



Friends of Mound Springs

ISSUE 3, APRIL 2007

ABN 965 837 602 66

DATES OF INTEREST:

- **FOMS Tour of SA Springs 24-30 June 2007**
- **Oodnadatta Races , SA 5-6 May 2007**
- **Finke Desert Bike Race , NT 10-11 June 2007**
- **Next GABCC meeting Roxby Downs, SA 11 July 2007**
- **Marree Camel Cup , SA 7 July 2007**
- **Alice Springs Camel Cup , NT 14 July 2007**
- **SA Arid Lands NRM Board Meeting Marla/ Oodnadatta SA 17-18 July 2007**
- **Next FOMS meeting anticipated for July/August in Adelaide. Details will be advised closer to the time.**

President's Message

In our second Newsletter issued in December last year I suggested that 2007 would be an interesting and productive year for FOMS and thus far there is every indication that will indeed be the case. Details elsewhere in this Newsletter indicate a wide range of activities and issues associated with the springs and there will be FOMS interest or involvement with many of them.

The most recent general meeting of FOMS was held at DEH Keswick on 29 March 2007 and those who were not able to attend, but have since received the minutes, will have seen that those present covered a lot of ground. It is not my intention to re-work that ground, but some highlights do merit a special mention.

In particular, I am delighted to confirm that Dr Barbara Hardy AO has agreed to be Patron of FOMS. Barbara is a scientist with a most distinguished career, marked by an outstanding commitment to better management of the environment. She has worked tirelessly for a great many environmental and conservation causes over decades and has always led by personal example. Her interest and involvement with mound springs can be traced back almost thirty years and in a forthcoming newsletter we will profile in more detail the story of this remarkable person: welcome Barbara!

It is also most pleasing to note that around \$7.5m from the National Water Initiative will be available over four years for mound springs research and investigations in the Far North of South Australia. Matched with an equivalent in-kind State contribution, this funding will enable considerable progress to be made with detailed spatial documentation of the springs, spring hydrology and land use and land management issues associated with the springs.

FOMS members have by now been contacted separately in relation to the introductory field trip that will be held from Sunday 24-Saturday 30 June 2007 inclusive. Planning is underway for the trip and for those able to participate it promises to be a most interesting week. One of the sites to be looked at will be Strangways Springs near William Creek and it is pleasing to report that more interpretative signage is about to be installed at the old Overland Telegraph Repeater Station at the Springs. The signage will be in place for the forthcoming cattle drive along the Oodnadatta Track and follows the complete replacement of earlier signage in mid 2006.

I look forward to joining with a number of you on the forthcoming field trip!

Best wishes

Colin Harris

President, Friends of Mound Springs



Source:http://www.amonlin.net.au/up_close/2006.cfm

Report of FOMS meeting

On 29 March 2007 a FOMS meeting took place in Adelaide. As well as welcoming new members, various presentations and discussions occurred. Travis Gotch, GAB Springs Project Officer for the SA Arid Lands NRM Board, talked about the success of the NWI funding application to improve knowledge of GAB springs hydrology (see press release below). He was also able to describe some of his recent mapping work at Strangway Springs and Francis Swamp where many more springs were found than expected. Simon Lewis gave a presentation of the DEH monitoring program over the last 20 years, some of which is detailed later in the newsletter. Discussions also concerned the forthcoming FOMS trip from Sunday 24 June to Saturday 30 June 2007. It is expected that the trip will focus on springs (a) near Hermit Hill; (b) in Wabma Kadarbu MS Conservation Park; (c) Strangways; (d) Peak repeater station and (e) east of the Peak & Dennison Range. FOMS has established a sub-committee to develop a detailed itinerary and this will be emailed out to FOMS members and associates as soon as possible.

Press release !

On 2/2/2007 it was announced that the Federal government, through the Raising National Water Standards program will provide over \$7 million out of a total \$14 million to fund a project to improve the understanding of surface and groundwater interactions and mound spring characteristics in the GAB in SA and NT. The project will investigate groundwater recharge along the GAB's western margin, map the springs and help determine the water requirements of the springs.

It also agreed to provide \$876,000 out of \$1,046,000 to enable improved groundwater management of the intake beds of the GAB in NSW. This project will help achieve GABSI outcomes of providing continuous access to artesian water and opportunities to improve management of water dependent ecosystems, in particular, protection of springs and water remote ecosystems.

