Friends of Mound Springs

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DATES OF INTEREST:

- Next FOMS Meeting early March 2007. Final Date, Venue & Time to be advised.
- Friends of Parks Group Forum 3-5 August 2007, Port Lincoln SA.
- GAB Consultative Committee Next Meeting scheduled for March or April 2007 at Roxby Downs, SA.
- Cooper Pedy Opal festival 7 April 2007

Source: A Love's GAB presentation at IAH Seminar, Alice Springs, 7-8 September 2006

Presidents Message

Following the inaugural Meeting of the Friends of Mound Springs (FOMS) on 29 June this year the group has since been established as a formal entity under the DEH Friends of Parks network. I am particularly grateful for the efforts of Simon Lewis and Tony Latz, Secretary and Treasurer respectively, in shouldering the burden of this work.

A second meeting was held on 16 November and it was pleasing to be able to welcome to the meeting Geoff Axford and Mike Hinsliff from DEH. Geoff and Mike have important regional responsibilities for mound springs management both within and outside of the formal parks and reserves system of the Far North and it was most useful to hear from them about some of their work. It was also instructive to hear from FOMS Vice President Travis Gotch about his continuing work on springs.

Also discussed at the meeting was the need for more interpretative signage to better inform the large number of visitors to mound springs, particular in Wabma Kadarbu Mound Springs Conservation Park near Coward Springs. Signage which had been in place at the Park faded and was removed some time ago, but has not been replaced and Mike indicated that he would follow this up. A similar problem existed at the nearby Strangways Springs Overland Telegraph Station site, but happily the Heritage Branch of DEH has organised replacement signage and after helping the Branch with this project I made a trip a few months back to view the completed work.

FOMS intend to organise an introductory field trip to the mound springs in mid 2007 and as part of this we will meet as many pastoral lessees with mound springs on their leases as possible. We will also have a range of professionals in the party to introduce trip participants to the hydrogeology, ecology and cultural heritage of the springs. Planning for the trip will commence shortly and we will advise FOMS members of dates and details as soon as possible.

It remains only to extend seasonal greetings and best wishes to all FOMS members. I have no doubt that we can look forward to an interesting and productive year in 2007 in pursuing our interest in mound springs and working with others towards their more effective management.

Colin Harris
President, Friends of Mound Springs

Rangers Report

Mike Hinsliff , Dept of Environment and Heritage (DEH) ranger reported at the last FOMS' meeting that Dalhousie Springs and Wabma Kadarbu were the main focus from the DEH / National Parks and Wildlife viewpoint; and that DEH was keen to be closely involved with FOMS in activities relating to these springs.

Mike noted that the access road into Wabma Kadarbu was in poor shape and that negotiations with Transport SA were in progress regarding an upgrade of the track. Wabma Kadarbu has high visitation and there are implications in this for signage, paths, viewing platforms etc. Mike foreshadowed that FOMS assistance with these management issues would be useful.

Mike reported that rabbit-proofing work was being undertaken at Blanche Cup and The Bubbler. There had also been suggestions for a walking trail that could include Hamilton Hill, but this would need further consideration.

Report of FOMS' second meeting

The second meeting of the Friends of Mound Springs (FOMS) was held on 16 November 2006 at 1 Richmond Road, Keswick, Adelaide. Thirteen Friends attended, including DEH representatives Geoff Axford and Mike Hinsliff. Treasurer Tony Latz reported that FOMS currently has 15 financial members.

Travis Gotch, FOMS Vice President noted that there had been some concerns amongst traditional owners regarding access by tour operators to McLachlan. Access rather than impact was the main concern. Travis also noted that renovation work had been undertaken at Finniss Well. There are still problems there however with erosion. He further noted that the spring monitoring work previously undertaken by Colin, Tony and Simon had not been repeated during 2006. It was agreed that it would be reasonable to leave this until sometime during winter 2007 , but at the same time, it was noted that there were some fencing issues that should be checked before then.

