Angas Bremer Irrigation Management Zone 2012 – 2013 Annual Report

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Angas Bremer Water Management Committee Inc

Supported by

Natural Resources
SA Murray-Darling Basin

Government of South Australia
South Australian Murray-Darling Basin
Natural Resources Management Board

2012-13 Annual Irrigation Report

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Angas Bremer Water Management Committee Members 2012-2013

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Mac Cleggett, Rob Tonkin,
Dale Wenzel, George Borrett, Nick McDonald, Loene Furler,
Darren Aworth and David Eckert.
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Secretary - Barbara Blaser
Program/Project Coordinator - Sylvia Clarke
Kate Heppner, Cameron Welsh and Michael Cutting – *Natural Resources SA Murray Darling Basin*

Report of the Activities of the Committee 2012-2013

1. Salt Trends

Report by Michael Cutting, Natural Resources SA Murray Darling Basin.

The Angas Bremer salt trends project continued during 2012-13 with some additional sites installed across the region. All monitoring sites were equipped with a pair of FullStops and a GDot soil moisture monitoring unit. The GDot (Figure 1) is connected to a gypsum block and displays soil moisture tension which is a measure of how hard it is for the plant to extract water from the soil. The soil moisture tension is represented by a series of flip dots within a display panel. As the soil moisture levels reduce and the plants are forced to work harder to extract water from the soil and the number of dots illuminated reduces.

Figure 1: GDot Soil Tension Sensor

Results indicate that salt accumulation is directly related to the quality of water being applied and the depth in the soil profile at which salt accumulates is influenced by the application rate of irrigation events. Previous rootzone salinity monitoring completed in the Angas Bremer district showed that there was little, if any benefit gained from in-season salinity leaching irrigations. The current trial work has confirmed that the application of leaching irrigations during winter and following natural rainfall was the most effective way of managing root zone salinity accumulation. Figure 2 (a) below shows a reduction in rootzone salinity levels during the winter/spring period but an increase in levels as irrigation resumes.

During 2012/13 work also commenced on preparing a report on the 10 years of community salinity monitoring that has occurred in the Angas Bremer district. The report is being written by Dr. Richard Stirzaker (CSIRO) and aims to capture the key learning's and outcomes of the salinity monitoring efforts of the local community. It is hoped to have the report finalised in late 2013.

