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.

FOR OFFICE USE ONLY.

1. Date this sheet was completed/updated:

DD MM YY

Designation date

Site Reference Number

August 2000

2. Country:

Australia

3. Name of wetland:

Muir-Byenup System

4. Geographical coordinates:

Latitude: 34° 26' S to 34° 33' S
Longitude: 116° 38' E to 116° 49' E

5. Elevation: (average and/or max. & min.) 170-180 m (Australian Height Datum)

6. Area: (in hectares) 10,631 ha (of which approximately 7000 ha is wetland)

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

The Site comprises a suite of partly inter-connected lakes and swamps of varied size (up to 4600 ha), salinity (saline to fresh), permanence (permanent to seasonal) and substrate (peat and inorganic), in an internally-draining catchment. The open lakes are used for moulting by thousands of Australian Shelduck *Tadorna tadornoides* and for drought refuge by tens of thousands of other ducks while the sedge/shrub-dominated swamps support an important population of Australasian Bittern *Botaurus poiciloptilus,* and threatened orchids. Vegetation communities of the Site's wet flats are among the few remaining in non-coastal parts of South-Western Australia and the Site has some of the largest natural sedgelands in Western Australia.

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

Where the type includes options, the relevant options are shown in bold:

O (permanent freshwater lakes).
R (**seasonal**/intermittent **saline**/brackish/alkaline **lakes** and flats).

Tp (permanent freshwater **marshes**/pools).
Ts (**seasonal**/intermittent freshwater **marshes**/pools on inorganic soil).
U (non-forested peatlands).
W (shrub-dominated wetlands).
Xf (freshwater, tree-dominated wetlands).

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

R, U, O, Ts, Tp, W, Xf.

9. Ramsar Criteria: (the applicable criteria; see point 12.)

2 (it supports vulnerable, endangered or critically endangered species or threatened ecological communities).
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: 4

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:

Roger Jaensch, Wetlands International - Oceania, GPO Box 636, Canberra ACT 2601, Australia, (Tel: +61-2-6250-0779; Fax: +61-2-6250-0799; email: roger.jaensch@ea.gov.au), on behalf of the Western Australian Department of Conservation & Land Management (CALM), in November 1998. Updated by CALM staff in August 2000. All inquiries should be directed to Jim Lane, Department of Conservation & Land Management, 14 Queen Street, Busselton WA 6280, Australia, (Tel: +61-8-9752-1677; Fax: +61-8-9752-1432; email: jiml@calm.wa.gov.au).

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

2. Three wetland-dependent orchids (see item 17) that are formally recognised as nationally vulnerable, and at least one other wetland plant species that may soon be so recognised, occur at the Site in appreciable numbers. These plants mainly occur on seasonally inundated areas or wetland margins, which have been extensively cleared for agriculture elsewhere in South-Western Australia.

4. The open lakes of the Site regularly support moulting by thousands of Australian Shelducks (see item 18); this is one of the most important moulting sites for shelducks in

South-Western Australia. Lake Muir is used as a drought refuge by tens of thousands of waterbirds (see criterion 5 and item 18).

5. Up to 51,000 waterbirds have been counted at the Site (at Lake Muir, when full: see item 18). 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, which in the context of wetland availability in Western Australia is considered sufficient evidence of regular use by 20,000 waterbirds.

6. At least five, possibly in the order of 10 Australasian Bitterns occur regularly and possibly breed in the sedge swamps of the Site, which constitutes more than 1% of the South-Western Australian population. The Site contains the core component of a wider suite of wetlands that constitutes one of the five remaining refuges for the South-Western Australian population of this globally threatened species (see item 18).

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

The Muir-Byenup System is primarily in the Shire of Manjimup and to a lesser extent the Shire of Cranbrook (local authorities) in the State of Western Australia (population ca. 1.9 million). Lake Muir is 55 km east-south-east of the town of Manjimup (population ca. 4300).

The Muir-Byenup System comprises the portion of Nature Reserve 31880 that is south of Muirs Highway. Named wetlands in the Site include Lake Muir, Byenup Lagoon, Tordit-Gurrup Lagoon, Poorginup Swamp, Neeranup Swamp, Coorimup Swamp and Wimbalup Swamp. Freehold land and gazetted road reserves enclosed by the Ramsar Site boundary are not part of the Ramsar Site. Parts of the western shoreline of Lake Muir are outside the Reserve and Ramsar Site (but see item 23).

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 deposits and peat (peat to 4 m thick) overlying granite and gneiss, in broadly undulating country. It includes a large lake (Lake Muir: 4600 ha), smaller lakes and swamps (notably Byenup Lagoon, Tordit-Gurrup Lagoon and Poorginup Swamp: each 140-690 ha), and inter-connected flats, all of which are natural wetlands.

