignment of wetland attribute categories from existing datasets has some limitations and resulted in a significant percentage of wetlands being assigned unknown for several attributes (Table 40). The assignment of the unknown category to attributes that inform the identification of the wetland type contributed to 39% of wetlands being of an unknown type.

Table . Percentage (approximate) of wetlands where the attribute category was assigned as unknown.

| Attribute | Percentage of wetlands |
| --- | --- |
| Wetland system (lacustrine or palustrine) | 25 |
| Wetland system (estuarine/marine) | 0 |
| Wetland origin | <1 |
| Dominant vegetation | 34 |
| Water regime | 2 |
| Groundwater source | 49 |
| River water source | <1 |
| Artificial water source | 12 |
| Salinity regime | 9 |
| Wetland type | 39 |

The confidence level of the assigned category for each attribute varied (Table 41) but there were a significant percentage of wetlands with low confidence ratings for dominant vegetation attribute. As the latter is used in the classification of wetland system, this also contributed to 33% of wetlands being assigned low confidence for wetland system classification.

Approximately 80% of wetlands in the Victorian wetland inventory are less than or equal to ten hectares in area. Data sources, such as the Modelled 2005 EVCs (updated) dataset, often do not discriminate between small wetlands and the surrounding landscape. This means that wetland attributes derived from those sources may be inaccurate. In addition, independent data sources for an attribute may record conflicting categories for the attribute, may use categories that cannot easily be aligned or may not exist.

While some data sources are of high quality, improvements to the level of confidence for wetland system and habitat attributes and filling of data gaps relies on:

* development of more accurate datasets for individual wetland attributes;
* ground truthing; and
* further testing of the accuracy of some existing data sources, especially for the water regime, salinity and dominant vegetation attributes.

Table . Percentage (approximate) of wetlands with different confidence levels assigned for attributes.

| Attribute | High | Moderate | Low | Not applicable |
| --- | --- | --- | --- | --- |
| Wetland system | 17 | 26 | 33 | 25 |
| Wetland origin | 43 | 56 | 1 | <1 |
| Dominant vegetation | 37 | 12 | 18 | 34 |
| Water regime | 9 | 88 | 0 | 2 |
| Water source - groundwater | 18 | 33 | <1 | 49 |
| Water source - river | 82 | 9 | 8 | <1 |
| Water source - tidal | 100 | 0 | 0 | 0 |
| Water source - artificial | 19 | 69 | 1 | 12 |
| Salinity regime | 16 | 72 | 3 | 9 |

Comprehensive spatial definition of wetland EVCs would be of significant benefit.

* It would improve the accuracy of the dominant vegetation category assigned to wetlands.
* It would aid in the discrimination between marshes and meadows, allowing for more specificity in wetland type definition.
* It would inform the assignment of the salinity regime and water regime categories. The salinity regime preferences for individual wetland EVCs were assigned by an expert in wetland vegetation (Appendix 6) as were the water regime EVC preferences. This work is currently being reviewed. When the wetland EVCs that are present at a wetland are identified, the salinity regime of a wetland can be inferred with a high degree of confidence. Inferring water regime is more difficult as EVCs typically have a wider degree of water regime category preferences, but for wetlands where the wetland EVCs present all have a similar preference, the knowledge would be informative.

Regular updates of attribute data from IWC and other field assessments is recommended. Further work is also recommended to monitor wetland water regime, for example using LANDSAT data that informs Geoscience Australia’s Water Observations from Space (WOFS) product, and to test the accuracy of this product for wetlands. Due to lack of any other comprehensive, independent dataset on water regime, in this project, the accuracy of the WOFS dataset was not able to be tested.

An online tool to allow natural resource managers and planners to check attributes for individual wetlands has been developed. The tool allows wetland managers to propose updates to wetland attributes based on ground-truthed observations which will be validated and incorporated in updates to the WETLAND\_CURRENT dataset.

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Appendix 1. EVCs occurring within wetlands

Wetland EVCs have been described in DEPI 2013 (Table A1.1). They have not been mapped across Victoria but the location of EVCs has been identified for wetlands where IWC assessments have been undertaken. Location information is stored in the IWC Data Management System.

The list of 145 wetland EVCs (DEPI 2013), (Table A1.1) includes provisional EVCs that have yet to be formally approved by DELWP. Their descriptions may be subject to future change.  A107-A113 are provisional wetland EVCs that represent resolution of the components of EVC 9 - Coastal Saltmarsh Aggregate. These are presented in more detail in the recently completed Victorian Saltmarsh Study (Boon et al. 2011). A101-A102 and A104-A106, A114-A115 are other provisional wetland EVCs.

In Victoria, EVCs that were described prior to the definition of wetland EVCs (DEPI 2013) are mapped in the geospatial layer Modelled 2005 EVCs. Details of these are provided in a set of benchmark descriptions available on the DELWP website. An unpublished geospatial layer (DELWP Modelled 2005 EVC unpublished update) was also available for the project. It updates Modelled 2005 EVC mapping based on surveys undertaken in some parts of the state after 2005. These data sources focused primarily on mapping of terrestrial EVCs.

For this project, the DELWP Modelled 2005 EVC unpublished update dataset was overlaid on the Modelled 2005 EVCs dataset for areas where mapping had been updated since 2005 to form a single layer (Modelled 2005 EVCs (updated)) which was used in this project (Table A3.1).

In the Modelled 2005 EVCs (updated) dataset, the EVCs which are mapped as occurring in wetlands fall into three different groups:

1. wetland EVCs (included in Table A1.1);
2. EVCs which occur in wetlands but are not included in DEPI (2013) due to the fact that they have been superseded in the review of wetland EVCs (DEPI 2013) (TableA1.2); and
3. EVCs which do not occur in wetlands, but, because of the scale of mapping and possible inaccuracies in the Modelled 2005 EVCs (updated) dataset, are mapped as intersecting wetlands (TableA1.2).

The EVCs in the third group were included in the analysis to assign the wetland system and dominant vegetation attribute categories (Sections 4.4 and 5.4) as, for the majority of wetlands, these was the only geospatial data on wetland vegetation available.

A1.1 Assigning dominant vegetation categories to wetland EVCs

The categories assigned to wetland EVCs to identify emergent vegetation (to aid in the identification of lacustrine wetlands) and to determine the dominant vegetation category of each wetland are indicated in the Table A1.1. They were based on interpretation of the benchmark descriptions for each wetland EVC (DEPI 2013). The term emergent refers to vegetation that emerges above the surface of the water when water is present in the wetland.

An EVC was classed as non-emergent if:

* it occurred only as a floating surface layer;
* it was rooted but was only weakly emergent above the water surface; or
* it was characteristic of a drier phase and would not persist and emerge above the water surface when inundated.

In the case of the dominant vegetation category, where an EVC could potentially be assigned to more than one category based on structural characteristics, the tallest structural category was adopted. For example, Coastal Saltmarsh Aggregate may be dominated by either shrubs or herbaceous to grassy and sedgy species. It was assigned the dominant vegetation category of shrub. Where an EVC was a recognised component of coastal saltmarsh that could also occur in inland situations, it was assigned to the coastal saltmarsh category in coastal settings but to a structural category in inland settings. This applied to all EVCs in Table 9 except A107 – A112, based on information in DSE (2012) and the wetland EVC descriptions in DEPI (2013).

Table A1.1 Wetland EVCs and their emergent vegetation and dominant vegetation categories.

| EVC no. | EVC name | Emergent vegetation category | Dominant vegetation category |
| --- | --- | --- | --- |
| 1111 | Alkaline Basaltic Wetland Aggregate | Emergent | Sedge/grass/forb |
| 806 | Alluvial Plains Semi-arid Grassland | Emergent | Sedge/grass/forb |
| 239 | Alpine Creekline Herbland | Emergent | Sedge/grass/forb |
| 171 | Alpine Fen | Emergent | Sedge/grass/forb |
| 288 | Alpine Heath Peatland | Emergent | Moss/heath |
| 1011 | Alpine Hummock Peatland | Emergent | Moss/heath |
| 905 | Alpine Short Herbland | Emergent | Sedge/grass/forb |
| 306 | Aquatic Grassy Wetland | Emergent | Sedge/grass/forb |
| 653 | Aquatic Herbland | Emergent | Sedge/grass/forb |
| 308 | Aquatic Sedgeland | Emergent | Sedge/grass/forb |
| 334 | Billabong Wetland Aggregate | Emergent | Sedge/grass/forb |
| 369 | Black Box Wetland | Emergent | Forest/Woodland |
| 875 | Blocked Coastal Stream Swamp | Emergent | Sedge/grass/forb |
| 537 | Brackish Aquatic Herbland | Non-emergent | No emergent vegetation |
| 934 | Brackish Grassland | Emergent | Sedge/grass/forb |
| 538 | Brackish Herbland | Emergent | Sedge/grass/forb |
| 636 | Brackish Lake Aggregate | Emergent | No emergent vegetation |
| 539 | Brackish Lake Bed Herbland | Non-emergent | Sedge/grass/forb |
| 947 | Brackish Lignum Swamp | Emergent | Shrub |
| 13 | Brackish Sedgeland | Emergent | Sedge/grass/forb |
| 1114 | Brackish Sedgy Shrubland | Emergent | Shrub |
| 973 | Brackish Shrubland | Emergent | Shrub |
| 656 | Brackish Wetland Aggregate | Emergent | Sedge/grass/forb |
| A106 | Calcareous Sedgy Shrubland | Emergent | Shrub |
| 591 | Calcareous Wet Herbland | Emergent | Sedge/grass/forb |
| 291 | Cane Grass Wetland | Emergent | Sedge/grass/forb |
| 602 | Cane Grass Wetland/Aquatic Herbland Complex | Emergent | Sedge/grass/forb |
| 606 | Cane Grass Wetland/Brackish Herbland Complex | Emergent | Sedge/grass/forb |
| 284 | Claypan Ephemeral Wetland | Emergent | Sedge/grass/forb |
| A110 | Coastal Dry Saltmarsh | Emergent | Coastal saltmarsh |
| 976 | Coastal Ephemeral Wetland | Emergent | Forest/Woodland |
| A111 | Coastal Hypersaline Saltmarsh | Emergent | Coastal saltmarsh |
| 11 | Coastal Lagoon Wetland | Emergent | Sedge/grass/forb |
| A109 | Coastal Saline Grassland | Emergent | Coastal saltmarsh |
| 9 | Coastal Saltmarsh Aggregate | Emergent | Coastal saltmarsh (coastal) |
| 9 | Coastal Saltmarsh Aggregate | Emergent | Shrub (non-coastal) |
| A112 | Coastal Tussock Saltmarsh | Emergent | Coastal saltmarsh |
| 673 | Dune Soak Woodland | Emergent | Forest/Woodland |
| 949 | Dwarf Floating Aquatic Herbland | Non-emergent | No emergent vegetation |
| 678 | Ephemeral Drainage-line Grassy Wetland | Emergent | Sedge/grass/forb |
| 914 | Estuarine Flats Grassland | Emergent | Coastal saltmarsh |
| 952 | Estuarine Reedbed | Emergent | Sedge/grass/forb |
| 953 | Estuarine Scrub | Emergent | Shrub |
| 10 | Estuarine Wetland | Emergent | Sedge/grass forb |
| 721 | Fern Swamp | Emergent | Shrub\* |
| 809 | Floodplain Grassy Wetland | Emergent | Sedge/grass/forb |
| 56 | Floodplain Riparian Woodland | Emergent | Forest/Woodland |
| 280 | Floodplain Thicket | Emergent | Shrub |
| 172 | Floodplain Wetland Aggregate | Emergent | Sedge/grass/forb |
| 810 | Floodway Pond Herbland | Non-emergent | No emergent vegetation |
| 945 | Floodway Pond Herbland/Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 723 | Forest Bog | Emergent | Shrub |
| 728 | Forest Creekline Sedge Swamp | Emergent | Sedge/grass/forb |
| 718 | Freshwater Lake Aggregate | Emergent | No emergent vegetation |
| 954 | Freshwater Lignum - Cane Grass Swamp | Emergent | Shrub |
| 657 | Freshwater Lignum Shrubland | Emergent | Shrub |
| 968 | Gahnia Sedgeland | Emergent | Sedge/grass/forb |
| 1112 | Granite Rock-pool Wetland | Emergent | Sedge/grass/forb |
| 106 | Grassy Riverine Forest | Emergent | Forest/Woodland |
| 811 | Grassy Riverine Forest/Floodway Pond Herbland Complex | Emergent | Forest/Woodland |
| 812 | Grassy Riverine Forest/Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 124 | Grey Clay Drainage-line Aggregate | Emergent | Sedge/grass/forb |
| 956 | Herb-rich Gilgai Wetland | Emergent | Sedge/grass/forb |
| 708 | Hypersaline Inland Saltmarsh Aggregate | Emergent | Shrub |
| 813 | Intermittent Swampy Woodland | Emergent | Forest/Woodland |
| 822 | Intermittent Swampy Woodland/Riverine Grassy Woodland Complex | Emergent | Forest/Woodland |
| 107 | Lake Bed Herbland | Non-emergent | No emergent vegetation |
| 974 | Lava Plain Ephemeral Wetland | Emergent | Sedge/grass/forb |
| 808 | Lignum Shrubland | Emergent | Shrub |
| 104 | Lignum Swamp | Emergent | Shrub |
| 823 | Lignum Swampy Woodland | Emergent | Forest/Woodland |
| 140 | Mangrove Shrubland | Emergent | Mangrove |
| 966 | Montane Bog | Emergent | Moss/heath |
| 41 | Montane Riparian Thicket | Emergent | Shrub |
| 40 | Montane Riparian Woodland | Emergent | Forest/Woodland |
| 148 | Montane Sedgeland | Emergent | Sedge/grass/forb |
| 318 | Montane Swamp | Emergent | Sedge/grass/forb |
| 185 | Perched Boggy Shrubland Aggregate | Emergent | Shrub |
| 125 | Plains Grassy Wetland | Emergent | Sedge/grass/forb |
| 755 | Plains Grassy Wetland/Aquatic Herbland Complex | Emergent | Sedge/grass/forb |
| 767 | Plains Grassy Wetland/Brackish Herbland Complex | Emergent | Sedge/grass/forb |
| 958 | Plains Grassy Wetland/Calcareous Wet Herbland Complex | Emergent | Sedge/grass/forb |
| A101 | Plains Grassy Wetland/Lignum Swamp Complex | Emergent | Shrub |
| 959 | Plains Grassy Wetland/Sedge-rich Wetland Complex | Emergent | Sedge/grass/forb |
| 960 | Plains Grassy Wetland/Spike-sedge Wetland Complex | Emergent | Sedge/grass/forb |
| 961 | Plains Rushy Wetland | Emergent | Sedge/grass/forb |
| 888 | Plains Saltmarsh | Emergent | Sedge/grass/forb |
| 647 | Plains Sedgy Wetland | Emergent | Sedge/grass/forb |
| 1010 | Plains Sedgy Wetland/Sedge Wetland Complex | Emergent | Sedge/grass/forb |
| 283 | Plains Sedgy Woodland | Emergent | Forest/Woodland |
| 651 | Plains Swampy Woodland | Emergent | Forest/Woodland |
| 784 | Plains Swampy Woodland/Lignum Swamp Complex | Emergent | Forest/Woodland |
| 292 | Red Gum Swamp | Emergent | Forest/Woodland |
| A114 | Red Gum Swamp/Cane Grass Wetland Complex | Emergent | Forest/Woodland |
| A115 | Red Gum Swamp/Plains Rushy Wetland Complex | Emergent | Forest/Woodland |
| 191 | Riparian Scrub | Emergent | Shrub |
| 59 | Riparian Thicket | Emergent | Shrub |
| 103 | Riverine Chenopod Woodland | Emergent | Forest/Woodland |
| 975 | Riverine Ephemeral Wetland | Emergent | Forest/Woodland |
| 814 | Riverine Swamp Forest | Emergent | Forest/Woodland |
| 815 | Riverine Swampy Woodland | Emergent | Forest/Woodland |
| 804 | Rushy Riverine Swamp | Emergent | Sedge/grass/forb |
| 842 | Saline Aquatic Meadow | Non-emergent | No emergent vegetation |
| 717 | Saline Lake Aggregate | Non-emergent | No emergent vegetation |
| 648 | Saline Lake-verge Aggregate | Non-emergent | No emergent vegetation |
| 676 | Salt Paperbark Woodland | Emergent | Forest/Woodland |
| A113 | Saltmarsh-grass Swamp | Emergent | Coastal saltmarsh (Coastal) |
| A113 | Saltmarsh-grass Swamp | Emergent | Sedge/grass/forb (Non-coastal) |
| 101 | Samphire Shrubland | Emergent | Shrub |
| 845 | Sea-grass Meadow | Non-emergent | No emergent vegetation |
| 195 | Seasonally Inundated Shrubby Woodland | Emergent | Forest/Woodland |
| 196 | Seasonally Inundated Sub-saline Herbland | Emergent | Sedge/grass/forb (Non-coastal) |
| 196 | Seasonally Inundated Sub-saline Herbland | Emergent | Coastal saltmarsh (Coastal) |
| 136 | Sedge Wetland | Emergent | Sedge/grass/forb |
| A102 | Sedge Wetland/Aquatic Herbland Complex | Emergent | Sedge/grass/forb |
| 963 | Sedge Wetland/Aquatic Sedgeland Complex | Emergent | Sedge/grass/forb |
| 1113 | Sedge Wetland/Brackish Herbland Complex | Emergent | Sedge/grass/forb |
| 883 | Sedge Wetland/Calcareous Wet Herbland Complex | Emergent | Sedge/grass/forb |
| 281 | Sedge-rich Wetland | Emergent | Sedge/grass/forb |
| 816 | Sedgy Riverine Forest | Emergent | Forest/Woodland |
| 817 | Sedgy Riverine Forest/Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 707 | Sedgy Swamp Woodland | Emergent | Forest/Woodland |
| 964 | Shell-beach Herbland | Emergent | Sedge/grass/forb |
| 908 | Sink-hole Wetland | Emergent | Sedge/grass/forb |
| 819 | Spike-sedge Wetland | Emergent | Sedge/grass/forb |
| 80 | Spring Soak Woodland | Emergent | Forest/Woodland |
| 857 | Stony Rises Pond Aggregate | Emergent | Sedge/grass/forb |
| 210 | Sub-alpine Wet Heathland | Emergent | Moss/heath |
| 917 | Sub-alpine Wet Sedgeland | Emergent | Sedge/grass/forb |
| 918 | Submerged Aquatic Herbland | Non-emergent | No emergent vegetation |
| 820 | Sub-saline Depression Shrubland | Emergent | Shrub |
| 49 | Swamp Heathland Aggregate | Emergent | Forest/Woodland |
| 53 | Swamp Scrub | Emergent | Shrub |
| 2004 | Swamp Scrub/Gahnia Sedgeland Complex | Emergent | Shrub |
| 83 | Swampy Riparian Woodland | Emergent | Forest/Woodland |
| 937 | Swampy Woodland | Emergent | Forest/Woodland |
| 920 | Sweet Grass Wetland | Emergent | Sedge/grass/forb |
| 821 | Tall Marsh | Emergent | Sedge/grass/forb |
| 999 | Unknown/Unclassified | Emergent | Unknown |
| 990 | Unvegetated (open water/bare soil/mud) | Non-emergent | No emergent vegetation |
| 8 | Wet Heathland | Emergent | Shrub |
| A104 | Wet Heathland/Plains Grassy Wetland Complex | Emergent | Shrub |
| A105 | Wet Heathland/Plains Sedgy Wetland Complex | Emergent | Shrub |
| 931 | Wet Heathland/Sedge Wetland Complex | Emergent | Shrub |
| A107 | Wet Saltmarsh Herbland | Emergent | Coastal saltmarsh |
| A108 | Wet Saltmarsh Shrubland | Emergent | Coastal saltmarsh |
| 12 | Wet Swale Herbland | Emergent | Sedge/grass/forb |
| 932 | Wet Verge Sedgeland | Emergent | Sedge/grass/forb |

\*Included in shrub category, though dominated by ferns.