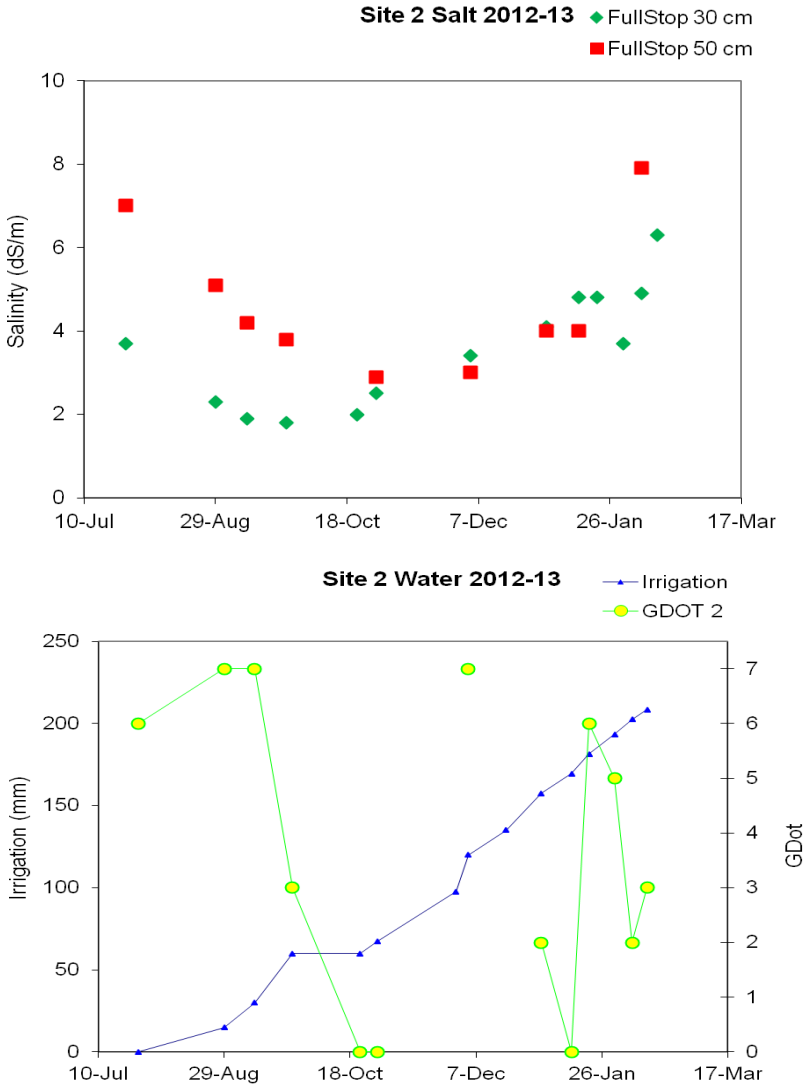

Figure 2: Fullstop (a) data at 30cm and 50cm and soil tension and irrigation data (b) during the 2012/13 season

2. Managed Aquifer Recharge Risk Assessment Project

The Aquifer Storage and Recovery (ASR) risk assessment project (now referred to as Managed Aquifer Recharge (MAR) was developed with the aim of identifying whether or not there were contaminates present in the surface water used for recharge and, if present, what impacts could this cause to the aquifer and water users.

Since 2007, water samples have been collected and analysed by the Australian Water Quality Centre (AWQC). The original protocol involved collecting samples from recharge water sources; the Angas and Bremer Rivers, and Lake Alexandrina, and a well used for artificial recharge on a property in Langhorne Creek. Since this time, samples have been collected from relevant source waters or bores depending on the amount of funding available each year (apart from 2010 when no funding was available).

Funding was obtained from the SA Murray Darling Basin NRM Board Volunteer Grants for a further three samples to be analysed in the 2013 year. In July 2013 samples were taken from the Angas and Bremer rivers and Lake Alexandrina when river levels were high. Most analytes were within the Australian Drinking Water Guideline levels, with the exception of Total Dissolved Solids levels in the Angas and Bremer Rivers, high turbidity in the Angas and Lake Alexandrina samples, chloride in both the rivers, phosphorus in the Angas, while iron and bacterial (coliform) levels were above the guidelines in all three sources. Turbidity, phosphorus, iron and faecal bacteria levels were higher in the Angas than in the Bremer river sample this year; however, the conductivity level in the Angas on the 8th of July 2013 was lower at 2000 µS/cm than the Bremer river, at 3830 µS/cm. This analysis only provides a snapshot of the water quality of the rivers which would vary considerably over each season.

From the data available on the Department of Environment Water and Natural Resources website, the conductivity of River Murray water (in the proximity of Jervois where the water is diverted to the Creeks Pipeline Company) on the 8th of July 2013, was 534 µS/cm at Woods Point Pontoon and 593 µS/cm downstream of Wellington Ferry. This was the only water quality information available for the River Murray water. It is generally assumed that the River Murray water is of much better quality than Angas and Bremer water and is currently the preferred option for MAR where it is accessible.

3. Biodiversity Fund Project

The Angas Bremer Water Management Committee has been undertaking a project since June 2012 supported by the Clean Energy Futures Biodiversity Fund, through funding from the Australian Government. The aim of this project is to restore vegetation along the Angas and Bremer Rivers and the shore of Lake Alexandrina as well as associated swamps and wetlands within the Langhorne Creek area, to improve and link biodiversity corridors.

The project has chosen 15 sites; 6 on the Bremer River, 2 swamps or wetlands associated with the Bremer River, one site neighbouring Gollan's waterhole, and 6 on the Angas River (Figure 3). Work is taking place on a total of 42 hectares. Sites were chosen on criteria such as landholder interest, continuity with other sites, and their importance as refuges.

