Ramsar Information Sheet

Published on 15 July 2019
Update version, previously published on : 1 January 1998

Australia

Kerang Wetlands

Designation date	15 December 1982
Site number	265
Coordinates	35°39'39"S 143°52'16"E
Area	9 784,00 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

1.1 - Summary description

Please provide a short descriptive text summarising the key characteristics and internationally important aspects of the site.
You may prefer to complete the four following sections before returning to draft this summary.

Summary

(This field is limited to 2500 characters)

The Kerang Wetlands Ramsar Site is located in northern Victoria approximately 300 kilometres northwest of Melbourne. The site comprises 23 named lakes, marshes and swamps which vary in area, depth and salinity on the lower reaches of the Avoca and Loddon Rivers and the Pyramid Creek near the town of Kerang. The site supports eight Ramsar wetland types. It is dominated by permanent and intermittent freshwater lakes but also includes a significant area of permanent and intermittent saline lakes.
Approximately six decades before the time of listing in 1982, some wetlands within the Ramsar site were modified from their pre-European state for to store water for irrigation. The water supply to these permanent freshwater wetlands is regulated. Some intermittent freshwater wetlands are managed for conservation purposes but also have a regulated water supply due to the legacy of changes to natural flow paths associated with irrigation development. Five saline wetlands are managed as salt disposal basins to reduce salt loads entering the Murray River. The remaining wetlands are not regulated. Water depths in the site's wetlands vary from very shallow, i.e. less than 1 meter, to in excess of 8 meters. Kangaroo Lake is the deepest lake at 8.4 meters.
The variety of salinity and water regimes within the site results in a diversity of wetland vegetation communities including black box, river red gum, tangled lignum, chenopod shrubland, grassland, sedgeland, aquatic herbland and reed beds. The wetlands support an abundance and diversity of waterbirds and over 50 species have been recorded breeding within the site.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Compiler 1

Name	Janet Holmes
Institution/agency	Department of Environment, Land, Water and Planning
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Compiler 2

Name	
Institution/agency	
Postal address *(This field is limited to 254 characters)*	
E-mail	
Phone	
Fax	

2.1.2 - Period of collection of data and information used to compile the RIS

From year	1975
To year	2015

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Kerang Wetlands
Unofficial name (optional)	

2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes ○ No ◉
(Update) The boundary has been delineated more accurately	☐
(Update) The boundary has been extended	☐
(Update) The boundary has been restricted	☐
(Update) B. Changes to Site area	the area has increased
(Update) The Site area has been calculated more accurately	☑
(Update) The Site has been delineated more accurately	☑
(Update) The Site area has increased because of a boundary extension	☐
(Update) The Site area has decreased because of a boundary restriction	☐

Important note: If the boundary of the designated site is being restricted/reduced, before submitting this updated RIS to the Secretariat the Contracting Party should have followed:
- the requirements in Article 2.5 of the Convention; or
- the procedures established by the Conference of the Parties in the annex to Resolution VIII.20 (2002); or
- where appropriate instead, the procedures in the annex to Resolution IX.6 (2005). Contracting Parties should also have provided to the Secretariat a report on changes prior to the submission of an updated RIS.

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?	No
(Update) Are the changes	Positive ◉ Negative ○ Positive & Negative ○

What extent of the Ramsar site is affected (%)

(Update) Positive %

(Update) Negative %

(Update) No information available ☑

(Update) Optional text box to provide further information

(This field is limited to 2000 characters)

Criterion 1
The justification for criterion 1 has been reviewed. It has been determined that the original assessment that the Kerang Wetlands Ramsar Site met this criterion at listing was an error.
The appropriate bioregion for the site is the Murray-Darling drainage division. There are eight wetland types represented in the Kerang Wetlands Ramsar Site
Mapping and classification of the wetlands in the Murray Darling drainage division, indicates that the Kerang wetlands do not represent any "rare" or "unique" wetland types. Therefore, this criterion could only be considered met on the basis of a representative wetland in the bioregion in "near natural" condition. Many of the wetlands within the Ramsar site have been modified for use as water storages or saline disposal basins and as such could not be considered to be in "near natural" condition. While the Avoca Marshes, comprising First, Second and Third Marsh, are unregulated, recent assessments in 2008 and 2014 (during and post Millennium drought) found that they were in poor condition and cannot be considered to be good representatives of their type in the bioregion.
This criterion was erroneously assessed as being in met at nomination and in the 2011 ECD. This criterion was not met at the time of listing and remains unmet.
Criterion 6
This criterion is only applied to wetland dependent flora and fauna that are regularly supported (in two thirds of seasons) at a Ramsar site. The ECD states that this criterion is met for the banded stilt based on four occasions between 1982 and 2003. This is insufficient to meet the requirements of "regularly supports". Recent data indicates that the site may support 1% of the population of Australasian bittern, however this is not confirmed. This criterion was not met at the time of listing and remains unmet.

Are changes the result of (tick each category which applies):

(Update) Changes resulting from causes operating within the existing boundaries? ☐

(Update) Changes resulting from causes operating beyond the site's boundaries? ☐

(Update) Changes consequent upon site boundary reduction alone (e.g., the exclusion of some wetland types formerly included within the site)? ☐

(Update) Changes consequent upon site boundary increase alone (e.g., the inclusion of different wetland types in the site)? ☐

(Update) Please describe any changes to the ecological character of the Ramsar Site, including in the application of the Criteria, since the previous RIS for the site.

(This field is limited to characters)

Positive:
Significant natural regeneration of indigenous vegetation has occurred at some of the wetlands in this Ramsar site, including the Avoca Marshes, Johnson Swamp and Hird Swamp. These wetlands were effected by artificially prolonged inundation caused by changed hydrological regimes and saline groundwater intrusion, which cause widespread declines in tree health and extensive tree death and invasion of previously fresh water ecosystems by halophytes.