Water is derived from a surface catchment that covers about 38,400 ha, mainly from minor seasonal streams up to about 5 km long. Some of the component wetlands, and a swamp that is outside the Site and is subject to peat mining, drain into Lake Muir. Substantial parts of the surface catchments of most of the component wetlands are cleared. Little is yet known on the interactions between the shallow and deep groundwater systems in the area and the interaction of these with the surface water systems (hence the potential for impacts on conservation values of the wetlands).

Lake Muir and most of the other component wetlands are terminal drainage basins. Lake Muir is seasonal, often dry in autumn: maximum depth recorded since 1978 is 1.3 m (November 1988) and the September mean is 0.78 m. Byenup Lagoon is permanent:

maximum depth recorded is 2.6 m (September 1991) and the September mean is 2.3 m. Some of the other component wetlands are permanent or near-permanent, though peaty Poorginup Swamp frequently shows little or no surface water, and the minor swamps and broad flats are inundated or waterlogged only in winter-spring.

Water quality, Lake Muir: salinity ranges from 96 parts per thousand (March 1982) to 0.6 ppt (November 1990) with a September mean of 10.1 ppt (n=12); water pH ranges from 6.2 to 9.7; and the water is colourless. Water quality, Byenup Lagoon: salinity ranges from 42 ppt (March 1988) to 1.4 ppt (November 1988) with a September mean of 3.2 ppt (n=15); and water pH varies from 7.4 to 9.3. Other component wetlands such as Tordit-Gurrup Lagoon and Poorginup Swamp are less saline, or fresh, some are more acidic and some have brown coloured water.

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

Median and mean annual rainfall at Rocky Gully (29 km east of Lake Muir) are 723 mm and 715 mm respectively, mostly falling in May-September. Annual evaporation is about 1300 mm.

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

The Site's wetlands possibly contribute to maintenance of groundwater in surrounding areas, but little is known on the interactions between the shallow and deep groundwater systems in the area and the interaction of these with the surface water systems.

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

Lake Muir supports a narrow zone of open-scrub, sedgeland and low shrubland at or near its margins. The dominant low shrubs are the samphires *Sarcocornia quinqueflora* and *Halosarcia lepidosperma*, the wetland scrub is dominated by the tall shrubs *Melaleuca halmaturorum* and *M. cuticularis* and there is some *M. rhaphiophylla* and *M. viminea*. Other wetland plants near the lake margins include *Lepidosperma effusum*, *Gahnia trifida*, *Schoenus submicrostachyus* and *Wilsonia backhousei*.

Most of the other component lakes and swamps support extensive sedgeland and fringing or scattered areas of low closed-forest or closed-scrub, while open-heathland over open-sedgeland occurs on the wet flats. Major areas of sedgeland are dominated by *Baumea articulata*; commonly associated species are *Baumea* spp. and *Triglochin hueglii*, and at Poorginup Swamp *Leptocarpus scariosus*, *B. vaginalis* and *Gahnia. trifida* also occur. The dominant wetland tree is *Melaleuca rhaphiophylla. Melaleuca lateritia, Astartea fascicularis* and *Agonis juniperina* occur in some wetlands. (Halse *et al*. 1993; Lane *et al.* 1996; N. Gibson pers. comm.).

Surrounding areas mainly support open-forest dominated by eucalypts, or are cleared.

Since the above description was prepared, the flora and vegetation units of Lake Muir Nature Reserve, and other nearby Nature Reserves, have been extensively surveyed and mapped. 649

indigenous flora taxa were recorded in the Reserve and it has been estimated (N. Gibson pers. comm.) that at least 600 taxa occur within the Ramsar Site. This is a rich flora for such a small area. The reasons for such diversity probably relate to complexes of soil types and hydrological patterns found over short distances. The complex of vegetation patterning is related to these patterns, particularly period of inundation and quality of groundwater, and also to fire history. Structural vegetation mapping showed a complex mosaic of almost 30 vegetation types within the Site (Gibson & Keighery 1999)

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

Three species of wetland-dependent orchids *Caladenia christineae* ms, *Caladenia harringtoniae* ms and *Diuris drummondii* that occur in appreciable numbers at the margins of Lake Muir and elsewhere in the Site (Halse *et al*. 1993; Lane *et al.* 1996, R.W. Hearn pers. comm.) are listed as "Species that are Vulnerable" (Threatened Species) under the Commonwealth of Australia's Environment Protection and Biodiversity Conservation Act 1999.