Arid South Australia really is like Mars..

Since the late 1990's scientists have been looking closely at the Simpson Desert and using it to create models for water behaviour on Mars. When it was first revealed that large portions of Mars' surface contained channel like features, researchers started to speculate on the occurrence of surface water flows. Paleoflood hydrology uses ancient flood deposits to define the geological flood record, by using dating techniques to determine the age of flood deposits. Deposits of the same age along the river profile are correlated, which enables estimation of the gradient of the flood surface, and subsequently a calculation of the volume of the flood discharge. Using these techniques, paleoflood forms of the unconfined channel reaches of the Todd and Hale Rivers, terminating in floodouts within the longitudinal

dunes of the Simpson Desert, have been used as the basis for generating models designed to improve understanding of the flood processes, forms and deposits of the unconfined river systems that occupy the hypothesized flood terrain on Mars. For more information see papers by M Bourke & J Zimelman at <http://www.lpi.usra.edu/publications>.

Moreover in September 2004 the Mars Society Australia organized an expedition to the Arkaroola region in South Australia, using it as an analog location to develop strategies and technologies to assist in a successful "Human to Mars" mission. Amongst the research projects to be carried out was a study of the hydrology of the mound springs along the eastern margin of Lake Frome. Some of the expedition research papers are available at <http://chapters.marssociety/canada/expedition-mars.org/ExpeditionTwo>, and more information about the group is available from Dr Jonathan Clarke of the Mars Society Australia at <http://www.marssociety.org.au/>.

Editorial Note: Travis Gotch was the uncredited photographer of 2 of the photographic images used in the last newsletter which were derived from the presentation by A Love at the Alice Springs IAH seminar in 2006.

Source: http://www.nasa.gov/mission_pages/mars/overview/index.html

Mars Exploration Rover Spirit panorama near "Husband Hill."



Contributions to the newsletter are always welcome and may be emailed to the Publicity Officer (details on back page).

Introduction to a spring or two...

