



# SA dairy industry in the Murray Darling Basin: Trends and Basin Plan Impacts

*November 2017*

## Introduction

Dairy Australia on behalf of the Australian Dairy Industry Council Water Taskforce has requested a review of the changes in the dairy industry in the South Australian Murray Darling Basin (SAMDB) between 2005 and 2016. The review will be used to inform input into the dairy industry's policy and positions in response to the *Basin Plan's* implementation up to 2024.

## Background

The SA dairy industry in the Murray Darling Basin is located along the lower Murray River, around Lakes Alexandrina and Albert, and in the eastern Mount Lofty Ranges. The SA River Murray Region for the purposes of this report is defined as the Lower Murray Reclaimed Irrigation Areas (LMRIA) and farms at Wellington and Meningie. Dairy farmers in the SA River Murray Region produced approximately 95 million litres of milk in 2015/2016. The industry has still not recovered from the Millennium Drought and ongoing industry challenges; cow numbers are only now starting to stabilise at approximately 15,300 cows from 2013/14. The pre-drought peak production levels observed by the Dairy Authority of South Australia (DASA) were 36,800 cows in 2002/2003 achieving a milk production of around 224 million litres in that year.

Milk production trends reflect the challenging adjustment period experienced by the SA dairy industry in the Murray Darling Basin over the last decade. In particular, changes in national water policy over the past ten years are driving adjustment on the SA River Murray Region, as much as volatile global and local market as well as variable seasonal conditions.

Change drivers in the region have included:

- Dairy industry deregulation
- Lower Murray Reclaimed Irrigation Areas (LMRIA) infrastructure upgrade and exit package
- The Millennium Drought
- Unbundling water rights from land

- The recovery of 89.2 GL (Commonwealth water purchases), 48.3GL (infrastructure initiatives) and 6.4GL (State government recoveries) of water from irrigators for the environment under the Murray Darling Basin Plan, making a total of 143.9GL from SA as of the 31<sup>st</sup> of July 2017. Source: DAWR.
- Relaxed water trade restrictions and
- Increased competition for water on the southern Basin temporary market from new and expanding horticultural industries upstream.

The Australian Dairy Industry Council Basin Water Taskforce approached Dairy Australia to commission a study into the SA dairy industry in the Murray Darling Basin. This study will explore how the industry is adapting to changes in the operating environment linked to the Murray Darling *Basin Plan*, and how it may be affected if more water is recovered from irrigators in the southern Basin.

## The Task - Objective and Terms of Reference

The objective is to track changes in the dairy industry on the SA River Murray Region in South Australia between 2005/2006 and 2015/2016, with particular reference to:

- Number and location of dairy farms
- Size of herds
- Area farmed (ie, are farms becoming more or less intensive a land use per head?)
- Milk production
- Number and location of factories
- Dairy water ownership by entitlement type and volume
- Volume of dairy-owned water sold to the environment under *Basin Plan* buybacks
- Volume of dairy-owned water sold to other parties, and no longer used in dairying
- Volume of dairy-owned water entitlements transferred to the environment in return for Federal or State Government funding farm upgrades
- Types of government-funded upgrades – ie, new dairies, modernised irrigation infrastructure, etc.
- Reliance on temporary water market to meet current production needs.
- Changes in irrigation practice (ie, irrigated fodder, not pasture, and more dryland cropping) and productivity (ie, ML/tonne of DM).

The project was also required to capture critical water issues/concerns for SA dairy farmers, ie:

- Water quality in the river and lower lakes
- Salinity concentrations in lower lakes
- Environmental Impact Statement (EIS) for a canal or pipeline connecting southern Lake Albert to Coorong to improve water exchange
- Upgrading and automating the barrages to improve water flow to the sea, particularly when lakes are high.
- Addressing impediments to water exchange through the Narrung Narrows, ie remains of the bund blocking flow
- Maintaining minimum water levels in lower Murray River to maintain access for pumps

- Maintenance of the Murray Swamps and levy banks as properties fall into disuse (impacts on adjoining land owners)
- Potential sources of the 450 GL upwater if no more is recovered from irrigators in the southern Basin.

The project seeks to utilise this information to enable informed input into the dairy industry's policy and positions in response to the *Basin Plan's* implementation up to 2024.

## Methodology

DairySA conducted a face-to-face, phone and email survey of dairy farmers remaining in the SA River Murray Region. The survey aimed to understand how their business had changed since 2005/2006 until today and the key issues for them with regard to the *Basin Plan*. All farm businesses were contacted multiple times by phone or email to seek participation; 33 out of the 39 dairy farm businesses in the SA Murray region participated in this survey. This included 21 farms surveyed of a total of 25 dairy farms in the LMRIA, one of two farms at Wellington and 11 farms surveyed of 12 dairy farms in the Meningie area.

DairySA also met with a number of key community leaders to discuss their views on the issues facing the region under the *Basin Plan*.

