

# Information Sheet on Ramsar Wetlands

*Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.*

## 1. Date this sheet was completed/updated:

May 1999

FOR OFFICE USE ONLY.

DD	MM	YY

Designation date

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Site Reference Number

## 2. Country:

Australia

## 3. Name of wetland:

Kerang Wetlands, Victoria

## 4. Geographical coordinates:

Latitude: (approx) 35° 30' to 35° 50'S ; Longitude: (approx) 143° 42' to 144° 10'E

## 5. Altitude:

Approx 80 metres

## 6. Area:

9419 hectares

Note: This is a revised area figure based on GIS Mapping (1995) and does not represent any change to the Ramsar Site boundary.

## 7. Overview:

The Kerang wetlands are a system of lakes and swamps which differ widely in permanence, depth, salinity and amounts of aquatic vegetation. The wetlands are important waterbird habitats. They support large populations of some common endemic Australian species and they also provide habitat for migratory species listed under the Japan-Australia and the China-Australia Migratory Birds Agreements.

## 8. Wetland Type:

marine-coastal: A B C D E F G H I J K  
inland: L M N **O** P **Q** R Sp Ss  **Tp**   **Ts**   
U Va Vt W Xf Xp Y Zg Zk  
man-made: 1 2 3 4 5 6 7 8 9

## 9. Ramsar Criteria:

**1a** **1b** 1c 1d | 2a **2b** 2c 2d | **3a** **3b** **3c** | 4a 4b

Please specify the most significant criterion applicable to the site:

10. Map of site included? Please tick *yes*  -or- *no*

11. Name and address of the compiler of this form:

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## **12. Justification of the criteria selected under point 9, on previous page.**

1(a) The wetland is a particularly good representative example of a natural or near-natural wetland characteristic of the appropriate biogeographical region.

The Kerang Wetlands are a particularly good example of a diverse system of inland wetlands in the Riverina biogeographic region.

1(b) The wetland is a particularly good representative example of a natural or near-natural wetland common to more than one biogeographical region.

The Kerang Wetlands are a particularly good example of diverse systems of inland lakes and swamps associated with river floodplains in the Murray-Darling Basin.

2(b) A wetland is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna.

Kerang wetlands is of special value because it supports a high diversity and abundance of waterfowl species (Lugg *et al.* 1989). It also supports a large number of native plant species including a community of Tangled Lignum shrubland which is under represented in Victoria wetland reserves (O'Donnell 1990).

3(b) Regularly supports substantial numbers of waterfowl from particular groups

Most of the Kerang lakes support significant numbers of ducks including Grey Teal (up to 85,000 Grey Teal at Lake Cullen), Black Duck (up to 11,000 at Lake Cullen, 3,000 at Hird's Swamp, 2,000 at Johnson's Swamp), Australian Shelduck (up to 4,500 at Lake Bael Bael, 8,000 at Lake Cullen), Pink-eared Duck (up to 5,000 at Lake Cullen) and Australasian Shoveler (up to 2,400 at Lake Cullen) (ANCA 1996).

Lake Cullen has supported up to 44,000 Eurasian Coot (ANCA 1996).

Third, Middle and Reedy lakes and Hird's and Johnson's Swamps are important for Straw-necked and White Ibis (see below).

3(c) Regularly supports 1% on the individuals in a population of one species or subspecies

Third, Middle and Reedy lakes have supported more than 10% of the regional breeding population of Straw-necked Ibis and Australian White Ibis and more than 5% of the Victorian breeding population of Royal Spoonbill (ANCA 1996).

Internationally significant numbers of Banded Stilts have been recorded at Lake Cullen (6,500) and Lake William (3,000) (Watkins 1993).

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## **13. General location:**

Lower reaches of the Avoca and Loddon Rivers and the Pyramid Creek near Kerang in northern Victoria.