\*\* Occurs on the fringes of EVC 717 and assigned the same category as EVC 717.

A1.2 Assigning dominant vegetation categories to Modelled 2005 EVCs (updated) dataset EVCs

One of the two EVC data sources for the Modelled 2005 EVCs (updated) dataset (Modelled 2005 EVC) has assigned EVCs to groups. Where the group name aligned with a dominant vegetation category, the EVCs in that group were assigned to the dominant vegetation category indicated by the group name unless the EVC description indicated that this was not appropriate. For the EVCs in the Modelled 2005 EVC (updated) dataset that are in groups that are not aligned with the dominant vegetation categories and for the EVCs derived from the other source dataset (DELWP Modelled 2005 EVC unpublished update), benchmark descriptions were examined and the EVCs individually assigned to the emergent and dominant vegetation categories. Where an EVC could potentially be assigned to more than one category based on structural characteristics, the tallest structural category was adopted.

In the Modelled 2005 EVC (updated) dataset, some EVCs are assigned the Corrick category name (Table 1). Using the information in Table 1, it was possible to assign two of these EVCs (freshwater meadow and shallow freshwater marsh) to the emergent vegetation category of emergent. However, it was not possible to determine the emergent vegetation category for other such EVCs or to determine the dominant vegetation category for any of the EVCs that matched Corrick categories based on the subcategories in Table 1. The assigned categories are shown in Table A1.2.

Table A1.2 Modelled 2005 EVCs (updated) dataset EVCs and their emergent vegetation and dominant vegetation categories.