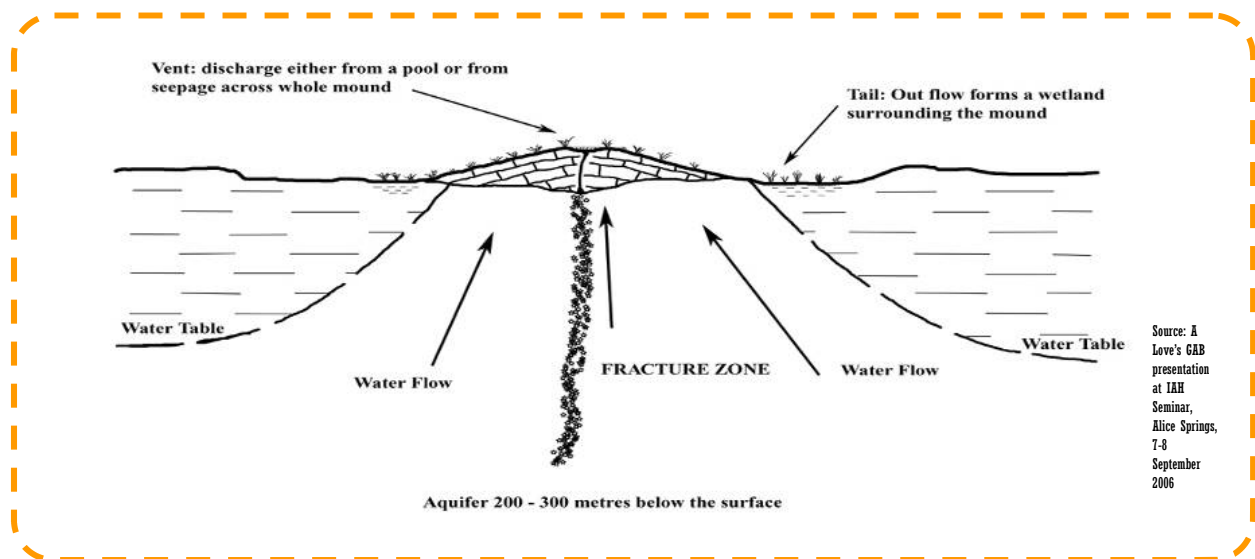
Old Nilpinna

Old Nilpinna spring comprises three main vents, of which two have been included within a fenced area of approximately 5ha. Fencing was completed in 1992. The fenced area includes the remains of the Old Nilpinna homestead. The introduced bamboo, *Arundo donax*, is predominant at the outlet of the main vent (vent 1), grading into *Phragmites* which in turn grades into *Cyperus gymnocaulos* and *C laevigatus*. Following fencing, there has been a slight progression of the bamboo down the tail, and a very pronounced increase and progression in *Phragmites*, to take over from much of the *C gymnocaulos* further down the tail. The extent of *Phragmites* appears to have stabilised since about 1996. *Typha* is not recorded within the fenced area but occurs at the third (unfenced) vent west of the fenced area. There is a suggestion that this outlet originated as a bore sunk during petroleum exploration, but no records have been located to confirm this. Three fish species have been recorded at Old Nilpinna. Mature date palms (*Phoenix dactylifera*) are present at the head of vent 1 (i.e., adjacent to the former homestead)

Big Cadna-owie

Big Cadna-owie comprises a single vent with a reasonable flow, set in a travertine mound and flowing down a well-defined channel to support a lower wetland area approximately two hectares in size. Only a small area (0.2ha) was fenced in the late 1980s as the lessees at the time were keen to maintain stock access to the remainder. Prior to fencing, the spring vent area contained patches of open water, extensive *Cyperus laevigatus*, and localised patches of *Phragmites*. It was also recorded as containing a hydrobiid species (freshwater snail), thought to be a local variant of the widespread *Fonscochlea zeidlereri*. Following fencing, there was rapid colonisation of the fenced area by *Phragmites*, to the extent that it now completely dominates the fenced wetland area, with growth up to 4m tall. The effect of this upon the hydrobiid is not completely clear but the species has not been noted at this site in recent years. Three species not recorded by SEA in the early 1980s, *Acacia salicina*, *Bolboschoenus caldwellii* and *Sporobolus virginicus*, have also been recorded since the late 1990s. The unfenced wetland area has waxed and waned over the years (in terms of vegetation biomass and condition) reflecting variations in cattle pressure. The unfenced wetland is of interest because of its high degree of species richness. Fencing of the bulk of the wetland while retaining some stock access to water has been discussed with the current lessee.

Simon Lewis & Colin Harris



The Flow of Water to Mound Springs

The flow of water to springs cannot be seen. Because it occurs underground, within the rock and the soil, it can only be inferred. The easiest way to notice this flow is when water is seen discharging from a vent at the earth's surface. However this visible flow of water at the surface does not account for all of the water flowing to a spring in the subsurface.

Boggy or moist ground also indicates the presence of a flow of water to a spring, and evapotranspiration also needs to be taken into account. Water can evaporate from the uppermost couple of metres below the ground, and plants can transpire water from depths even greater than this. Evapotranspiration at the spring can sometimes account for all of the flow of water to the spring, and can be sustaining significant ecological or cultural values. In other words, water is flowing to the spring, but discharging to the atmosphere as water vapour, not as a visible flow of water.

Many springs have a noticeable discharge of water flowing from the spring during winter months, when evapotranspiration is low, but this flow ceases during summer, when all the water is taken up by evapotranspiration. Variations in atmospheric pressure can also result in changes to spring discharges. Similarly, changes in artesian pressure or subartesian groundwater levels in the vicinity of a spring can also change the flow of water to that spring. Spring flow depends on a pressure gradient existing between the aquifer and the atmosphere. By lowering the pressure in the aquifer, or increasing the atmospheric pressure, flow to the spring decreases and can cease. Many springs have not been seen to flow for many years, principally because of drops in aquifer pressure resulting from water extraction from bores.

Taken from explanatory notes to the new Qld GAB Water Plan by Micheal Jamieson, Senior Policy Officer, Groundwater at the Qld Dept of Natural Resources, Mines & Water.

GAB SPRINGS PROTECTION AND MONITORING PROGRAM, 1984 – 2005 – LESSONS LEARNT AND FUTURE DIRECTIONS

Extracts from Paper prepared for GAB Springs Researchers Forum, February 2006, Adelaide by Colin Harris and Simon Lewis



Source: Travis Gotch, SAALNRMB The Little Bubbler

In 1984, the then SA Department of Environment and Planning commenced a comprehensive review of the significance of the 4000 plus GAB vents and springs in SA covering Aboriginal heritage, European heritage and biodiversity features. This culminated in the production of the 1986 report, "Heritage of the mound springs". Based upon this work, the Department identified ten springs as a priority for fencing and protection. Using a mixture of State, Commonwealth and industry funding, the GAB springs at Blanche Cup, The Bubbler, Strangways, Big Perry, The Fountain, Twelve Mile, Outside, Tarlton, Old Nilpinna and Big Cadna-Owie were fenced during the period 1985 to 1988.