DairySA contacted DEWNR Water Licencing to source any available water trade data for the region however after significant delays the available data was only to water class level (class 3A) for the whole of SA so had limited value to this project.

Murray Darling Basin Authority (MDBA) data from the evaluation of the *Basin Plan* was able to be accessed to assist in the evaluation of changes to water holdings in the region.

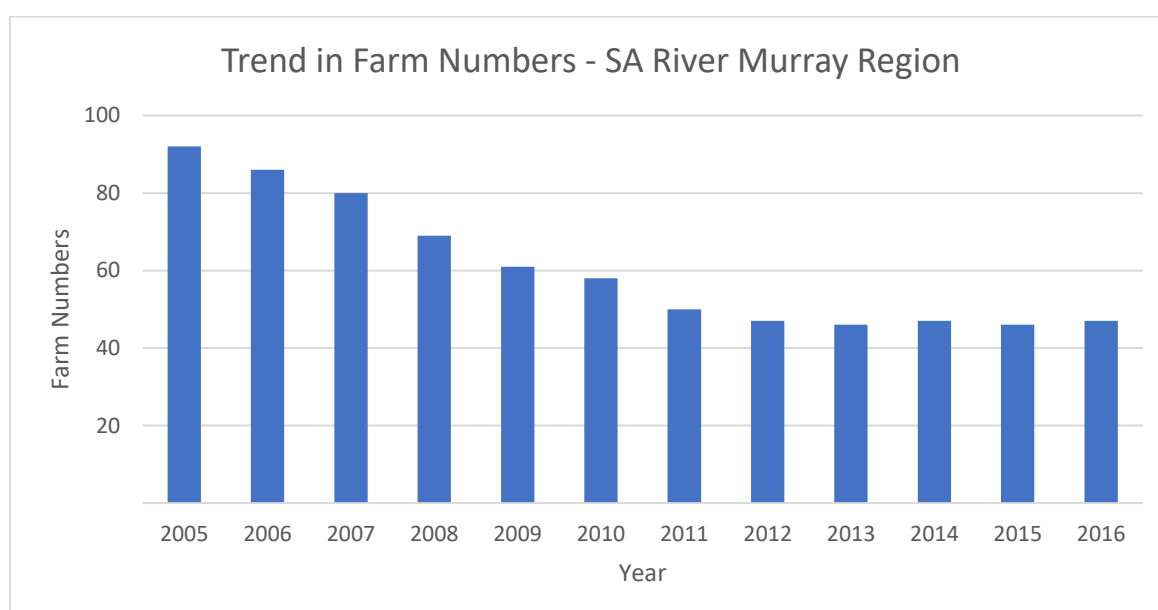
DairySA sourced all available GIS information from the crop surveys conducted from 2003 onwards however it appears that much of the data collected at the time has now been lost. The remaining dataset held by DairySA for the LMRIA is the only comprehensive data from the drought that can be accessed. The project explored the use of 2008 cadastral land use information as a methodology to identify irrigated land use in the region however the results did not correlate well with 2005/2006 data provided by surveyed farmers. As a result, a second approach using infrared remote sensing to identify the irrigated areas was used; these are the results shown in this report.

## Results

### Background to change in the region.

#### Number and location of dairy farms

In 2005/2006 the Dairy Authority of South Australia (DASA) kept farm numbers for the SA River Murray Region in a combined form. There were 86 farms in the SA River Murray Region at the end of 2006 and by 2015/2016 this had reduced by 45% to 47 farms. This project identified a total of 39 farms in the SA River Murray Region from DairySA records, 25 in the LMRIA, 12 on the Lakes and two at Wellington. It is not clear if the other farms identified by DASA are farm entities where more than one business name exists or if other farms in the Goolwa area are included.