## **14. Physical features:**

Much of the Kerang Lakes area consists of Tertiary alluvium, some being overlain by Quaternary alluvium from the Avoca and Loddon Rivers. Lunettes (Quaternary aeolian deposits) occur on the eastern flanks of many of the wetlands. These plus the adjacent lakes represent small localised land systems upon the broad alluvial plains. The lake sediments are grey, often saline calcareous clays, while the lunette deposits are finely textured duplex soils of red sands and calcareous clays. Soil erosion and salting are common problems

The region has a 'semi-arid' climate, with an annual rainfall of less than 400 mm. Summers are typically hot and winters mild. Rainfall mainly occurs as low intensity winter falls, the remainder is largely via irregular summer storms.

The individual shallow swamps and lakes of this system range in salinity from freshwater marshes to highly saline lakes. Permanent wetlands are the dominant type within the area. This is due to a constantly available water supply - irrigation quality water in the supply lakes and drainage water in the saline lakes and evaporation basins. Water depths vary from very shallow, i.e. less than 1 metre, to in excess of 8 metres. Kangaroo Lake is the deepest lake at 8.4 metres.

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### **15. Hydrological values:**

Eight of the wetlands are Water Supply Reserves (Reedy Lake, Middle Lake, Third Lake, Little Lake Charm, Lake Charm, Racecourse Lake, Kangaroo Lake and Cullen's Lake) and three are Salinity Disposal Reserves (Lake Kelly, Lake William and Lake Tutchewop)

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### **16. Ecological features:**

The deep permanent freshwater lakes generally support a sparse aquatic vegetation apart from a narrow fringe of *Typha* spp. The shallow seasonal wetlands have the most diverse vegetation. These wetlands often support an over-storey of trees (Red Gum and/or Black Box), an understorey of shrubs (lignum) and ground layers of grasses and herbs. During prolonged flooding an aquatic and semi-aquatic flora develops, with Rushes, Sedges, Pondweeds, Milfoils, Azollas and Duckweeds becoming common.

Semi-permanent freshwater swamps such as Hirds and Johnsons Swamps are dominated by vegetation, including Cumbungi (*Typha* spp.), Pondweeds, Milfoils, Eel-grass, floating Duck-weeds and Azollas.

Saline wetlands are dominated by Sea Tassel (*Ruppia* spp.) and alga (*Characea*). These species are abundant at the lower salinities (e.g. 10,000 - 30,000 Ec) but become progressively less common up to 100,000 Ec (i.e. in hypersaline wetlands).

The diversity of wetland type and the associated diversity of vegetation types present a wide range of habitats for waterbirds.

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### **17. Noteworthy flora:**

*Acacia osswaldii* (Umbrella Wattle) - depleted in Victoria.

Present in Black Box and Tangled Lignum vegetation communities of Lake Bael Bael.

*Asperula gemella* (Twin-leaf Bedstraw) - vulnerable in Victoria.

Present in periodically flooded situations in Red Gum, Black Box and Tangled Lignum communities of Third Lake, Town Swamp and Cemetery Swamp.

*Muehlenbeckia horrida* (Spiny Lignum) - rare in Victoria.

Restricted to clay soils. Found mainly in open chenopod shrublands, but also in Red Gum, Black Box and dry grassland communities. Reedy Lake, Middle Lake, Little Lake Charm, Racecourse Lake, Kangaroo Lake, Lake Charm and Cullen's Lake

*Ranunculus undosus* (Swamp Buttercup) - vulnerable in Victoria.

Found in swamp margins and in drainage lines, in shallow water and wet or drying mud. Restricted to areas of regular shallow flooding. Within reedbed, Tangled Lignum or wet grassland (herbfield) communities of Reedy Lake, Town Common (Back Swamp) and Town Swamp.

*Callitris columellaris* (White Cypress Pine) and *Allocasuarina leuhmanii* (Buloke) - both depleted in Victoria.

These have highly depleted distributions in the Kerang Lakes area. Formerly with extensive coverage across the plains, these species have been heavily cleared, and are now limited to a few locations. Most individuals remaining are overmature, with little chance of regeneration due to high intensity grazing. Both species are found at Lake Bael Bael. White Cypress Pine is also found at Kangaroo Lake and Buloke is also found at Cullen's Lake.