| EVC no. | EVC name | Emergent vegetation category | Dominant vegetation category |
| --- | --- | --- | --- |
| 67 | Alluvial Terraces Herb-rich Woodland | Emergent | Forest/Woodland |
| 455 | Alluvial Terraces Herb-rich Woodland/Claypan Ephemeral Wetland Mosaic | Emergent | Forest/Woodland |
| 81 | Alluvial Terraces Herb-rich Woodland/Creekline Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 452 | Alluvial Terraces Herb-rich Woodland/Hills Herb-rich Woodland Complex | Emergent | Forest/Woodland |
| 152 | Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex | Emergent | Forest/Woodland |
| 258 | Alluvial Terraces Herb-rich Woodland/Plains Woodland/Gilgai Wetland Complex | Emergent | Forest/Woodland |
| 457 | Alluvial Terraces Herb-rich Woodland/Sedge Wetland Complex | Emergent | Forest/Woodland |
| 153 | Alluvial Terraces Herb-rich Woodland/Valley Grassy Forest Complex | Emergent | Forest/Woodland |
| 156 | Alpine Coniferous Shrubland | Emergent | Shrub |
| 1000 | Alpine Crag Complex | Non-emergent | No emergent vegetation |
| 1002 | Alpine Damp Grassland | Emergent | Sedge/grass/forb |
| 1001 | Alpine Grassland | Emergent | Sedge/grass/forb |
| 1004 | Alpine Grassy Heathland | Emergent | Shrub |
| 1005 | Alpine Grassy Heathland/Alpine Grassland Mosaic | Emergent | Shrub |
| 1105 | Alpine Rocky Outcrop Heathland/Alpine Dwarf Heathland Mosaic | Emergent | Shrub |
| 1043 | Aquatic Herbland/Floodplain Grassy Wetland Mosaic | Emergent | Sedge/grass/forb |
| 1044 | Aquatic Herbland/Floodway Pond Herbland Mosaic | Emergent | Sedge/grass/forb |
| 691 | Aquatic Herbland/Plains Sedgy Wetland Mosaic | Emergent | Sedge/grass/forb |
| 1045 | Aquatic Herbland/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 915 | Aquatic Herbland/Swamp Scrub Mosaic | Emergent | Shrub |
| 1047 | Aquatic Herbland/Tall Marsh Mosaic | Emergent | Sedge/grass/forb |
| 14 | Banksia Woodland | Emergent | Forest/Woodland |
| 993 | Bare Rock/Ground | Non-emergent | No emergent vegetation |
| 705 | Basalt Creekline Shrubby Woodland | Emergent | Forest/Woodland |
| 642 | Basalt Shrubby Woodland | Emergent | Forest/Woodland |
| 311 | Berm Grassy Shrubland | Emergent | Shrub |
| 297 | Billabong Wetland/Red Gum Swamp Mosaic | Emergent | Forest/Woodland |
| 154 | Bird Colony Shrubland | Emergent | Shrub |
| 155 | Bird Colony Succulent Herbland | Emergent | Sedge/grass/forb |
| 910 | Bird Colony Succulent Herbland/Coastal Tussock Grassland Mosaic | Emergent | Sedge/grass/forb |
| 663 | Black Box Lignum Woodland | Emergent | Forest/Woodland |
| 27 | Blackthorn Scrub | Emergent | Shrub |
| 61 | Box Ironbark Forest | Emergent | Forest/Woodland |
| 685 | Box Ironbark Forest/Heathy Woodland Complex | Emergent | Forest/Woodland |
| 643 | Brackish Drainage-line Aggregate | Emergent | Sedge/grass/forb |
| 833 | Cane Grass Wetland/Lignum Swampy Woodland Mosaic | Emergent | Shrub |
| 941 | Cane Grass Wetland/Salt Paperbark Woodland Mosaic | Emergent | Forest/Woodland |
| 898 | Cane Grass-Lignum Halophytic Herbland | Emergent | Shrub |
| 829 | Chenopod Grassland | Emergent | Shrub |
| 158 | Chenopod Mallee | Unknown | Unknown |
| 644 | Cinder Cone Woodland | Emergent | Forest/Woodland |
| 7 | Clay Heathland | Emergent | Shrub |
| 159 | Clay Heathland/Wet Heathland/Riparian Scrub Mosaic | Emergent | Shrub |
| 58 | Cleared/Severely Disturbed | Unknown | Unknown |
| 2 | Coast Banksia Woodland | Emergent | Forest/Woodland |
| 921 | Coast Banksia Woodland/Coastal Dune Scrub Mosaic | Emergent | Forest/Woodland |
| 144 | Coast Banksia Woodland/Warm Temperate Rainforest Mosaic | Emergent | Forest/Woodland |
| 181 | Coast Gully Thicket | Emergent | Shrub |
| 858 | Coastal Alkaline Scrub | Emergent | Shrub |
| 922 | Coastal Alkaline Scrub/Bird Colony Succulent Herbland Mosaic | Emergent | Sedge/grass/forb |
| 879 | Coastal Dune Grassland | Emergent | Sedge/grass/forb |
| 160 | Coastal Dune Scrub | Emergent | Shrub |
| 909 | Coastal Dune Scrub/Bird Colony Succulent Herbland Mosaic | Emergent | Shrub |
| 1 | Coastal Dune Scrub/Coastal Dune Grassland Mosaic | Emergent | Shrub |
| 161 | Coastal Headland Scrub | Emergent | Shrub |
| 162 | Coastal Headland Scrub/Coastal Tussock Grassland Mosaic | Emergent | Shrub |
| 797 | Coastal Landfill/Sand Accretion | Non-emergent | No emergent vegetation |
| 900 | Coastal Saltmarsh/Coastal Dune Grassland/Coastal Dune Scrub/Coastal Headland Scrub Mosaic | Emergent | Shrub |
| 901 | Coastal Saltmarsh/Estuarine Flats Grassland Mosaic | Emergent | Coastal saltmarsh |
| 302 | Coastal Saltmarsh/Mangrove Shrubland Mosaic | Emergent | Mangrove |
| 5 | Coastal Sand Heathland | Emergent | Shrub |
| 163 | Coastal Tussock Grassland | Emergent | Sedge/grass/forb |
| 4 | Coastal Vine-rich Forest | Emergent | Forest/Woodland |
| 57 | Conifer Plantation | Emergent | Forest/Woodland |
| 31 | Cool Temperate Rainforest | Emergent | Forest/Woodland |
| 68 | Creekline Grassy Woodland | Emergent | Forest/Woodland |
| 869 | Creekline Grassy Woodland/Red Gum Swamp Mosaic | Emergent | Forest/Woodland |
| 164 | Creekline Herb-rich Woodland | Emergent | Forest/Woodland |
| 640 | Creekline Sedgy Woodland | Emergent | Forest/Woodland |
| 654 | Creekline Tussock Grassland | Emergent | Sedge/grass/forb |
| 29 | Damp Forest | Emergent | Forest/Woodland |
| 929 | Damp Forest - Hardwood Plantation | Emergent | Forest/Woodland |
| 165 | Damp Heath Scrub | Emergent | Shrub |
| 710 | Damp Heathland | Emergent | Shrub |
| 746 | Damp Heathland/Damp Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 763 | Damp Heathland/Damp Heathy Woodland/Seasonally Inundated Shrubby Woodland Mosaic | Emergent | Forest/Woodland |
| 734 | Damp Heathland/Damp Heathy Woodland/Wet Heathland Mosaic | Emergent | Shrub |
| 505 | Damp Heathland/Riparian Scrub Complex | Emergent | Shrub |
| 595 | Damp Heathland/Riparian Scrub Mosaic | Emergent | Shrub |
| 762 | Damp Heathland/Sand Heathland Mosaic | Emergent | Shrub |
| 625 | Damp Heathland/Wet Heathland Mosaic | Emergent | Shrub |
| 793 | Damp Heathy Woodland | Emergent | Forest/Woodland |
| 1106 | Damp Heathy Woodland/Lowland Forest Mosaic | Emergent | Forest/Woodland |
| 3 | Damp Sands Herb-rich Woodland | Emergent | Forest/Woodland |
| 713 | Damp Sands Herb-rich Woodland/Damp Heathland/Damp Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 418 | Damp Sands Herb-rich Woodland/Heathy Woodland Complex | Emergent | Forest/Woodland |
| 881 | Damp Sands Herb-rich Woodland/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 781 | Damp Sands Herb-rich Woodland/Herb-rich Foothill Forest Mosaic | Emergent | Forest/Woodland |
| 791 | Damp Sands Herb-rich Woodland/Plains Grassy Woodland Complex | Emergent | Forest/Woodland |
| 885 | Damp Sands Herb-rich Woodland/Plains Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 732 | Damp Sands Herb-rich Woodland/Plains Swampy Woodland/Aquatic Herbland Mosaic | Emergent | Forest/Woodland |
| 757 | Damp Sands Herb-rich Woodland/Seasonally Inundated Shrubby Woodland Mosaic | Emergent | Forest/Woodland |
| 421 | Damp Sands Herb-rich Woodland/Sedgy Riparian Woodland Complex | Emergent | Forest/Woodland |
| 779 | Damp Sands Herb-rich Woodland/Shallow Sands Woodland Mosaic | Emergent | Forest/Woodland |
| 414 | Damp Sands Herb-rich Woodland/Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 672 | Damp Sands Herb-rich Woodland/Shrubby Woodland Mosaic | Emergent | Forest/Woodland |
| 878 | Damp Sands Herb-rich Woodland/Swamp Scrub Complex | Emergent | Forest/Woodland |
| 925 | Damp Sands Herb-rich Woodland/Swamp Scrub Mosaic | Emergent | Forest/Woodland |
| 681 | Deep Freshwater Marsh | Emergent | Unknown |
| 807 | Disused Floodway Shrubby Herbland | Emergent | Shrub |
| 168 | Drainage-line Aggregate | Emergent | Forest/Woodland |
| 1022 | Drainage-line Aggregate/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1023 | Drainage-line Aggregate/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 1025 | Drainage-line Aggregate/Tall Marsh Mosaic | Emergent | Forest/Woodland |
| 679 | Drainage-line Woodland | Emergent | Forest/Woodland |
| 285 | Dry Creekline Woodland | Emergent | Forest/Woodland |
| 34 | Dry Rainforest | Emergent | Forest/Woodland |
| 169 | Dry Valley Forest | Emergent | Forest/Woodland |
| 695 | Dry Valley Forest/Swamp Scrub/Warm Temperate Rainforest Mosaic | Emergent | Forest/Woodland |
| 89 | Dunefield Heathland | Emergent | Shrub |
| 994 | Dunes | Non-emergent | No emergent vegetation |
| 895 | Escarpment Shrubland | Emergent | Forest/Woodland |
| 143 | Estuarine Wetland/Coastal Saltmarsh Mosaic | Emergent | Coastal saltmarsh |
| 935 | Estuarine Wetland/Estuarine Swamp Scrub Mosaic | Emergent | Shrub |
| 969 | Exotic Non-native vegetation | Unknown | Unknown |
| 1049 | Floodplain Grassy Wetland/Floodway Pond Herbland Mosaic | Emergent | Sedge/grass/forb |
| 1051 | Floodplain Grassy Wetland/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1052 | Floodplain Grassy Wetland/Riverine Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 1054 | Floodplain Grassy Wetland/Spike-sedge Wetland Mosaic | Emergent | Sedge/grass/forb |
| 1055 | Floodplain Grassy Wetland/Tall Marsh Mosaic | Emergent | Sedge/grass/forb |
| 863 | Floodplain Reedbed | Emergent | Sedge/grass/forb |
| 690 | Floodplain Riparian Woodland/Billabong Wetland Mosaic | Emergent | Forest/Woodland |
| 256 | Floodplain Riparian Woodland/Floodplain Wetland Mosaic | Emergent | Forest/Woodland |
| 1033 | Floodplain Riparian Woodland/Floodway Pond Herbland Mosaic | Emergent | Forest/Woodland |
| 250 | Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 1032 | Floodplain Riparian Woodland/Riverine Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 1034 | Floodplain Riparian Woodland/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1035 | Floodplain Riparian Woodland/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 1037 | Floodplain Riparian Woodland/Tall Marsh Mosaic | Emergent | Forest/Woodland |
| 434 | Floodplain Thicket/Damp Heathland Complex | Emergent | Shrub |
| 432 | Floodplain Thicket/Shallow Freshwater Marsh Complex | Emergent | Shrub |
| 585 | Floodplain Thicket/Wet Heathland Complex | Emergent | Shrub |
| 1058 | Floodway Pond Herbland/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1060 | Floodway Pond Herbland/Tall Marsh Mosaic | Emergent | Sedge/grass/forb |
| 680 | Freshwater Meadow | Emergent | Sedge/grass/forb |
| 135 | Gallery Rainforest | Emergent | Forest/Woodland |
| 260 | Gilgai Wetland/Plains Grassy Woodland Complex | Emergent | Forest/Woodland |
| 72 | Granitic Hills Woodland | Emergent | Forest/Woodland |
| 22 | Grassy Dry Forest | Emergent | Forest/Woodland |
| 320 | Grassy Dry Forest/Heathy Dry Forest Complex | Emergent | Forest/Woodland |
| 174 | Grassy Dry Forest/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic | Emergent | Forest/Woodland |
| 128 | Grassy Forest | Emergent | Forest/Woodland |
| 1015 | Grassy Riverine Forest/Drainage-line Aggregate Mosaic | Emergent | Forest/Woodland |
| 1029 | Grassy Riverine Forest/Floodway Pond Herbland Mosaic | Emergent | Forest/Woodland |
| 1016 | Grassy Riverine Forest/Plains Grassy Woodland/Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 1017 | Grassy Riverine Forest/Riverine Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 1030 | Grassy Riverine Forest/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1062 | Grassy Riverine Forest/Riverine Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 1063 | Grassy Riverine Forest/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 1065 | Grassy Riverine Forest/Tall Marsh Mosaic | Emergent | Forest/Woodland |
| 175 | Grassy Woodland | Emergent | Forest/Woodland |
| 252 | Grassy Woodland/Alluvial Terraces Herb-rich Woodland Complex | Emergent | Forest/Woodland |
| 76 | Grassy Woodland/Alluvial Terraces Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 697 | Grassy Woodland/Alluvial Terraces Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 719 | Grassy Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 896 | Grassy Woodland/Heathy Dry Forest Complex | Emergent | Forest/Woodland |
| 802 | Grassy Woodland/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 752 | Grassy Woodland/Hills Herb-rich Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 274 | Grassy Woodland/Plains Grassy Woodland Complex | Emergent | Forest/Woodland |
| 924 | Grassy Woodland/Swamp Scrub Mosaic | Emergent | Forest/Woodland |
| 251 | Grassy Woodland/Valley Grassy Forest Mosaic | Emergent | Forest/Woodland |
| 902 | Gully Woodland | Emergent | Forest/Woodland |
| 279 | Heathland Thicket | Emergent | Shrub |
| 426 | Heathland Thicket/Sand Heathland Complex | Emergent | Shrub |
| 565 | Heathland Thicket/Seasonally Inundated Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 20 | Heathy Dry Forest | Emergent | Forest/Woodland |
| 391 | Heathy Dry Forest/Damp Sands Herb-rich Woodland Complex | Emergent | Forest/Woodland |
| 176 | Heathy Dry Forest/Grassy Woodland Complex | Emergent | Forest/Woodland |
| 393 | Heathy Dry Forest/Heathy Woodland Complex | Emergent | Forest/Woodland |
| 396 | Heathy Dry Forest/Sedgy Riparian Woodland Complex | Emergent | Forest/Woodland |
| 392 | Heathy Dry Forest/Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 179 | Heathy Herb-rich Woodland | Emergent | Forest/Woodland |
| 785 | Heathy Herb-rich Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 88 | Heathy Mallee | Emergent | Shrub |
| 48 | Heathy Woodland | Emergent | Forest/Woodland |
| 650 | Heathy Woodland/Damp Heathy Woodland/Damp Heathland Mosaic | Emergent | Forest/Woodland |
| 481 | Heathy Woodland/Heathy Dry Forest Complex | Emergent | Forest/Woodland |
| 790 | Heathy Woodland/Heathy Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 786 | Heathy Woodland/Heathy Herb-rich Woodland/Damp Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 737 | Heathy Woodland/Limestone Woodland Mosaic | Emergent | Forest/Woodland |
| 493 | Heathy Woodland/Plains Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 892 | Heathy Woodland/Sand Heathland Mosaic | Emergent | Forest/Woodland |
| 471 | Heathy Woodland/Shrubby Woodland Mosaic | Emergent | Forest/Woodland |
| 23 | Herb-rich Foothill Forest | Emergent | Forest/Woodland |
| 178 | Herb-rich Foothill Forest/Shrubby Foothill Forest Complex | Emergent | Forest/Woodland |
| 71 | Hills Herb-rich Woodland | Emergent | Forest/Woodland |
| 745 | Hills Herb-rich Woodland/Plains Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 400 | Hills Herb-rich Woodland/Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 677 | Inland Saltmarsh | Emergent | Shrub |
| 939 | Lake Bed Herbland/Red Gum Swamp Mosaic | Emergent | Forest/Woodland |
| 1014 | Late-lying Snowpatch Herbland | Emergent | Sedge/grass/forb |
| 704 | Lateritic Woodland | Emergent | Forest/Woodland |
| 760 | Lateritic Woodland/Heathy Dry Forest Mosaic | Emergent | Forest/Woodland |
| 942 | Lignum Swampy Woodland/Lake Bed Herbland Mosaic | Emergent | Forest/Woodland |
| 943 | Lignum Swampy Woodland/Plains Grassland Mosaic | Emergent | Forest/Woodland |
| 655 | Lignum-Cane Grass Swamp | Emergent | Shrub |
| 15 | Limestone Box Forest | Emergent | Forest/Woodland |
| 133 | Limestone Pomaderris Shrubland | Emergent | Shrub |
| 91 | Loamy Sands Mallee | Unknown | Unknown |
| 102 | Low Chenopod Shrubland | Emergent | Shrub |
| 66 | Low Rises Woodland | Emergent | Forest/Woodland |
| 1038 | Low Rises Woodland/Riverine Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 87 | Lowan Sands Mallee | Emergent | Shrub |
| 16 | Lowland Forest | Emergent | Forest/Woodland |
| 916 | Lowland Forest - Hardwood Plantation | Emergent | Forest/Woodland |
| 795 | Lowland Forest/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 698 | Lowland Forest/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 877 | Lowland Herb-rich Forest | Emergent | Forest/Woodland |
| 652 | Lunette Woodland | Emergent | Forest/Woodland |
| 903 | Mangrove Shrubland/Estuarine Flats Grassland Mosaic | Emergent | Mangrove |
| 38 | Montane Damp Forest | Emergent | Forest/Woodland |
| 36 | Montane Dry Woodland | Emergent | Forest/Woodland |
| 702 | Montane Grassland | Emergent | Sedge/grass/forb |
| 37 | Montane Grassy Woodland | Emergent | Forest/Woodland |
| 703 | Montane Grassy Woodland/Montane Grassland Mosaic | Emergent | Forest/Woodland |
| 319 | Montane Herb-rich Woodland | Emergent | Forest/Woodland |
| 183 | Montane Shrubby Woodland | Emergent | Forest/Woodland |
| 39 | Montane Wet Forest | Emergent | Forest/Woodland |
| 1048 | Mosaic of Aquatic Herbland/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1046 | Mosaic of Aquatic Herbland/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1039 | Mosaic of Drainage-line Aggregate/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1021 | Mosaic of Drainage-line Aggregate/Grassy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1024 | Mosaic of Drainage-line Aggregate/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1056 | Mosaic of Floodplain Grassy Wetland/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1050 | Mosaic of Floodplain Grassy Wetland/Grassy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1053 | Mosaic of Floodplain Grassy Wetland/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1036 | Mosaic of Floodplain Riparian Woodland/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1057 | Mosaic of Floodway Pond Herbland/Grassy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1059 | Mosaic of Floodway Pond Herbland/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1020 | Mosaic of Grassy Riverine Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1019 | Mosaic of Grassy Riverine Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1061 | Mosaic of Grassy Riverine Forest-Riverine Swamp Forest Complex/Riverine Swamp Forest | Emergent | Forest/Woodland |
| 1042 | Mosaic of Riverine Grassy Woodland/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1072 | Mosaic of Riverine Swamp Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1074 | Mosaic of Riverine Swampy Woodland/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1078 | Mosaic of Sedgy Riverine Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1075 | Mosaic of Sedgy Riverine Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1080 | Mosaic of Sedgy Riverine Forest-Riverine Swamp Forest Complex/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1079 | Mosaic of Sedgy Riverine Forest-Riverine Swamp Forest Complex/Tall Marsh | Emergent | Forest/Woodland |
| 1083 | Mosaic of Tall Marsh/Floodway Pond Herbland-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1085 | Mountain Valley Riparian Woodland | Emergent | Forest/Woodland |
| 950 | Native EVCs - Hardwood Plantation | Emergent | Forest/Woodland |
| 982 | No EVC assigned - need editing | Unknown | Unknown |
| 971 | Non-Woody Vegetation - No EVC assigned | Unknown | Unknown |
| 996 | Not assessed to date | Unknown | Unknown |
| 981 | Parilla Mallee | Emergent | Shrub |
| 682 | Permanent Open Freshwater | Non-emergent | No emergent vegetation |
| 684 | Permanent Saline | Non-emergent | No emergent vegetation |
| 891 | Plains Brackish Sedge Wetland | Emergent | Sedge/grass/forb |
| 899 | Plains Freshwater Sedge Wetland | Emergent | Sedge/grass/forb |
| 132 | Plains Grassland | Emergent | Sedge/grass/forb |
| 897 | Plains Grassland/Plains Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 267 | Plains Grassland/Plains Grassy Woodland/Gilgai Wetland Mosaic | Emergent | Forest/Woodland |
| 715 | Plains Grassland/Stony Knoll Shrubland Mosaic | Emergent | Shrub |
| 151 | Plains Grassy Forest | Emergent | Forest/Woodland |
| 832 | Plains Grassy Wetland/Red Gum Swamp Mosaic | Emergent | Forest/Woodland |
| 55 | Plains Grassy Woodland | Emergent | Forest/Woodland |
| 261 | Plains Grassy Woodland/Creekline Grassy Woodland Mosaic | Emergent | Forest/Woodland |
| 238 | Plains Grassy Woodland/Creekline Grassy Woodland/Floodplain Riparian Woodland Mosaic | Emergent | Forest/Woodland |
| 240 | Plains Grassy Woodland/Creekline Grassy Woodland/Wetland Formation Mosaic | Emergent | Forest/Woodland |
| 186 | Plains Grassy Woodland/Floodplain Riparian Woodland Complex | Emergent | Forest/Woodland |
| 259 | Plains Grassy Woodland/Gilgai Wetland Mosaic | Emergent | Forest/Woodland |
| 263 | Plains Grassy Woodland/Plains Grassland/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 739 | Plains Grassy Woodland/Plains Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 716 | Plains Grassy Woodland/Stony Knoll Shrubland Mosaic | Emergent | Forest/Woodland |
| 927 | Plains Grassy Woodland/Swamp Scrub/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 188 | Plains Grassy Woodland/Valley Grassy Forest Complex | Emergent | Forest/Woodland |
| 190 | Plains Grassy Woodland/Valley Grassy Forest/Grassy Woodland Complex | Emergent | Forest/Woodland |
| 826 | Plains Savannah | Emergent | Sedge/grass/forb |
| 780 | Plains Sedgy Woodland/Shallow Sands Woodland/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 776 | Plains Swampy Woodland/Swamp Scrub Mosaic | Emergent | Forest/Woodland |
| 803 | Plains Woodland | Emergent | Forest/Woodland |
| 787 | Plains Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 235 | Plains Woodland/Herb-rich Gilgai Wetland Mosaic | Emergent | Forest/Woodland |
| 855 | Plains Woodland/Lignum Swamp Mosaic | Emergent | Forest/Woodland |
| 693 | Plains Woodland/Plains Grassland Mosaic | Emergent | Forest/Woodland |
| 273 | Plains Woodland/Plains Grassland/Gilgai Wetland Mosaic | Emergent | Forest/Woodland |
| 660 | Plains Woodland/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 724 | Plains Woodland/Plains Sedgy Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 856 | Plains Woodland/Red Gum Swamp Mosaic | Emergent | Forest/Woodland |
| 149 | Plantation (Softwood and Hardwood) | Emergent | Forest/Woodland |
| 987 | Plantation (undefined) | Emergent | Forest/Woodland |
| 997 | Private Land No Tree Cover | Unknown | Unknown |
| 138 | Railway-Roadside-Fenceline Vegetation | Unknown | Unknown |
| 830 | Red Gum Swamp/Cane Grass Wetland Mosaic | Emergent | Forest/Woodland |
| 834 | Red Gum Swamp/Lignum Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 333 | Red Gum Swamp/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 831 | Red Gum Swamp/Spike-sedge Wetland Mosaic | Emergent | Forest/Woodland |
| 886 | Red Gum Wetland/Aquatic Herbland Mosaic | Emergent | Forest/Woodland |
| 458 | Red Gum Wetland/Shallow Freshwater Marsh Mosaic | Emergent | Forest/Woodland |
| 95 | Red Swale Mallee | Emergent | Shrub |
| 300 | Reed Swamp | Emergent | Sedge/grass/forb |
| 96 | Ridged Plains Mallee | Emergent | Shrub |
| 18 | Riparian Forest | Emergent | Forest/Woodland |
| 237 | Riparian Forest/Swampy Riparian Woodland Mosaic | Emergent | Forest/Woodland |
| 84 | Riparian Forest/Swampy Riparian Woodland/Riparian Shrubland/Riverine Escarpment Scrub Mosaic | Emergent | Forest/Woodland |
| 123 | Riparian Forest/Warm Temperate Rainforest Mosaic | Emergent | Forest/Woodland |
| 509 | Riparian Scrub/Heathland Thicket Mosaic | Emergent | Shrub |
| 510 | Riparian Scrub/Sedgy Riparian Woodland Complex | Emergent | Forest/Woodland |
| 596 | Riparian Scrub/Sedgy Riparian Woodland Mosaic | Emergent | Forest/Woodland |
| 17 | Riparian Scrub/Swampy Riparian Woodland Complex | Emergent | Forest/Woodland |
| 19 | Riparian Shrubland | Emergent | Shrub |
| 269 | Riparian Shrubland/Swampy Riparian Woodland Mosaic | Emergent | Forest/Woodland |
| 641 | Riparian Woodland | Emergent | Forest/Woodland |
| 668 | Riparian Woodland/Escarpment Shrubland Mosaic | Emergent | Forest/Woodland |
| 321 | Riverine Chenopod Woodland/Lignum Swamp Mosaic | Emergent | Forest/Woodland |
| 110 | Riverine Chenopod Woodland/Plains Grassland Mosaic | Emergent | Forest/Woodland |
| 82 | Riverine Escarpment Scrub | Emergent | Shrub |
| 1088 | Riverine Grassland | Emergent | Sedge/grass/forb |
| 295 | Riverine Grassy Woodland | Emergent | Forest/Woodland |
| 1027 | Riverine Grassy Woodland/Grassy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 870 | Riverine Grassy Woodland/Plains Woodland Complex | Emergent | Forest/Woodland |
| 871 | Riverine Grassy Woodland/Plains Woodland/Gilgai Wetland Complex | Emergent | Forest/Woodland |
| 872 | Riverine Grassy Woodland/Plains Woodland/Riverine Chenopod Woodland Complex | Emergent | Forest/Woodland |
| 873 | Riverine Grassy Woodland/Riverine Chenopod Woodland/Wetland Mosaic | Emergent | Forest/Woodland |
| 1028 | Riverine Grassy Woodland/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 1040 | Riverine Grassy Woodland/Riverine Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 1041 | Riverine Grassy Woodland/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 658 | Riverine Grassy Woodland/Sedgy Riverine Forest/Aquatic Herbland Mosaic | Emergent | Forest/Woodland |
| 255 | Riverine Grassy Woodland/Sedgy Riverine Forest/Wetland Formation Mosaic | Emergent | Forest/Woodland |
| 1067 | Riverine Swamp Forest/Riverine Swampy Woodland Mosaic | Emergent | Forest/Woodland |
| 1068 | Riverine Swamp Forest/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 1069 | Riverine Swamp Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex | Emergent | Forest/Woodland |
| 1070 | Riverine Swamp Forest/Spike-sedge Wetland Mosaic | Emergent | Forest/Woodland |
| 1071 | Riverine Swamp Forest/Tall Marsh Mosaic | Emergent | Forest/Woodland |
| 946 | Riverine Swampy Woodland/Lignum Swamp Mosaic | Emergent | Forest/Woodland |
| 1099 | Riverine Swampy Woodland/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 1073 | Riverine Swampy Woodland/Sedgy Riverine Forest Mosaic | Emergent | Forest/Woodland |
| 64 | Rocky Chenopod Woodland | Emergent | Forest/Woodland |
| 193 | Rocky Outcrop Herbland | Emergent | Sedge/grass/forb |
| 28 | Rocky Outcrop Shrubland | Emergent | Shrub |
| 73 | Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic | Emergent | Shrub |
| 351 | Rocky Outcrop Shrubland/Rocky Outcrop Herbland/Grassy Dry Forest Complex | Emergent | Shrub |
| 986 | Rocky Shore | Non-emergent | No emergent vegetation |
| 741 | Salt Paperbark Woodland/Samphire Shrubland Mosaic | Emergent | Forest/Woodland |
| 940 | Samphire Shrubland/Saline Lake Mosaic | Emergent | Shrub |
| 134 | Sand Forest | Emergent | Forest/Woodland |
| 6 | Sand Heathland | Emergent | Shrub |
| 500 | Sand Heathland/Damp Heathland Complex | Emergent | Shrub |
| 307 | Sand Heathland/Wet Heathland Mosaic | Emergent | Shrub |
| 264 | Sand Ridge Woodland | Emergent | Forest/Woodland |
| 93 | Sandstone Ridge Shrubland | Emergent | Shrub |
| 257 | Sandstone Ridge Shrubland/Box Ironbark Forest Mosaic | Emergent | Forest/Woodland |
| 694 | Sandstone Ridge Shrubland/Low Rises Woodland Mosaic | Emergent | Forest/Woodland |
| 985 | Sandy Beach | Non-emergent | No emergent vegetation |
| 141 | Sandy Flood Scrub | Emergent | Shrub |
| 874 | Sandy Stream Shrubland | Emergent | Shrub |
| 674 | Sandy Stream Woodland | Emergent | Forest/Woodland |
| 894 | Scoria Cone Woodland | Emergent | Forest/Woodland |
| 529 | Seasonally Inundated Shrubby Woodland/Heathland Thicket Mosaic | Emergent | Forest/Woodland |
| 751 | Seasonally Inundated Shrubby Woodland/Plains Sedgy Woodland Mosaic | Emergent | Forest/Woodland |
| 531 | Seasonally Inundated Shrubby Woodland/Sedge Wetland Complex | Emergent | Forest/Woodland |
| 198 | Sedgy Riparian Woodland | Emergent | Forest/Woodland |
| 798 | Sedgy Riparian Woodland/Riparian Scrub Mosaic | Emergent | Forest/Woodland |
| 1076 | Sedgy Riverine Forest/Spike-sedge Wetland Mosaic | Emergent | Forest/Woodland |
| 1077 | Sedgy Riverine Forest/Tall Marsh Mosaic | Emergent | Forest/Woodland |
| 98 | Semi-arid Chenopod Woodland | Emergent | Forest/Woodland |
| 828 | Semi-arid Parilla Woodland | Emergent | Forest/Woodland |
| 97 | Semi-arid Woodland | Unknown | Unknown |
| 683 | Semi-Permanent Saline | Unknown | Unknown |
| 200 | Shallow Freshwater Marsh | Emergent | Unknown |
| 519 | Shallow Freshwater Marsh/Floodplain Thicket Mosaic | Emergent | Shrub |
| 521 | Shallow Freshwater Marsh/Seasonally Inundated Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 882 | Shallow Sands Woodland | Emergent | Forest/Woodland |
| 788 | Shallow Sands Woodland/Heathy Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 748 | Shallow Sands Woodland/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 711 | Shallow Sands Woodland/Plains Sedgy Woodland Mosaic | Emergent | Forest/Woodland |
| 749 | Shallow Sands Woodland/Plains Sedgy Woodland/Seasonally Inundated Shrubby Woodland Mosaic | Emergent | Forest/Woodland |
| 750 | Shallow Sands Woodland/Plains Sedgy Woodland/Seasonally Inundated Shrubby Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 867 | Shallow Sands Woodland/Plains Woodland Mosaic | Emergent | Forest/Woodland |
| 316 | Shrubby Damp Forest | Emergent | Forest/Woodland |
| 21 | Shrubby Dry Forest | Emergent | Forest/Woodland |
| 45 | Shrubby Foothill Forest | Emergent | Forest/Woodland |
| 315 | Shrubby Foothill Forest/Damp Forest Complex | Emergent | Forest/Woodland |
| 938 | Shrubby Gully Forest | Emergent | Forest/Woodland |
| 818 | Shrubby Riverine Woodland | Emergent | Forest/Woodland |
| 201 | Shrubby Wet Forest | Emergent | Forest/Woodland |
| 282 | Shrubby Woodland | Emergent | Forest/Woodland |
| 439 | Shrubby Woodland/Alluvial Terraces Herb-rich Woodland Complex | Emergent | Forest/Woodland |
| 438 | Shrubby Woodland/Alluvial Terraces Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 547 | Shrubby Woodland/Damp Sands Herb-rich Woodland Complex | Emergent | Forest/Woodland |
| 436 | Shrubby Woodland/Damp Sands Herb-rich Woodland Mosaic | Emergent | Forest/Woodland |
| 441 | Shrubby Woodland/Heathy Woodland Complex | Emergent | Forest/Woodland |
| 449 | Shrubby Woodland/Riparian Scrub Complex | Emergent | Forest/Woodland |
| 799 | Shrubby Woodland/Riparian Scrub Mosaic | Emergent | Forest/Woodland |
| 448 | Shrubby Woodland/Sand Heathland Complex | Emergent | Forest/Woodland |
| 443 | Shrubby Woodland/Seasonally Inundated Shrubby Woodland Complex | Emergent | Forest/Woodland |
| 450 | Shrubby Woodland/Sedgy Riparian Woodland Complex | Emergent | Forest/Woodland |
| 1012 | Snowpatch Grassland | Emergent | Sedge/grass/forb |
| 1081 | Spike-sedge Wetland/Tall Marsh Mosaic | Emergent | Sedge/grass/forb |
| 714 | Stony Knoll Shrubland/Plains Grassy Woodland/Plains Grassy Wetland Mosaic | Emergent | Forest/Woodland |
| 203 | Stony Rises Woodland | Emergent | Forest/Woodland |
| 792 | Stony Rises Woodland/Stony Knoll Shrubland Complex | Emergent | Forest/Woodland |
| 851 | Stream Bank Shrubland | Emergent | Shrub |
| 204 | Sub-alpine Damp Heathland | Emergent | Shrub |
| 1003 | Sub-alpine Dry Shrubland | Emergent | Shrub |
| 206 | Sub-alpine Grassland | Emergent | Sedge/grass/forb |
| 208 | Sub-alpine Riparian Shrubland | Emergent | Shrub |
| 42 | Sub-alpine Shrubland | Emergent | Shrub |
| 44 | Sub-alpine Treeless Vegetation | Emergent | Shrub |
| 211 | Sub-alpine Wet Heathland/Alpine Valley Peatland Mosaic | Emergent | Moss/heath |
| 317 | Sub-alpine Wet Heathland/Sub-alpine Grassland Mosaic | Emergent | Shrub |
| 43 | Sub-alpine Woodland | Emergent | Forest/Woodland |
| 720 | Swamp Scrub/Aquatic Herbland Mosaic | Emergent | Shrub |
| 687 | Swamp Scrub/Plains Grassland Mosaic | Emergent | Shrub |
| 639 | Swamp Scrub/Plains Grassy Forest Mosaic | Emergent | Forest/Woodland |
| 700 | Swamp Scrub/Plains Sedgy Wetland Mosaic | Emergent | Shrub |
| 733 | Swamp Scrub/Plains Sedgy Wetland/Aquatic Herbland Mosaic | Emergent | Shrub |
| 701 | Swamp Scrub/Warm Temperate Rainforest/Billabong Wetland Mosaic | Emergent | Forest/Woodland |
| 638 | Swamp Scrub/Wet Heathland Mosaic | Emergent | Shrub |
| 126 | Swampy Riparian Complex | Emergent | Shrub |
| 212 | Swampy Riparian Woodland/Perched Boggy Shrubland Mosaic | Emergent | Forest/Woodland |
| 688 | Swampy Riparian Woodland/Swamp Scrub Mosaic | Emergent | Forest/Woodland |
| 35 | Tableland Damp Forest | Emergent | Forest/Woodland |
| 1087 | Tall Marsh/Aquatic Herbland Mosaic | Emergent | Sedge/grass/forb |
| 1084 | Tall Marsh/Non-Vegetation Mosaic | Emergent | Sedge/grass/forb |
| 1090 | Tall Marsh/Open Water Mosaic | Emergent | Sedge/grass/forb |
| 1082 | Tall Marsh/Riverine Swamp Forest Mosaic | Emergent | Forest/Woodland |
| 90 | Tea-tree Scrub | Emergent | Shrub |
| 313 | Unclassified Moist Forests | Emergent | Forest/Woodland |
| 47 | Valley Grassy Forest | Emergent | Forest/Woodland |
| 409 | Valley Grassy Forest/Heathy Woodland Complex | Emergent | Forest/Woodland |
| 408 | Valley Grassy Forest/Herb-rich Foothill Forest Complex | Emergent | Forest/Woodland |
| 241 | Valley Grassy Forest/Plains Grassy Woodland Complex | Emergent | Forest/Woodland |
| 699 | Valley Grassy Forest/Swamp Scrub Mosaic | Emergent | Forest/Woodland |
| 127 | Valley Heathy Forest | Emergent | Forest/Woodland |
| 32 | Warm Temperate Rainforest | Emergent | Forest/Woodland |
| 995 | Water - Ocean | Non-emergent | No emergent vegetation |
| 1107 | Water Body - estuary | Non-emergent | No emergent vegetation |
| 992 | Water Body - Fresh | Non-emergent | No emergent vegetation |
| 998 | Water Body - man-made | Non-emergent | No emergent vegetation |
| 991 | Water body - salt | Non-emergent | No emergent vegetation |
| 983 | Water Body - to be determined | Non-emergent | No emergent vegetation |
| 30 | Wet Forest | Emergent | Forest/Woodland |
| 930 | Wet Forest - Hardwood Plantation | Emergent | Forest/Woodland |
| 686 | Wet Heathland/Damp Heathland Mosaic | Emergent | Shrub |
| 645 | Wet Heathland/Heathy Woodland Mosaic | Emergent | Forest/Woodland |
| 768 | Wet Heathland/Riparian Scrub Mosaic | Emergent | Shrub |
| 233 | Wet Sands Thicket | Emergent | Shrub |
| 74 | Wetland Formation | Emergent | Sedge/grass/forb |
| 824 | Woorinen Mallee | Unknown | Unknown |
| 86 | Woorinen Sands Mallee | Unknown | Unknown |

