

Information Sheet on Ramsar Wetlands

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

NOTE: It is important that you read the accompanying *Explanatory Note and Guidelines* document before completing this form.

1. Date this sheet was completed/updated:

August 2000

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Designation date

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Site Reference Number

2. Country:

Australia

3. Name of wetland:

Lake Gore

4. Geographical coordinates:

Latitude: 33° 44' S to 33° 50' S

Longitude: 121° 26' E to 121° 32' E

5. Elevation: (average and/or max. & min.) approx. 10-20 m (Australian Height Datum)

6. Area: (in hectares) approx. 4017 ha of which Lake Gore itself comprises 740 ha.

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)

The Site comprises a near-permanent saline lake and part of a downstream system of inter-connected lakes and swamps of various sizes which are intermittently inundated. Lake Gore itself supports the largest known populations of Hooded Plover *Thinornis rubricollis*, is important for moulting by thousands of Australian Shelduck *Tadorna tadornoides* and for drought refuge by thousands of ducks and shorebirds, and it supports thousands of Banded Stilt *Cladorhynchus leucocephalus*.

8. Wetland Type (please circle the applicable codes for wetland types as listed in Annex I of the *Explanatory Note and Guidelines* document.)

R (seasonal/intermittent saline/brackish/alkaline lakes and flats)

Ss (seasonal/intermittent saline/brackish/alkaline marshes/pools)

Please now rank these wetland types by listing them from the most to the least dominant:

R, Ss.

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page.)

4 (it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions).

5 (it regularly supports 20,000 or more waterbirds).

- 6 (it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird).

Please specify the most significant criterion applicable to the site: 6

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

(Please refer to the *Explanatory Note and Guidelines* document for information regarding desirable map traits).

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

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12. Justification of the criteria selected under point 9. (Please refer to Annex II in the *Explanatory Note and Guidelines* document).

4. Lake Gore regularly supports moulting by thousands of Australian Shelducks (see item 18); it is one of the most important moulting sites for shelducks in South-Western Australia. The Lake is also used as a drought refuge by large numbers of waterbirds (see criterion 5 and item 18).
5. More than 29,000 waterbirds have been counted at Lake Gore (see item 18). The number of individual waterbirds that use the lake each year probably exceeds 20,000 and the annual data on water depth suggest conditions are suitable for use by 20,000 waterbirds at least several times within a 25 year period; in the context of wetland availability in Western Australia this is considered sufficient evidence of regular use by 20,000 waterbirds.
6. Lake Gore supports up to 1600 Hooded Plovers which constitutes more than 1% (actually almost one third) of the global population. Lake Gore is the single most important wetland for this species. The 1% criterion also is met for Banded Stilt: thousands occur regularly and counts of up to 20,000 (about 10% of the population) have been recorded. See also item 18.

13. General location: (include the nearest large town and its administrative region)

Lake Gore is in the Shire of Esperance (local authority) in the State of Western Australia (population ca. 1.9 million). It is 34 km west-north-west of the town of Esperance (population ca. 13,200).

The Lake Gore Ramsar Site comprises the entire area of Nature Reserve 32419 and the eastern part of Nature Reserve 26885, which are almost contiguous (see map). The western boundary of the Site is the "protected road" (unformed track) that provides vehicular access across Nature Reserve 26885 to Warrinup Beach. Wetlands within the Site include Lake Gore and part of a downstream system of inter-connected lakes and swamps of varied sizes ("the overflow wetlands").

A strip of land oriented east-west and approximately 686 m wide inside the northern boundary of Nature Reserve 26885 is excluded from the Site in anticipation of possible future exchange of this land for freehold land that may be added (subject to negotiation with and voluntary agreement of the present owner) to Nature Reserve 32419, and which would substantially enhance the conservation values and management of the wetlands. Lakes Gidong, Kubitch and Carbul, which are adjacent to Lake Gore, are not in the Ramsar Site; neither are Quallilup Lake or the un-reserved overflow wetlands that connect that Lake to the Site. There is potential for addition of these areas of wetland to the Site in the future, subject to resolution of tenure and other issues.