Graph 1: *Trend in farm numbers, SA River Murray Region*, Source: DASA

#### South Australian Industry.

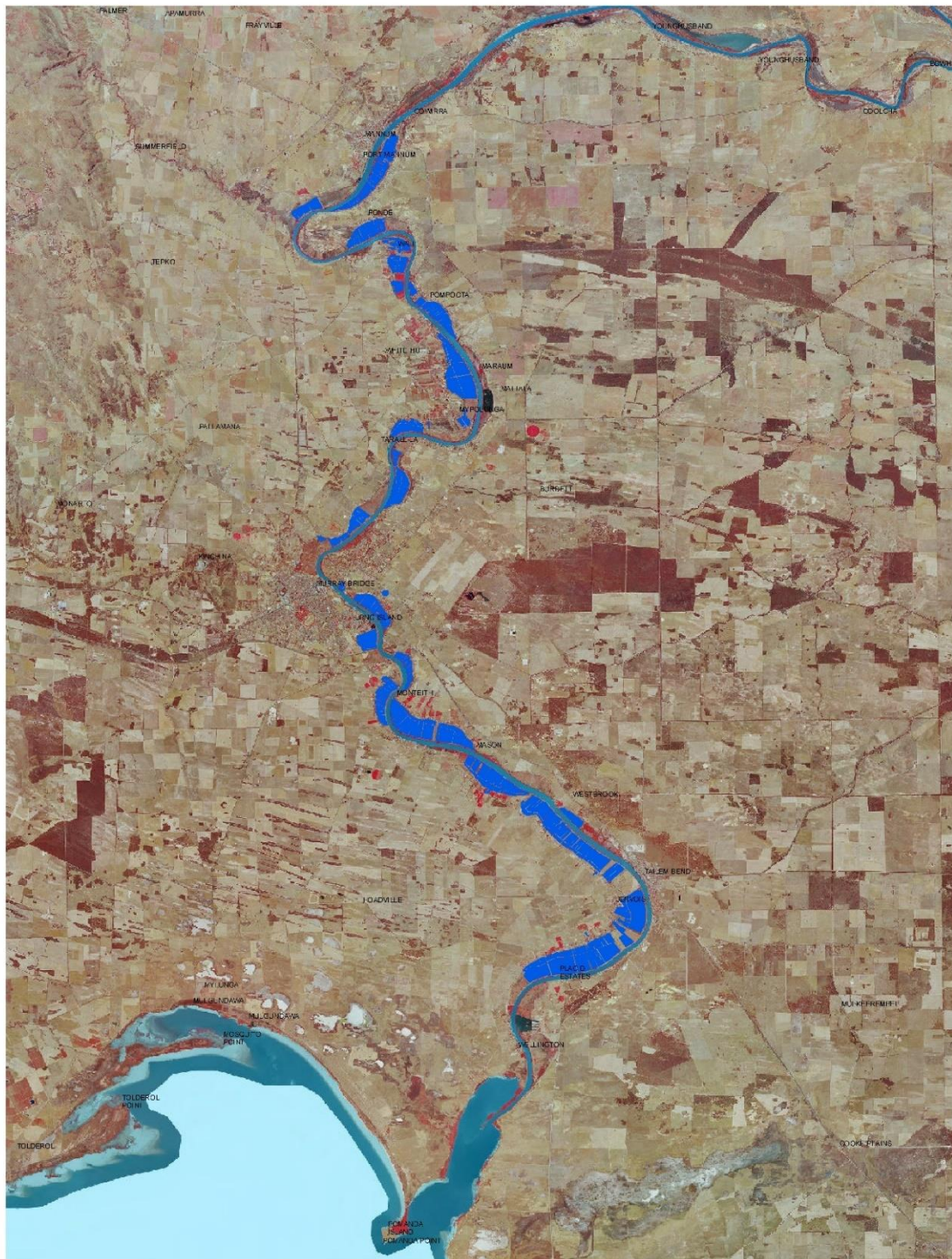
In 2005/2006 the DASA identified that the South Australian dairy industry produced 645 million litres of milk from an average of 393 dairy farms (383 farms at 30 June 2006). Average production per cow in 2005/2006 was 6226 litres from 102,937 cows. The dairy industry had been affected by the aftermath of the drought conditions in recent years, and late seasonal breaks, resulting in reduced feed reserves and high prices for feed. Farmers left the industry due to cost price pressures as milk prices have only increased slightly and costs such as fuel and feed have continued to increase.

#### SA River Murray Region.

SA River Murray Region cow numbers in 2005/2006 were 26,913 and by 2015/2016 had reduced to 15,331 a reduction of 43%. Milk production based on the DASA per cow averages were 2005/2006, 167.6 ML and 2015/2016, 95 ML - a decrease of 43%.







### Dairies in production 2005/6

■ Dairies in production 2005-6 [3845ha]