Management (including the removal of a sill on the overflow of the Avoca Marshes and environmental watering that allows for significant drying events at Johnson Swamp and Hird Swamp) has re-instated a more appropriate hydrological regime to these wetlands.

The level of the saline water table dropped significantly over the millennium drought and has not risen significantly since, and the large floods of 2010/11 also flushed salt from the wetland systems. The return of more appropriate water regimes and drop in soil surface salinity has allowed the regeneration of river red gum, black box and understory species more typical of freshwater wetland systems to being to regenerate over some areas of the Avoca Marshes, Johnson Swamp and Hird Swamp.

Negative:
There has been significant loss of freshwater aquatic herblands throughout some of wetlands of the Kerang Ramsar site since the 1990's. For example submerged and emergent aquatic species including Vallisneria americana, Potamogeton crispus and Myriophyllum caput-medusae were recorded as being common or abundant in the Reedy Lake system in 1990 (O'Donnell), however these species were not detected despite thorough searching in 2011 (Cook et al 2013). The reason for this decline is unclear.

(Update) Is the change in ecological character negative, human-induced AND a significant change (above the limit of acceptable change) Yes ○ No ◉

(Update) Has an Article 3.2 report been submitted to the Secretariat? Yes ○ No ◉

2.2 - Site location

2.2.1 - Defining the Site boundaries

a) GIS boundaries *link*

Materials presented on this website, particularly maps and territorial information, are as-is and as-available based on available data and do not imply the expression of any opinion whatsoever on the part of the Secretariat of the Ramsar Convention concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

b) Digital map/image

AU265_map1606.png

Former maps

<no file available>

Boundaries description

(This field is limited to 2500 characters)

The boundary comprises crown land parcels that include the outer extremities of the wetland dependent ecosystems for 23 named lakes, marshes and swamps that comprise the site: Lake Tutchewop, Lake William, Lake Kelly, Little Lake Kelly, Kangaroo Lake, Racecourse Lake, Lake Charm, Little Lake Charm, Stevenson Swamp, Third Lake, Middle Lake, Reedy Lake, Lake Cullen, Town Swap and Kerang Weir Pool, Third Marsh, Second Marsh, First Marsh, Lake Bael Bael, Cemetery Swamp, Fosters Swamp, Johnson Swamp and Hird Swamp.

Stevenson Swamp boundary matches the Stevenson Swamp Wildlife Reserve boundary. The Johnson Swamp wildlife reserve forms part of the boundary for Johnson Swamp. The Hird Swamp wildlife reserve forms part of the boundary for Hird Swamp.

A more detailed boundary description is provided as an attachment.

Coordinates of the centre of the site, as automatically estimated from the GIS boundaries (for information only)

2.2.2 - General location

a) In which large administrative region does the site lie? Victoria

b) What is the nearest town or population centre? Kerang

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes ○ No ◉

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes ○ No ◉

c) Is the site part of a formal transboundary designation with another Contracting Party? Yes ○ No ◉

d) Transboundary Ramsar Site name:

2.2.4 - Area of the Site

If you have not established an official area by other means, you can copy the area calculated from the GIS boundaries into the 'official area' box.

Official area, in hectares (ha): 9784

Area, in hectares (ha) as calculated from GIS boundaries: 9784.52

2.2.5 - Biogeography

Please provide the biogeographic region(s) encompassing the site and the biogeographic regionalization scheme applied:

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	
Marine Ecoregions of the World (MEOW)	Murray - Darling

Other biogeographic regionalisation scheme

(This field is limited to 2500 characters)

Murray-Darling Basin Drainage Division (Australian Hydrological Geospatial Fabric)

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

Tick the box against each criterion applied to the designation of the Ramsar Site. All criteria which apply should be ticked.
Please explain why you selected a criterion by filling in the relevant fields on this page, on the three other pages of this section 'Criteria & justification' and on the 'Wetland types' page of the section 'What is the site like?'. More guidance on how to justify a criterion will appear when you tick it as well as in the help box.

☐ Criterion 1: Representative, rare or unique natural or near-natural wetland types

To justify this Criterion, please select at least one wetland type as representative, rare or unique in the section What is the site like? > Wetland types and provide further details in at least one of the three boxes below.

Hydrological services provided
(This field is limited to 3000 characters)

The hydrology of much of the Kerang area was significantly modified from natural conditions in 1923, prior to listing of the Ramsar site. At the time of listing, the regulated, fresh supply irrigation wetlands were used as storage supply and flood control basins. The level of irrigation in the surrounding area affected the frequency and duration of freshwater flowing through the system. These wetlands had been maintained as permanent, open water bodies prior to listing and continue to function in the same manner today. The site provides a number of hydrologically related services including provision of natural hazard reduction at Lake Cullen and also the Avoca Marshes. Several of the wetlands are salt disposal basins and as such contribute to management of toxicants (salt) entering into the downstream, Murray River system.

Other ecosystem services provided
(This field is limited to 3000 characters)

Other reasons
(This field is limited to 3000 characters)

Kerang Wetlands Ramsar site includes a cluster of 23 wetlands representative of a range of wetland types found within the Murray-Darling Drainage Division biogeographical region. Six Ramsar types are present including five inland wetland types: Permanent freshwater lakes (O), Permanent saline/brackish lakes (Q), Intermittent saline wetlands (R), Permanent freshwater marshes (Tp) and Freshwater tree dominated wetlands (Xf) and one small area of a human-made type (8: wastewater treatment areas; sewage farms, settling ponds, oxidation basins) . Seven of the wetlands are over 500 ha in size, with only 20 other wetlands of this size found within the Murray-Darling Basin. The Ramsar Convention requires sites that include a cluster of wetlands be justified on the basis of meeting one or more of five criteria (DSEWPAC 2012). The Kerang Wetlands Ramsar Site meets four of the criteria including being a hydrologically linked system, supporting regional populations of waterbirds, are ecologically interdependent wetlands and provide a range of wetland types of varying permanency which collectively contribute to the support of regional biodiversity.