At the meeting it was agreed that FOMS Objectives and Program next year will include conducting a general tour of the springs along the Oodnadatta Track, possibly linked with the spring monitoring program, in 2007. It was also agreed that FOMS will aim to meet three times per year; ie. about every four months. The next meeting was tentatively scheduled for March 2007.

The partial skeleton of Opallionectes, as displayed at the South Australian Museum;

Opalised fossil finds

Dr Benjamin Kear, Natalie Schroeder and Dr Micheal Lee from the University of Adelaide and SA Museum recently identified two new species of ancient marine reptiles that swam the shallow waters of an inland sea in Australia 115 million years ago. Dr Kear and his colleagues identified the new species based on the opalised fossils of 30 individuals found in old collections and recent excavations. Several of these specimens have been found southwest of Lake Eyre, both near Curdimurka and north of Marree.

The most recent skeleton was found in 2002. However, isolated opalised bones and teeth come in constantly from miners. The most recent of these was in May 2006. The fossils all occur within the 120 million year old marine deposits of the Bulldog Shale whereas the mound springs are a much more recent feature.

Umoonasaurus and *Opallionectes* belonged to a group of animals called plesiosaurs, long-necked marine reptiles resembling the popular image of the Loch Ness monster that lived during the time of the dinosaurs. Both creatures lived in a freezing polar sea that covered what is now Australia 115 million years ago, when the continent was located much closer to Antarctica.

Umoonasaurus was a rhomaleosaurid – a kind of plesiosaur that was the "killer whale equivalent of the Jurassic," according to Dr Kear. Distinguished by its relatively small size (around 2.4 metres) and three crest-like ridges on its skull, *Umoonasaurus* was also a "Cretaceous living fossil" outliving its giant predatory relatives by more than 100 million years. "Imagine a compact body with four flippers, a reasonably long neck, small head and short tail – much like a reptilian seal." The team named the reptile after Umoona, the Aboriginal name for the Coober Pedy region where the most complete skeletons have been found.

Opallionectes was also a plesiosaur but much larger - about six metres long with masses of fine, needle-like teeth for trapping small fish and squid. Its name means "the opal swimmer from Andamooka".

The team's findings were recently published in both the international journal *Palaeontology*, and the online edition of the *Biology Letters*, a periodical published by the prestigious Royal Society of London.

What are Mound Springs?

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

The mound springs present at Wabma Kardarbu National Park are part of the artesian springs of the Great Artesian Basin(GAB). The GAB underlies 22% of Australia. Its groundwater resource is formed by alternate layers of waterholding sandstone aquifers and impermeable siltstones and mudstones. The GAB comprises three primary resources, namely water, pressure and heat. Natural discharge from the GAB occurs mainly through diffuse vertical leakages towards the regional water table, and through fractures forming artesian springs at its margins. Since bores were first sunk into the GAB over one hundred years ago it is estimated that natural flows to these springs have declined by 30%.

There are more than 1700 GAB springs arranged in 12 supergroups with 23 spring complexes in SA. The springs support endemic populations of unique and threatened flora and fauna, and are of huge ecological and cultural significance.

The Lake Eyre supergroup clustered around the southwest margin of the GAB contains the largest number of active springs. These mound springs are named for their characteristic mound which may be up to 8m in height and 30m in diameter, and which is formed by the accumulation and carbonate cementation of sand, silt and clay. The mound springs are the only permanent water resource in SA's arid interior.

The mound springs support many rare and endemic species and are important drought refuge areas for wildlife. This importance has been recognised by the listing of the community of native species dependent upon the natural discharge of groundwater from the GAB springs as 'endangered', and therefore to be protected under the *Environment Protection and Biodiversity Conservation Act 1999(CW).* The GAB springs and their dependent ecosystems have also been listed as endangered under the *National Parks and Wildlife Act 1972(SA).* In addition, the mound springs are very culturally significant and remain an important resource for Aboriginal people. They were also the main water resource for early explorers, and both the Overland Telegraph and the original Ghan railway route were sited according to the location of the springs.