2008 Murraylands Satellite Image ©

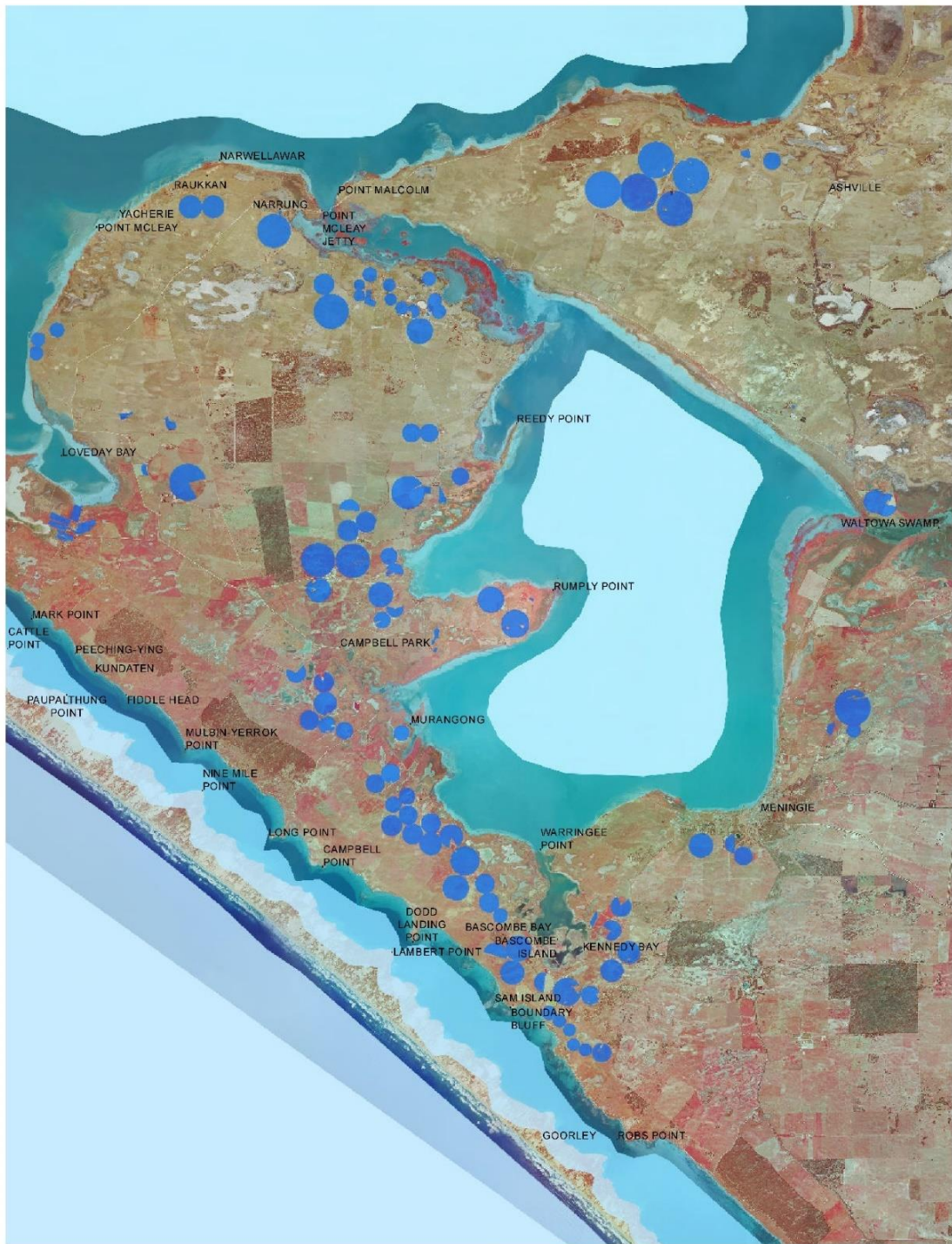
Map 2: *Dairies in Production 05/06* shows the dairies on the LMRIA in 2005/2006. At 3845 ha irrigated it demonstrates that irrigation in the region had already declined from the peak levels of approximately 4200 ha of reclaimed swamp land. Land at Mobilong, Toora, Jerojis and Mypolonga can easily be identified where dairies had ceased production.