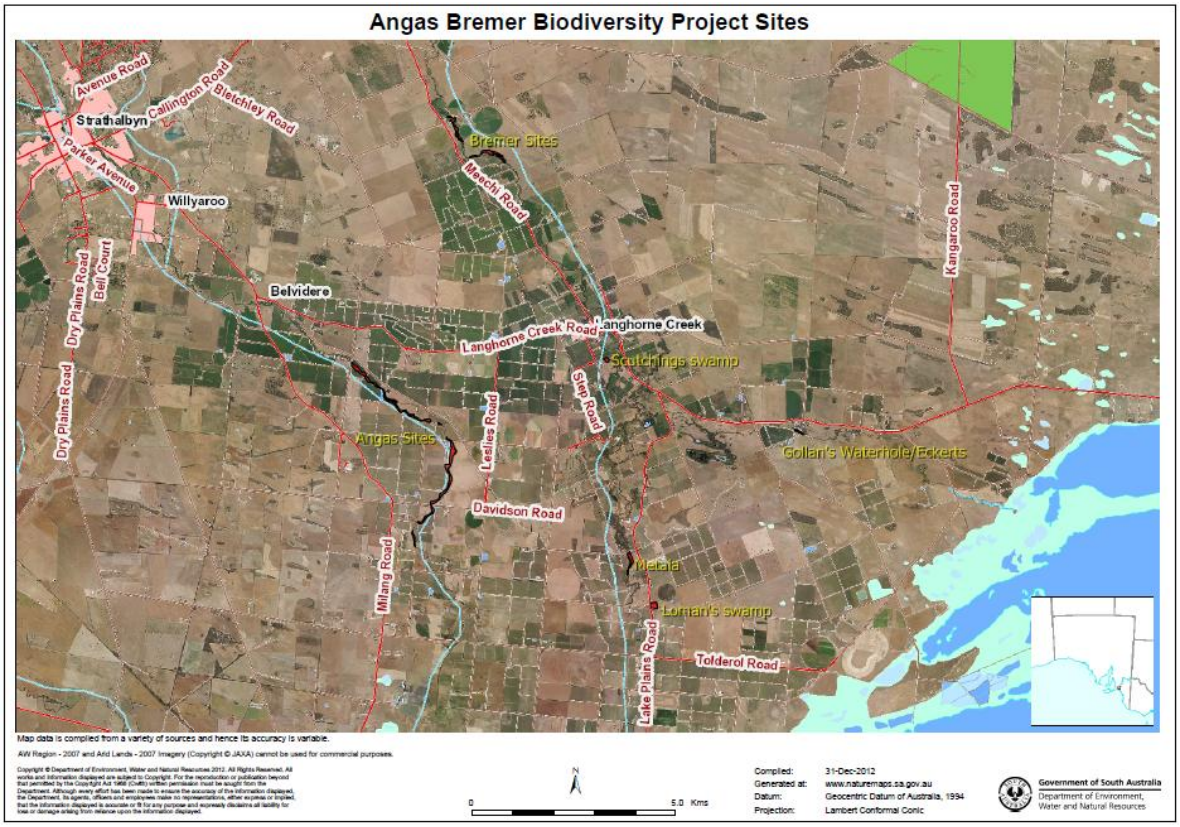

Figure 3. Biodiversity Project sites, coloured red, with yellow labels.

Fencing along watercourses has been completed on a number of sites. Weed control and direct seeding has occurred at most sites on the Bremer River and near Gollan's waterhole and one site on the Angas River, with new plants just starting to emerge. Planting of tubestock sedges took place as the water receded in Spring 2013 at some sites. Seventeen different species of local native plants have been used on the sites already. More plants are being grown at the Milang Community Nursery for planting next year after further weed control (including large woody weeds) has taken place. An extensive rabbit baiting program also took place in winter 2013 at most sites. The work for this project has been undertaken by the ABWMC project officer, contractors coordinated by Jeff Whitaker, and a great deal by the landholders themselves. We look forward to seeing native birds and animals return to these sites as the areas of suitable habitat develop and provide refuges in times of changing climate.