At the time of this fencing, the Department of Environment and Planning commenced a monitoring program to assess the effects of the stock exclusion etc. The monitoring also included an unfenced spring, Little Bubbler, near The Bubbler and Blanche Cup to provide information on the condition of a spring still accessible to stock and other introduced animals.

In the early to mid 1990s, pastoralists S Kidman and Co offered to relinquish a portion of the Stuart Creek pastoral lease – areas including and surrounding Blanche Cup and the Bubbler – to be included in the national parks system. These negotiations succeeded and Wabma Kadarbu Mound Springs Conservation Parks was established in 1995. This included Coward

Springs, Little Bubbler and other springs within the immediate environs of Blanche Cup and The Bubbler. In the late 1990s, the new lessees of Stuart Creek, Western Mining Corporation, offered to relinquish a much larger area surrounding Wabma Kadarbu, to protect many other springs including Jersey, Elizabeth, Horse, Buttercup and Mount Hamilton springs. These negotiations were also fruitful and the expanded Wabma Kadarbu GAB springs Conservation Park was proclaimed in 2001.

The springs listed above have been monitored annually since their fencing. Coward Springs was included for monitoring with the initial dedication of the Wabma Kadarbu Mound Springs Conservation Park. At the time of the initial fencing program in the 1980s, the Department engaged Dr Tim Fatchen to design a monitoring program. At that time it was envisaged that pastoral lessees and possibly others resident in the region could be engaged in assisting with monitoring. The focus of monitoring has therefore been the following: photopoints; recording of plant species present; some measurements of pool diameter and extent of fringing vegetation; and some transects to show distribution of dominant plant species from vent to wetland.

The GAB springs fencing program and the resultant exclusion of stock and other animals has led to a substantial increase in the biomass and, in some instances, area of wetland vegetation as well as associated dryland vegetation. In some cases a relatively stable situation appears to have developed (e.g., Blanche Cup, Bubbler, Little Bubbler and, to some extent, Old Nilpinna). In other cases there has been a proliferation of reeds, *Phragmites* and/or *Typha*, which appear to have stabilised in terms of cover (sometimes because they now comprise 100% of wetland cover) but which now wax and wane in terms of condition and biomass (e.g., Big Perry, Fountain, Outside, Big Cadna-owie). At two other springs (Twelve Mile and Coward Springs) the spread of *Phragmites* is continuing. At Tarlton there has been a proliferation of *Typha* through the 1990s, followed by a decline in spring flow and death of *Typha* – with the most recent observations, in 2004, suggesting that the springs may be about to dry up completely. At the fenced spring at Strangways, there has been a steady decline in pool vegetation and apparently spring flow at the fenced spring during the last five years. The proliferation of *Phragmites* and/or *Typha* has created concerns including: the loss of open pools and the reduction in plant diversity, potentially adverse effects on aquatic fauna, particularly the significant hydrobiids (freshwater snails), and the potential for the dense growth to reduce spring flows through increased evapotranspiration and possibly through plugging of the spring vent. Reflecting these concerns, active manipulation of the reeds, on a carefully monitored trial basis, is recommended at selected springs. This work will need to link with burning trials elsewhere (e.g., on Finnis Springs).

Further information and the full paper are available from Colin Harris and Simon Lewis.



Feb 16, 2007 — Floods in the Cooper & Diamantina

which feed into Lake Eyre...sometimes

A fresh round of rain over Australia's Channel Country brought a resurgence of floods, reported the Australian Broadcasting Corporation (ABC) on February 10, 2007. Heavy rains filled the creeks and channels of southwestern Queensland and northeastern South Australia at the end of January, but those floods had started to recede when another storm brought additional moisture on February 9 and 10. The new floods cut off the town of Birdsville near the Queensland-South Australia border for the second time in 2007, reported ABC News.