Source: http://www.connectingthecontinent.com/ctcwebsite/moundsprings/moundsprings.htm

Queensland Great Artesian Basin Water Resource Plan —a Murray–Darling perspective

Edited extracts from a presentation at the 10th Murray Darling Basin Groundwater Workshop held in Canberra 18-20 September 2006 given by Adrian McKay and Brooke Nolan from the QLD Dept of Natural Resources, Mines and Water.

The final Queensland Great Artesian Basin (GAB) Water Resource Plan (WRP) was released in March 2006 and is available at http://www.nrm.qld.gov.au/wrp/gab.html. The GAB WRP provides a framework for the long term holistic management of the aquifers in the Queensland Section of the GAB adopting the principles associated with the National Water Initiative (NWI) and the GAB Strategic Management Plan (SMP).

The Queensland section of the Great Artesian Basin comprises approximately 70% of the total GAB area. The aquifers of the GAB are an important water source for a range of purposes from stock and domestic, town water supply, industrial, stock intensive and mining. GAB aquifers supply water for at least 51 towns in Queensland. The GAB is becoming increasingly important to rural communities as water available under overlying surface water plans becomes further restricted. Demand across Queensland is for approximately 101,000 ML used for consumptive purposes. In the last five years there has been a large increase in applications for new water licences to access GAB aquifers in the south – eastern part of the basin. Water licence applications totalling almost 33,000 ML for GAB water across the Queensland MDB area were being held at the time the GAB WRP was released. This represents 95% of the total volume of new applications in the GAB and approximately one third of the total volume of entitlement for the GAB.

Queensland Great Artesian Basin Water Resource Plan—a Murray–Darling perspective continued...

The GAB WRP provides a stable legislative and management platform that provides for appropriate development, whilst recognising the need for protection of springs that support significant environmental and cultural values associated with water from the GAB. Groundwater extraction through bores has resulted in major reductions in spring flows and many springs have ceased to flow in the discharge areas of the Basin (such as at Eulo in south-west Queensland) (Fensham and Fairfax 2003). The pressure decline since 1980 in spring zones has been between 5 and 15 metres; however, in the Eulo spring area the decline has been typically 60 metres. While limited data exists, declines in the recharge areas located along the more elevated eastern extremities of the basin have been observed or reported. These recharge spring systems are similarly affected by aquifer pressure declines, although the declines are much less obvious. The head reductions combined with other non water related management issues led to a decline in the number and health of both recharge and discharge springs across the basin. The springs in the discharge area have high conservation value because of the "oasis" habitat they provide in otherwise arid lands for a variety of species including plants, fish, and snails that do not occur elsewhere.

Capturing springs under this plan is a significant change in Queensland water management, as previously, springs have been identified and managed as surface water. Identifying springs as water under the GAB WRP allows the management and protection of the spring at its source. After identifying the purpose of the WRP and the water it applies to, it is necessary to identify the outcomes to be achieved. The GAB WRP outcomes are to protect the flow of water to springs that support significant cultural and environmental values; provide for the continued use of all water entitlements and other authorisations to take water; reserve water in storage in the aquifer for future generations; ensure a reliable supply of water from the Plan area; and to make water available for new users.