# Lakes



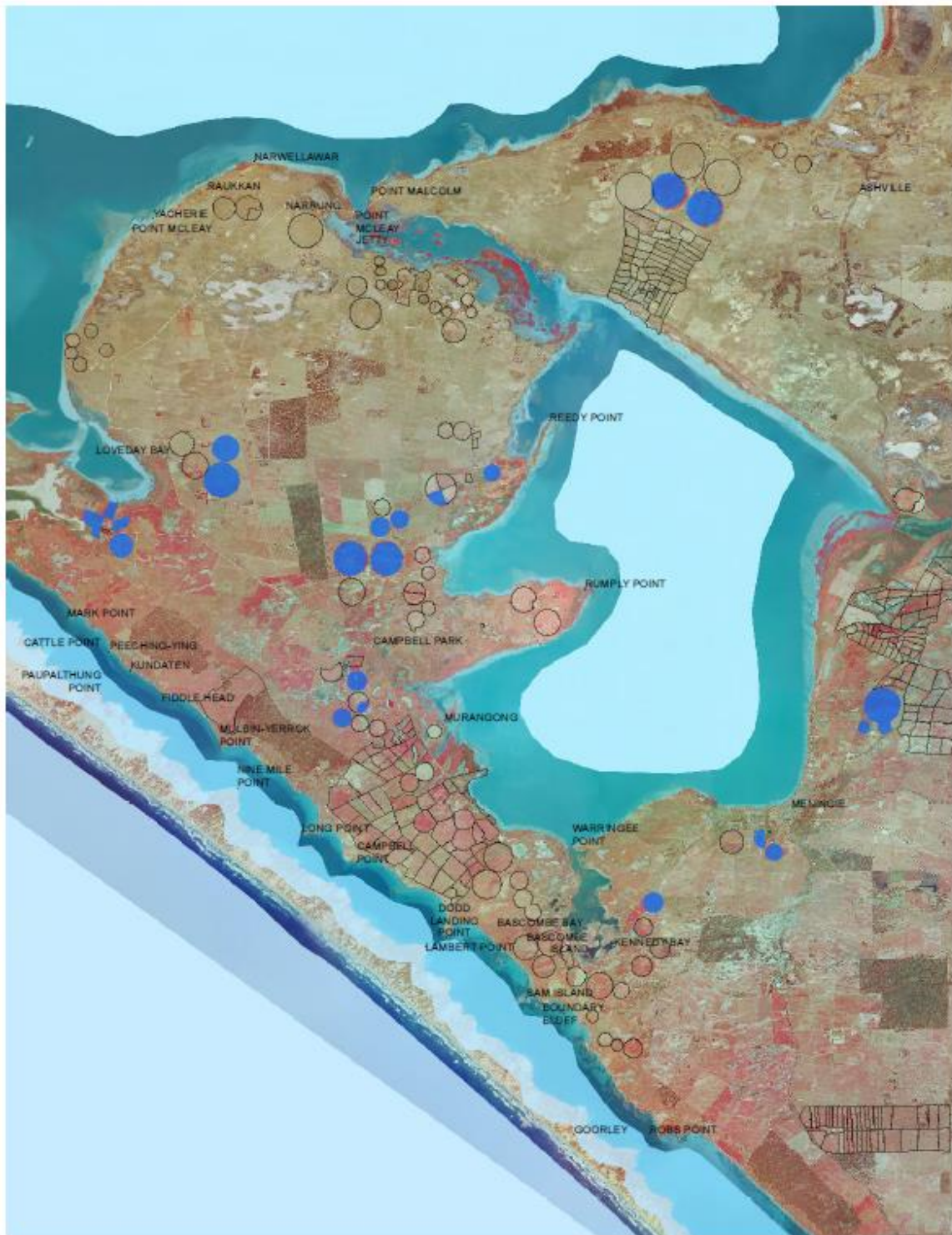
Irrigated crop survey (2003) - Coorong

Irrigated crop survey Coorong (3255ha)



Map 4: *Irrigated crop survey (2003) - Coorong* shows all irrigation in the Lakes region identified by the face-to-face surveys undertaken at that time, including non-dairy irrigation.





Map 5: *Irrigated Areas (2008 Remote sensing from air photo)* shows the location of all irrigation including non-dairy in the Lakes by 2008. All irrigation in the area had reduced 70% from approximately 3255ha to 985ha.





Your Levy at Work



Dairy Paddocks

July\_2017\_IRR

1130ha

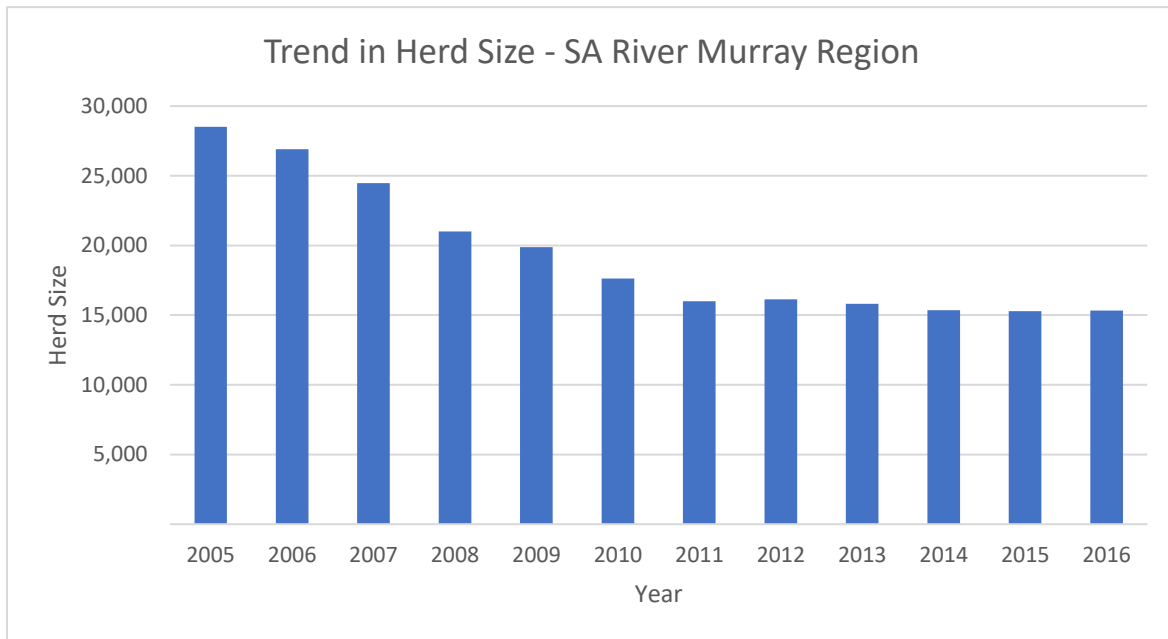
2008 Murraylands Satellite Image CI

Irrigated areas (2017 remote sensed) - Coorong

Map 6: *Irrigated areas (2017 remote sensed) - Coorong* shows the irrigated areas, including non-dairy, that remain today.