Monitoring of water quality, aquatic invertebrates and frogs has occurred at each site every Spring, and vegetation in Autumn. Photos of the sites have been taken every 6 months to monitor the progress of the project (see Figures 4 and 5 for examples).

Frogs, which are thought to be an indicator of wetland health, were recorded at every site in 2013, which is a promising sign. Gollan's waterhole on Mosquito Creek stood out with a greater number of frog species than the other sites and the only place where Peron's tree frogs (*Litoria peronii*) were recorded. Other frog species noted so far in the monitoring sessions were the Common Froglet (*Crinia signifera*), Eastern Banjo Frog (*Limnodynastes dumerilii*), the Spotted Marsh Frog (*Limnodynastes tasmaniensis*) and the Southern Brown Tree Frog (*Litoria ewingii*).

Bird surveys have been carried out by the Strathalbyn Naturalists Club in Spring and Autumn, with a diverse range of birds being identified. A section of Jeff Whitaker's report is provided here - '*The bird survey results have so far been fairly predictable with generally a strong emphasis on the species well adapted to very open woodland that offer limited mid storey shrub species for refuge. At least a few of the large dominating species such as Magpies, Miners, Ravens and various birds of prey are present on all sites. Only those sites with advanced revegetation work or some remnant dense vegetation have any hope of providing suitable refuge for the more sensitive bird species.*

Waterbirds have also appeared in the lists and this is to be expected on a corridor project associated with watercourses. Generally all the sites only have ephemeral water in narrow watercourses. Luckily this project has commenced after the big drought of recent years and no doubt the bird list has been increased because of the presence of surface water and re-invigorated bird populations.


Blue Wren
Photo: Darcy Whittaker

It is expected that as these sites develop more species diverse mid storey and understorey vegetation structure, changes in the bird populations utilizing the sites will be observed. The linking of previous individual revegetation efforts into more substantial areas will provide opportunities for greater diversity. Already species such as White Browed Babblers (which are colony nesters needing reasonable areas of dense bush to thrive) are re-establishing themselves in the revegetation work carried out some years ago at Rosemount. As more of the appropriate habitat develops more babbler families will be found along the Angas. Even as that is occurring the areas that the babblers have already settled may well be developing to a stage where other more sensitive species can get a toe hold on some new territory.


Black faced cuckoo shrike
Photo: Darcy Whittaker

The purpose of these surveys is purely to provide a base-line understanding of what species currently use the sites so that future change can be recognised.'

Funding for this project extends until June 2014, by which time we plan to have undertaken weed control and planting of native species at all sites. Landholders are then responsible for the management of the sites on their properties for the next 10 years, with technical support being provided by the Angas Bremer Water Management Committee if needed.

Figure 4. Site for weed control and native species planting on the Angas River.

Figure 5 a) and b). Sites that have undergone initial weed control and direct seeding on the Bremer River, November 2013.

a)

b)

Irrigation Annual Report Forms Data Summary and Comment

Irrigation Annual Report forms (IAR's) were mailed to 134 irrigators. 105 irrigators who returned their completed forms on time have achieved "Accredited Irrigator" status and have been issued with accreditation certificates. Eighty eight of these irrigators submitted their reports on line through the website, less than the 96 who used the on-line facility last year. Twenty two IAR's that were received by the Committee after the due date did not achieve accreditation and a further 3 irrigators have not (at the date of this report) returned their IAR forms, one due to illness. The data from 132 irrigators has been collated and that data is presented in the following graphs and tables. Comments are included with each chart or table.

Flooding:- Flooding by diversion or pumping was reported by a number of irrigators. The flooding events occurred during July and August 2012. 596.20 ha was recorded as being flooded this year, an increase over the 150 ha flooded in 2011-12, but less than the 1,053 ha covered by floodwater in 2010-11. These figures include some properties that were flooded twice or more over the year.