The GAB WRP sets limits on the amount of additional water entitlement available in management areas. The protection of springs and stream base flows is a contributing factor in the setting of the low volumes of unallocated water in some management areas. Following the release of the GAB WRP, a resource operations plan (ROP) is being developed that provides the management guidelines to enable the outcomes of the GAB WRP to be achieved. The ROP implements the management and monitoring requirements specified in the WRP. The release of the draft GAB ROP occurred in July 2006 and the statutory community consultation and submission phase finishes in September 2006. The final ROP is proposed for release before December 2006. It will include detail on release processes for unallocated water, water sharing rules, spring protection criteria, relocation of existing entitlement and monitoring requirements. The GAB ROP will protect flow to GAB dependant springs and stream baseflows by specifying spring protection criteria that will be applied when a licence is granted or amended. This is likely to be in the form of a prescribed maximum cumulative impact on head around a spring that would result from allowing new water licences at prescribed distances from springs or watercourses. Research into spring aquifer interactions and monitoring In order to accurately predict impacts of groundwater extraction and spring pressure recovery, a better understanding of the local hydrology around springs is necessary. Therefore, research in this field will be promoted. Spring monitoring is a complex task and will require the coordinated involvement of a range of agencies and experts that will develop over time.

As part of the development of the GAB WRP two assessments of the springs and baseflows of the GAB were undertaken. The first assessment involved the identification and prioritisation of the springs. A key outcome from the assessment is the categorisation of each spring complex in Queensland. The 310 Queensland GAB spring complexes have been prioritised into the following six categories:

Category 1a Provide habitat for biota endemic to one spring complex
Category 1b Provide habitat for biota endemic (or suspected endemic) to spring wetlands; or suspected endemic to one spring complex
Category 1c Provide habitat for relevant species listed under State or Federal legislation
Category 2 Provide habitat for some isolated populations of plant species, or are outstanding examples of their type
Category 3 Any spring of lower value than above that is relatively intact
Category 4 Severely degraded

The determination of the condition and location of these complexes through the WRP process will ensure the protection of the ecological values associated with these high value areas. The second assessment undertaken sought to identify the locations where river base flow is potentially benefiting from discharge from the GAB. The assessment combined spring location and geology to determine the areas in Queensland where this may be occurring. The information outlined in the report provided a basis for the protection of these flows from the impact of future extraction in the GAB WRP.

Source: www.sea-us.org.au/roxby/springsdrying.html#Details

The GAB WRP incorporates past management approaches used in Queensland, SMP directions as well as new innovative approaches to management issues in the GAB. The GAB WRP provides the first holistic management platform that combines both legislative and management outcomes in Queensland. It provides protection to the resource, springs and existing users, directions for monitoring and research as well as providing for development incorporating the principles of the NWI. While it is anticipated that the GAB WRP will develop and evolve as further information becomes available, it is, however, an important management step for this most valuable of water resources.

The full and unabbreviated paper from the above presentation is available in the proceedings of the conference.

Whats Happening with SA GAB Springs?

Travis Gotch is the GAB Springs Project Officer for the SA Arid Lands NRM Board and gave a presentation on his activities to the last FOMS meeting held in November 2006. He is currently involved in several aspects of mound springs documentation and management, including the following:

Spatial Data Collection

Travis has been finding new springs and verifying their location. 2351 vents have been mapped to +/- 50mm precision. It is estimated that there are 4000 to 5000 vents in SA and about two years' additional work is needed to complete the mapping. Travis linked this project with mapping undertaken by Darren Niejalke in 1996 and by SEA in the early 1980s. Data management systems are being established and the information is being integrated with the SA Wetlands Information Database (SAWID).

Date Palm Control, Dalhousie Springs

Date palm proliferation has had serious impacts upon endemic and other native species at Dalhousie. The adopted management policy is to retain the mature (historic) palms at the old ruins but to remove the rest. To date, a palm removal program has been undertaken at Old Man Springs – the worst affected by palms. The palms are burnt then cut off near the base. Fire will not kill the palms but cutting off after fire will kill most – there is very little re-shooting. Travis showed some spectacular photographs of palms in flame. He noted that the same approach would be used at one other spring.