☑ Criterion 2 : Rare species and threatened ecological communities

Justification,see: - relevant plant species in the section Criteria & justification> Plant species (3.2) - relevant animal species in the section Criteria & justification> Animal species (3.3) - relevant ecological communities in the section Criteria & justification> Ecological communities (3.4)

Optional text box to provide further information
(This field is limited to 3000 characters)

There are numerous, but patchy records of Australasian bittern from within the Ramsar site. The species was present in Hird and / or Johnsons Swamp in 2003, 2004, 2005, 2006, 2007, 2014, 2015 and 2016. There are over 150 records of curlew sandpiper in the Kerang Wetlands Ramsar site spanning from the 1970s to 2015. Between 1980 and 2015 they were recorded in 69 percent of years. They have been recorded at Fosters Swamp, Kangaroo Lake and Lakes Cullen, Kelly and Tutchewop.

☑ Criterion 3 : Biological diversity

Justification,see: - relevant plant species in the section Criteria & justification> Plant species (3.2) - relevant animal species in the section Criteria & justification> Animal species (3.3)

Justification
(This field is limited to 3000 characters)

The Kerang Wetlands Ramsar site supports a high diversity of waterbirds, most likely related to the diversity of habitats provided by the site (permanent and temporary, fresh and saline, vegetated and open water). A variety of data sources indicate that the total number of wetland dependent bird species recorded at Kerang Wetlands Ramsar site is 86 (this list includes species that regularly occur as well as vagrants and isolated records). This represents the second most species rich Ramsar site, with respect to waterbirds, in the bioregion after the Coorong and Lakes Alexandrina and Albert Ramsar site which supports 118 waterbird species. In addition to the number of species supported, species are distributed across a full range of functional groups (ducks, herbivores, large wading birds, piscivores and shorebirds) representing a higher diversity than sites that support species from only one or two functional groups.

☑ Criterion 4 : Support during critical life cycle stage or in adverse conditions

Justification,see: - relevant plant species in the section Criteria & justification> Plant species (3.2) - relevant animal species in the section Criteria & justification> Animal species (3.3) and explain the life cycle stage or nature of adverse conditions in the accompanying 'justification' box.

Optional text box to provide further information
(This field is limited to 3000 characters)

There are five species of international migratory shorebirds that are regularly recorded in the Kerang Wetlands Ramsar site.
The Kerang Wetlands Ramsar site supports Australian shelduck (Tadorna tadornoides) and musk duck (Biziura lobata) during the critical life stage of moulting.
There are records of 28 species of waterbird breeding within the Ramsar site. The site continues to support large-scale waterbird breeding of Australian white ibis (Threskiornis molucca) and straw necked ibis (Threskiornis spinicollis).
The permanent wetlands in the site provide drought refuge, particularly for waterbirds. During years of below average rainfall, as many as 55900 waterbirds have been recorded within the Ramsar site.

☑ Criterion 5 : >20,000 waterbirds

Justification,see:- the total number of waterbirds and the period of data collection - relevant waterbird species, and if possible their population size, in the section Criteria & justification> Animal species (3.3)

Overall waterbird numbers: 31600 average annual count of waterbirds for the site for the period 1977–2016

Start year: 1977

End year: 2016

Source of data: ECD Addendum (2017)

Optional text box to provide further information
(This field is limited to 3000 characters)

☐ Criterion 6 : >1% waterbird population

Justification,see:Criteria & justification> Animal species (3.3)

Optional text box to provide further information
(This field is limited to 3000 characters)

☐ Criterion 7 : Significant and representative fish

Justification,see:Criteria & justification> Animal species (3.3)

Justification
(This field is limited to 3000 characters)

☐ Criterion 8 : Fish spawning grounds, etc.

To justify this Criterion, please give information in the box below. Completion of details on relevant fish species in the section Criteria & justification> Animal species (3.3) is optional.

Justification
(This field is limited to 3000 characters)

☐ Criterion 9 : >1% non-avian animal population

To justify this Criterion, please give details on relevant non-avian species and their population size in the section Criteria & justification> Animal species (3.3)

Optional text box to provide further information
(This field is limited to 3000 characters)

3.2 - Plant species whose presence relates to the international importance of the site

Scientific name	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Duma florulenta	Tangled lignum	☐	☑	☐		☐		Unusual community - unknown from elsewhere

Optional text box to provide further information on plant species of international importance:

(This field is limited to 3000 characters)

Tangled lignum (Duma florulenta) is one of the common species throughout the Ramsar site, however the community at Reedy and Middle Reedy Lakes is significant as it is the only known population which survives in permanently inundated conditions in Australia (Roberts and Marston, 2011). Twenty Ecological Vegetation Classes have been identified at the site (Rakali Ecological Consulting 2014).