Other notable plants that occur in winter-wet swamps at the Site include several species that currently are poorly known and that soon may be declared rare at a State level: *Stylidium ripidium*, *Wurmbea sp.* Cranbrook, and *Caladenia starteorum* ms.

Vegetation communities of the wet flats are well represented at the Site and are among the few remaining in non-coastal parts of South-Western Australia. The Site has some of the largest natural sedgelands in Western Australia.

Since the above was prepared, the flora of Lake Muir Nature Reserve has been extensively surveyed and described (Gibson & Keighery 1999. See item 16 above). Among the 649 indigenous flora taxa they recorded on this Reserve were three species declared rare (threatened) under the Western Australian Wildlife Conservation Act (*Caladenia christineae* ms, *Caladenia harringtoniae* ms and *Diuris drummondii*) and 19 "priority taxa" (State supplementary listing of poorly known, or rare but not threatened, taxa). One of these, *Eryngium* sp. Lake Muir, appears to be an endemic taxon to winter-wet clay flats of the Lake Muir area, and currently is only known from the Ramsar Site. The two large populations of *Euphrasia scabra* are the only known extant populations for this taxon in Western Australia; it has been recommended for listing nationally as critically endangered, based on severe population declines in eastern Australia. During recent surveys of the *Euphrasia scabra* populations a new population of the orchid *Caladenia lodgeana* was found. This species was previously known only from a few restricted populations in the Augusta area, some 150 km to the west (N. Gibson pers. comm.).

The shrublands and forests surrounding Lake Muir contain the only known populations of *Lilaeopsis polyantha* in WA. The aquatic sedge *Schoenus natans* has recently been de-listed as Declared Rare Flora based on the large population of this taxon in the Ramsar Site and several nearby Nature Reserves; it was previously believed to be restricted to the Swan Coastal Plain. *Tribonanthes* sp. Lake Muir, which appears to be a previously unrecognised taxon, also appears to be endemic to winter-wet clay flats of the Ramsar Site and other nearby Nature Reserves.

Of the above-mentioned plants, only *Eryngium* sp. Lake Muir is endemic (based on current knowledge) to the Muir-Byenup Ramsar Site.

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

Lake Muir is regularly used in spring for moulting by thousands of Australian Shelduck. Moulting also occurs on the smaller open lakes, an exceptional concentration of 12,000 shelduck being recorded at Tordit-Gurrup Lagoon in December 1982. Muir-Byenup System is one of the most important moulting sites for shelduck in South-Western Australia.

The same lakes are also used as drought refuges by large numbers of waterbirds. The highest number of waterbirds counted at Lake Muir was 51,600 in March 1989, an unusually high total following a wet winter in the surrounding district but, together with depth data, indicative of occurrence by more than 20,000 waterbirds from time to time.

The Australasian Bittern has been recorded in four of the component sedge-dominated wetlands and probably also occurs elsewhere in the Site. The Site possibly supports in the order of ten pairs of Australasian Bittern and behaviour suggests that some pairs breed there. This number constitutes more than 1% of the South-Western Australian population: the 1% level is 3 birds (Rose & Scott 1997). The Site contains the core component of a wider suite of wetlands that constitutes one of the five remaining refuges for the South-Western Australian population of this globally threatened (Collar *et al.* 1994) species. The Australasian Bittern is specially protected under State legislation as a species that is “rare or likely to become extinct”.

Other information on waterbirds: Surveys have recorded 23 waterbird species at Lake Muir and 41 at Byenup Lagoon: most are non-migrants. The most abundant species at Lake Muir are Pacific Black Duck *Anas superciliosa* (up to 18,450), Grey Teal *Anas gracilis* (16,000) and Eurasian Coot *Fulica atra* (9630) (all counts in March 1989). Lake Muir is a migration stop-over site for small numbers of shorebirds, notably Red-necked Stint *Calidris ruficollis* (up to 517 in November 1985). A breeding colony of up to 40 pairs of Silver Gull *Larus novaehollandiae* occurs on rock outcrops in Lake Muir; up to 700 birds have been counted. Little Bittern *Ixobrychus minutus* and Spotless Crake *Porzana tabuensis* are among the several waterbirds recorded breeding in the sedge-dominated wetlands.

Other noteworthy fauna: fishes. Recent surveys (Storey 1998) of 27 wetlands (including eight in the Muir-Byenup Ramsar Site) in the adjoining catchments of Lake Muir and Lake Unicup have revealed a total of seven fish species, with six being endemic to South-Western Australia and one introduced. Of the 27 wetlands surveyed, Poorginup Swamp had the greatest number (five) of native species. Mulgarnup Swamp, also within the Site, had four native species. The two least-frequently encountered native species, *Galaxiella nigrostriata* and *G. munda*, were found only at Poorginup Swamp and one other wetland outside the Site. All seven fish species occurred within the Ramsar Site; no species was restricted to it.