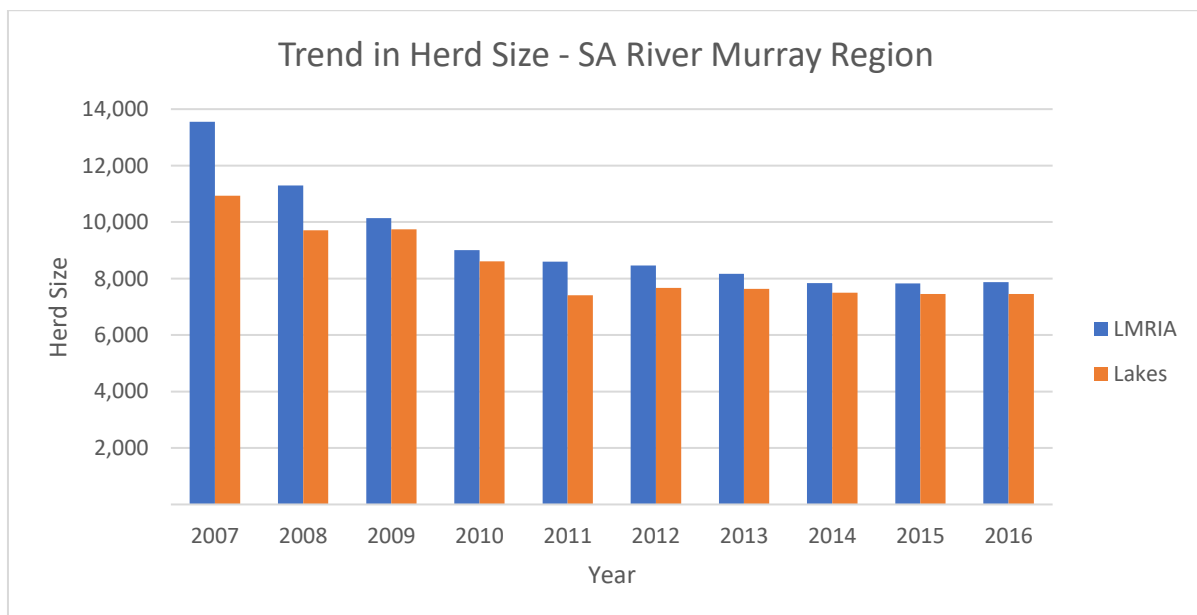


## Size of herds



Graph 2: *Trend in Herd numbers, SA River Murray Region*, Source: DASA

DASA identified cow numbers in 2005/2006 in the SA River Murray Region were 26,913 and by 2015/2016 had reduced to 15,331 a reduction of 43%. Post 2006 the DASA separately identified data between LMRIA and Lakes, Graph 3 illustrates this.



Graph 3: *Trend in herd numbers between LMRIA & Lakes*, Source: DASA

## Farm Area and Intensity

The following provides information on whether farms are becoming more or less intensive in regard to land use per head.

Of the 33 surveyed farms, eight LMRIA and nine Lakes farms (17) have not changed the farm area since 2005 while eight LMRIA and three Lakes farms (11) have expanded, including two farms that have purchased more than 1000 ha and nine farms that purchased less than 1000 ha. Five LMRIA farms have reduced landholdings each having sold less than 300 ha.

When asked about their farming system three farmers that increased land area had also converted from a pasture based feeding system to a Partial Mixed Ration (PMR) system while one had converted to a Total Mixed Ration (TMR) system. The additional land purchased by farmers was chosen to provide home grown feed for the dairy herd. One farm has reduced land area but has increased the herd and production through a focus on increasing productivity on the remaining land in a pasture based system.

Conversations with those surveyed highlighted that there has been no “one size fits all” approach to farming since the Millennium Drought. Each farm has evolved based on a range of factors including:

- existing farming system preferences;
- existing resources such as availability of dryland/cropping areas and haymaking equipment;
- milk company supplied;
- succession options; and
- access to government grants.

As water is removed from land through trade or previously irrigated land being purchased “dry”, the land in the LMRIA is no longer permanently irrigated. Grazed pasture was historically expected to be able to achieve a stocking rate of 5-6 cows/acre (12-14 cows/hectare). Today farmers are seeking to optimise the use of the water that they have through a range of approaches and mix of options.

These include:

- moving from clover ryegrass pastures to lucerne based pastures;
- startup and finishing irrigations of winter rainfed crops or pastures; and
- use of fodder crops for cut and carry systems.