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Birds																		
CHORDATA/ AVES	*Acrocephalus australis*	Australian Reed Warbler	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Anas gracilis*	Grey Teal	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Anas superciliosa*	Gray Duck; Pacific Black Duck	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Anhinga novaehollandiae*	Australasian Darter	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Ardea modesta*	eastern great egret	☐	☑	☐	☐	☑	☑	☐	☐					☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Ardea pacifica*	White-necked Heron	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA/ AVES	*Aythya australis*	Hardhead	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Uses site as a drought refuge
CHORDATA/ AVES	*Biziura lobata*	Musk Duck	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Significant moulting site
CHORDATA/ AVES	*Botaurus poiciloptilus*	Australasian Bittern	☑	☑	☐	☐	☑	☑	☐	☐				EN	☐	☐	National (EPBC) - endangered	Estimate up to 20 individuals during breeding in 2016 Breeding recorded within the site
CHORDATA/ AVES	*Calidris acuminata*	Sharp-tailed Sandpiper	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Non-breeding foraging habitat for international migratory species.
CHORDATA/ AVES	*Calidris ferruginea*	Curlew Sandpiper	☑	☑	☐	☐	☑	☑	☐	☐				NT	☐	☐	National (EPBC) - critically endangered	A small number of curlew sandpiper are regularly recorded in the Kerang Wetlands Ramsar Site, with maximum counts of around 200 in 1987 and 1990. Between 1980 and 2015 they were recorded in 69 percent of years." International migratory shorebird
CHORDATA/ AVES	*Calidris ruficollis*	Red-necked Stint	☐	☑	☐	☐	☑	☑	☐	☐				NT	☐	☐		Non-breeding foraging habitat for international migratory species.
CHORDATA/ AVES	*Chlidonias hybrida*	Whiskered Tern	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Chroicocephalus novaehollandiae*	Silver Gull	☐	☑	☐	☐	☑	☑	☐	☐					☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Circus approximans*	Swamp Harrier	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Cygnus atratus*	Black Swan	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Gallinula tenebrosa tenebrosa*	dusky moorhen	☐	☑	☐	☐	☑	☑	☐	☐					☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Gelochelidon nilotica*	Gull-billed Tern	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Haliaeetus leucogaster*	White-bellied Sea Eagle	☐	☑	☐	☐	☐	☐	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Himantopus himantopus*	Black-winged Stilt	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Malacorhynchus membranaceus*	Pink-eared Duck	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Microcarbo melanoleucos*	Little Pied Cormorant	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Nycticorax caledonicus*	Nankeen Night Heron; Rufous Night Heron	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Phalacrocorax carbo*	Great Cormorant	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐		Breeding recorded within the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA/ AVES	*Phalacrocorax sulcirostris*	Little Black Cormorant	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Phalacrocorax varius*	Australian Pied Cormorant	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Platalea flavipes*	Yellow-billed Spoonbill	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Platalea regia*	Royal Spoonbill	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Podiceps cristatus*	Great Crested Grebe	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Porphyrio porphyrio*	Purple Swamphen	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Stictonetta naevosa*	Freckled Duck	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Breeding recorded within the site
CHORDATA/ AVES	*Tadorna tadornoides*	Australian Shelduck	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Significant moulting site
CHORDATA/ AVES	*Threskiornis molucca*	Australian White Ibis	☐	☑	☐	☐	☑	☑	☐	☐					☐	☐		Colonial nesting species breeding recorded within the site
CHORDATA/ AVES	*Threskiornis spinicollis*	Straw-necked Ibis	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Colonial nesting species breeding recorded within the site
CHORDATA/ AVES	*Tringa nebularia*	Common Greenshank	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Non-breeding foraging habitat for international migratory species.
CHORDATA/ AVES	*Tringa stagnatilis*	Marsh Sandpiper	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		Non-breeding foraging habitat for international migratory species.
Fish, Mollusc and Crustacea																		
CHORDATA/ ACTINOPTERYGII	*Bidyanus bidyanus*	silver perch	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐	National (EPBC) - critically endangered. vulnerable in Victoria	wetland dependant
CHORDATA/ ACTINOPTERYGII	*Craterocephalus fluviatilis*	Murray hardyhead; Murray hardyhead	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☐	National (EPBC) - endangered. Vulnerable in Victoria	wetland dependant

1) Percentage of the total biogeographic population at the site

Optional text box to provide further information on animal species of international importance:

(This field is limited to 3000 characters)

3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
<no data available>			

Optional text box to provide further information

(This field is limited to 3000 characters)

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

Please summarize the ecological components, processes and services which are critical to determining the ecological character of the site. Please also summarize any natural variability in the ecological character of the site, and any known past or current change

(This field is limited to 4000 characters)

The Ramsar site is a cluster of 23 lakes and wetlands with varying hydrological and salinity regimes. The Ramsar site has been influenced by the Torrumbarry Irrigation System since 1923, approximately six decades prior to listing. There are four hydrological types in the cluster of wetlands including (Kellogg, Brown & Root Pty Ltd 2011):
• irrigation/regulated wetlands maintained as permanent open water (for storage),
• terminal/regulated drainage wetlands managed as salt disposal basins (evaporation basins to reduce salt discharge into the Murray River),
• regulated fresh supply, non-irrigation wetlands reserved to protect natural features and
• natural/unregulated freshwater wetlands that are influenced by flows from the Avoca River.
The site supports 8 critical components, processes and ecosystem services and benefits which determines the sites ecological character (hydrology, salinity, waterbird abundance, colonially nesting waterbird species breeding, waterbird diversity, vegetation diversity, diversity of wetland types and threatened waterbird species). The variable hydrological and salinity ranges across the 23 wetlands in the site support a diverse assemblage of biota with the site being notable for supporting significant numbers and diversity of waterbirds (86 species) at the bioregional scale.
Waterbirds: The site provides drought refuge during extreme dry periods; supports significant waterbird colonial nesting events and provides key moulting habitat for several waterfowl.
Vegetation: the hydrology and salinity determines the distribution and extent of different vegetation associations. Twelve ecological vegetation communities are present:
1. Freshwater lake aggregate, Aquatic herbland, Lakebed herbland, Tall marsh (freshwater lake aggregate group)
2. Brackish lake bed herbland, Samphire shrubland (saline vegetation group)
3. Lignum shrubland, Lignum swamp, Lignum swampy woodland (lignum-dominated group)
4. Intermittent swamp woodland, Riverine chenopod woodland, Grassy riverine forest (tree-dominated group)
Threatened waterbird species: the Ramsar site regularly supports two threatened species listed under the EPBC Act and / or the IUCN Red List.

4.2 - What wetland type(s) are in the site?