14. Physical features: (e.g. geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate)

The Site is situated in the Albany-Fraser Orogen, in alluvial/lacustrine sediments overlying marine limestone and gneiss/sandstone on a sub-coastal plain. It includes a large lake (Lake Gore: 738 ha), and a downstream system of inter-connected small lakes, swamps and creeks ("the overflow wetlands"), all of which are natural wetlands.

Water is derived from a relatively large surface catchment, mainly from Dalyup River, Coobidge Creek and minor seasonal streams. The total wetland area downstream of Lake Gore and within the Ramsar Site boundary is in the order of 600 ha. The greater part of the surface catchment of the Ramsar Site is cleared of native vegetation.

Lake Gore is a sub-terminal drainage basin. It is seasonal or near-permanent, sometimes being dry in autumn: maximum depth recorded is 2.0 m (September 1996) and the September mean is 1.4 m. In particularly wet years, which have occurred at least four times in the last 25 years, Lake Gore flows out at two points into the overflow wetlands: at times flow may continue for another 1-2 km beyond the Ramsar Site to Lake Quallilup (a terminal basin) and exceptionally also about 10 kilometres westward beyond the Ramsar Site to Barkers Inlet. Water may be more than 1.0 m deep in the overflow wetlands and may persist for more than 12 months before drying out, unless there are further floods.

Water quality, Lake Gore: salinity ranges from saturated salt (e.g. January 1984, when less than 0.5 m deep) to 6.5 parts per thousand (September 1989) with a September mean of 52.1 ppt (n=12); water pH ranges from 7.1 to 9.4; and the water is colourless. The overflow wetlands mainly hold water when the lake has overflowed and are at the lower end of salinities recorded for Lake Gore.

Water data are from monitoring by the Department of Conservation & Land Management.

Median and mean annual rainfall at Esperance (34 km east-south-east of Lake Gore) are 553 mm and 568 mm respectively, mostly falling in May-August. Annual evaporation is about 1800 mm.

15. Hydrological values: (groundwater recharge, flood control, sediment trapping, shoreline stabilisation etc)

None recognised.

16. Ecological features: (main habitats and vegetation types)

Lake Gore and many of the overflow wetlands support a zone (generally narrow, wide in some overflow swamps) of open-woodland of saltwater paperbark *Melaleuca cuticularis* over understorey of the sedges *Gahnia trifida* and *Schoenus brevifolius* at or near the margins (Halse *et al.* 1993; Lane *et al.* 1996). Areas of low shrubland dominated by the samphires *Suaeda australis* and *Sarcocornia quinqueflora*, the grass *Sporobolus virginicus* and the herb *Samolus repens*, occur in the overflow wetlands.

There is little information on long-term changes to the vegetation though many dead trees in the paperbark woodlands are indicative of prolonged inundation, possibly due in part to increased inflow to the Lake following land clearance in the surface catchment.

Surrounding areas support mainly open-scrub or open-heathland, or are cleared.

17. Noteworthy flora: (indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc)

There are no rare, threatened or endemic plants known at the Site.

18. Noteworthy fauna: (indicating, e.g., which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

Almost one third of the world population (Rose & Scott 1997) of the Hooded Plover occurs regularly at Lake Gore: the maximum count was 1600 in January 1995. The birds often occur in loose groups, sometimes in dense flocks, along the broad north and north-east beaches of Lake Gore. Few if any have been seen in the overflow swamps and there is no evidence of Hooded Plover breeding anywhere in the Site. Although other nearby wetlands, including the Gidong suite of lakes and the Ramsar listed Lake Warden System (at Esperance), also support hundreds of Hooded Plovers, despite many surveys Lake Gore remains clearly the single most important wetland for this species.

Up to almost 10% of the world population of Banded Stilt (20,000 in March 1988) occurs at Lake Gore, usually when the Lake has dried back substantially. This is one of the most important drought refuges for Banded Stilt in South-Western Australia.