### Species of Significant Environmental Value

Species such as Red Gum (*Eucalyptus camaldulensis*) and Black Box (*E. largiflorens*) are important in that they provide a habitat capable of supporting a range of flora and fauna. Tangled Lignum (*Muehlenbeckia cunninghamii*) is the major nesting site for Ibis (*Threskiornis* spp.), an abundant bird of

the Kerang Lakes area. Reedbeds of Cumbungi (*Typha* spp.) and Common Reed (*Phragmites australis*) are also significant, providing important habitat for birds such as the Clamorous Reed Warbler (*Acrocephalus stentoreus*). Black-seeded Glasswort (*Halosarcia pergranulata* ssp. *pergranulata*) is the major plant capable of dominating saline soils in the Kerang Lakes area; without it, problems of erosion and environmental degradation would be much worse. Sea Tassel (*Ruppia* spp.) is the only aquatic macrophyte to dominate saline lakes; without it, the potential of these lakes to support a diverse fauna is markedly diminished.

#### Additional threatened species

*Eragrostis falcata* (Sickle Love-grass) - rare in Victoria

*Panicum decompositum* (Australian Millet) - rare in Victoria

*Atriplex stipitata* (Kidney Saltbush) - vulnerable in Victoria

*Trigonella suavissima* (Sweet Fenugreek) - rare in Victoria

*Diplachne fusca* (Brown Beetle-grass) - rare in Victoria

*Cynodon dactylon* var. *pulchellus* (Native Couch) - insufficiently known in Victoria

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### 18. Noteworthy fauna:

The lakes with flooded forest, reedbeds or Tangled Lignum are important breeding areas for waterbirds (e.g. Middle Lake and Hind Swamp regularly contain more than 1000 nesting Straw-necked and Sacred Ibis; Second and Third Marsh support breeding colonies of Pied, Little Pied, Black and Little Black Cormorants, Darter, Yellow and Royal Spoonbill and high densities of hollow nesting waterfowl.)

During summer and particularly during drought large flocks of waterfowl concentrate on the more open lakes (e.g. Cullens Lake 100000 Hardhead in 1975, 70000 Grey Teal in 1988). Migratory waders are common around saline lakes. A number of waders species seen rarely in Victoria have been recorded.

Bony Bream (*Nematolos erebi*) is a rare fish species in Victoria. In the Kerang wetlands, this fish is found in Kangaroo Lake, Lake Bael Bael and Lake Charm.

#### Threatened Species

##### Birds

Darter (*Anhinga melanogaster*) - restricted colonial breeding in Victoria

Great Egret (*Ardea alba*) - restricted colonial breeding in Victoria

Whiskered Tern (*Chidonias hybridus*) - restricted colonial breeding in Victoria

Murray Hardyhead (*Craterocephalus fluviatilis*) - rare in Victoria

Grey Falcon (*Falco hypoleucos*) - vulnerable in Victoria

Black Falcon (*Falco subniger*) - rare in Victoria

White-bellied Sea-Eagle (*Haliaeetus leucogaster*) - rare in Victoria

Eastern Curlew (*Numenius madagascariensis*) - rare in Victoria

Blue-billed Duck (*Oxyura australis*) - rare in Victoria

Plains Wanderer (*Pedionomus torquatus*) - vulnerable in Victoria and nationally

Pied Cormorant (*Phalacrocorax varius*) - restricted colonial breeding in Victoria

Royal Spoonbill (*Platalea regia*) - restricted colonial breeding in Victoria

Painted Snipe (*Rostratula benghalensis*) - insufficiently known

Gull-billed Tern (*Sterna nilotica*) - restricted colonial breeding in Victoria

Freckled Duck (*Stictonetta naevosa*) - rare in Victoria

Regent Honeyeater (*Xanthomyza phrygia*) - endangered in Victoria and nationally

##### Fish

Silver Perch (*Bidyanus bidyanus*) - vulnerable in Victoria

Golden Perch (*Macquaria ambigua*) - rare in Victoria

Freshwater Catfish (*Tandanus tandanus*) - vulnerable in Victoria

##### Reptiles

Carpet Python (*Morelia spilota variegata*) - vulnerable in Victoria

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### 19. Social and cultural values:

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## **20. Land tenure/ownership:**

Of the 22 wetlands, 7 are State Wildlife Reserves (Lake Bael Bael, First Marsh, Second Marsh, Third Marsh, Stevenson Swamp, Hird Swamp and Johnson Swamp), 8 are Water Supply Reserves (Reedy Lake, Middle Lake, Third Lake, Little Lake Charm, Lake Charm, Racecourse Lake, Kangaroo Lake and Lake Cullen), 3 are Salinity Disposal Reserves (Lake Kelly, Lake William and Lake Tutchewop) and 4 are Crown Land without specific reservation.