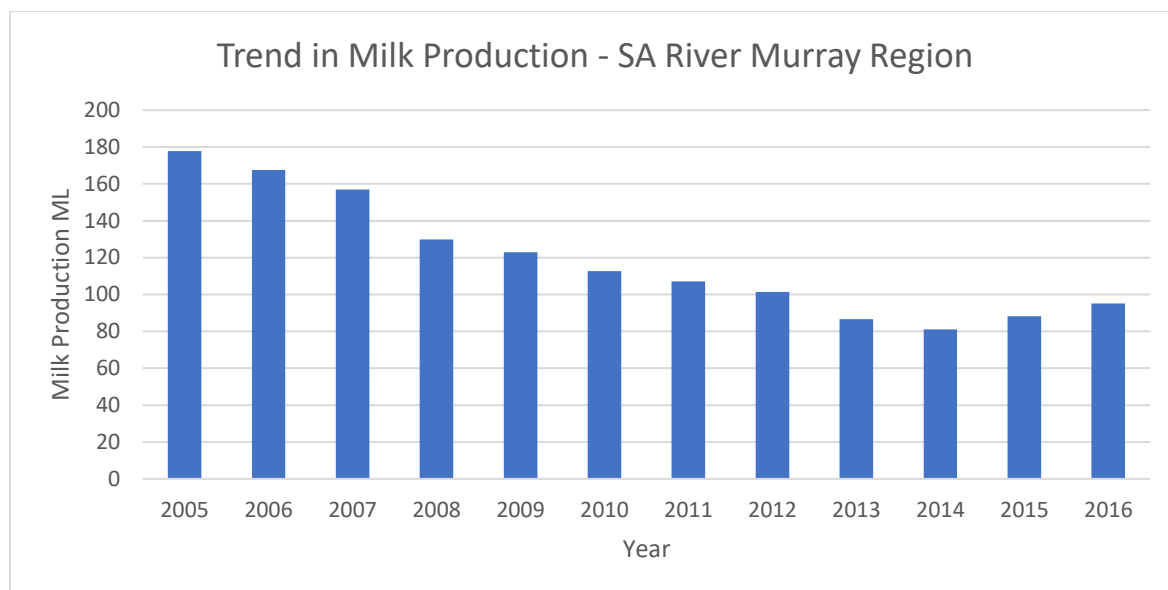
These changes have not led to a consistent change in the stocking rate in the LMRIA, with almost equal numbers of farms intensifying their system as have stayed the same or de-intensified.

Ongoing cost pressures are significantly impacting dairy businesses. Power price increases on pumped irrigation systems have led to farmers exploring new and novel approaches that get the best return from tight margins. *“We have yet to find the sweet spot following the drought”*



## Milk production

Milk production based on the DASA per cow averages for the central region were 2005/2006, 167.6 ML and 2015/2016, 95 ML a decrease of 43%.



Graph 4: *Trend in Milk Production*, Source: DASA

Of the 32 farmers surveyed, milk production from the surveyed farms on the River Murray has dropped from 40.13ML to 37.19 ML while Lakes production (including Wellington) has dropped from 45.8 ML to 34.36 ML from 2005/2006 to 2015/2016. Farmers noted that 2008/2009 was their lowest production and at least four farms that ceased milking completely during the drought have now resumed production.

## Number and location of factories

The SA River Murray Region is supported by large factories in Adelaide (Clarence Gardens, Salisbury and Mile End) and locally at Murray Bridge and Jervois. In 2005/2006 one farm also processed milk on-farm under the Murray Valley Cheese Company label.