Please list all wetland types which occur on the site, and for each of them:
- rank the four most abundant types by area from 1 (greatest extent) to 4 (least extent) in the third column,
- if the information exists, provide the area (in ha) in the fourth column
- if this wetland type is used for justifying the application of Criterion 1, indicate if it is representative, rare or unique in the last column
- you can give the local name of the wetland type if different from the Ramsar classification system in the second column

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
<no data available>				

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Lakes and pools >> O: Permanent freshwater lakes	Permanent freshwater lake	1	2257	
Fresh water > Lakes and pools >> P: Seasonal/ intermittent freshwater lakes	Temporary freshwater lake	0	762	
Saline, brackish or alkaline water > Lakes >> Q: Permanent saline/ brackish/ alkaline lakes	Permanent saline lake	4	976	
Saline, brackish or alkaline water > Lakes >> R: Seasonal/ intermittent saline/ brackish/ alkaline lakes and flats	Temporary saline lake	3	1038	
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools	Permanent freshwater swamp	0	196	
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils	Temporary freshwater swamp, Temporary freshwater marshes and meadows	2		
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands	Temporary freshwater swamp, Temporary freshwater marshes and meadows	2		

Human-made wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
8: Wastewater treatment areas	Sewage farm	1	6	

What non-wetland habitats are within the site?

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Fringing native woodlands	1665

idem

(ECD) Habitat connectivity	The site consists of 23 individual lakes, some of which are connected by drains or channels/creeks, most are isolated within a rural agricultural landscape.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
Acacia oswaldii	Umbrella wattle	depleted in Victoria
Asperula gemella	Twin-leaf bedstraw	Vulnerable in Victoria
Callitris columellaris	White cypress pine	depleted in Victoria
Cynodon dactylon	Native Couch	insufficiently known in Victoria
Diplachne fusca	Brown bettle grass	rare in Victoria
Eragrostis falcata	Sickle love grass	rare in Victoria
Panicum decompositum	Australian Millet	rare in Victoria
Ranunculus undosus	Swamp Buttercup	Vulnerable in Victoria

Invasive alien plant species

Scientific name	Common name	Impacts	Changes at RIS update
Juncus acutus	spiny rush	Actually (minor impacts)	increase
Lycium ferocissimum	Box thorn	Actually (minor impacts)	decrease
Phragmites australis	Common reed	Actually (minor impacts)	increase
Salix cinerea	Grey sallow	Actually (major impacts)	decrease
Typha orientalis	Cumbungi	Actually (minor impacts)	increase

Optional text box to provide further information

(This field is limited to 2500 characters)

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AVES	*Anhinga melanogaster*	Oriental Darter;Darter				restricted colonial breeding in Victoria
CHORDATA/AVES	*Ardea alba*	Great Egret				restricted colonial breeding in Victoria
CHORDATA/AVES	*Falco hypoleucos*	Grey Falcon				vulnerable in Victoria
CHORDATA/AVES	*Falco subniger*	Black Falcon				rare in Victoria
CHORDATA/ACTINOPTERYGII	*Macquaria ambigua*	golden perch				rare in Victoria
CHORDATA/REPTILIA	*Morelia spilota variegata*	carpet python				vulnerable in Victoria
CHORDATA/AVES	*Oxyura australis*	Blue-billed Duck				rare in Victoria
CHORDATA/AVES	*Pedionomus torquatus*	Plains-wanderer				vulnerable in Victoria and nationally
CHORDATA/AVES	*Rostratula benghalensis*	Greater Painted Snipe				insufficiently known
CHORDATA/AVES	*Sterna nilotica*	Gull billed tern				restricted colonial breeding in Victoria
CHORDATA/ACTINOPTERYGII	*Tandanus tandanus*	Eeltail catfish;Tandan				vulnerable in Victoria
CHORDATA/AVES	*Xanthomyza phrygia*	Regent Honeyeater				endangered in Victoria

Invasive alien animal species

Phylum	Scientific name	Common name	Impacts	Changes at RIS update
CHORDATA/ACTINOPTERYGII	*Cyprinus carpio*	European carp	Actually (minor impacts)	unknown
CHORDATA/ACTINOPTERYGII	*Gambusia holbrooki*	Eastern gambusia	Potentially	unknown
CHORDATA/MAMMALIA	*Lepus europaeus*	European Hare	Potentially	increase
CHORDATA/MAMMALIA	*Oryctolagus cuniculus*	European Rabbit	Actually (minor impacts)	No change
CHORDATA/MAMMALIA	*Sus scrofa*	Wild boar	Actually (minor impacts)	No change
CHORDATA/MAMMALIA	*Vulpes vulpes*	Red Fox	Actually (minor impacts)	unknown

Optional text box to provide further information

(This field is limited to 2500 characters)

4.4 - Physical components

4.4.1 - Climate

Please indicate the prevailing climate type(s) by selecting below the climatic region(s) and subregion(s), using the Köppen-Geiger Climate Classification System.

Climatic region	Subregion
B: Dry climate	BSk: Mid-latitude steppe (Mid-latitude dry)

If changing climatic conditions are affecting the site, please indicate the nature of these changes:

(This field is limited to 1000 characters)

Timbal et al. (2016) have defined three climatic regions in Victoria. The Kerang Wetlands are located in the Murray Basin region. Under modelled simulations for the high representative concentration pathway (RCP) - RCP8.5 (little curbing of emissions) the predictions for this region are:
- sustained warming by 2090 by around 3.5 - 4°C
- a marked increase in the duration of warm spells (consecutive days above the 90th percentile measured against the 1986–2005 baseline period)
- mean annual rainfall decline of 28% to 11% by 2090 relative to the 1986–2005 period
- heavy rainfall events are expected to increase despite rainfall declines
- the proportion of time spent in any category of drought (from mild to extreme) is projected to increase through the century, especially by 2090
- the median change for annual runoff for 2090 is a decrease of slightly more than 20% for the Murray Basin.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 0

a) Maximum elevation above sea level (in metres): 80

b) Position in landscape/river basin:

- Entire river basin ☐
- Upper part of river basin ☐
- Middle part of river basin ☑
- Lower part of river basin ☐
- More than one river basin ☐
- Not in river basin ☐
- Coastal ☐

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

(This field is limited to 1000 characters)

Murray-Darling Basin

4.4.3 - Soil

Mineral ☑

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Organic ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

No available information ☐

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes ◉ No ○

Please provide further information on the soil (optional)

(This field is limited to 1000 characters)

Salinisation is a regional issue. Acid sulfate soils (ASS) have been found in some wetlands within the site but no activation of ASS has been documented.