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## **21. Current land use:**

**(a) the site:** The lakes are used for nature conservation, recreation, saline water disposal, irrigation water storage and transport, duck hunting and sewerage disposal.

**(b) the surroundings/catchment:** Dryland and irrigation farming.

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## **22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:**

Ecological change has not been significant since the Ramsar information sheet for the site was last updated in 1992.

Historically, the Kerang Lakes have undergone significant changes in water regime since the development of the Torrumbarry Irrigation System in 1896. After the upgrading of the system in 1923, land salinisation became a major problem and shallow water tables became widespread leading to an increase in the salinity levels in many of the wetlands.

Altered catchment hydrology resulting in greater river flows has caused lakes on the Avoca River to fill more frequently causing decline of Red Gum forests.

Saline groundwater intrusion from local and regional groundwater tables, saline irrigation tailwater disposal to wetlands and the isolation of wetlands from the natural flood flows is causing increases in lake salinity and associated changes in biota.

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## **23. Conservation measures taken:**

- The values of First, Second and Third Marshes and Cullen's Lake have been recognised by listing on the Register of the National Estate.
  - The conservation values of the Kerang Wetlands have been identified in a series of studies (on waterbirds, vegetation, invertebrates, fish and recreation) by the Kerang Lakes Assessment Group. These studies contribute to a wider Irrigation Management Plan for the Kerang Area. The studies identified actions required to maintain or enhance the conservation values of the Kerang Lakes.
  - An Environmental Watering Program has commenced to restore more natural watering regimes in several of the wetlands.
  - The outlet at Third Marsh has been modified to alleviate prolonged flooding.
  - Action Statements under the Flora and Fauna Guarantee Act 1988 have been produced for the following fauna species which occur at this Ramsar site. The statements outline conservation measures for these species.
    - Grey Falcon (1997)
    - White-bellied Sea-eagle (1994)
    - Plains Wanderer (1995)
    - Regent Honeyeater (1994)
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## **24. Conservation measures proposed but not yet implemented:**

### Lake Bael Bael and First, Second and Third Marshes:

- modification of the upper catchment to reduce flooding and salinity of Avoca River water.
- a strategy to eradicate the problem of saline groundwater inflows to Second and Third Marshes.

### Cullen's Lake:

- regular flushing to reduce salinity levels,
- prevention of uncontrolled grazing and cultivation along shoreline.

In an integrated approach to planning at Ramsar sites, management strategies are being prepared for all Ramsar sites in Victoria, including the Kerang Wetlands, to provide general strategic direction and site specific strategies. The strategies will be completed by June 1999.

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**25. Current scientific research and facilities:**

Much survey work was undertaken during the planning phase of the 1992 Salinity Management Plan on flora and fauna inhabiting the Lakes.

Tree health and water quality have been monitored for many Kerang wetlands.

Water quality monitoring is ongoing.

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**26. Current conservation education:**

There is a bird hide located at Reedy Lake with an associated information display.

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**27. Current recreation and tourism:**

The public land of the Kerang Lakes area is a very valuable resource for recreation. Land based activities, water based activities and water enhanced activities are all catered for. The value of the land for recreation partially stems from its natural ecological assets, its plant life and its wildlife, but also from the reliable supply of fresh water which has been brought into the area for irrigation purposes. Activities include pleasure driving/sightseeing, camping, picnicking, swimming, sailing, waterskiing, boating, fishing, hunting and nature study/appreciation.

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**28. Jurisdiction:**

Government of Victoria.

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**29. Management authority:**

Managed under the Department of Natural Resources and Environment Parks Program by Parks Victoria - 8,389 Ha (89%)

Natural Resources and Environment - 169 Ha (1.8%)

Water Authority - 861 Ha (9.2%)

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**30. Bibliographical references:**

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