Revegetation: - The total area of re-vegetation reported in the Irrigation Annual reports has not changed substantially from the 1,850 ha reported last year. There will be an increase in the area revegetated next year after the completion of the Biodiversity Project.

Red Gum Health:- 78 Irrigators reported on the health of the red gums on their properties. Health, or otherwise, was rated from 0 to 5, 5 being healthy and 0 being dead. Red gums were generally noted to be once again in relatively good health. Three irrigators reported all the trees on their property as long dead but of those whose trees largely remain, 27 irrigators reported that their red gums were all 100% healthy, while the remainder listed the majority of their trees to be either healthy or in sub-optimal health. The good health of the trees was attributed to the continuation of good flows in the rivers over winter and flood water reaching many swamps.

Water Leasing:- Table 1 below shows the amount of water leased in 2012-13 compared with water leased in 2011-12. Overall, there was slightly less water leased by irrigators this year than last. In the previous irrigation year there had been a substantial increase in the amount of River Murray water traded, with a greater amount of water available from Lake Alexandrina as well as being delivered through the pipeline into the region. This year the amount leased to irrigators outside the Angas Bremer Irrigation Zone increased again but the volume of River Murray water leased into the Zone was 910ML less than last year. However, more River Murray water was again leased into the region than was leased out. The amount of groundwater leased between irrigators within the zone was low last year and in the 2012-13 irrigation year no reports of leased Groundwater within the zone were received. This reflects the lower volume of groundwater used generally over the year and the increasing importance of River Murray water for irrigation in the region.

Table 1

Type of Lease	Megalitres 2011-2012	Megalitres 2012-2013
RM water leased from ABIMZ to outside ABIMZ	790.0	1070.00
RM water leased from outside ABIMZ to inside ABIMZ	2473.0	1563.20
RM water leased from inside ABIMZ to inside ABIMZ	571.98	431.47
Groundwater leased from AB licence to AB licence	20.71	0

Figure 6: Angas and Bremer Rivers Water Extractions 2008-2013:- Not all of the water taken from these rivers, such as the water diverted through weirs and sluices, is accounted for in this chart. The volumes on this graph are metered volumes as well as the amount recharged into the aquifer from these rivers as reported on the Irrigation Annual Reports. The amount of water that was recorded as having been extracted from these
rivers was just slightly higher than the volume from 2011-12. More meters are likely to be installed and monitored, after the Eastern Mt Lofty Ranges Water Allocation Plan comes into effect.