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change
Usually seasonal, ephemeral or intermittent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from rainfall	☐	decrease
Water inputs from groundwater	☑	increase
Water inputs from surface water	☑	No change

Water destination

Presence?	Changes at RIS update
Feeds groundwater	unknown
To downstream catchment	unknown

Stability of water regime

Presence?	Changes at RIS update
Water levels largely stable	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology.

(This field is limited to 2000 characters)

Hydrology of the site in terms of surface water flows and management under a regulated system is described in detail in the ECD for the site.

(ECD) Connectivity of surface waters and of groundwater	Connectivity of surface waters was believed to have been reduced prior to listing and that the character of the site is a reflection of the more isolated conditions at the time of listing.
(ECD) Stratification and mixing regime	No current data available on this aspect of the character of the site.

4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Significant accretion or deposition of sediments occurs on the site ☑

(Update) Changes at RIS update: No change ○ Increase ○ Decrease ○ Unknown ◉

Significant transportation of sediments occurs on or through the site ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Sediment regime is highly variable, either seasonally or inter-annually ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Sediment regime unknown ☑

Please provide further information on sediment (optional):

(This field is limited to 1000 characters)

Sediment deposition at Reedy and Middle Reedy Lakes is thought to contribute to sustaining the tangled lignum community which tolerates permanent inundation - the actual way in which sediment deposition achieves this is a knowledge gap.

(ECD) Water turbidity and colour	No current data available on this aspect of the character of the site.
(ECD) Light - reaching wetland	No current data available on this aspect of the character of the site.
(ECD) Water temperature	No current data available on this aspect of the character of the site.

4.4.6 - Water pH

Acid (pH<5.5) ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Circumneutral (pH: 5.5-7.4) ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Alkaline (pH>7.4) ☐

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Unknown ☑

Please provide further information on pH (optional):

(This field is limited to 1000 characters)

4.4.7 - Water salinity

Fresh (<0.5 g/l) ☑

(Update) Changes at RIS update: No change ◉ Increase ○ Decrease ○ Unknown ○

Mixohaline (brackish)/Mixosaline (0.5-30 g/l) ☑

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Euhaline/Eusaline (30-40 g/l) ☑

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Hyperhaline/Hypersaline (>40 g/l) ☑

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Unknown ☐

Please provide further information on salinity (optional):

(This field is limited to 1000 characters)

The Ramsar site wetlands exhibit a full range of salinities from very fresh to hypersaline. These include:
1. deep permanent freshwater lakes with mean salinities typically less than 500 EC (Racecourse Lake 360 EC, Kangaroo Lake 360 EC, Little Lake Charm 200 EC, Reedy Lake 420 EC, Middle Lake 200 EC, Third Lake 360 EC)
2. wetlands that generally range between 4000 EC to 50 000 EC (Lake Bael Bael 2000 EC, Avoca Marshes range from 2000 to 25000 EC, Town Swamp and Kerang Weir Pool range from 1800 to 2300 EC, Lake Cullen ranges from 4000 to 170000 EC, Johnson Swamp range from 400 to 1500 EC and Hird Swamp ranges from 2600 to 3100 EC) and
3. salt disposal basins with salinities over 100,000 EC (Lake Tutchewop mean 50,000 EC, Lake William, Lake Kelly and Little Lake Kelly).

(ECD) Dissolved gases in water

(This field is limited to 1000 characters)

No current data available on this aspect of the character of the site.

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic ☐

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Mesotrophic ☐

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Oligotrophic ☐

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Dystrophic ☐

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Unknown ☑

Please provide further information on dissolved or suspended nutrients (optional):

(This field is limited to 1000 characters)

(ECD) Dissolved organic carbon: No current data available on this aspect of the character of the site.

(ECD) Redox potential of water and sediments: No current data available on this aspect of the character of the site.

(ECD) Water conductivity: No current data available on this aspect of the character of the site.

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself: i) broadly similar ○ ii) significantly different ◉

If the surrounding area differs from the Ramsar Site, please indicate how: (Please tick all categories that apply)

Surrounding area has greater urbanisation or development ☐

Surrounding area has higher human population density ☐

Surrounding area has more intensive agricultural use ☑

Surrounding area has significantly different land cover or habitat types ☑

Please describe other ways in which the surrounding area is different:

(This field is limited to 2000 characters)

The area surrounding the Ramsar site is primarily dryland, largely cleared of native vegetation and used for agriculture whereas the site is comprised mainly of wetlands which retain many of their natural values and are reserved and managed for conservation, water supply, salinity disposal and other public purposes.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Please select below all relevant ecosystem services/benefits currently provided by the site and indicate their relative importance in the right-hand column.

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	Low
Fresh water	Water for irrigated agriculture	High
Fresh water	Drinking water for humans and/or livestock	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Pollution control and detoxification	Water purification/waste treatment or dilution	High
Climate regulation	Local climate regulation/buffering of change	not relevant for site
Hazard reduction	Flood control, flood storage	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	High
Recreation and tourism	Nature observation and nature-based tourism	Medium
Recreation and tourism	Water sports and activities	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Scientific and educational	Educational activities and opportunities	Low

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Low

Optional text box to provide further information

(This field is limited to 2500 characters)

Other ecosystem service(s) not included above:

(This field is limited to 2000 characters)

Please make a rough estimate of the approximate number of people who directly benefit from the ecological services provided by this site (estimate at least in orders of magnitude: 10s, 100s, 1000s, 10 000s etc.):

Within the site: 10s

Outside the site: 1000s

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes ○ No ○ Unknown ◉

Where economic studies or assessments of economic valuation have been undertaken at the site, it would be helpful to provide information on where the results of such studies may be located (e.g. website links, citation of published literature):

(This field is limited to 2500 characters)

Goulburn-Murray Water Connection Project to bypass Third Reedy Lake for water savings and reinstatement of a more natural wetland watering regime is valued at approximately $7.9 million.