Lake Gore is used each year in spring-summer for moulting by thousands (up to 12,000, November 1986) of Australian Shelduck. It is one of the most important moulting sites for shelducks in the bioregion.

Use by shelducks and stilts (see above) indicates that Lake Gore is one of the most important drought refuges for waterbirds in the bioregion. The highest number of waterbirds counted was 29,273 in March 1988 and though no other counts have reached 20,000 the number of individual waterbirds that use the lake each year probably exceeds 20,000. The most abundant species at Lake Gore are Banded Stilt, Australian Shelduck, Grey Teal *Anas gracilis* (3500, December 1987) and Hoary-headed Grebe *Poliiocephalus poliocephalus* (1000, March 1988).

Other information on waterbirds: Surveys have recorded 48 waterbird species at Lake Gore and about 33 at the overflow wetlands; 14 are migrant shorebirds. Fairy Tern *Sterna nereis* (unusual inland) and Freckled Duck *Stictonetta naevosa* sometimes occur in small numbers. Eight species of waterbirds have been recorded breeding at Lake Gore; several species (e.g. Chestnut Teal *Anas castanea*) breed in the overflow wetlands. Most breeding is in wetter years, mainly in samphire and inundated woodland. The most abundant migrant shorebird is Red-necked Stint *Calidris ruficollis* (625 at Lake Gore). Major roost sites for waterbirds in Lake Gore are at the delta-spit of Dalyup River and on rock outcrops (flightless shelducks).

Other noteworthy fauna: The beaches of Lake Gore have red shell deposits of an ostracod (cf *Australocypris* sp.) that thrives in the lake (S. Halse pers. comm.).

Data are from Jaensch *et al.* 1988, Halse *et al.* 1990, Lane *et al.* 1996 and data sets held by the Western Australian Department of Conservation & Land Management.

19. Social and cultural values: (e.g. fisheries production, forestry, religious importance, archaeological site etc.)

None recognised. (See also item 26.)

20. Land tenure/ownership of: (a) site (b) surrounding area

(a). The Ramsar Site comprises A-Class Nature Reserve 32419 and the eastern part of Nature Reserve 26885, both vested in the National Parks and Nature Conservation Authority (appointed by the Government of Western Australia), for the purposes of "Water and Conservation of Flora and Fauna" (32419), and "Conservation of Flora" (26885). Reserve 26885 has been proposed as an addition to Stokes Inlet National Park (CALM 1991).

(b). Surrounding areas include freehold (privately owned) land, Nature Reserve, Recreation Reserve, Unallocated Crown Land and marine waters.

21. Current land use: (a) site (b) surroundings/catchment

(a). The principal land use within the Ramsar Site is nature conservation. In addition, low level recreational use occurs. There are no developed facilities for nature-based recreation and this type of recreation is negligible within the Ramsar Site.

(b). The most important land uses in the surface catchment are agriculture (cereal, other seed crops) and grazing of sheep. Some adjoining areas are reserved for nature conservation. Some recreational fishing by local residents occurs at or near Warrinup Beach, which is also popular for surfing. Human population in the surface catchment of the Site is in the order of several hundreds of people.

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

(a). Major algal blooms, probably due to use of agricultural fertilisers in the Dalyup River catchment, occur at Lake Gore from time to time and result in deposits of algal mats on the shores. The impact of these blooms/mats on waterbirds including Hooded Plovers is not known. It is thought that the Site's wetlands were naturally saline and that further substantial salinisation probably will not occur. Dead trees in the paperbark woodlands are indicative of prolonged inundation, possibly due in part to increased inflow to the Lake following land clearance in the surface catchment.

(b). Eutrophication and salinisation are significant threats in surrounding farmland and wetlands. Changes in agriculture are possible, e.g. possible establishment of tree plantations, which if extensive may reduce surface and ground water inputs and input of nutrients and salt.

23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made: management practices; whether an officially approved management plan exists and whether it has been implemented)

Cooperative management of parts of the surface catchment, with substantial community participation (Dalyup Catchment Group), is occurring under the federally funded Landcare program. The Water & Rivers Commission is preparing an Action Plan with the Dalyup Catchment Group to protect the Dalyup River. This work includes foreshore surveys of the Dalyup and West Dalyup Rivers and tributaries and the development of recommendations addressing management issues.