Appendix 2. ANAE classification framework habitat attributes for surface waters

Table A2.1 ANAE classification attributes for aquatic habitats (AETG (2012).

| System | Attribute | Metrics | | | |
| --- | --- | --- | --- | --- | --- |
| Marine and estuarine | Substrate | Unbroken rock  Broken rock/Boulder/Cobble  Pebble/Gravel  Sand  Silt | | | |
| Structural Macrobiota | Mangroves  Saltmarsh  Seagrass  Macroalgae  Coral  Filter feeders | | | |
| Water Depth | Supratidal  Intertidal  Subtidal  Shallow  Deep  Abysmal | | | |
| Light Availability | >15%  5 – 15%  <5% | or | | Photic zone  Low light zone  Aphotic zone |
| Nutrient Availability | High  Medium  Low | or | | Oligotrophic  Mesotrophic  Eutrophic |
| Exposure | Sheltered  Exposed | | | |
| Lacustrine and palustrine | Landform | High Energy  Upland  Slope  Low Energy  Upland (Plateau)  Lowland | | | |
| Lacustrine and palustrine | Soils | Porous  Peat (organic)  Mineral (soil)  Sand (non-soil  Non-porous  Rock (non-soil) | | | |
| Dominant vegetation | Forested  Shrub  Sedge/grass/forb  No emergent vegetation | | | |
| Dominant water source (>70%) | Surface water  Groundwater  Both surface and ground (where there is temporal dominance by one or the other)  Localised rainfall | | | |
| Water type | Salinity  Fresh (<3000 mg/L)  Brackish (3000 – 5000 mg/L)  Saline (> 5000 mg/L) | or | pH  Acidic (<6)  Neutral (6 – 8)  Alkaline (>7) | |
| Water regime | Permanently inundated  Seasonally inundated  Aseasonally inundated | or | Commonly wet (>70% of time)  Periodic inundation  Waterlogged | |

Appendix 3. Datasets used to assign system and habitat attributes

Table A3.1. Datasets used to assign wetland system and habitat attributes to wetlands in WETLAND\_CURRENT.

| Dataset name | Description | Attribute | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Wetland system | Wetland origin | Dominant vegetation | Water source | Water regime | Salinity regime |
| 1 in 100 year flood extent | Polygon data delineating modelled statistical flood extent with an Average Recurrence Interval of 100 years  <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803003630.htm> |  |  |  | ✓ |  |  |
| All Victorian dam boundaries | A dataset developed for DELWP by SKM that maps dams across Victoria (unpublished). |  | ✓ |  | ✓ |  |  |
| ALPS | A layer developed by DELWP which defines high country peatlands as described in Lawrence et al. 2009 |  | ✓ | ✓ |  |  |  |
| DRWaterbodies | Melbourne Water’s stormwater assets database (unpublished). |  | ✓ |  | ✓ |  |  |
| ESTUARIES | DELWP geospatial layer defining the spatial extent of estuaries, developed by Deakin University (Barton et al. 2008) | ✓ |  |  |  |  | ✓ |
| Features of interest | A dataset intended to describe and record the location of features of interest as supplied by an authoritative source, including features such as education centres, landmarks, geographical points, mines. <http://www.dse.vic.gov.au/__data/assets/pdf_file/0018/142470/Vicmap-Features-of-Interest-Prod-Desc-V1_1.pdf> |  | ✓ |  |  |  |  |
| Floodplain extent | Wetland landscapes 12 (Riverine mid-Murray), 13 (Riverine – Mallee) and 15 (Lowland Riparian Floodplain) on the WETLAND\_REGIONS dataset (Section 3.1.1, Figure 8) |  |  |  | ✓ |  |  |
| Floodway | Polygon features representing 'declared' or otherwise delineated floodways. Floodways are typically areas of low lying land close to rivers that are prone to flooding  <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803004311.htm> |  |  |  | ✓ |  |  |
| GB\_SPR | A layer developed by Goulburn Broken CMA which defines springs as described in Coates et al. 2010 |  | ✓ | ✓ |  |  |  |
| GB\_SS | A layer developed by Goulburn Broken CMA which defines soaks as described in Carr et al. 2006 |  | ✓ | ✓ |  |  |  |
| Geoscience Australia’s *Water Observations From Space* | Dataset obtained from Geoscience Australia  <http://www.ga.gov.au/scientific-topics/hazards/flood/wofs> |  |  |  |  | ✓ |  |
| IWC Data Management System (IWCDMS) | A dataset stored in the Index of Wetland Condition Data Management System (IWCDMS) which includes the proportion of each EVC present at each assessed wetland as recorded in IWC field assessments and using the EVCs in Appendix 1. |  |  | ✓ |  |  | ✓ |
| Modelled 2005 EVCs (updated) | A dataset combined from two sources:  Modelled 2005 EVCs - polygon features delineating native vegetation type across Victoria, modelled in 2005 using EVCs <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803003495.htm>  DELWP Modelled 2005 EVC unpublished update - polygon features delineating native vegetation type (EVCs) across parts of Victoria had been updated from modelled EVC 2005 based on surveys after 2005. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| National Atlas of Groundwater Dependent Ecosystems (GDE Atlas) | An atlas of groundwater dependent ecosystems released by the Australian Government <http://www.bom.gov.au/water/groundwater/gde> <<add reference>> |  |  |  | ✓ |  |  |
| Victorian Coastal Saltmarsh and Estuarine EVCs | Mapping of coastal saltmarsh and estuarine EVCs (Table 9) across Victoria (unpublished dataset developed for the Victorian Saltmarsh Study (Boon et al. 2011) | ✓ |  |  |  |  | ✓ |
| VMINDEX\_FRAMEWORK\_AREA\_POLYGON | Polygon version of outline of Victoria’s landmass at 1:25:000 scale. <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803002865.htm> | ✓ |  |  |  |  | ✓ |
| Water area 1:25,000 | Polygon features delineating hydrological features, including lakes, flats (subject to inundation), wetlands, pondages (saltpan and sewage), watercourse areas, rapids and waterfalls. <http://services.land.vic.gov.au/rhok/Metadata/HY_WATER_AREA_POLYGON.htm> |  | ✓ |  | ✓ | ✓ |  |
| Watercourse network 1:25,000 | Line features delineating hydrological features. For the analysis of data for river water source attribute, the dataset was restricted to features categorised as a watercourse\_river or watercourse\_stream (as per FEATURE\_TYPE\_CODE attribute)  <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803002490.htm> |  |  |  | ✓ |  |  |
| Watercourse network 1:250,000 to  1 :5,000,000 | Line features delineating hydrological features, for this analysis restricted to features categorised as a watercourse\_river or watercourse\_stream (as per FEATURE\_TYPE\_CODE attribute)  <http://www.giconnections.vic.gov.au/content/vicgdd/record/ANZVI0803003512.htm> |  |  |  | ✓ |  |  |
| WETLAND\_1788 | A DELWP layer developed by Corrick which estimates the extent and type of wetlands present at the time of European settlement using the Corrick classification. |  | ✓ |  |  |  |  |
| WETLAND\_1994 | A layer developed by DELWP which defines the spatial extent of wetlands as well as their Corrick categories and subcategories based on data from 1976 to 1994 and subsequent refinements. |  | ✓ | ✓ | ✓ | ✓ | ✓ |

Appendix 4. Description of Australian Soil Resources Information System regions in Victoria

Table A4.1 Description of Australian Soil Resources Information System regions in Victoria. Source: Pain et al. (2011).

| Region number | Province | Region | Region description |
| --- | --- | --- | --- |
| 10701 | Kosciuszkan Uplands Province | Hume Slopes | Ridges and minor tablelands stepping down westwards and breaking into detached hills with intervening alluvial valley floors. Some strong structural control on landforms. |
| 10703 | Kosciuszkan Uplands Province | Australian Alps | Dissected high upland, glaciated locally with some periglacial features. Uplifted blocks surrounded by highly dissected high relief hill country. |
| 10704 | Kosciuszkan Uplands Province | Tinderry-Gourock Ranges | High hill chains of granite, sandstone and greywacke, moderately dissected, some fault lines. |
| 10705 | Kosciuszkan Uplands Province | Monaro Fall | Deeply dissected steeply sloping plateau margin in metamorphics and granite. Bounded in the west by the Great Escarpment. |
| 10706 | Kosciuszkan Uplands Province | Monaro Tableland | Undulating upland plains with some tablular basalt relief and granite tors. |
| 10707 | Kosciuszkan Uplands Province | East Victorian Uplands | Dissected high plateaus on various resistant rocks, with isolated high plains. |
| 10708 | Kosciuszkan Uplands Province | West Victorian Uplands | Moderately high plateaus and strike ridges. |
| 10709 | Kosciuszkan Uplands Province | West Victorian Plains | Plains mainly on basalt lavas with many volcanic forms and lakes, partly on weak sedimentary rocks. |
| 10710 | Kosciuszkan Uplands Province | South Victorian Uplands | Low fault blocks, mainly of tilted and dissected sandstone; granite hills and islands, in two parts either side of Port Phillip Bay. |
| 10711 | Kosciuszkan Uplands Province | Gippsland Plain | Terraced plains with sand and gravels.. |
| 20301 | Murray Lowlands Province | Lower Darling Plain | Floodplain and lunette lakes. |
| 20302 | Murray Lowlands Province | Cobar Plains | Plains with remnants of silcrete and low sandstone ridges, sand cover in west, with west-east longitundinal dunes. |
| 20303 | Murray Lowlands Province | Condobolin Plains | Plains of gravel and sandy alluvium. |
| 20304 | Murray Lowlands Province | Ivanhoe Plains | Plains with low west-east stabilised longitundinal dunes and sandplain, small pans with lunettes, minor sandstone ridges, floodplains. |
| 20305 | Murray Lowlands Province | Riverine Plain | Alluvial plain. |
| 20306 | Murray Lowlands Province | Mallee Dunefield | Fixed west-east calcareous longitudinal dunes. |
| 20307 | Murray Lowlands Province | Wimmera Plain | Aeolian and alluvial sandplain, minor low sandstone ridges. |
| 20308 | Murray Lowlands Province | Coorong Plain | Coastal barrier, lagoons and limestone dunes. |
| 20309 | Murray Lowlands Province | Millicent Plain | Parallel dune limestone ridges with intervening swamps; closed karst depressions and young volcanoes in south east. |
| 20310 | Murray Lowlands Province | West-Turkey Plains | Plains with variable dune cover, claypans, saline swamps, and intermittent lakes in low-lying areas. |

Appendix 5. Definition of Victorian wetland landscapes

The steps used in the process of defining wetland landscapes are shown in Figure A5.1. Notes following the flow chart provide information on data sources (Table A5.1) and specific steps.

**STEP 9**

2. Define major river floodplains in the remaining IBRA subregions

1. Amalgamate the following IBRA subregions: Mallee Scroll Belt, Robinvale Plains and Murray Fans (Murray bioregions)

3. Within the Victorian Riverina IBRA subregion, select:

* the Loddon River floodplain downstream of Serpentine
* the floodplains of the Murray, Mitta Mitta, Kiewa, Ovens, King, Broken and Goulburn and Avoca Rivers and Broken and Boosey Creeks

Add these to the amalgamated Murray bioregions

4. Divide the amalgamated area from Steps 1 and 3 at the eastern edge of the Loddon floodplain

13. Riverine - Mallee

12. Riverine – mid-Murray

15. Lowland riparian floodplain

**PROCESS STEP**

**WETLAND LANDSCAPE**

1. Alpine, sub-alpine

2. Montane

7. Define near coastal areas

5. Identify areas with elevation >1200 metres

6. Identify areas <= 1200 metres and > 700 metres in elevation

8. Remove near-coastal areas and wetland landscapes 1, 2, 12 and 13 from major river floodplains

**PROCESS STEP**

**WETLAND LANDSCAPE**

13. Add the Lowan Mallee IBRA subregion to the Murray Mallee IBRA subregion

11. Mallee – non-riverine

8. Lowland grassy plains - Wimmera

15. Remove areas within wetland landscapes 10 and 15 from the Wimmera Plain IBRA subregion

14. Remove areas within wetland landscape 10

16. From the Victorian Volcanic Plain IBRA subregion, remove:

* the area originally supporting foothill forest
* areas within wetland regions 10, 14 and 15

6. Lowland grassy plains – western volcanics

10. Select the area originally supporting the Plains Grassy Woodland EVC near Mansfield in the Central Victorian Uplands IBRA subregion and add it to the remainder of the Victorian Riverina IBRA subregion

7. Lowland grassy plains – Riverina Plains

9. Remove wetland landscapes 12, 13 and 15 from the Victorian Riverina IBRA subregion

11. Define lowland sandy/heathy areas

12. Remove lowland sandy/heathy areas from the near coastal area

14. Near-coastal

10. Lowland sandy/heathy

17. Remove the wetland landscapes identified in Steps 1-16 from the IBRA subregion geospatial layer (i.e. regions 1, 2, 6-8, 10-15)

**STEP 18**

24. Amalgamate the Glenelg Plain, Warrnambool Plain and Otway Plain IBRA subregions

3. Lower montane to foothill/wet forest

5. Drier western hills, tablelands and northern slopes

9. Lowland grassy plains – coastal/southern plains

**PROCESS STEP**

**WETLAND REGION**

18. In the area remaining after Step 17, identify areas originally supporting wet forest

26. Add the areas that remain in the Greater Grampians, Gippsland Plain and Dundas Tablelands to those that remain in the Glenelg Plain, Warrnambool Plain and Otway Plain IBRA subregions

20. In the remaining area, identify areas originally supporting foothill forest

21. Amalgamate the Greater Grampians, Gippsland Plain and the Dundas Tablelands IBRA subregions

4. Hills: Foothills, inland slopes and hilly near coastal

23. Remove all areas that originally supported dry forest and woodland (leaving only those areas which will go into wetland landscape 9)

19. Remove wetland landscape 3

22. Remove all wetland landscapes previously identified (all but 5 and 9)

25. Remove all wetland landscapes previously identified (all but 5 and 9)

27. Remove the all wetland landscapes previously identified from the IBRA subregion geospatial layer

Figure A5.1. Process steps in the definition of Victorian wetland landscapes.

**STEP 9**

8. Remove near-coastal areas and wetland landscapes 1, 2, 12 and 13 from major river floodplains

Table A5.1 Sources of data used to define Victorian Wetland landscapes.

|  |  |  |
| --- | --- | --- |
| Data type | Data source | Scale |
| IBRA subregions | VBIOREG100 | 1:100,000 |
| Vegetation - original extent of EVCs | NV1750\_EVC | 1:100,000 |
| Geomorphic units  Present floodplain | LSYS250 | 1:250,000 |
| Extant wetlands | WETLAND\_1994 | 1:100,000 |
| Major rivers | HY\_WATERCOURSE |  |
| Flora species | VBA\_FLORA25  VBA\_FLORA100 | 1:25,000  1:100,000 |
| Elevation | Vicmap Elevation 10 - 20 m | - |

Step 2. Definition of major river floodplains

The main rivers in Victoria outside the Mallee Scroll Belt, Robinvale Plains and Murray Fans Victorian subregions (Table A5.2) were selected and a 500 metre buffer added to both sides of each river. A set of EVCs that occur on lowland riparian floodplains was selected (Table A5.3). The selected EVC polygons that intersected with the 500 metre river buffer were added to the buffer. The area of present floodplain in the LANDSYS layer that intersected the combined area of river buffer and floodplain EVCs was then added. Finally, wetlands on the WETLAND\_1994 layer that intersected the combined area of river buffer, floodplain EVCs and present floodplain were added to define the major river floodplains in the IBRA subregions outside the Mallee Scroll Belt, Robinvale Plains and Murray Fans.