4.5.2 - Social and cultural values

Is the site considered internationally important for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? If so, please describe this importance under one or more of the four following categories. You should not list here any values derived from non-sustainable exploitation or which result in detrimental ecological changes.

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland ☐

Description if applicable

(This field is limited to 2500 characters)

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☐

Description if applicable

(This field is limited to 2500 characters)

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples ☐

Description if applicable

(This field is limited to 2500 characters)

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland ☐

Description if applicable

(This field is limited to 2500 characters)

4.6 - Ecological processes

This section is not intended for completion as part of a standard RIS, but is included for completeness as part of the agreed format of a 'full' Ecological Character Description (ECD) outlined by Resolution X.15

(ECD) Primary production	No information available
(ECD) Nutrient cycling	Land use affects the nutrient cycle. the Avoca Marshes are fed by inflows from the Avoca River which derives its water primarily from surface flows from a catchment dominated by agriculture.
(ECD) Carbon cycling	No information available
(ECD) Animal reproductive productivity	The Ramsar site provides a diverse range of breeding habitat which varies by wetland type and hydrology source. In the period 1980-2005, 99 colonial nesting breeding events were recorded (ibis, darters, cormorants, spoonbills).
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	There are over 170 wetland dependent plant species from five functional groups which form 12 identifiable vegetation types (ecological vegetation classes).
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	Foxes and rabbits compete with and prey on native fauna. Rabbits and carp destroy fauna habitat, increase soil erosion and decrease water quality. Grazing destroys native vegetation cover, erodes soils and increases nutrients
(ECD) Notable aspects concerning animal and plant dispersal	Colonial nesting waterbirds disperse after successful breeding events in the wetland.
(ECD) Notable aspects concerning migration	23 species of international migratory shorebird species migrate annually.
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Very high risks to the site are from unlicensed livestock grazing and invasive species.

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	☑	☐

Private ownership

Category	Within the Ramsar Site	In the surrounding area
<no data available>		

Other

Category	Within the Ramsar Site	In the surrounding area
<no data available>		

Provide further information on the land tenure / ownership regime (optional):

(This field is limited to 1000 characters)

The site consists of natural features reserves (Scotts Swamp, Lake Cullen, Johnson Swamp, Hird Swamp, Fosters Swamp, Stevensons Swamp, Cemetery Swamp, Lake Bael Bael, First, Second and Third Marsh), water supply reserves (Reedy, Middle and Third Lakes, Kangaroo Lake, Racecourse Lake, Lake Charm), salinity disposal reserves (Lakes Tutchewop, Kelly, William and Little Lake Kelly), freehold land owned by Goulburn Murray Water (Little Lake Charm), a sewage purposes reserve (part of Fosters Swamp) and public purposes reserves (Kerang Weir Pool and Town Swamp).

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

(This field is limited to 1000 characters)

Parks Victoria, North Central CMA, Goulburn-Murray Water, , Lower Murray Water, Department of Environment Land Water and Planning

Provide the name and title of the person or people with responsibility for the wetland:

Bruce Wehner, Regional Area of Work Coordinator (Environment Land and Water)

Postal address:

(This field is limited to 1000 characters)

Parks Victoria, 127 Welsford St, Shepparton VIC 3630

E-mail address:

bruce.wehner@parks.vic.gov.au

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
<no data available>						

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Canalisation and river regulation	Low impact	Medium impact	☑	increase	☑	increase
Salinisation	Medium impact	High impact	☑	increase	☑	increase

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Livestock farming and ranching	Medium impact	Medium impact	☑	No change	☑	increase

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
<no data available>						

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
<no data available>						

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fishing and harvesting aquatic resources	Low impact	Low impact	☑	increase	☐	No change

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	Low impact	Low impact	☑	unknown	☐	No change

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Dams and water management/use			☑		☑	

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/ alien species	Medium impact	Medium impact	☑	increase	☑	increase

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Agricultural and forestry effluents	Medium impact	Medium impact	☑	increase	☑	increase
Household sewage, urban waste water	Low impact	Low impact	☑	increase	☑	increase

Geological events

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
<no data available>						

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Habitat shifting and alteration	unknown impact	unknown impact	☑	unknown	☑	unknown
Droughts	Medium impact	High impact	☑	increase	☑	increase
Temperature extremes	Low impact	Medium impact	☑	increase	☐	unknown

Please describe any other threats (optional):

(This field is limited to 3000 characters)

Potential for acid sulfate soils to be present within some of the Ramsar wetlands. Several of the lakes are managed as salt disposal basins.