Other noteworthy fauna: invertebrates. A survey of macroinvertebrates by DeHaan (1987) revealed 97 invertebrate taxa in the suite comprising Tordit-Gurrup Lagoon, Byenup Lagoon and Poorginup Swamp. These included 11 water mites Hydracarina, six of which (found at Poorginup Swamp) have restricted distributions (e.g. *Pseudohydryphantes doegi*, *Acercella poorginup*) and are of considerable zoogeographic interest. One species, *Huitfeldtia* sp. nov., is the second known species in its genus; the other species occurs in northern Europe and Canada. The crustaceans *Cherax preissii* and *C. quinquecarinatus* occur at the site.

More recently, Storey (1998) has surveyed the macroinvertebate communities of 27 wetlands (including eight in the Muir-Byenup Ramsar Site) in the adjoining catchments of Lakes Muir and Unicup. A total of 219 taxa was recorded; with 32 endemic to South-Western Australia. Poorginup Swamp had the greatest number (16) of South-Western Australian endemics. Two new species of dytiscid water beetle *Sternopriscus* sp. nov. and *Antiporus pennifoldae* (*Antiporus* Sp. 1 of Storey,

1998) were recorded, the former was widespread in the catchments, the latter from Poorginup and another location. Storey also recorded a possible new species of ceinid amphipod *Austrochiltonia* sp.

Another new species of dytiscid *Antiporus mcraeae* has recently been found (Watts and Pinder in press) in the Muir-Unicup area (Kodjinup Swamp, outside the Site) during a biological survey funded under the State Salinity Action Plan.

Preliminary identification of microinvertebrates collected during Storey's (1998) survey has revealed a rich and diverse fauna. At least 78 species of ostracods and copepods were recorded. Of these, six ostracods and one cyclopoid copepod are to date only known from the Muir-Unicup area, with two of the ostracods and the cyclopoid being found within the Site (S. Halse pers. comm.). Within the Rotifera there were 11 new records for Western Australia, one new record for Australia and one new species, yet to be described. Within the Cladocera there were two new species and the second record of new, undescribed genus. It is considered likely that much-needed taxonomic revision will reveal that the Muir-Unicup collection contains other new cladoceran taxa. South-Western Australia has been shown to have more endemic species and genera of cladocerans than any other region of Australia (R. Shiel pers. comm.)

Unless otherwise indicated, data above are from Jaensch & Vervest 1988, Jaensch *et al.* 1988, Halse *et al.* 1990, Lane *et al*. 1996, R. Hearn pers. comm. 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.)

No information.

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

(a). The Ramsar Site is the portion of A-Class Nature Reserve 31880 that is south of Muirs Highway. This reserve is vested in the National Parks and Nature Conservation Authority (appointed by the Government of Western Australia) for the purposes of "Conservation of Flora and Fauna" and "Water".

(b). Surrounding areas include freehold (privately owned) land, Nature Reserve, special leases for mining, and State Forest. An area of freehold land is enclosed within, but is not part of, the Ramsar Site (see map).

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

(a). There is no land use other than nature conservation within the Ramsar Site. There are no facilities for nature-based recreation and this type of recreation is limited within the Ramsar Site.

(b). Freehold land enclosed by and adjoining the Ramsar Site is used for agriculture, notably grazing of domestic sheep and cattle and tree plantations. The special leases are for extraction of peat. They expire in 2003 and 2004 though mining may finish earlier than this. Timber is

extracted from the State Forests. The most important land uses in the catchment are agriculture and forestry (plantations and native forest). Human population in the Site's surface catchment is in the order of about 20, with a further 8 absentee owners.

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). Recently pigs *Sus scrofa* were unlawfully released on the Site. They are causing considerable damage to vegetation and soil. Determined efforts are being made to reduce feral pig numbers by trapping, shooting and poisoning but eradication may be impossible without new technology. Also, exotic plants such as *Typha orientalis* are appearing in some of the wetlands. Some unlawful disturbance of dry lake bed by motor vehicles occurs at Lake Muir.

Potentially important factors include: eutrophication (algal blooms caused by agricultural fertilisers); salinisation (particularly smaller wetlands adjacent to cleared land), too frequent and/or inappropriate fires (destruction of peat and retardation of regeneration of wetland shrub thickets, especially those used by breeding waterbirds), and drainage works.