Table A5.2 Main rivers selected to define lowland riparian floodplains outside the Mallee Scroll Belt, Robinvale Plains and Murray Fans Victorian subregions.

| Murray-Darling Drainage Division | South East Coast Drainage Division |
| --- | --- |
| Murray River  Mitta Mitta River  Kiewa River  Ovens River  King River  Broken River  Broken Creek  Kiewa River  Boosey Creek  Goulburn River  Campaspe River  Loddon River  Avoca River  Wimmera River | Genoa River  Cann River  Bemm River  Brodribb River  Snowy River  Buchan River  Tambo River  Nicholson River  Dargo River  Wonnangatta River  Mitchell River  Avon River  Macalister River  Thomson River  La Trobe River  Tarwin River  Yarra River  Werribee River  Barwon River  Leigh River  Yarrowee River  Mount Emu Creek  Hopkins River  Wannon River  Glenelg River |

Table A5.3 EVCs that occur on lowland riparian floodplains.

|  |  |
| --- | --- |
| EVC number | EVC name |
| 663 | Black Box Lignum Woodland |
| 68 | Creekline Grassy Woodland |
| 679 | Drainage-line Woodland |
| 56 | Floodplain Riparian Woodland |
| 813 | Intermittent Swampy Woodland |
| 822 | Intermittent Swampy Woodland/Riverine Grassy Woodland Complex |
| 823 | Lignum Swampy Woodland |
| 641 | Riparian Woodland |
| 103 | Riverine Chenopod Woodland |
| 321 | Riverine Chenopod Woodland/Lignum Swamp Mosaic |

Step 7. Definition of near coastal areas

Near coastal areas were defined by combining the following areas:

1. the Barrier Complexes - Discovery Bay, Gippsland Lakes geomorphic units from the LANDSYS layer;
2. the Bridgewater IBRA subregion;
3. a selection of coastal EVCs (Table A5.4);
4. wetlands from the WETLAND\_1994 layer that intersect the combination of 1-3 above or occur in marine waters; and
5. selected coastal areas in the Otway Plain IBRA subregion (Figure A5.2)

Table A5.4 Coastal EVCs used in the definition of near coastal areas.

| EVC number | EVC name |
| --- | --- |
| 1 | Coastal Dune Scrub/Coastal Dune Grassland Mosaic |
| 2 | Coast Banksia Woodland |
| 9 | Coastal Saltmarsh |
| 10 | Estuarine Wetland |
| 11 | Coastal Lagoon Wetland |
| 144 | Coast Banksia Woodland/Warm Temperate Rainforest Mosaic |
| 160 | Coastal Dune Scrub |
| 161 | Coastal Headland Scrub |
| 162 | Coastal Headland Scrub/Coastal Tussock Grassland Mosaic |
| 163 | Coastal Tussock Grassland |
| 181 | Coast Gully Thicket |
| 302 | Coastal Saltmarsh/Mangrove Shrubland Mosaic |
| 665 | Coastal Mallee Scrub |
| 797 | Coastal Landfill/Sand Accretion |
| 858 | Coastal Alkaline Scrub |
| 879 | Coastal Dune Grassland |
| 900 | Coastal Saltmarsh/Coastal Dune Grassland/Coastal Dune Scrub/Coastal Headland Scrub Mosaic |
| 904 | Coast Banksia Woodland/Swamp Scrub Mosaic |
| 909 | Coastal Dune Scrub/Bird Colony Succulent Herbland Mosaic |
| 914 | Estuarine Flats Grassland |
| 919 | Coastal Headland Scrub/Coast Banksia Woodland Mosaic |
| 921 | Coast Banksia Woodland/Coastal Dune Scrub Mosaic |
| 922 | Coastal Alkaline Scrub/Bird Colony Succulent Herbland Mosaic |
| 935 | Estuarine Wetland/Estuarine Swamp Scrub Mosaic |

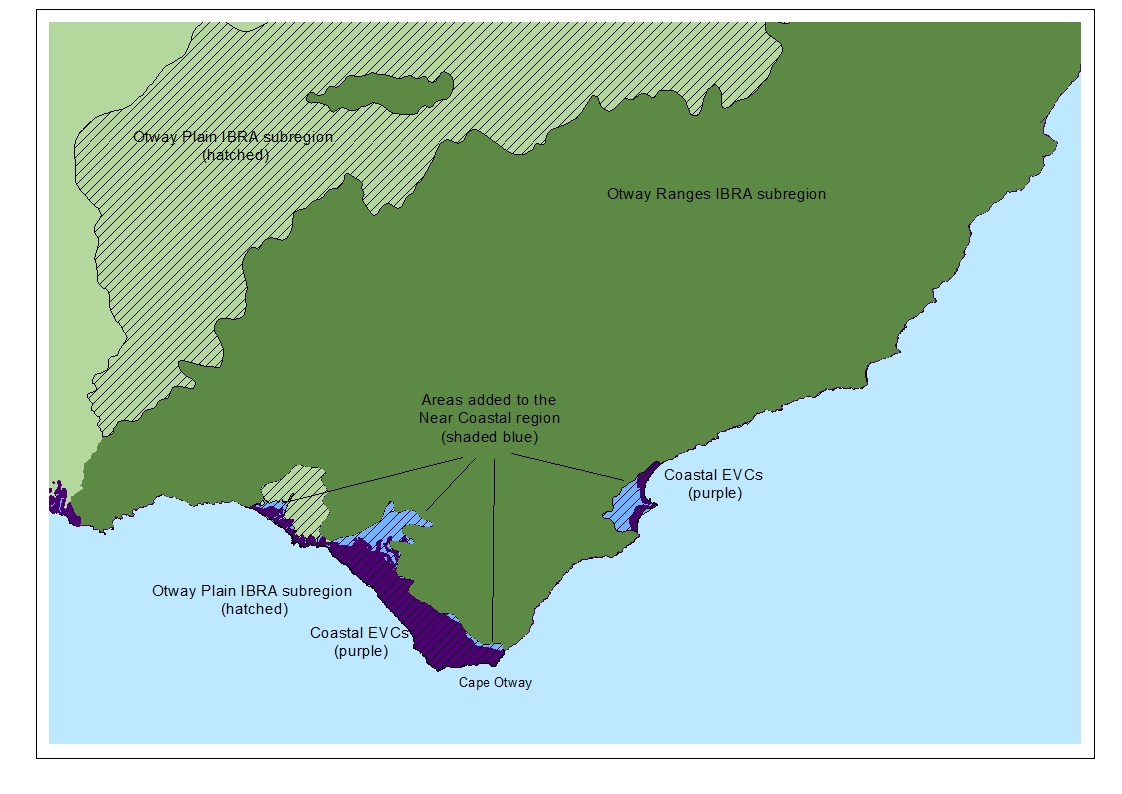


Figure A5.2. Selected areas in the Otway Plain IBRA subregion assigned to the near coastal region.

Step 10. Selection of area in the Central Victorian Uplands IBRA subregion for inclusion in wetland landscape 7

The area in the Central Victorian Uplands IBRA subregion assigned to the Lowland grassy plains – Riverina plains wetland landscape was manually defined based on the occurrence of the Plains Grassy Woodland in the modelled 2005 EVC dataset (Figure A5.3).

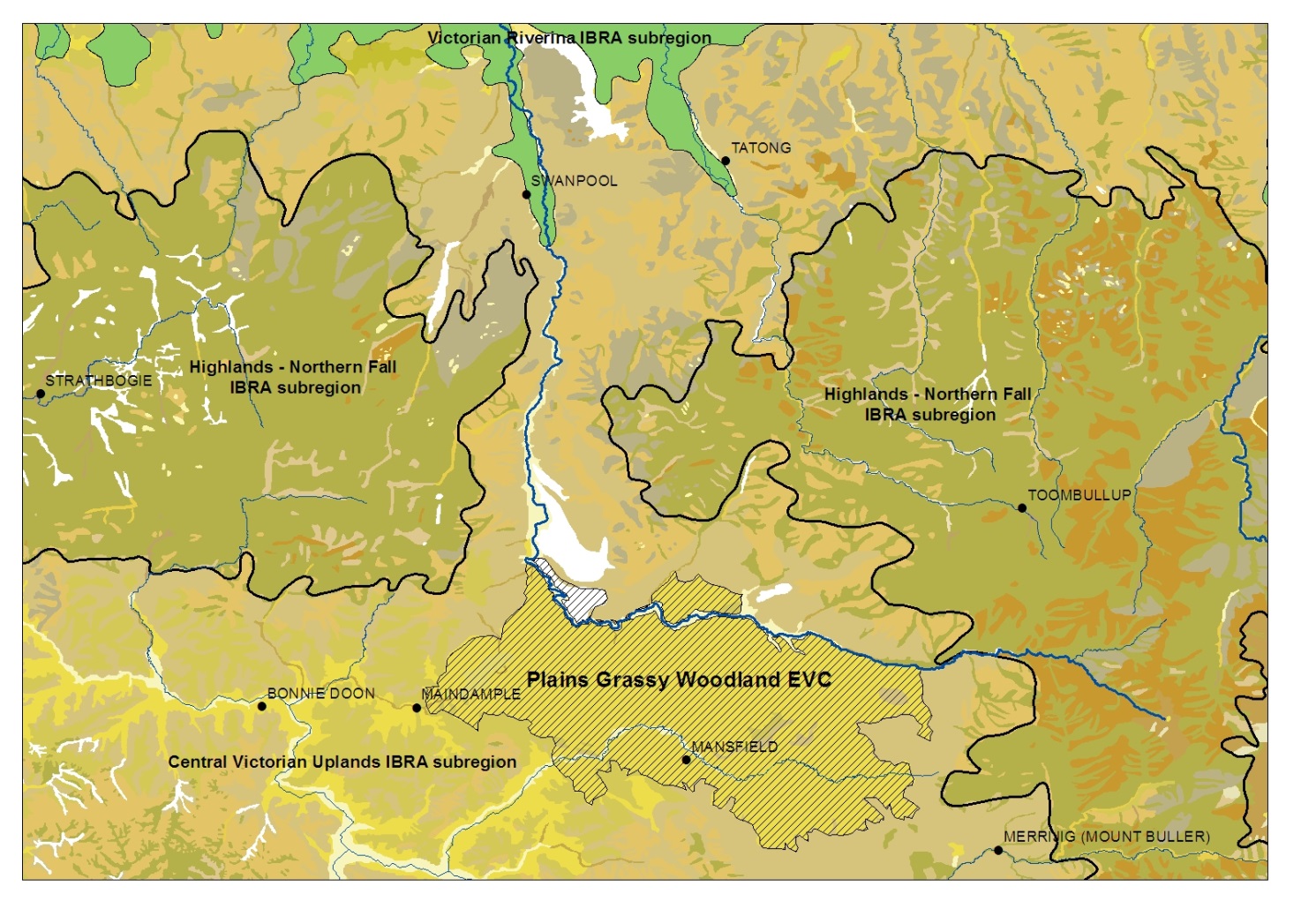


Figure A5.3. Selected polygon (hatched) in the Central Victorian Uplands IBRA subregion assigned to the Lowland grassy plains – Riverina plains wetland landscape.

Step 11. Definition of lowland sandy/heathy areas

Heathy EVCs were selected (Table A5.5) and displayed against IBRA subregions. Heathy EVCs in the alpine and montane wetland landscapes were not included.

For the Lowan Mallee IBRA subregion, the whole of the southernmost polygon was selected as being of predominantly heathy vegetation. For the Wimmera IBRA subregion, geomorphic units and heathy EVCs were displayed and polygons were manually drawn or geomorphic unit polygons were selected where heathy vegetation predominated. For the remainder of the State, heathy polygons were manually drawn where heathy vegetation predominated, based on expert knowledge of heathy/sandy areas where wetlands were likely to occur.

Table A5.5 Heathy EVCs used in the definition of the lowland/sandy/heathy wetland landscape.

| EVC number | EVC name |
| --- | --- |
| 7 | Clay Heathland |
| 159 | Clay Heathland/Wet Heathland/Riparian Scrub Mosaic |
| 5 | Coastal Sand Heathland |
| 165 | Damp Heath Scrub |
| 836 | Damp Heath Scrub/Heathy Woodland Complex |
| 710 | Damp Heathland |
| 746 | Damp Heathland/Damp Heathy Woodland Mosaic |
| 763 | Damp Heathland/Damp Heathy Woodland/Seasonally Inundated Shrubby Woodland Mosaic |
| 734 | Damp Heathland/Damp Heathy Woodland/Wet Heathland Mosaic |
| 505 | Damp Heathland/Riparian Scrub Complex |
| 595 | Damp Heathland/Riparian Scrub Mosaic |
| 762 | Damp Heathland/Sand Heathland Mosaic |
| 754 | Damp Heathland/Seasonally Inundated Shrubby Woodland Mosaic |
| 625 | Damp Heathland/Wet Heathland Mosaic |
| 793 | Damp Heathy Woodland |
| 1106 | Damp Heathy Woodland/Lowland Forest Mosaic |
| 673 | Dune Soak Woodland |
| 89 | Dunefield Heathland |
| 279 | Heathland Thicket |
| 426 | Heathland Thicket/Sand Heathland Complex |
| 565 | Heathland Thicket/Seasonally Inundated Shrubby Woodland Complex |
| 601 | Heathland Thicket/Sedgy Riparian Woodland Complex |
| 427 | Heathland Thicket/Wet Heathland Complex |
| 771 | Heathy Dry Forest/Sand Heathland Mosaic |
| 179 | Heathy Herb-rich Woodland |
| 48 | Heathy Woodland |
| 478 | Heathy Woodland/Damp Heathland Complex |
| 650 | Heathy Woodland/Damp Heathy Woodland/Damp Heathland Mosaic |
| 487 | Heathy Woodland/Grassy Dry Forest Complex |
| 481 | Heathy Woodland/Heathy Dry Forest Complex |
| 790 | Heathy Woodland/Heathy Herb-rich Woodland Mosaic |
| 786 | Heathy Woodland/Heathy Herb-rich Woodland/Damp Heathy Woodland Mosaic |
| 584 | Heathy Woodland/Hills Herb-rich Woodland Complex |
| 737 | Heathy Woodland/Limestone Woodland Mosaic |
| 485 | Heathy Woodland/Plains Grassy Woodland Complex |
| 493 | Heathy Woodland/Plains Grassy Woodland Mosaic |
| 467 | Heathy Woodland/Riparian Scrub Complex |
| 477 | Heathy Woodland/Sand Heathland Complex |
| 892 | Heathy Woodland/Sand Heathland Mosaic |
| 756 | Heathy Woodland/Seasonally Inundated Shrubby Woodland Mosaic |
| 468 | Heathy Woodland/Sedgy Riparian Woodland Complex |
| 475 | Heathy Woodland/Sedgy Riparian Woodland Mosaic |
| 489 | Heathy Woodland/Shrubby Woodland Complex |
| 471 | Heathy Woodland/Shrubby Woodland Mosaic |
| 464 | Heathy Woodland/Valley Grassy Forest Complex |
| 278 | Herb-rich Heathy Forest |
| 704 | Lateritic Woodland |
| 760 | Lateritic Woodland/Heathy Dry Forest Mosaic |
| 764 | Lateritic Woodland/Heathy Woodland Mosaic |
| 664 | Limestone Ridge Woodland |
| 670 | Limestone Woodland |
| 134 | Sand Forest |
| 6 | Sand Heathland |
| 500 | Sand Heathland/Damp Heathland Complex |
| 502 | Sand Heathland/Seasonally Inundated Shrubby Woodland Mosaic |
| 307 | Sand Heathland/Wet Heathland Mosaic |
| 282 | Shrubby Woodland |
| 441 | Shrubby Woodland/Heathy Woodland Complex |
| 766 | Shrubby Woodland/Lateritic Woodland Mosaic |
| 448 | Shrubby Woodland/Sand Heathland Complex |
| 90 | Tea-tree Scrub |
| 8 | Wet Heathland |
| 686 | Wet Heathland/Damp Heathland Mosaic |
| 645 | Wet Heathland/Heathy Woodland Mosaic |
| 504 | Wet Heathland/Riparian Scrub Complex |
| 768 | Wet Heathland/Riparian Scrub Mosaic |

Steps 16 and 20. Definition of foothill forest

The EVCs in Table A5.6 were used to identify the distribution of foothill forest. Polygons were manually drawn around areas where foothill forest predominated.

Table A5.6. EVCs used to identify foothill forest.

| EVC number | EVC name |
| --- | --- |
| 23 | Herb-rich Foothill Forest |
| 379 | Herb-rich Foothill Forest/Damp Sands Herb-rich Woodland Complex |
| 600 | Herb-rich Foothill Forest/Damp Sands Herb-rich Woodland Mosaic |
| 381 | Herb-rich Foothill Forest/Grassy Dry Forest Complex |
| 378 | Herb-rich Foothill Forest/Lowland Forest Complex |
| 380 | Herb-rich Foothill Forest/Sedgy Riparian Woodland Complex |
| 178 | Herb-rich Foothill Forest/Shrubby Foothill Forest Complex |
| 16 | Lowland Forest |
| 623 | Lowland Forest/Damp Sands Herb-rich Woodland Complex |
| 795 | Lowland Forest/Damp Sands Herb-rich Woodland Mosaic |
| 388 | Lowland Forest/Grassy Dry Forest Complex |
| 382 | Lowland Forest/Heathy Dry Forest Complex |
| 384 | Lowland Forest/Heathy Woodland Complex |
| 698 | Lowland Forest/Heathy Woodland Mosaic |
| 558 | Lowland Forest/Hills Herb-rich Woodland Complex |
| 385 | Lowland Forest/Riparian Forest Complex |
| 386 | Lowland Forest/Riparian Scrub Complex |
| 387 | Lowland Forest/Riparian Shrubland Complex |
| 590 | Lowland Forest/Shrubby Woodland Complex |
| 383 | Lowland Forest/Valley Grassy Forest Complex |
| 877 | Lowland Herb-rich Forest |
| 45 | Shrubby Foothill Forest |
| 377 | Shrubby Foothill Forest/Heathy Dry Forest Complex |
| 376 | Shrubby Foothill Forest/Lowland Forest Complex |

Step 18. Definition of wet forest

The EVCs in Table A5.7 were used to identify the distribution of wet forest. Polygons were manually drawn around areas where wet forest predominated. Truly montane areas (> 700 metres elevation) were excluded but Montane EVCs that occur at lower elevations were included.

Table A5.7. EVCs used to identify wet forest.

|  |  |
| --- | --- |
| EVC number | EVC name |
| 31 | Cool Temperate Rainforest |
| 33 | Cool Temperate Rainforest/Warm Temperate Rainforest Overlap |
| 29 | Damp Forest |
| 371 | Damp Forest/Herb-rich Foothill Forest Complex |
| 597 | Damp Forest/Herb-rich Foothill Forest Mosaic |
| 372 | Damp Forest/Lowland Forest Complex |
| 373 | Damp Forest/Riparian Scrub Complex |
| 38 | Montane Damp Forest |
| 36 | Montane Dry Woodland |
| 39 | Montane Wet Forest |
| 316 | Shrubby Damp Forest |
| 201 | Shrubby Wet Forest |
| 35 | Tableland Damp Forest |
| 32 | Warm Temperate Rainforest |
| 30 | Wet Forest |
| 589 | Wet Forest/Damp Forest Complex |

Step 23. Definition of dry forest and woodland

The EVCs in Table A5.8 were used to identify the distribution of dry forest and woodland. Polygons were manually drawn around areas where dry forest and woodland predominated.