5.2.2 - Legal conservation status

Please list any other relevant conservation status, at global, regional or national level and specify the boundary relationships with the Ramsar Site:

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
<no data available>			

Regional (international) legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
<no data available>			

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
crown land wildlife reserve	Cemetery Swamp		partly
crown land wildlife reserve	Fosters Swamp		partly
crown land wildlife reserve	Lake Bael Bael, Avoca Marshes, Lake Cullen, Hird Swamp, Johnsons Swamp, Stevenson Swamp		whole
crown land wildlife reserve	Little Lake Charm		partly
freehold land	Little Lake Charm		partly
municipal purposes reserve	Cemetery Swamp		partly
public land vested in water authority	Town Swamp, Kerang Weir Pool		partly
salinity disposal reserve	Lakes Tutchewop, Kelly, William and Little Lake Kelly		whole
sewage purposes reserve	Fosters Swamp		partly
timber reserve	Cemetery Swamp		partly
water supply reserve	Reedy Lake, Third Lake, Middle Lake, Kangaroo Lake, Racecourse Lake, Lake Charm		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Northern Victorian Wetlands	http://www.birdata.com.au/iba.vm	partly

5.2.3 - IUCN protected areas categories (2008)

Ia Strict Nature Reserve ☐

Ib Wilderness Area: protected area managed mainly for wilderness protection ☐

II National Park: protected area managed mainly for ecosystem protection and recreation ☐

III Natural Monument: protected area managed mainly for conservation of specific natural features ☐

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention ☐

V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation ☐

VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems ☑

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Catchment management initiatives/controls	Partially implemented
Habitat manipulation/enhancement	Partially implemented
Hydrology management/restoration	Partially implemented
Improvement of water quality	Partially implemented

Species

Measures	Status
Threatened/rare species management programmes	Partially implemented
Control of invasive alien animals	Partially implemented
Control of invasive alien plants	Partially implemented

Human Activities

Measures	Status
<no data available>	

Other:

(This field is limited to 3000 characters)

Production of a detailed action plan and establishing a site coordinating committee between the main state agencies and local authorities who have responsibility for parts of the site commenced in 2015. Environmental Water Management Plans exist for Lake Cullen, Hirds Swamp and Johnson Swamp. Goulburn-Murray Water will be developing land and on-water management plans for Kangaroo Lake and Lake Charm.

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Is the management plan/planning implemented? Yes ◉ No ○

The management plan covers All of Ramsar Site

Is the management plan currently subject to review and update? Yes ○ No ◉

Has a management effectiveness assessment been undertaken for the site? Yes ◉ No ○

Please give link to site-specific plan or other relevant management plan if this is available via the Internet or upload it in section 'Additional material':

(This field is limited to 500 characters)

The Kerang Wetlands Ramsar Site Management plan is included in the North Central Waterway Strategy:
http://www.nccma.vic.gov.au/sites/default/files/publications/north_central_waterway_strategy_2014-20 22.pdf

A Kerang Wetlands Ramsar Site Action plan has been developed and is being implemented:
http://www.nccma.vic.gov.au/sites/default/files/publications/kerang_wetlands_action_plan_2017_-_fina l_low_res.pdf

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes ○ No ◉

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

(This field is limited to 1000 characters)

There is no Ramsar centre, educational facility or visitor facility at the site.

URL of site-related webpage (if relevant):

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No, but a plan is being prepared

Has the plan been implemented? Yes ○ No ◉

The restoration plan covers: All of Ramsar Site

Is the plan currently being reviewed and updated? Yes ○ No ◉

Where the restoration is being undertaken to mitigate or respond to a threat or threats identified in this RIS, please indicate it / them:

(This field is limited to 1000 characters)

Further information

(This field is limited to 2500 characters)

The detailed Action Plan which is being developed for the Kerang Wetlands Ramsar Site will cover aspects of rehabilitation, as required.

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water regime monitoring	Implemented
Water quality	Implemented
Animal species (please specify)	Implemented
Birds	Implemented
Plant species	Implemented

Please indicate other monitoring activities:

(This field is limited to 3000 characters)

There are no other monitoring activities.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

(This field is limited to 3000 characters)

Cook, D. and Bayes, E. (2014). Kerang Ramsar and Other Significant Wetlands Monitoring Project. Rakali Consulting, Chewton, Victoria.
Cook, D., Foreman, P., Just, K., and Jolly, K. (2013). Ecological Vegetation Class Assessment for the Reedy Lake system, Little Lake Charm and Racecourse Lake and surrounding areas in the Kerang Wetlands Ramsar Site. Rakali Consulting, Chewton, Victoria.
Kellogg Brown and Root. (2011). Ecological Character Description for the Kerang Wetlands Ramsar site. Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT.
Kingsford, R., Bino, G., Porter, J., and Brandis, K. (2014). Waterbird Communities in the Murray-Darling Basin, 1983-2012. Australian Wetlands, Rivers and Landscapes Centre, University of New South Wales, Canberra, ACT.
North central CMA (in prep.) Kerang Wetlands Ramsar Action Plan 2016-2024. North Central Catchment Management Authority, Huntly, Victoria.
North Central CMA. (2013). Lake Cullen Environmental Water Management Plan. North Central CMA, Huntly, Victoria.
O'Donnell, C.F.J. (2011). Breeding of the Australasian Bittern (Botaurus poiciloptilus) in New Zealand. Emu 111(3): 197–201.
Rakali Ecological Consulting, 2014. Kerang Ramsar and Other Significant Wetlands Monitoring Project 2014. Report prepared for the North Central Catchment Management Authority, Rakali Ecological Consulting, Chewton, Victoria.
Roberts, J. & Marston, F. 2011, Water regime for wetland and floodplain plants. A source book for the Murray–Darling Basin. National Water Commission, Canberra.
Timbal, B., Ekstrom, M., Fiddes, S., Grose, M., Kironon, W., Eun-Pa, L., Lucas, C. and Wilson, L. (2016). Climate change science and Victoria. Bureau Research Report no. 014. Bureau of Meteorology, Melbourne.

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)
AU265_ECD1510.pdf

iii. a description of the site in a national or regional wetland inventory
<no file available>

iv. relevant Article 3.2 reports
<no file available>

v. site management plan
AU265_mgt190404.pdf
AU265_mgt190404_1.pdf

vi. other published literature
AU265_lit170823__Boundary_Description.docx
AU265_lit190404__ECD_Addendum_2017.pdf

Please note that any documents uploaded here will be made publicly available.

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Kerang Wetlands Ramsar Site (*Department of Environment, Land, Water and Planning, 06-01-2011*)

6.1.4 - Designation letter and related data

Designation letter
AU265_DesLet190415.pdf

Date of Designation: 1982-12-15