The mud-laden flood water colored the landscape a brilliant blue on February 12, when the MODIS on NASA's Terra satellite captured this image. This type of image, made with both visible and infrared light, typically displays water as dark blue or black. In this case, the water contains light-scattering dirt, which gives it the turquoise color seen here. The barren desert landscape is tan and pink, while vegetation is green.

Source: <http://modis.gsfc.nasa.gov/gallery/>

A Traditional Story of Big Cadna-owie *Kadnjawi*

Big Cadna-owie Spring was an important traditional camping site until 1919 when the entire group of traditional people living there was killed by an influenza epidemic brought by a passing camel-driver. Cadna-owie or *Kadnjawi* is also the name given to Mt Dutton and means hill-water or hill with springs. Big Cadna-owie, and four other springs in the vicinity of Mt Dutton including the Wandillina Springs are all connected with the story of the *ngampa* or nardoo stone. A *ngampa* stone is a large stone on which nardoo and other large seeds are broken up with a hammer stone. The outline of the story is that the Aranda ancestor *Indarra* could hear the beautiful ringing sound of the *ngampa* far far away to the south. It drew him towards the lower Finke, and then to the northern tip of the Alkaowra flood flats before he tracked the sound all the way to Mt Dutton. He camped first at the *Ngampayiwalanha* spring and asked the *Kadnjawi* people for the stone. They tried to fob him off with a broken stone and then inferior ones. He moved onto other springs and repeated his request. Finally they had to give him their favourite *ngampa* stone. Big Cadna-owie was one of the places where *Indarra* camped and the main camp of the *Kadnjawi* people was nearby.



Source: <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/1301.0Feature>



Nardoo Source: http://www.farrer.csu.edu.au/ASGAP/APOL18/jun00_1.html

Between the ruins of Wandillina homestead and the main Marree-Oodnadatta road there are three springs almost in a straight line to the north-east. In the far distance, almost in a straight line and visible from far away is Mt Arthur. As soon as *Indarra* got the *ngampa* stone, he said he was going back, and that now it was indeed he who would beat seed with the stone. He put the stone on his head and without looking back he set off towards home via Mt Arthur or *Pakalta*. He stayed there for a while, put down the stone and just looked at it and admired it. Mt Arthur represents the stone. The *Kadnjawi* song cycle, much of which is in Aranda, goes with this story.

This story was taken from SA Dept of Environment & Planning (1986) *Heritage of the Mound Springs: The assessment of Aboriginal Cultural Significance of Mound Springs in South Australia* prepared by Dr Luise Hercus & Dr Peter Sutton.

PUBLIC ACCESS TO SA MOUND SPRINGS

Given their location in the Far North of the State, most of South Australia's mound springs occur on land held under *pastoral lease* tenure. Others, amongst them some of the most significant of the springs, are protected within *national parks and reserves*, and some others occur immediately adjacent to *public roads* or at the termination of *public access routes*. Conditions attached to public access vary with all of these locations and a brief summary is provided below.

In the interests of establishing and maintaining good working relationships with all land managers in the region it is very important that FOMS members understand the conditions and abide by them if they are planning trips to the springs country.

Pastoral lease tenure

Most of the country where mound springs occur is held under pastoral lease, one of the oldest forms of land tenure in the State. Pastoral leases are used (with insignificant exceptions) in outback South Australia where the country is unsuitable for conventional farming. Pastoralism in the region is characterised by the depasturing of livestock (sheep to the south and cattle to the north of the Dog Fence) on the original dryland native vegetation.

Subject to quite strict land management conditions, (administered by a *Pastoral Board* set up under the *Pastoral Land Management and Conservation Act*, 1989) pastoralists have a right to use the land for pastoral purposes and to help them with their management, there are some important controls placed on public access to the land. Unless the traveller is travelling on a public road or public access route (see below) the permission of the relevant lessee is needed (the only exception to this is for bushwalkers on foot and for safety reasons this is uncommon and not generally recommended in the Far North in any case). If permission is given, overnight camping is not allowed within 500m of a stock watering point, nor is it allowed within one kilometre of any homestead or building. Pastoralists may refuse permission for a variety of reasons (including land rehabilitation and stock movements), but in such an event there is a right of appeal to the Minister responsible for administration of the pastoral legislation.