Source: A Love's GAB presentation at IAH Seminar, Alice Springs, 7-8 September 2006

National Water Initiative

The National Water Initiative (NWI) funded by the Federal Government has just closed a funding round for projects aimed at achieving water use efficiencies and/or fostering ecological flows. A joint application had been prepared and submitted by DWLBC, DEH and the SA Arid Lands NRM Board for investigations of GAB springs and their hydrology, their recharge processes and links with the GAB. This work would also provide tool sets for the GAB Water Allocation Plan. The project would also look at ecological / hydrological relationships, such as the relationship between flow and wetland size. High value springs would be identified and weed and grazing issues would be investigated. Travis indicated that the application involved a $14.5m package of actions over four years. The application had been well received but no announcements had been made as yet.

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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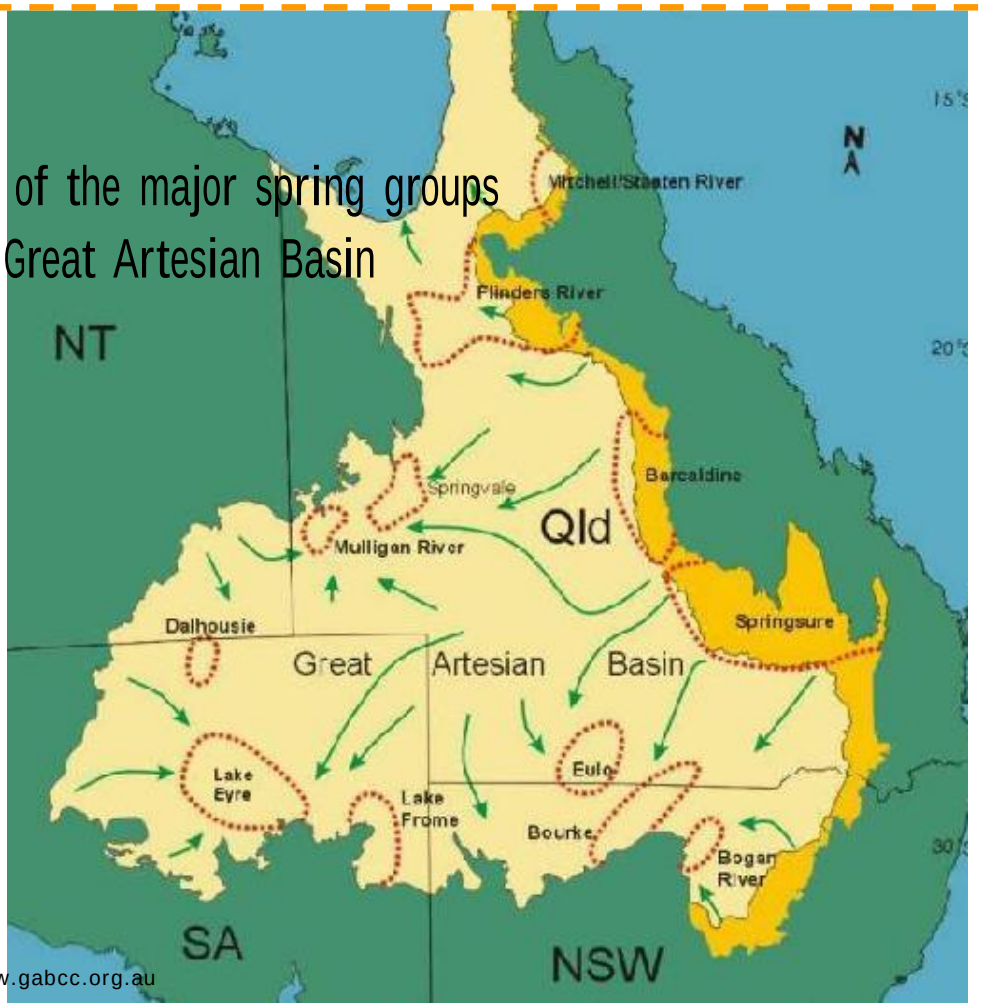
A map of the major spring groups of the Great Artesian Basin



Source: www.gabcc.org.au