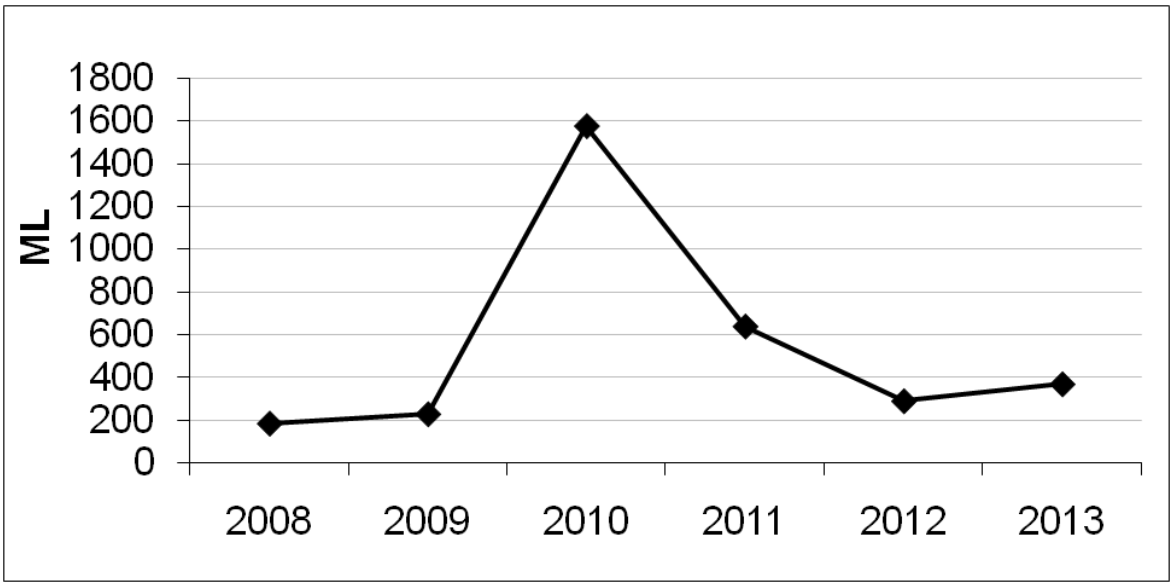

Figure 7: River Murray Water Entitlement, Site Use Approval and Extraction 2008-2013:- Entitlement (RivM Ent) is the volume of water endorsed on licenses and does not include any credits for rollover, recharge etc. The River Murray Site Use Approval (RivM SUA) is the maximum quantity of River Murray water that can be used for irrigation on land identified as being in the Angas Bremer Irrigation Management Zone in 2011-2012. Extraction (RivM Ext) is the volume of water that was used during the irrigation year. As Site Use Approval volumes give a more accurate description of the amount of water that could potentially be used in the region, it is now being recorded on the charts instead of the Entitlement volume. The total Site Use Approval volume for 2012-13 was 28,382 ML, and the recorded use was 17,379 ML, slightly lower than the amount used last year.

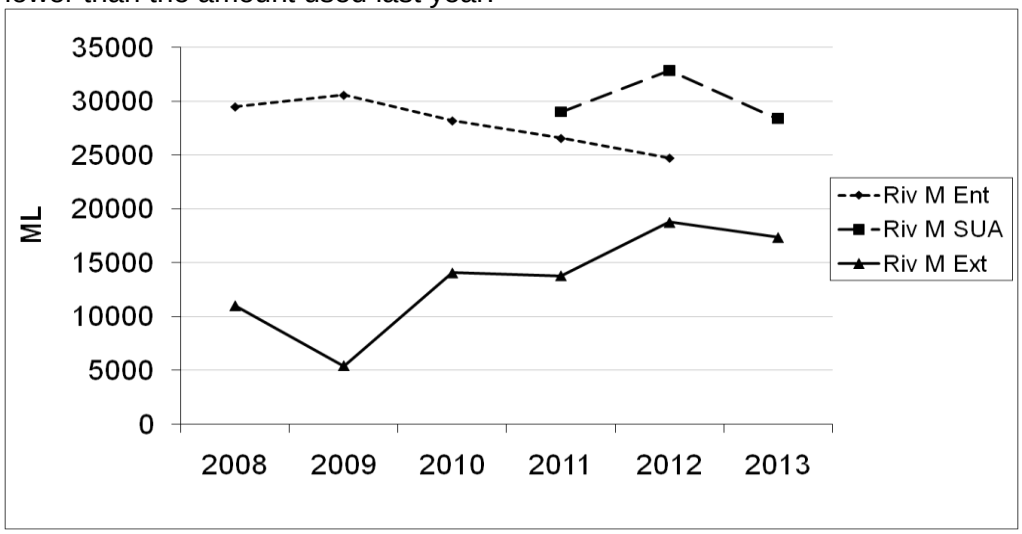

Figure 8: Groundwater Entitlement and Extraction 2008-2013:- The maximum entitlement for 2012-13 was 6,500ML and the recorded use was 1287.62ML. This is much lower than the 7,700 ML used four years previously and brings the region back even closer to the levels of 2006 when less than 1,000ML was extracted from the aquifer. However, use seems to have levelled off somewhat over the last few years. The impact on the aquifer was again reduced because of the reasonably wet weather and most irrigators preferentially using the better quality water available from the Angas and Bremer Rivers and particularly the Murray River.