At this stage FOMS has not negotiated any special arrangements with pastoral lessees and all FOMS members wanting to access springs need to be aware of these access conditions and abide by them. If the name of the pastoral property and contact details are not known to intending travellers they should contact the Pastoral Branch of the Department of Water, Land & Biodiversity Conservation (DWLBC) on (08) 8303 9751. The South Australian Association of Four Wheel Drive Clubs website, <http://www.saafwdc.asn.au> also has some useful information, including a pro-forma sheet (which may be down-loaded) for seeking lessee approval. Quite apart from the legal requirements outlined above, there are many points of protocol, safety and commonsense which need to be taken into account when accessing pastoral country and these will be the subject of an article in a future FOMS Newsletter.

National Parks and Reserves

To date, two conservation areas have been established to protect mound springs under the provisions of the *National Parks & Wildlife Act*, 1972, *Witjira National Park* and *Wabma Kadarbu Mound Springs Conservation Park*. Wabma Kadarbu (12 050 ha) is the more southerly of the two, and was initially established to protect the well known and heavily visited Blanche Cup and Bubbler mound springs. It straddles the Marree-Oodnadatta public road between Marree and William Creek and has a formed road to the main springs. Witjira (771 109 ha) abuts the SA/Northern Territory border north east of Oodnadatta and was established to protect the highly significant Dalhousie Springs and associated tableland and Finke River flood-out country. It is usually accessed via the Oodnadatta-Hamilton Homestead public road and the Hamilton Homestead-Pedirka-Witjira public access route. Although generally open to public access there are park-specific conditions that apply to all visitors and a Desert Parks Pass is required for both reserves (contact 1800 816 078 or [08] 8648 5300 for details). In addition to the above, the Department for Environment and Heritage has fenced a number of significant springs to provide protection from livestock, but these remain under pastoral tenure and any visits require approval as outlined for pastoral tenure generally.

Public Roads

Public roads in outback South Australia are maintained by Transport SA, but most are not surveyed and fenced in the same formal way as roads in the more settled southern parts of the State. In terms of providing access to mound springs, the most important is the Marree-Oodnadatta track and its northern extension to Hamilton Station where it links with the public access route to Witjira National Park. In the vicinity of Coward Springs, especially, some mound springs (both active and extinct) are immediately adjacent to the road or within safe walking distance of it. Overnight camping is permitted along public roads, subject to the provisions relating to pastoral leases outlined above. The Marree-Oodnadatta track is constructed and maintained to a standard suitable for conventional (non 4WD) vehicles, but actual conditions can vary greatly. With this, and the general remoteness of the region in mind, most travellers use 4WD vehicles. As for all unsealed outback roads, rain can very quickly make the track impassable, even after only moderate falls, and road closures applied in such situations are strictly enforced. Information on outback road conditions and any closures in force can be obtained by calling 1300 361 033.

Public Access Routes

Public access routes (PARs) are established under the provisions of the *Pastoral Land Management and Conservation Act*, 1989 and provide public access to points of interest that are not serviced by the public roads network. As mentioned above, Witjira National Park is linked by a PAR (43 km in length) to the public road network at Hamilton Station north of Oodnadatta. Further south, a 16 km PAR provides access from the Oodnadatta track to Freeling Springs and the associated Peake Overland Telegraph heritage site, while a 2.5 km PAR provides access from the Oodnadatta track to the Strangways Springs mound springs and associated Overland Telegraph Repeater Station heritage site. Although not directly associated with mound springs, a short (1.0 km) PAR provides access from the Oodnadatta track to the heritage-listed Curdimurka Railway Siding on the old narrow-gauge Ghan railway line. Public access routes are not constructed and maintained to the same standard as public roads: of those mentioned above, the PARs to Witjira and the Peake Overland Telegraph heritage site require high clearance 4WDs, whilst those to Strangways and Curdimurka are suitable for lower clearance 4WDs and/or conventional vehicles.

Camping is permitted adjacent to some PARs, but not others. Intending travellers should refer to an *Outback South Australia* map produced jointly and updated regularly by the *Outback Areas Community Development Trust* and the *Flinders Ranges and Outback South Australia* tourism body. In addition to PAR information, the map includes UHF radio repeater station coverage: it is available from the producing bodies mentioned and information centres serving the outback.

Colin Harris

Friends of Mound Springs

If you wish to become a member, please send \$10 together with your name, phone number, postal and email addresses to Tony Latz, Treasurer of FOMS, 10 Waratah Way, Stonyfell SA 5066. Membership runs with the financial year.

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