Table A5.8. EVCs used to identify dry forest and woodland.

| EVC number | EVC name |
| --- | --- |
| 61 | Box Ironbark Forest |
| 247 | Box Ironbark Forest/Grassy Woodland Complex |
| 685 | Box Ironbark Forest/Heathy Woodland Complex |
| 22 | Grassy Dry Forest |
| 248 | Grassy Dry Forest/Granitic Hills Woodland Complex |
| 320 | Grassy Dry Forest/Heathy Dry Forest Complex |
| 599 | Grassy Dry Forest/Rocky Outcrop Shrubland Mosaic |
| 174 | Grassy Dry Forest/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic |
| 128 | Grassy Forest |
| 175 | Grassy Woodland |
| 20 | Heathy Dry Forest |
| 71 | Hills Herb-rich Woodland |
| 789 | Hills Herb-rich Woodland/Grassy Dry Forest Complex |
| 402 | Hills Herb-rich Woodland/Heathy Dry Forest Complex |
| 21 | Shrubby Dry Forest |
| 47 | Valley Grassy Forest |
| 213 | Valley Grassy Forest/Box Ironbark Forest Complex |
| 587 | Valley Grassy Forest/Grassy Dry Forest Complex |
| 265 | Valley Grassy Forest/Grassy Dry Forest Mosaic |
| 268 | Valley Grassy Forest/Grassy Woodland Complex |

Appendix 6. Salinity category preferences for wetland EVCs

Table A6.1. Salinity preferences for wetland EVCs. Coastal saltmarsh and estuarine EVCs (Table 9) are marked with an asterisk. Source: DSE (unpublished).

| EVC number | EVC name | Salinity category | Salinity category preference |
| --- | --- | --- | --- |
| 1111 | Alkaline Basaltic Wetland Aggregate | Fresh (calcareous) | Common |
| 806 | Alluvial Plains Semi-arid Grassland | Fresh | Common |
| 806 | Alluvial Plains Semi-arid Grassland | Hyposaline | Less common |
| 239 | Alpine Creekline Herbland | Fresh | Common |
| 171 | Alpine Fen | Fresh | Common |
| 288 | Alpine Heath Peatland | Fresh | Common |
| 1011 | Alpine Hummock Peatland | Fresh | Common |
| 905 | Alpine Short Herbland | Fresh | Common |
| 306 | Aquatic Grassy Wetland | Fresh | Common |
| 653 | Aquatic Herbland | Fresh | Common |
| 653 | Aquatic Herbland | Hyposaline | Less common |
| 308 | Aquatic Sedgeland | Fresh | Common |
| 308 | Aquatic Sedgeland | Hyposaline | Less common |
| 334 | Billabong Wetland Aggregate | Fresh | Common |
| 369 | Black Box Wetland | Fresh | Common |
| 875 | Blocked Coastal Stream Swamp | Fresh | Common |
| 875 | Blocked Coastal Stream Swamp | Hyposaline | Less common |
| 537 | Brackish Aquatic Herbland | Hyposaline | Common |
| 934 | Brackish Grassland | Hyposaline | Common |
| 538\* | Brackish Herbland | Hyposaline | Common |
| 538\* | Brackish Herbland | Mesosaline | Less common |
| 636 | Brackish Lake Aggregate | Hyposaline | Common |
| 539 | Brackish Lake Bed Herbland | Hyposaline | Common |
| 947\* | Brackish Lignum Swamp | Hyposaline | Common |
| 947\* | Brackish Lignum Swamp | Mesosaline | Less common |
| 13 | Brackish Sedgeland | Hyposaline | Common |
| 1114 | Brackish Sedgy Shrubland | Hyposaline | Common |
| 1114 | Brackish Sedgy Shrubland | Fresh | Less common |
| 973 | Brackish Shrubland | Hyposaline | Common |
| 973 | Brackish Shrubland | Fresh | Less common |
| 656 | Brackish Wetland Aggregate | Hyposaline | Common |
| 656 | Brackish Wetland Aggregate | Mesosaline | Less common |
| A106 | Calcareous Sedgy Shrubland | Fresh (calcareous) | Common |
| 591 | Calcareous Wet Herbland | Fresh (calcareous) | Common |
| 291 | Cane Grass Wetland | Fresh | Common |
| 602 | Cane Grass Wetland/Aquatic Herbland Complex | Fresh | Common |
| 606 | Cane Grass Wetland/Brackish Herbland Complex | Hyposaline | Common |
| 284 | Claypan Ephemeral Wetland | Fresh | Common |
| A110\* | Coastal Dry Saltmarsh | Mesosaline | Common |
| A110\* | Coastal Dry Saltmarsh | Hypersaline | Less common |
| 976 | Coastal Ephemeral Wetland | Fresh | Common |
| A111 | Coastal Hypersaline Saltmarsh | Hypersaline | Common |
| 11 | Coastal Lagoon Wetland | Fresh | Common |
| 11 | Coastal Lagoon Wetland | Hyposaline | Less common |
| A109\* | Coastal Saline Grassland | Mesosaline | Common |
| 9\* | Coastal Saltmarsh Aggregate | Mesosaline | Common |
| 9 | Coastal Saltmarsh Aggregate | Hypersaline | Common |
| A112\* | Coastal Tussock Saltmarsh | Mesosaline | Common |
| 673 | Dune-soak Woodland | Fresh | Common |
| 949 | Dwarf Floating Aquatic Herbland | Fresh | Common |
| 678 | Ephemeral Drainage-line Grassy Wetland | Fresh | Common |
| 914\* | Estuarine Flats Grassland | Hyposaline | Common |
| 952 | Estuarine Reedbed | Hyposaline | Common |
| 952 | Estuarine Reedbed | Mesosaline | Less common |
| 953 | Estuarine Scrub | Hyposaline | Common |
| 953 | Estuarine Scrub | Mesosaline | Less common |
| 10\* | Estuarine Wetland | Hyposaline | Common |
| 10\* | Estuarine Wetland | Mesosaline | Less common |
| 721 | Fern Swamp | Fresh | Common |
| 809 | Floodplain Grassy Wetland | Fresh | Common |
| 56 | Floodplain Riparian Woodland | Fresh | Common |
| 280 | Floodplain Thicket | Fresh | Common |
| 172 | Floodplain Wetland Aggregate | Fresh | Common |
| 810 | Floodway Pond Herbland | Fresh | Common |
| 945 | Floodway Pond Herbland/Riverine Swamp Forest Complex | Fresh | Common |
| 723 | Forest Bog | Fresh | Common |
| 728 | Forest Creekline Sedge Swamp | Fresh | Common |
| 718 | Freshwater Lake Aggregate | Fresh | Common |
| 954 | Freshwater Lignum - Cane Grass Swamp | Fresh | Common |
| 657 | Freshwater Lignum Shrubland | Fresh | Common |
| 968 | Gahnia Sedgeland | Fresh (calcareous) | Common |
| 1112 | Granite Rock-pool Wetland | Fresh | Common |
| 106 | Grassy Riverine Forest | Fresh | Common |
| 811 | Grassy Riverine Forest/Floodway Pond Herbland Complex | Fresh | Common |
| 812 | Grassy Riverine Forest/Riverine Swamp Forest Complex | Fresh | Common |
| 124 | Grey Clay Drainage-line Aggregate | Hyposaline (possibly calcareous) | Common |
| 708 | Hypersaline Inland Saltmarsh Aggregate | Hypersaline | Common |
| 813 | Intermittent Swampy Woodland | Fresh | Common |
| 813 | Intermittent Swampy Woodland | Hyposaline | Less common |
| 822 | Intermittent Swampy Woodland/Riverine Grassy Woodland Complex | Fresh | Common |
| 107 | Lake Bed Herbland | Fresh | Common |
| 107 | Lake Bed Herbland | Hyposaline | Less common |
| 808 | Lignum Shrubland | Fresh | Common |
| 808 | Lignum Shrubland | Hyposaline | Less common |
| 104 | Lignum Swamp | Fresh | Common |
| 104 | Lignum Swamp | Hyposaline | Less common |
| 823 | Lignum Swampy Woodland | Fresh | Common |
| 823 | Lignum Swampy Woodland | Hyposaline | Less common |
| 140\* | Mangrove Shrubland | Mesosaline | Common |
| 966 | Montane Bog | Fresh | Common |
| 41 | Montane Riparian Thicket | Fresh | Common |
| 40 | Montane Riparian Woodland | Fresh | Common |
| 148 | Montane Sedgeland | Fresh | Common |
| 318 | Montane Swamp | Fresh | Common |
| 185 | Perched Boggy Shrubland Aggregate | Fresh | Common |
| 125 | Plains Grassy Wetland | Fresh | Common |
| 755 | Plains Grassy Wetland/Aquatic Herbland Complex | Fresh | Common |
| 767 | Plains Grassy Wetland/Brackish Herbland Complex | Hyposaline (sometimes calcareous) | Common |
| 958 | Plains Grassy Wetland/Calcareous Wet Herbland Complex | Fresh (calcareous) | Common |
| A101 | Plains Grassy Wetland/Lignum Swamp Complex | Fresh | Common |
| A101 | Plains Grassy Wetland/Lignum Swamp Complex | Hyposaline | Less common |
| 959 | Plains Grassy Wetland/Sedge-rich Wetland Complex | Fresh | Common |
| 960 | Plains Grassy Wetland/Spike-sedge Wetland Complex | Fresh | Common |
| 961 | Plains Rushy Wetland | Fresh | Common |
| 888 | Plains Saltmarsh | Mesosaline | Common |
| 888 | Plains Saltmarsh | Hypersaline | Less common |
| 647 | Plains Sedgy Wetland | Fresh | Common |
| 1010 | Plains Sedgy Wetland/Sedge Wetland Complex | Fresh | Common |
| 283 | Plains Sedgy Woodland | Fresh | Common |
| 651 | Plains Swampy Woodland | Fresh | Common |
| 784 | Plains Swampy Woodland/Lignum Swamp Complex | Fresh | Common |
| 292 | Red Gum Swamp | Fresh | Common |
| A114 | Red Gum Swamp/Cane Grass Wetland Complex | Fresh | Common |
| A115 | Red Gum Swamp/Plains Rushy Wetland Complex | Fresh | Common |
| 191 | Riparian Scrub | Fresh | Common |
| 59 | Riparian Thicket | Fresh | Common |
| 103 | Riverine Chenopod Woodland | Fresh | Common |
| 103 | Riverine Chenopod Woodland | Hyposaline | Less common |
| 975 | Riverine Ephemeral Wetland | Fresh | Common |
| 814 | Riverine Swamp Forest | Fresh | Common |
| 815 | Riverine Swampy Woodland | Fresh | Common |
| 804 | Rushy Riverine Swamp | Fresh | Common |
| 842\* | Saline Aquatic Meadow | Mesosaline | Common |
| 842\* | Saline Aquatic Meadow | Hyposaline | Less common |
| 842\* | Saline Aquatic Meadow | Hypersaline | Less common |
| 717 | Saline Lake Aggregate | Mesosaline | Common |
| 717 | Saline Lake Aggregate | Hypersaline | Less common |
| 648 | Saline Lake-verge Aggregate | Mesosaline | Common |
| 648 | Saline Lake-verge Aggregate | Hypersaline | Less common |
| 676 | Salt Paperbark Woodland | Mesosaline | Common |
| 676 | Salt Paperbark Woodland | Hypersaline | Less common |
| A113\* | Saltmarsh-grass Swamp | Mesosaline | Common |
| A113\* | Saltmarsh-grass Swamp | Hypersaline | Less common |
| 101 | Samphire Shrubland | Hypersaline and often calcareous | Common |
| 101 | Samphire Shrubland | Mesosaline | Common |
| 845 | Sea-grass Meadow | Mesosaline | Common |
| 195 | Seasonally Inundated Shrubby Woodland | Fresh | Common |
| 196 | Seasonally Inundated Sub-saline Herbland | Hyposaline | Common |
| 196 | Seasonally Inundated Sub-saline Herbland | Mesosaline | Less common |
| 136 | Sedge Wetland | Fresh | Common |
| A102 | Sedge Wetland/Aquatic Herbland Complex | Fresh | Common |
| 963 | Sedge Wetland/Aquatic Sedgeland Complex | Fresh | Common |
| 1113 | Sedge Wetland/Brackish Herbland Complex | Hyposaline | Common |
| 883 | Sedge Wetland/Calcareous Wet Herbland Complex | Fresh (calcareous) | Common |
| 281 | Sedge-rich Wetland | Fresh | Common |
| 816 | Sedgy Riverine Forest | Fresh | Common |
| 817 | Sedgy Riverine Forest/Riverine Swamp Forest Complex | Fresh | Common |
| 707 | Sedgy Swamp Woodland | Fresh | Common |
| 964 | Shell-beach Herbland | Fresh | Common |
| 964 | Shell-beach Herbland | Hyposaline | Less common |
| 908 | Sink-hole Wetland Aggregate | Fresh (calcareous) | Common |
| 819 | Spike-sedge Wetland | Fresh | Common |
| 80 | Spring Soak Woodland | Fresh | Common |
| 857 | Stony Rises Pond Aggregate | Fresh | Common |
| 210 | Sub-alpine Wet Heathland | Fresh | Common |
| 917 | Sub-alpine Wet Sedgeland | Fresh | Common |
| 918 | Submerged Aquatic Herbland | Fresh | Common |
| 918 | Submerged Aquatic Herbland | Hyposaline | Less common |
| 820 | Sub-saline Depression Shrubland | Hyposaline | Common |
| 49 | Swamp Heathland Aggregate | Fresh | Common |
| 53 | Swamp Scrub | Fresh | Common |
| 2004 | Swamp Scrub/Gahnia Sedgeland Complex | Fresh | Common |
| 83 | Swampy Riparian Woodland | Fresh | Common |
| 937 | Swampy Woodland | Fresh | Common |
| 920 | Sweet Grass Wetland | Fresh | Common |
| 821 | Tall Marsh | Fresh | Common |
| 821 | Tall Marsh | Hyposaline | Less common |
| 990 | Unvegetated (open water/bare soil/mud – Non Vegetation) | Fresh | Common |
| 990 | Unvegetated (open water/bare soil/mud – Non Vegetation) | Hyposaline | Common |
| 990 | Unvegetated (open water/bare soil/mud – Non Vegetation) | Mesosaline | Common |
| 990 | Unvegetated (open water/bare soil/mud – Non Vegetation) | Hypersaline | Common |
| 8 | Wet Heathland | Fresh | Common |
| A104 | Wet Heathland/Plains Grassy Wetland Complex | Fresh | Common |
| A105 | Wet Heathland/Plains Sedgy Wetland Complex | Fresh | Common |
| 931 | Wet Heathland/Sedge Wetland Complex | Fresh | Common |
| A107\* | Wet Saltmarsh Herbland | Mesosaline | Common |
| A108\* | Wet Saltmarsh Shrubland | Mesosaline | Common |
| 12 | Wet Swale Herbland | Fresh | Common |
| 932 | Wet Verge Sedgeland | Fresh | Common |

Appendix 7. Assignment of selected attributes for coastal wetlands

The wetland system, water regime and salinity categories of wetlands located near the coast were manually assessed and assigned as described in Sections 4.2, 5.7 and 5.7 (Table A7.1). The number of wetlands in each wetland system, water regime and salinity category is provided in Table A7.2.

Table A7.1. Wetland system, water regime and salinity regime categories assigned to coastal wetlands.