These and other present and potential disturbances and threats have been described in CALM (1998), Storey (1998) and Gibson & Keighery (1999).

(b). Factors operating in the Site's catchments which potentially may affect the Site's ecological character include salinisation, past catchment drainage and future drainage proposals, and too frequent and/or inappropriate fires. See also CALM (1998), Storey (1998), Gibson & Keighery (1999).

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)

The Nature Reserve was established in 1973. In the past, proposed commercial extraction of peat from Tordit-Gurrup Lagoon was opposed by the Western Australian Department of Conservation & Land Management and others and was not approved. The entire Site is included on the Register of the National Estate.

Under the Salinity Action Plan for WA, Lake Muir and associated wetlands have been designated as a "Key Wetlands and Natural Diversity Catchment". Cooperative management of the catchment, with substantial community participation, is occurring. Besides commercial tree crops (both hardwood and softwood), non commercial plantings of recharge and discharge areas has been undertaken as joint operations between the Western Australian Department of Conservation & Land Management and landowners on private lands to improve water quality impacting downstream on wetlands. Stream flow and water quality monitoring is in place in several locations.

A Draft Management Plan for the Reserve (and nearby Perup and Unicup Reserves) was released for public comment late in 1998.

Large parts of the shoreline of Lake Muir and Byenup Lagoon have no protected area buffer zones whereas other wetlands within the Ramsar Site have protected buffers more than 100 m wide.

An area of lake and shoreline (Nelson Location 2198) on the south-western side of Lake Muir has recently been purchased by the Department of Conservation & Land Management and is proposed for addition to the Lake Muir Nature Reserve.

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

Measures proposed under the Salinity Action Plan include further planting of trees (including commercial plantations) on freehold land as a strategy to reduce dryland salinity in the Lake Muir catchment. Proposals to divert high salt water flows away from freshwater systems at critical times are being investigated. A Recovery Catchment Management Plan is being prepared.

There is potential to extend the Ramsar Site in the future, following consultation with land managers, to include Nature Reserves and possibly other government land (e.g. some Water & Rivers Commission land) to the north of Muirs Highway. The area of lake and shoreline on the south-western side of Lake Muir that has recently been purchased and is proposed for addition to the Nature Reserve (see item 23) could also potentially be added to the Site in the future.

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

Depth, salinity and other water quality parameters of Lake Muir, Byenup Lagoon, Tordit-Gurrup Lagoon and Poorginup Swamp have been measured by the Department of Conservation & Land Management at least twice each year since the late 1970s.

Waterbird usage was surveyed annually during 1981-91, with an emphasis on bitterns and ducks (Jaensch *et al.* 1988, Jaensch and Vervest 1988, Halse *et al.* 1990).

Intensive surveys of flora and fauna within the Site have recently been conducted with funding from Environment Australia Biodiversity Group (Natural Heritage Trust) and the State Government (Salinity Action Plan). Reports on the Site's fish, aquatic macroinvertebrates, physico-chemistry, flora and vegetation have been prepared (Storey 1998 and Gibson & Keighery 1999).

During the past three years, vegetation monitoring plots and/or transects have been established at Tordit-Gurrup, Mulgarnup, Byenup, North Byenup and Geordinup Lagoons, Poorginup Swamp, Lake Muir and two other locations within the Ramsar Site (Gibson & Keighery 1999; J. Lane pers. comm.).

Magnetic and radiometric survey data have been collected to improve knowledge of the geology of the area. Hydrogeological and limnological surveys, analysis and mapping will follow with a view to improving knowledge of groundwater and surface water systems. "Salt mapping" will allow synthesis into a model to facilitate planning of future management of the area, particularly (high water use) tree and agricultural crops on adjoining lands, to maintain conservation values of the wetland system.

The Ramsar Site is of interest for scientific research of past climatic regimes (peat record).

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

No facilities or materials are available at present. Construction of an information bay and interpretive facility at the northern end of Lake Muir is proposed for completion during 2001. An informative brochure will be prepared. The area is likely to become a target of education through the Perup Ecology Centre, located in the adjacent Perup Nature Reserve.

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

There is low level, irregular use for birdwatching from the few public access points, e.g. Muirs Highway adjacent to Lake Muir . 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 Manjimup District (based in Manjimup) of the Southern Forests Region, Western Australian Department of Conservation & Land Management.

30. Bibliographical references: (scientific/technical only)

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Watts, C.H.S and Pinder, A. (in press). Two new species of *Antiporus* from Western Australia (Coleoptera; Dytiscidae). Records of the South Australian Museum.

List of Attachments:

- Map of boundary of new Ramsar Site.

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Please return to:

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