Most of the shoreline of Lake Gore has less than 50 m of buffer zone within protected areas.

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area etc.)

There is some local interest in the surface catchment becoming designated as a "Key Wetlands and Natural Diversity Catchment" under the Salinity Action Plan for Western Australia and in the Site becoming part of a continuous "macro-corridor" of natural lands, including protected areas, along the South Coast between Albany and Esperance.

There is potential to extend the Ramsar Site in the future, subject to resolution of land tenure and other issues (see item 13).

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station etc.)

Depth, salinity and other water quality parameters have been measured by the Western Australian Department of Conservation & Land Management at least annually at Lake Gore since 1979. Waterbird usage was surveyed annually during 1981-91, with an emphasis on shorebirds and ducks (e.g. Jaensch *et al.* 1988, Halse *et al.* 1990). Intensive study of the Hooded Plover at Lake Gore and elsewhere in the bioregion has been undertaken by Birds Australia. Murdoch University and the

University of Western Australia have undertaken research on classification and management of the Coobidge Creek wetlands. Also see items 21 and 26.

26. Current conservation education: (e.g. visitors centre, hides, information booklet, facilities for school visits etc.)

No facilities or materials are available at present. Since 1994, depth, salinity and other water quality parameters have been measured at Lake Gore every three months by the Esperance Senior High School as part of a "Ribbons of Blue" community-based water monitoring program. The Site is difficult to access without a 4-wheel-drive vehicle.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

Low level recreation occurs, mainly in Reserve 26885 and associated with the coastline (fishing, swimming). Also see items 21 and 26.

28. Jurisdiction: (territorial e.g. state/region and functional e.g. Dept of Agriculture/Dept. of Environment etc.)

Territorial: The State Government of Western Australia.

Functional: The National Parks and Nature Conservation Authority (vesting) and the Western Australian Department of Conservation & Land Management (management).

29. Management authority: (name and address of local body directly responsible for managing the wetland)

The Esperance District (based in Esperance) of the South Coast Region, Western Australian Department of Conservation & Land Management.

30. Bibliographical references: (scientific/technical only)

CALM 1991. South Coast Region, Regional Management Plan 1992-2002. Management Plan No. 24, Department of Conservation & Land Management, Perth, Western Australia.

Jaensch, R.P. and Watkins, D. 1999. Nomination of additional Ramsar wetlands in Western Australia. Unpublished technical report by Wetlands International – Oceania for the Department of Conservation & Land Management, Perth.

Lane, J., Jaensch, R. and Lynch, R. 1996. Western Australia. In, ANCA. A Directory of Important Wetlands in Australia. Second edition. Australian Nature Conservation Agency, Canberra.

Halse, S.A., Jaensch, R.P., Munro, D.R. and Pearson, G.B. 1990. Annual waterfowl counts in south-western Australia - 1988/89. Dept. of Conservation & Land Management Technical Report No. 25. 43 pp.

Halse, S.A., Pearson, G.B. and Patrick, S. 1993. Vegetation of depth-gauged wetlands in nature reserves in south-west Western Australia. Western Australian Department of Conservation & Land Management Technical Report 30.

Jaensch, R.P., Vervest, R.M. and Hewish, M.J. 1988. Waterbirds in nature reserves of south-western Australia: reserve accounts. Royal Australasian Ornithologists Union Report No. 30. 290 pp.

Newbey, B.J. 1996. Report on Hooded Plover project, June 1994 to March 1996. WA Bird Notes 79, Suppl.

Rose, P.M. and Scott, D.A. 1997. Waterfowl population estimates. Second edition. Wetlands International Publication 44, Wageningen, The Netherlands.

Singor, M. 1999. Hooded Plover Report No. 2, 1996-1999. WA Bird Notes 90, Suppl.

List of Attachments:

- Map of boundary of new Ramsar Site.

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