| Wetland number | Wetland system | Water regime | Salinity regime |
| --- | --- | --- | --- |
| 54571 | Estuarine | Intertidal | Mesosaline |
| 56102 | Estuarine | Intertidal | Mesosaline |
| 56122 | Estuarine | Intertidal | Mesosaline |
| 56123 | Estuarine | Intertidal | Mesosaline |
| 56124 | Estuarine | Intertidal | Mesosaline |
| 56125 | Estuarine | Intertidal | Mesosaline |
| 56126 | Estuarine | Intertidal | Mesosaline |
| 56127 | Estuarine | Intertidal | Mesosaline |
| 56129 | Estuarine | Intertidal | Mesosaline |
| 56185 | Estuarine | Intertidal | Mesosaline |
| 56186 | Estuarine | Intertidal | Mesosaline |
| 56205 | Estuarine | Intertidal | Mesosaline |
| 70263 | Estuarine | Intertidal | Mesosaline |
| 70266 | Estuarine | Intertidal | Mesosaline |
| 70271 | Estuarine | Intertidal | Mesosaline |
| 70401 | Estuarine | Intertidal | Mesosaline |
| 70802 | Estuarine | Intertidal | Mesosaline |
| 70803 | Estuarine | Intertidal | Mesosaline |
| 70804 | Estuarine | Intertidal | Mesosaline |
| 70805 | Estuarine | Intertidal | Mesosaline |
| 70867 | Estuarine | Intertidal | Mesosaline |
| 70874 | Estuarine | Intertidal | Mesosaline |
| 70879 | Estuarine | Intertidal | Mesosaline |
| 70881 | Estuarine | Intertidal | Mesosaline |
| 70884 | Estuarine | Intertidal | Mesosaline |
| 70887 | Estuarine | Intertidal | Mesosaline |
| 70891 | Estuarine | Intertidal | Mesosaline |
| 70896 | Estuarine | Intertidal | Mesosaline |
| 70903 | Estuarine | Intertidal | Mesosaline |
| 70916 | Estuarine | Intertidal | Mesosaline |
| 70921 | Estuarine | Intertidal | Mesosaline |
| 70925 | Estuarine | Intertidal | Mesosaline |
| 71263 | Estuarine | Intertidal | Mesosaline |
| 80158 | Estuarine | Intertidal | Mesosaline |
| 80297 | Estuarine | Intertidal | Mesosaline |
| 80751 | Estuarine | Intertidal | Mesosaline |
| 80752 | Estuarine | Intertidal | Mesosaline |
| 80754 | Estuarine | Intertidal | Mesosaline |
| 80900 | Estuarine | Intertidal | Mesosaline |
| 80904 | Estuarine | Intertidal | Mesosaline |
| 80976 | Estuarine | Intertidal | Mesosaline |
| 81005 | Estuarine | Intertidal | Mesosaline |
| 83464 | Estuarine | Intertidal | Mesosaline |
| 83465 | Estuarine | Intertidal | Mesosaline |
| 83466 | Estuarine | Intertidal | Mesosaline |
| 83467 | Estuarine | Intertidal | Mesosaline |
| 83469 | Estuarine | Intertidal | Mesosaline |
| 83470 | Estuarine | Intertidal | Mesosaline |
| 83471 | Estuarine | Intertidal | Mesosaline |
| 83472 | Estuarine | Intertidal | Mesosaline |
| 83473 | Estuarine | Intertidal | Mesosaline |
| 83474 | Estuarine | Intertidal | Mesosaline |
| 83475 | Estuarine | Intertidal | Mesosaline |
| 83476 | Estuarine | Intertidal | Mesosaline |
| 91770 | Estuarine | Intertidal | Mesosaline |
| 94331 | Estuarine | Intertidal | Mesosaline |
| 94480 | Estuarine | Intertidal | Mesosaline |
| 94490 | Estuarine | Intertidal | Mesosaline |
| 94497 | Estuarine | Intertidal | Mesosaline |
| 95995 | Estuarine | Intertidal | Mesosaline |
| 20612 | Estuarine | Intertidal | Saline |
| 23499 | Estuarine | Intertidal | Saline |
| 23540 | Estuarine | Intertidal | Saline |
| 23592 | Estuarine | Intertidal | Saline |
| 25600 | Estuarine | Intertidal | Saline |
| 25744 | Estuarine | Intertidal | Saline |
| 25842 | Estuarine | Intertidal | Saline |
| 25863 | Estuarine | Intertidal | Saline |
| 50013 | Estuarine | Intertidal | Saline |
| 50202 | Estuarine | Intertidal | Saline |
| 50203 | Estuarine | Intertidal | Saline |
| 50205 | Estuarine | Intertidal | Saline |
| 50210 | Estuarine | Intertidal | Saline |
| 50307 | Estuarine | Intertidal | Saline |
| 51911 | Estuarine | Intertidal | Saline |
| 51912 | Estuarine | Intertidal | Saline |
| 54546 | Estuarine | Intertidal | Saline |
| 54573 | Estuarine | Intertidal | Saline |
| 54575 | Estuarine | Intertidal | Saline |
| 54576 | Estuarine | Intertidal | Saline |
| 54584 | Estuarine | Intertidal | Saline |
| 54786 | Estuarine | Intertidal | Saline |
| 54925 | Estuarine | Intertidal | Saline |
| 56101 | Estuarine | Intertidal | Saline |
| 70854 | Estuarine | Intertidal | Saline |
| 70855 | Estuarine | Intertidal | Saline |
| 70856 | Estuarine | Intertidal | Saline |
| 70858 | Estuarine | Intertidal | Saline |
| 70860 | Estuarine | Intertidal | Saline |
| 70861 | Estuarine | Intertidal | Saline |
| 70863 | Estuarine | Intertidal | Saline |
| 70894 | Estuarine | Intertidal | Saline |
| 70909 | Estuarine | Intertidal | Saline |
| 71034 | Estuarine | Intertidal | Saline |
| 95516 | Estuarine | Intertidal | Saline |
| 96004 | Estuarine | Intertidal | Saline |
| 96512 | Estuarine | Intertidal | Saline |
| 96517 | Estuarine | Intertidal | Saline |
| 96518 | Estuarine | Intertidal | Saline |
| 96519 | Estuarine | Intertidal | Saline |
| 96520 | Estuarine | Intertidal | Saline |
| 96521 | Estuarine | Intertidal | Saline |
| 96522 | Estuarine | Intertidal | Saline |
| 96559 | Estuarine | Intertidal | Saline |
| 97504 | Estuarine | Intertidal | Saline |
| 97509 | Estuarine | Intertidal | Saline |
| 97518 | Estuarine | Intertidal | Saline |
| 97804 | Estuarine | Intertidal | Saline |
| 97805 | Estuarine | Intertidal | Saline |
| 97806 | Estuarine | Intertidal | Saline |
| 97807 | Estuarine | Intertidal | Saline |
| 97808 | Estuarine | Intertidal | Saline |
| 97810 | Estuarine | Intertidal | Saline |
| 97813 | Estuarine | Intertidal | Saline |
| 98100 | Estuarine | Intertidal | Saline |
| 98101 | Estuarine | Intertidal | Saline |
| 98102 | Estuarine | Intertidal | Saline |
| 98103 | Estuarine | Intertidal | Saline |
| 98104 | Estuarine | Intertidal | Saline |
| 50011 | Estuarine | Supratidal | Hyposaline |
| 50014 | Estuarine | Supratidal | Hyposaline |
| 50015 | Estuarine | Supratidal | Hyposaline |
| 50329 | Estuarine | Supratidal | Hyposaline |
| 50330 | Estuarine | Supratidal | Hyposaline |
| 80156 | Estuarine | Supratidal | Hyposaline |
| 45463 | Estuarine | Supratidal | Mesosaline |
| 54560 | Estuarine | Supratidal | Mesosaline |
| 54595 | Estuarine | Supratidal | Mesosaline |
| 54597 | Estuarine | Supratidal | Mesosaline |
| 54710 | Estuarine | Supratidal | Mesosaline |
| 54711 | Estuarine | Supratidal | Mesosaline |
| 54713 | Estuarine | Supratidal | Mesosaline |
| 54802 | Estuarine | Supratidal | Mesosaline |
| 54803 | Estuarine | Supratidal | Mesosaline |
| 54829 | Estuarine | Supratidal | Mesosaline |
| 54861 | Estuarine | Supratidal | Mesosaline |
| 54927 | Estuarine | Supratidal | Mesosaline |
| 54931 | Estuarine | Supratidal | Mesosaline |
| 56187 | Estuarine | Supratidal | Mesosaline |
| 70264 | Estuarine | Supratidal | Mesosaline |
| 70413 | Estuarine | Supratidal | Mesosaline |
| 70414 | Estuarine | Supratidal | Mesosaline |
| 70509 | Estuarine | Supratidal | Mesosaline |
| 80294 | Estuarine | Supratidal | Mesosaline |
| 80295 | Estuarine | Supratidal | Mesosaline |
| 80296 | Estuarine | Supratidal | Mesosaline |
| 80304 | Estuarine | Supratidal | Mesosaline |
| 90965 | Estuarine | Supratidal | Mesosaline |
| 90991 | Estuarine | Supratidal | Mesosaline |
| 91077 | Estuarine | Supratidal | Mesosaline |
| 94333 | Estuarine | Supratidal | Mesosaline |
| 94342 | Estuarine | Supratidal | Mesosaline |
| 94344 | Estuarine | Supratidal | Mesosaline |
| 94349 | Estuarine | Supratidal | Mesosaline |
| 94351 | Estuarine | Supratidal | Mesosaline |
| 94352 | Estuarine | Supratidal | Mesosaline |
| 94476 | Estuarine | Supratidal | Mesosaline |
| 94487 | Estuarine | Supratidal | Mesosaline |
| 94495 | Estuarine | Supratidal | Mesosaline |
| 94499 | Estuarine | Supratidal | Mesosaline |
| 94500 | Estuarine | Supratidal | Mesosaline |
| 94501 | Estuarine | Supratidal | Mesosaline |
| 94521 | Estuarine | Supratidal | Mesosaline |
| 94522 | Estuarine | Supratidal | Mesosaline |
| 94523 | Estuarine | Supratidal | Mesosaline |
| 94525 | Estuarine | Supratidal | Mesosaline |
| 95986 | Estuarine | Supratidal | Mesosaline |
| 95991 | Estuarine | Supratidal | Mesosaline |
| 95997 | Estuarine | Supratidal | Mesosaline |
| 97524 | Estuarine | Supratidal | Mesosaline |
| 98113 | Estuarine | Supratidal | Mesosaline |
| 98140 | Estuarine | Supratidal | Mesosaline |
| 98144 | Estuarine | Supratidal | Mesosaline |
| 98145 | Estuarine | Supratidal | Mesosaline |
| 20000 | Estuarine | Supratidal | Saline |
| 20001 | Estuarine | Supratidal | Saline |
| 23539 | Estuarine | Supratidal | Saline |
| 23586 | Estuarine | Supratidal | Saline |
| 23754 | Estuarine | Supratidal | Saline |
| 25669 | Estuarine | Supratidal | Saline |
| 25743 | Estuarine | Supratidal | Saline |
| 25804 | Estuarine | Supratidal | Saline |
| 25817 | Estuarine | Supratidal | Saline |
| 25853 | Estuarine | Supratidal | Saline |
| 25889 | Estuarine | Supratidal | Saline |
| 26007 | Estuarine | Supratidal | Saline |
| 26021 | Estuarine | Supratidal | Saline |
| 50003 | Estuarine | Supratidal | Saline |
| 50005 | Estuarine | Supratidal | Saline |
| 50006 | Estuarine | Supratidal | Saline |
| 50007 | Estuarine | Supratidal | Saline |
| 50008 | Estuarine | Supratidal | Saline |
| 50040 | Estuarine | Supratidal | Saline |
| 50056 | Estuarine | Supratidal | Saline |
| 50204 | Estuarine | Supratidal | Saline |
| 50208 | Estuarine | Supratidal | Saline |
| 50209 | Estuarine | Supratidal | Saline |
| 50211 | Estuarine | Supratidal | Saline |
| 50309 | Estuarine | Supratidal | Saline |
| 50331 | Estuarine | Supratidal | Saline |
| 50332 | Estuarine | Supratidal | Saline |
| 50334 | Estuarine | Supratidal | Saline |
| 50335 | Estuarine | Supratidal | Saline |
| 51900 | Estuarine | Supratidal | Saline |
| 54569 | Estuarine | Supratidal | Saline |
| 54574 | Estuarine | Supratidal | Saline |
| 54578 | Estuarine | Supratidal | Saline |
| 54592 | Estuarine | Supratidal | Saline |
| 54715 | Estuarine | Supratidal | Saline |
| 54720 | Estuarine | Supratidal | Saline |
| 54765 | Estuarine | Supratidal | Saline |
| 54774 | Estuarine | Supratidal | Saline |
| 54822 | Estuarine | Supratidal | Saline |
| 54860 | Estuarine | Supratidal | Saline |
| 54875 | Estuarine | Supratidal | Saline |
| 54926 | Estuarine | Supratidal | Saline |
| 54930 | Estuarine | Supratidal | Saline |
| 54933 | Estuarine | Supratidal | Saline |
| 56100 | Estuarine | Supratidal | Saline |
| 56114 | Estuarine | Supratidal | Saline |
| 56121 | Estuarine | Supratidal | Saline |
| 56128 | Estuarine | Supratidal | Saline |
| 56130 | Estuarine | Supratidal | Saline |
| 56194 | Estuarine | Supratidal | Saline |
| 56194 | Estuarine | Supratidal | Saline |
| 56207 | Estuarine | Supratidal | Saline |
| 56208 | Estuarine | Supratidal | Saline |
| 70269 | Estuarine | Supratidal | Saline |
| 70270 | Estuarine | Supratidal | Saline |
| 70409 | Estuarine | Supratidal | Saline |
| 70506 | Estuarine | Supratidal | Saline |
| 70807 | Estuarine | Supratidal | Saline |
| 70857 | Estuarine | Supratidal | Saline |
| 70859 | Estuarine | Supratidal | Saline |
| 70862 | Estuarine | Supratidal | Saline |
| 70904 | Estuarine | Supratidal | Saline |
| 70928 | Estuarine | Supratidal | Saline |
| 70932 | Estuarine | Supratidal | Saline |
| 70936 | Estuarine | Supratidal | Saline |
| 70938 | Estuarine | Supratidal | Saline |
| 71021 | Estuarine | Supratidal | Saline |
| 71214 | Estuarine | Supratidal | Saline |
| 71216 | Estuarine | Supratidal | Saline |
| 71217 | Estuarine | Supratidal | Saline |
| 80154 | Estuarine | Supratidal | Saline |
| 80291 | Estuarine | Supratidal | Saline |
| 80293 | Estuarine | Supratidal | Saline |
| 80303 | Estuarine | Supratidal | Saline |
| 83478 | Estuarine | Supratidal | Saline |
| 91056 | Estuarine | Supratidal | Saline |
| 91084 | Estuarine | Supratidal | Saline |
| 91578 | Estuarine | Supratidal | Saline |
| 91578 | Estuarine | Supratidal | Saline |
| 91769 | Estuarine | Supratidal | Saline |
| 94235 | Estuarine | Supratidal | Saline |
| 94328 | Estuarine | Supratidal | Saline |
| 94335 | Estuarine | Supratidal | Saline |
| 94336 | Estuarine | Supratidal | Saline |
| 94337 | Estuarine | Supratidal | Saline |
| 94341 | Estuarine | Supratidal | Saline |
| 94346 | Estuarine | Supratidal | Saline |
| 94347 | Estuarine | Supratidal | Saline |
| 94348 | Estuarine | Supratidal | Saline |
| 94350 | Estuarine | Supratidal | Saline |
| 94485 | Estuarine | Supratidal | Saline |
| 94486 | Estuarine | Supratidal | Saline |
| 94489 | Estuarine | Supratidal | Saline |
| 94491 | Estuarine | Supratidal | Saline |
| 94493 | Estuarine | Supratidal | Saline |
| 94496 | Estuarine | Supratidal | Saline |
| 94513 | Estuarine | Supratidal | Saline |
| 94516 | Estuarine | Supratidal | Saline |
| 94517 | Estuarine | Supratidal | Saline |
| 94518 | Estuarine | Supratidal | Saline |
| 94519 | Estuarine | Supratidal | Saline |
| 94524 | Estuarine | Supratidal | Saline |
| 95975 | Estuarine | Supratidal | Saline |
| 95976 | Estuarine | Supratidal | Saline |
| 95977 | Estuarine | Supratidal | Saline |
| 95978 | Estuarine | Supratidal | Saline |
| 95979 | Estuarine | Supratidal | Saline |
| 95981 | Estuarine | Supratidal | Saline |
| 95985 | Estuarine | Supratidal | Saline |
| 95988 | Estuarine | Supratidal | Saline |
| 95990 | Estuarine | Supratidal | Saline |
| 95992 | Estuarine | Supratidal | Saline |
| 95993 | Estuarine | Supratidal | Saline |
| 95994 | Estuarine | Supratidal | Saline |
| 96000 | Estuarine | Supratidal | Saline |
| 96535 | Estuarine | Supratidal | Saline |
| 96536 | Estuarine | Supratidal | Saline |
| 96538 | Estuarine | Supratidal | Saline |
| 96539 | Estuarine | Supratidal | Saline |
| 96540 | Estuarine | Supratidal | Saline |
| 97500 | Estuarine | Supratidal | Saline |
| 97517 | Estuarine | Supratidal | Saline |
| 97519 | Estuarine | Supratidal | Saline |
| 97520 | Estuarine | Supratidal | Saline |
| 97521 | Estuarine | Supratidal | Saline |
| 97522 | Estuarine | Supratidal | Saline |
| 97525 | Estuarine | Supratidal | Saline |
| 97809 | Estuarine | Supratidal | Saline |
| 97814 | Estuarine | Supratidal | Saline |
| 98105 | Estuarine | Supratidal | Saline |
| 98111 | Estuarine | Supratidal | Saline |
| 98112 | Estuarine | Supratidal | Saline |
| 98128 | Estuarine | Supratidal | Saline |
| 98129 | Estuarine | Supratidal | Saline |
| 98130 | Estuarine | Supratidal | Saline |
| 98131 | Estuarine | Supratidal | Saline |
| 98133 | Estuarine | Supratidal | Saline |
| 98134 | Estuarine | Supratidal | Saline |
| 98135 | Estuarine | Supratidal | Saline |
| 98136 | Estuarine | Supratidal | Saline |
| 98137 | Estuarine | Supratidal | Saline |
| 98138 | Estuarine | Supratidal | Saline |
| 98139 | Estuarine | Supratidal | Saline |
| 98141 | Estuarine | Supratidal | Saline |
| 56115 | Lacustrine | Periodically inundated | Mesosaline |
| 56209 | Lacustrine | Periodically inundated | Mesosaline |
| 54714 | Lacustrine | Periodically inundated | Saline |
| 56119 | Lacustrine | Periodically inundated | Saline |
| 56131 | Lacustrine | Periodically inundated | Saline |
| 56211 | Lacustrine | Periodically inundated | Saline |
| 83480 | Lacustrine | Periodically inundated | Saline |
| 83481 | Lacustrine | Periodically inundated | Saline |
| 94488 | Lacustrine | Periodically inundated | Saline |
| 25674 | Lacustrine | Permanent | Fresh |
| 70296 | Lacustrine | Permanent | Fresh |
| 70482 | Lacustrine | Permanent | Fresh |
| 56117 | Lacustrine | Permanent | Hypersaline |
| 56148 | Lacustrine | Permanent | Mesosaline |
| 56212 | Lacustrine | Permanent | Saline |
| 94492 | Lacustrine | Permanent | Saline |
| 94498 | Lacustrine | Permanent | Saline |
| 94502 | Lacustrine | Permanent | Saline |
| 70262 | Marine | Intertidal | Mesosaline |
| 70265 | Marine | Intertidal | Mesosaline |
| 70883 | Marine | Intertidal | Mesosaline |
| 80912 | Marine | Intertidal | Mesosaline |
| 70412 | Palustrine | Periodically inundated | Hyposaline |
| 50333 | Palustrine | Periodically inundated | Hyposaline |
| 56108 | Palustrine | Periodically inundated | Mesosaline |
| 56109 | Palustrine | Periodically inundated | Mesosaline |
| 56111 | Palustrine | Periodically inundated | Mesosaline |
| 56112 | Palustrine | Periodically inundated | Mesosaline |
| 56113 | Palustrine | Periodically inundated | Mesosaline |
| 56147 | Palustrine | Periodically inundated | Mesosaline |
| 56164 | Palustrine | Periodically inundated | Mesosaline |
| 56192 | Palustrine | Periodically inundated | Mesosaline |
| 56195 | Palustrine | Periodically inundated | Mesosaline |
| 56196 | Palustrine | Periodically inundated | Mesosaline |
| 56210 | Palustrine | Periodically inundated | Mesosaline |
| 70505 | Palustrine | Periodically inundated | Mesosaline |
| 91088 | Palustrine | Periodically inundated | Mesosaline |
| 91109 | Palustrine | Periodically inundated | Mesosaline |
| 56118 | Palustrine | Periodically inundated | Mesosaline |
| 56106 | Palustrine | Periodically inundated | Saline |
| 56110 | Palustrine | Periodically inundated | Saline |
| 94329 | Palustrine | Periodically inundated | Saline |
| 94484 | Palustrine | Periodically inundated | Saline |
| 94520 | Palustrine | Periodically inundated | Saline |
| 50289 | Palustrine | Periodically inundated - seasonal | Fresh |
| 96003 | Palustrine | Periodically inundated - seasonal | Saline |
| 80703 | Palustrine | Permanent | Fresh |
| 80911 | Palustrine | Permanent | Fresh |
| 83515 | Palustrine | Permanent | Fresh |
| 96534 | Palustrine | Permanent | Fresh |
| 96537 | Palustrine | Permanent | Fresh |
| 80910 | Palustrine | Permanent | Hyposaline |
| 91197 | Palustrine | Permanent | Hyposaline |
| 96508 | Palustrine | Permanent | Hyposaline |

Table A7.2. Number and approximate percentage of 372 coastal wetlands in each wetland system, water regime and salinity category.

| Wetland system | | Water regime | | Salinity regime | |
| --- | --- | --- | --- | --- | --- |
| Category | No. (%) of wetlands | Category | No. (%) of wetlands | Category | No. (%) of wetlands |
| Estuarine  Lacustrine  Marine  Palustrine | 318 (85%)  18 (5%)  4 (1%)  32 (9%) | Intertidal  Supratidal  Permanent  Periodically inundated  Periodically inundated - seasonal | 123 (33%)  199 (53%)  17 (5%)  31 (8%)  2 (1%) | Fresh  Hyposaline  Mesosaline  Hypersaline  Saline | 9 (2%)  11 (3%)  131 (35%)  1 (<1%)  220 (59%) |

Appendix 8. Wetlands with a known artificial water source

A list of wetlands known to receive artificial water supplies was compiled by considering those that received water for the following purposes:

* recreation, based on information within Sustainable Water Strategies and from [www.gwmwater.org.au/information/recreational-lakes](http://www.gwmwater.org.au/information/recreational-lakes);
* salinity disposal, compiled from Murray-Darling Basin Authority website and local knowledge;
* water storage, based on the websites of Goulburn-Murray Water, Southern Rural Water and Grampians Wimmera Mallee Water; and
* environmental water based on information from the Victorian Environmental Water Holder (VEWH) and CMA websites.

For each of these wetlands, the wetland origin attribute was also assessed. Results are set out in Table A8.1.

Environmental water held by Victoria is now allocated to wetlands by the VEWH (instituted in 2010), in line with annual seasonal watering plans. These are formulated after consideration of seasonal watering proposals by the catchment management authorities (CMAs). The VEWH also publishes annual reports that identify wetlands that received environmental water. Prior to 2010, environmental water was allocated by DELWP. Environmental water held by the Commonwealth Environmental Water Holder is also allocated to wetlands in Victoria. Wetlands that have received environmental water usually do not receive environmental water every year as they may not be allocated as a priority site for watering in a particular year. It is possible that some wetlands that received environmental water on one occasion may not do so again as they may no longer be a priority for watering.

Information from the VEWH on which wetlands have received environmental water does not always accord with the information on CMA websites. In addition, information from these sources is not in a geospatial dataset and is sometimes inadequate to definitively identify individual wetlands. Table A8.1 identifies wetlands that that could positively be identified as receiving environmental water on at least one occasion. Table A8.1 may omit some wetlands that receive environmental water or include wetlands that are no longer a priority for watering.

Table A8.1. Wetlands with a known artificial water source and wetland origin for these wetlands.

| Wetland No | Name | Recreation | Salinity disposal | Water storage | Environ-mental water | Origin |
| --- | --- | --- | --- | --- | --- | --- |
| 11659 | Barbers Swamp | - | - | - | Yes | Naturally occurring |
| 60700 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60701 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60703 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60704 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60705 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60706 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60707 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60708 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60709 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60710 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60711 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60712 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60713 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60715 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60716 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60717 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60718 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60719 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60720 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60721 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60722 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63900 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63903 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63905 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63906 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63907 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63908 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63909 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63911 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63912 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63913 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63916 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63919 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63921 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63925 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63929 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63930 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63931 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63932 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63933 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63934 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63936 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63941 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63942 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63943 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63944 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63945 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63946 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63947 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63949 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63951 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63953 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63954 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63955 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63956 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63958 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63959 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63960 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63961 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63962 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63963 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63964 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63965 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63966 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63967 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63968 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63969 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63970 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63971 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63973 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63974 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63976 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63978 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63980 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63981 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63984 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63987 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63989 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63993 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63995 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63997 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 63998 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64004 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64005 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64008 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64010 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64014 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64037 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 64040 | Barmah Forest | - | - | - | Yes | Naturally occurring |
| 60702 | Barmah Lake | - | - | - | Yes | Naturally occurring |
| 45305 | Barton Swamp | - | - | - | Yes | Naturally occurring |
| 10837 | Beulah Weir Pool | Yes | - | - | Yes | Dam/Storage =>8ha |
| 63937 | Big Woodcutter Lagoon | - | - | - | Yes | Naturally occurring |
| 45354 | Black Charlie Lagoon | - | - | - | Yes | Naturally occurring |
| 64013 | Black Engine Lagoon | - | - | - | Yes | Naturally occurring |
| 45260 | Black Swamp | - | - | - | Yes | Naturally occurring |
| 63203 | Black Swamp | - | - | - | Yes | Naturally occurring |
| 63914 | Boals Deadwood | - | - | - | Yes | Naturally occurring |
| 11440 | Brickworks Billabong | - | - | - | Yes | Naturally occurring |
| 19295 | Brim Weir Pool - recreation | Yes | - | - | - | Dam/Storage <8ha |
| 11654 | Bull Swamp | - | - | - | Yes | Naturally occurring |
| 63999 | Bunyip Hole | - | - | - | Yes | Naturally occurring |
| 46067 | Campaspe Weir | - | - | - | Yes | Dam/Storage =>8ha |
| 11451 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 11495 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 11496 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 11497 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 11503 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 11505 | Cardross Lakes | - | - | - | Yes | Artificial (type unknown) |
| 45286 | Charcoal Swamp | - | - | - | Yes | Naturally occurring |
| 12154 | - | - | - | - | Yes | Naturally occurring |
| 12156 | - | - | - | - | Yes | Naturally occurring |
| 12157 | - | - | - | - | Yes | Naturally occurring |
| 41089 | Cherrip Swamp | - | - | - | Yes | Naturally occurring |
| 76678 | Clover Pondage | - | - | Yes | - | Dam/Storage <8ha |
| 45269 | Cockatoo Lagoon | - | - | - | Yes | Naturally occurring |
| 40972 | Corack Lake - Wimmera Mallee Pipeline | - | - | - | Yes | Naturally occurring |
| 45280 | Corduroy Swamp | - | - | - | Yes | Naturally occurring |
| 40014 | Creswick Swamp | - | - | - | Yes | Naturally occurring |
| 43161 | Cullens Lake | - | - | - | Yes | Naturally occurring |
| 62010 | Doctors Swamp | - | - | - | Yes | Naturally occurring |
| 40522 | Donald Park Lake | Yes | - | - | - | Naturally occurring |
| 90998 | Dowd Morass | - | - | - | Yes | Naturally occurring |
| 45355 | Dry Tree Lagoon | - | - | - | Yes | Naturally occurring |
| 64039 | Duck Hole Plain | - | - | - | Yes | Naturally occurring |
| 41710 | Goldfields Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 41735 | Government Dam | - | - | Yes | - | Dam/Storage <8ha |
| 19043 | Green Lake | Yes | - | Yes | - | Naturally occurring |
| 60254 | Green Lake | - | - | Yes | - | Naturally occurring |
| 11664 | Green Lake (Sea Lake) | Yes | - | - | - | Naturally occurring |
| 45274 | Green Swamp | - | - | - | Yes | Naturally occurring |
| 45239 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45240 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45241 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45242 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45243 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45244 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45246 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45248 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45249 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45250 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45251 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45252 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45253 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45255 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45256 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45257 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45258 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45259 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45261 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45262 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45263 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45271 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45273 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45276 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45277 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45278 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45279 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45281 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45287 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45288 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45292 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45295 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45296 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45297 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45299 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45301 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45306 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45307 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45308 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45309 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45311 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45312 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45314 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45317 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45318 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45319 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45320 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45321 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45322 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45323 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45324 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45328 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45329 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45330 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45331 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45333 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45337 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45339 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45341 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45342 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45343 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45351 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45352 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45353 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45356 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45357 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45359 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45360 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45362 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45363 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45364 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45367 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45373 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45376 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 46501 | Gunbower Forest | - | - | - | Yes | Naturally occurring |
| 45303 | Gunbower Island State Forest | - | - | - | Yes | Naturally occurring |
| 63935 | Harbours Lake | - | - | - | Yes | Naturally occurring |
| 45326 | Harrison Lagoon | - | - | - | Yes | Naturally occurring |
| 12765 | Heywood Lake | - | - | - | Yes | Naturally occurring |
| 45231 | Hird Swamp | - | - | - | Yes | Naturally occurring |
| 63982 | Hookes Lagoon | - | - | - | Yes | Naturally occurring |
| 11443 | Horseshoe Bend Billabong | - | - | - | Yes | Naturally occurring |
| 45270 | Horseshoe Lagoon | - | - | - | Yes | Naturally occurring |
| 54573 | Hospital Swamp | - | - | - | Yes | Naturally occurring |
| 60714 | Hut Lake | - | - | - | Yes | Naturally occurring |
| 45268 | Iron Punt Lagoon | - | - | - | Yes | Naturally occurring |
| 11491 | Irymple Tank | - | - | - | Yes | Naturally occurring |
| 40991 | Jeffcott Wildlife Reserve | - | - | - | Yes | Naturally occurring |
| 40817 | Jesse Swamp | - | - | - | Yes | Naturally occurring |
| 45222 | Johnson Swamp | - | - | - | Yes | Naturally occurring |
| 76679 | Junction Dam | - | - | Yes | - | Dam/Storage =>8ha |
| 43164 | Kangaroo Lake | - | - | Yes | - | Naturally occurring |
| 43229 | Kerang Weir | - | - | Yes | - | Dam/Storage =>8ha |
| 11360 | Kings Billabong | - | - | - | Yes | Naturally occurring |
| 63206 | Kinnairds Swamp | - | - | - | Yes | Naturally occurring |
| 45294 | Kow Swamp | - | - | Yes | - | Naturally occurring |
| 42125 | Laanecoorie Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 11137 | Lake Arawak | - | - | - | Yes | Naturally occurring |
| 76682 | Lake Banimboola | - | - | Yes | - | Naturally occurring |
| 43617 | Lake Boga | - | - | Yes | - | Naturally occurring |
| 42640 | Lake Boort | - | - | - | Yes | Naturally occurring |
| 11154 | Lake Brockie | - | - | - | Yes | Naturally occurring |
| 11136 | Lake Bulla | - | - | - | Yes | Naturally occurring |
| 12217 | Lake Carpul | - | - | - | Yes | Naturally occurring |
| 43192 | Lake Charm | - | - | Yes | - | Naturally occurring |
| 11696 | Lake Danaher Bushland Reserve | - | - | - | Yes | Naturally occurring |
| 43190 | Lake Elizabeth | - | - | - | Yes | Naturally occurring |
| 45826 | Lake Eppalock | - | - | Yes | - | Dam/Storage =>8ha |
| 40027 | Lake Hancock | Yes | - | - | - | Naturally occurring |
| 40096 | Lake Hancock | Yes | - | - | - | Naturally occurring |
| 11127 | Lake Hattah | - | - | - | Yes | Naturally occurring |
| 11350 | Lake Hawthorn | - | Yes | - | - | Naturally occurring |
| 18651 | Lake Hindmarsh | - | - | - | Yes | Naturally occurring |
| 77784 | Lake Hume | - | - | Yes | - | Dam/Storage =>8ha |
| 43193 | Lake Kelly | - | Yes | - | - | Naturally occurring |
| 11131 | Lake Konardin | - | - | - | Yes | Naturally occurring |
| 11198 | Lake Kramen | - | - | - | Yes | Naturally occurring |
| 10805 | Lake Lascelles | Yes | - | - | - | Naturally occurring |
| 43171 | Lake Leaghur | - | - | - | Yes | Naturally occurring |
| 11141 | Lake Lockie | - | - | - | Yes | Naturally occurring |
| 19456 | Lake Lonsdale | - | - | Yes | - | Dam/Storage =>8ha |
| 19538 | Lake Lonsdale | - | - | Yes | - | Dam/Storage =>8ha |
| 43180 | Lake Meering | - | - | - | Yes | Naturally occurring |
| 11130 | Lake Mournpall | - | - | - | Yes | Naturally occurring |
| 67918 | Lake Mulwala | - | - | Yes | - | Dam/Storage =>8ha |
| 43205 | Lake Murphy | - | - | - | Yes | Naturally occurring |
| 61955 | Lake Nagambie | - | - | Yes | - | Dam/Storage =>8ha |
| 12213 | Lake Powell | - | - | - | Yes | Naturally occurring |
| 11432 | Lake Ranfurly East | - | Yes | - | - | Naturally occurring |
| 11420 | Lake Ranfurly West | - | Yes | - | - | Naturally occurring |
| 11157 | Lake Roonki | - | - | - | Yes | Naturally occurring |
| 43158 | Lake Tutchewop | - | Yes | - | - | Naturally occurring |
| 10172 | Lake Wallawalla | - | - | - | Yes | Naturally occurring |
| 43172 | Lake William | - | Yes | - | - | Naturally occurring |
| 42643 | Lake Yando | - | - | - | Yes | Naturally occurring |
| 11143 | Lake Yelwell | - | - | - | Yes | Naturally occurring |
| 11142 | Lake Yerang | - | - | - | Yes | Naturally occurring |
| 55553 | Lal Lal Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 43878 | Lauriston Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 42639 | Little Lake Boort | - | - | - | Yes | Naturally occurring |
| 11129 | Little Lake Hattah | - | - | - | Yes | Naturally occurring |
| 43188 | Little Lake Kelly | - | Yes | - | - | Naturally occurring |
| 43187 | Little Lake Meering | - | - | - | Yes | Naturally occurring |
| 45266 | Little Punt Lagoon | - | - | - | Yes | Naturally occurring |
| 45283 | Little Reedy Lagoon | - | - | - | Yes | Naturally occurring |
| 63922 | Little Rushy Swamp | - | - | - | Yes | Naturally occurring |
| 42712 | Loddon Weir | - | - | Yes | - | Dam/Storage =>8ha |
| 45264 | Long Lagoon | - | - | - | Yes | Naturally occurring |
| 43866 | Malmsbury Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 11207 | Margooya Lagoon | - | - | - | Yes | Naturally occurring |
| 45245 | Marshall Lagoon | - | - | - | Yes | Naturally occurring |
| 45216 | Mcdonalds Swamp | - | - | - | Yes | Naturally occurring |
| 63910 | Mcdonalds Waterhole | - | - | - | Yes | Naturally occurring |
| 70520 | Melton Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 43218 | Middle Lake | - | - | Yes | - | Naturally occurring |
| 76677 | Mount Beauty Pondage | - | - | Yes | - | Dam/Storage =>8ha |
| 12801 | Narrung | - | - | - | Yes | Naturally occurring |
| 45254 | No. 2 Swamp | - | - | - | Yes | Naturally occurring |
| 63923 | Paddy Farrels Lagoon | - | - | - | Yes | Naturally occurring |
| 11439 | Merbein Common | - | - | - | Yes | Naturally occurring |
| 11441 | Merbein Common | - | - | - | Yes | Naturally occurring |
| 11442 | Merbein Common | - | - | - | Yes | Naturally occurring |
| 11444 | Merbein Common | - | - | - | Yes | Naturally occurring |
| 45345 | Pig Swamp | - | - | - | Yes | Naturally occurring |
| 63957 | Punt Paddock Lagoon | - | - | - | Yes | Naturally occurring |
| 45267 | Reedy Lagoon | - | - | - | Yes | Naturally occurring |
| 43217 | Reedy Lake | - | - | Yes | - | Naturally occurring |
| 54577 | Reedy Lake | - | - | - | Yes | Naturally occurring |
| 63950 | Reedy Lake | - | - | - | Yes | Naturally occurring |
| 63173 | Reedy Swamp Wildlife Reserve | - | - | - | Yes | Naturally occurring |
| 80939 | Reservoir on tributary to Billy Creek at Staceys Bridge | - | - | Yes | - | Dam/Storage <8ha |
| 80955 | Reservoir on tributary to Billy Creek at Staceys Bridge | - | - | Yes | - | Dam/Storage <8ha |
| 80956 | Reservoir on tributary to Billy Creek at Staceys Bridge | - | - | Yes | - | Dam/Storage <8ha |
| 46013 | Richardsons Lagoon (Bailleu Wetland) | - | - | - | Yes | Naturally occurring |
| 46014 | Richardsons Lagoon (Bailleu Wetland) | - | - | - | Yes | Naturally occurring |
| 46015 | Richardsons Lagoon (Bailleu Wetland) | - | - | - | Yes | Naturally occurring |
| 10597 | Robertson Wetland | - | - | - | Yes | Naturally occurring |
| 11608 | Roselyn Wetland | - | - | - | Yes | Naturally occurring |
| 43609 | Round Lake | - | - | - | Yes | Naturally occurring |
| 91145 | Sale Common | - | - | - | Yes | Naturally occurring |
| 11512 | Sandilong Creek | - | - | - | Yes | Naturally occurring |
| 19071 | Sawpit Swamp | - | - | - | Yes | Naturally occurring |
| 45298 | Smith Swamp | - | - | - | Yes | Naturally occurring |
| 71009 | South-Eastern Purification Plant (South) | - | - | Yes | - | Sewage treatment ponds |
| 41500 | Sth Drainage Lake | - | - | - | Yes | Naturally occurring |
| 63927 | Tarma Lagoon | - | - | - | Yes | Naturally occurring |
| 19060 | Taylors Lake | - | - | Yes | - | Naturally occurring |
| 12450 | Tchum Lake South - recreation | Yes | - | - | - | Naturally occurring |
| 90963 | The Heart Morass (East) | - | - | - | Yes | Naturally occurring |
| 91156 | The Heart Morass (West) | - | - | - | Yes | Naturally occurring |
| 43207 | Third Lake | - | - | Yes | - | Naturally occurring |
| 17699 | Toolondo Reservoir | Yes | - | Yes | - | Naturally occurring |
| 63904 | Top Island | - | - | - | Yes | Naturally occurring |
| 64038 | Top Lake | - | - | - | Yes | Naturally occurring |
| 61919 | Waranga Reservoir | - | - | Yes | - | Dam/Storage =>8ha |
| 10638 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10639 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10640 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10641 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10642 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10643 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 10644 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 11449 | Wargan Basins (Meridian Lakes) | - | Yes | - | - | Artificial (type unknown) |
| 19781 | Watchem Lake | Yes | - | - | - | Naturally occurring |
| 45272 | Whistler Lagoon | - | - | - | Yes | Naturally occurring |
| 41003 | Wooroonook Lake - Church | Yes | - | - | - | Naturally occurring |
| 41002 | Wooroonook Lake - Main | Yes | - | - | - | Naturally occurring |
| 81285 | Yallourn Storage | - | - | Yes | - | Dam/Storage =>8ha |
| 12230 | Yungera Wetland | - | - | - | Yes | Naturally occurring |
| 12239 | Yungera Wetland | - | - | - | Yes | Naturally occurring |
| 12780 | Yungera Wetland | - | - | - | Yes | Naturally occurring |

Appendix 9. Vegetation of spring soak and upland soak wetlands

Carr et al. (2006) identified 13 EVCs in spring-soak wetlands in Goulburn-Broken Catchment Management Authority region (Table A9.1). These include a variety of dominant vegetation categories but were assigned the moss/heath category due to lack of spatial EVC data in the GB\_SS dataset.

Table A9.1. EVCs in peatland and spring-soak wetlands in the Goulburn-Broken Catchment Management Authority region (Carr et al. 2006).

| Topographic area | EVC number and name |
| --- | --- |
| Sub-alpine zone (highest altitudes - e.g. Lake Mountain) | 171 Alpine Fen  210 Sub-alpine Wet Heathland  288 Alpine Valley Peatland |
| Montane elevations (e.g. Lake Mountain, Blue Range, variants of EVCs 148 and 41 extending to lower elevations at Murrundindi) | 40 Montane Riparian Woodland  41 Montane Riparian Thicket  148 Montane Sedgeland  966 Montane Bog (still as EVC 318 Montane Swamp in Highlands Northern Fall bioregion) |
| Foothills to lower montane (e.g. Strathbogies, Highlands, Warby Ranges) | 73 Rocky Outcrop Shrubland / Rocky Outcrop Herbland Mosaic  80 Spring-soak Woodland  83 Swampy Riparian Woodland  185 Perched Boggy Shrubland  191 Riparian Scrub  937 Swampy Woodland |

Dominant vegetation categories were assigned to spring soak and upland soak wetlands derived from the GB\_SPR layer (Appendix 3) based on the information in Coates et al. 2010 (Table A9.2). Paddock remnants were described by Coates et al. as being largely devoid of trees or shrubs but noted that the area was originally forested and the resulting changes have been brought about by land clearing an altered land use. This broad vegetation type has been classed as sedge/grass/forb on the assumption that these remnants area are now dominated by non-native pasture grasses.

Table A9.2. Classification of dominant vegetation in broad vegetation types of Coates et al. (2010) identified in soaks, wetlands and remnants on the Strathbogie Plateau.

| Broad vegetation type | Dominant vegetation category |
| --- | --- |
| Forest/woodland | Forest/Woodland |
| Shrub-dominated | Shrub |
| Sedgy/reedy | Sedge/grass/forb |
| Paddock remnant | Sedge/grass/forb |

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This report was prepared by Janet Holmes, Mark Stacey and Phil Papas. Wetland experts Rhonda Butcher of Water’s Edge Consulting, Jane Roberts and Jenny Davis, then of Monash University, now of the University of Canberra provided comments on an earlier version of the report. Andrea White reviewed the final draft of the report.

1. An EVC is a type of native vegetation classification that is described through a combination of its floristic, life form, and ecological characteristics, and through an inferred fidelity to particular environmental attributes. Each EVC includes a collection of floristic communities (i.e. a lower level in the classification that is based solely on groups of the same species) that occur across a biogeographic range, and although differing in species, have similar habitat and ecological processes operating (DNRE 2002). [↑](#footnote-ref-1)
2. The types are those used in the Ramsar Convention classification (<http://www.ramsar.org/sites/default/files/documents/pdf/guide/guide-list2009-e.pdf> - see Appendix B. The type number is that used by the Convention. [↑](#footnote-ref-2)