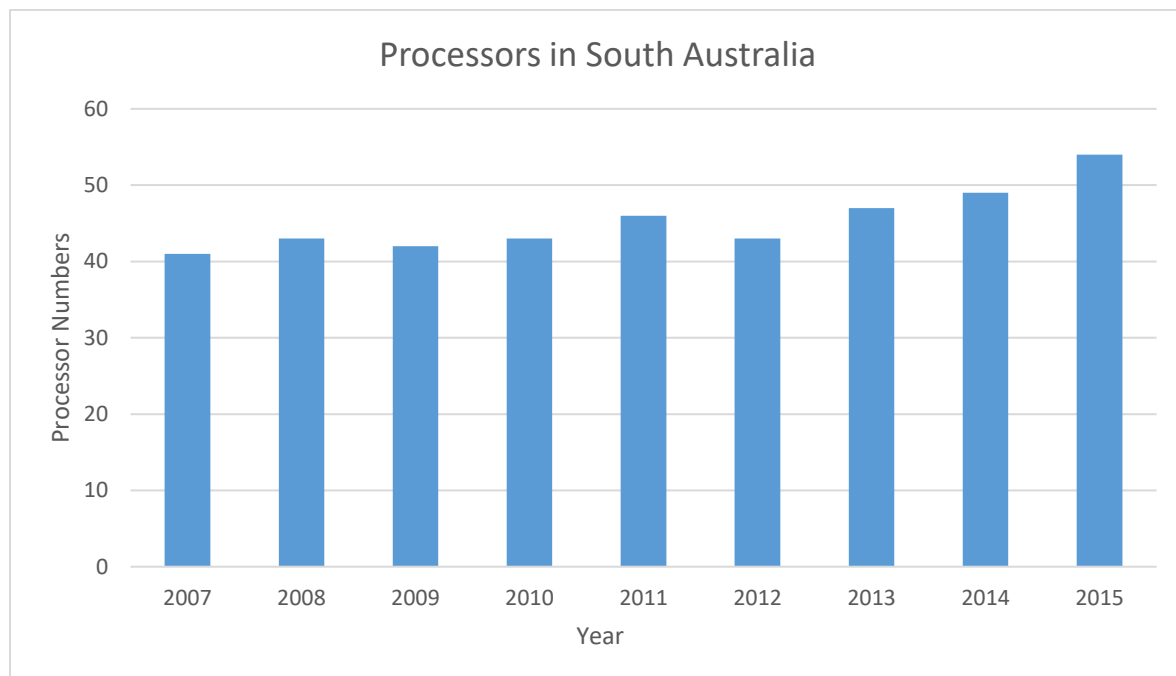
Farmers surveyed reported that in 2005 they predominantly supplied Lion or Dairy Farmers with milk processed in Adelaide, Murray Bridge or Jervois. DASA notes that 2005 was the first year that Warrnambool Cheese and Butter gained milk supply from SA. From the current survey two farmers reported for 2005 they were supplying Warrnambool and two others were supplying the small organic/biodynamic processor, BD Farms Paris Creek.

National Foods purchased Dairy Farmers in 2008/2009 and on sold the Clarence Gardens processing site to Parmalat. Murray Valley Cheese Company ceased operating as a dairy processor in 2010/2011. In 2011/2012 Lion/National Foods sold the Murray Bridge and Jervois plants to United Dairy Products (UDP). UDP closed the Murray Bridge and Jervois plants in April 2015. In August 2015 Beston Global Food Company purchased both plants and planned to reopen them. The operations have since been restructured in order to focus on manufacturing of premium dairy products, and

move away from bulk commodity products as was previously the case. At the re-opening of the plants in December 2015 it was noted that Beston’s had re-employed 35 staff and planned to increase this to 60 within 12 months.

In 2014/2015 a buffalo milk farm commenced milking on the LMRIA.

Smaller processors play a significant role in the industry in SA. The two major processors have grown to 18 processors that purchase their milk direct from the farm; the remaining processors are smaller enterprises that do not receive milk direct from farm but are supplied by another processor.



Graph 5: *Processors in South Australia*, Source DASA

By 2017 the 32 farmers surveyed supplied seven different companies, up from four in 2005. Companies supplied now are Lion Dairy and Drinks, Dairy Farmers Milk Cooperative, Warrnambool Cheese and Butter, La Vera, BD Farms Paris Creek, Beston Pure Foods and Parmalat. This reflects the significant change in the processing industry in SA since 2005.

## Water Allocations

### Background to SA Dairy Water Allocations

In 2005 all irrigation allocations for dairy in South Australia were “Class 3A”. Historically, Class 3A water access entitlement holders have generally received a 100% allocation if South Australia's full State Entitlement Flow has been received. Prior to the Millennium Drought these allocations were seen to have a reliability of around 90% with the Minister and the irrigation district having powers under the Irrigation Act to restrict allocations based on volume and quality considerations.



Currently 100% allocations against Class 3A (or equivalent) water access entitlements have been declared in 82% of years (or 31 out of 38 years) since 1975-76 (when licensing of the South Australian River Murray Prescribed Watercourse commenced).

The current draft *Water Allocation Plan (WAP)* has highlighted the intent to change the name of Class 3A water to Consumptive Pool E; this change is required to be consistent with current legislation and is administrative only.

The Lower Murray Reclaimed Irrigation Areas have an additional entitlement known as Environmental Land Management Allocation (ELMA), or Class 8. This water was first separated from Class 3A allocations in the LMRIA by the 2002 *WAP*. At this time Basin Cap negotiations saw 22.2GL of water used in the LMRIA removed from Class 3A to become Class 8. In effect this meant that irrigators in the region were able to continue to use Class 8 water but were not able to trade the water as it is ultimately held by the Minister rather than a private allocation. Under the current draft *WAP* Class 8 will become ELMA.

## Dairy Water Ownership by Entitlement and Volume.

Dairy water ownership data between 2005 and 2017 was unable to be sourced through the project. The reasons for these included issues with privacy for individuals and all irrigation entitlements being Class 3A which meant ownership by industry could not be identified. Entitlement data for the whole of SA is available but did not identify the region from which sales have occurred.

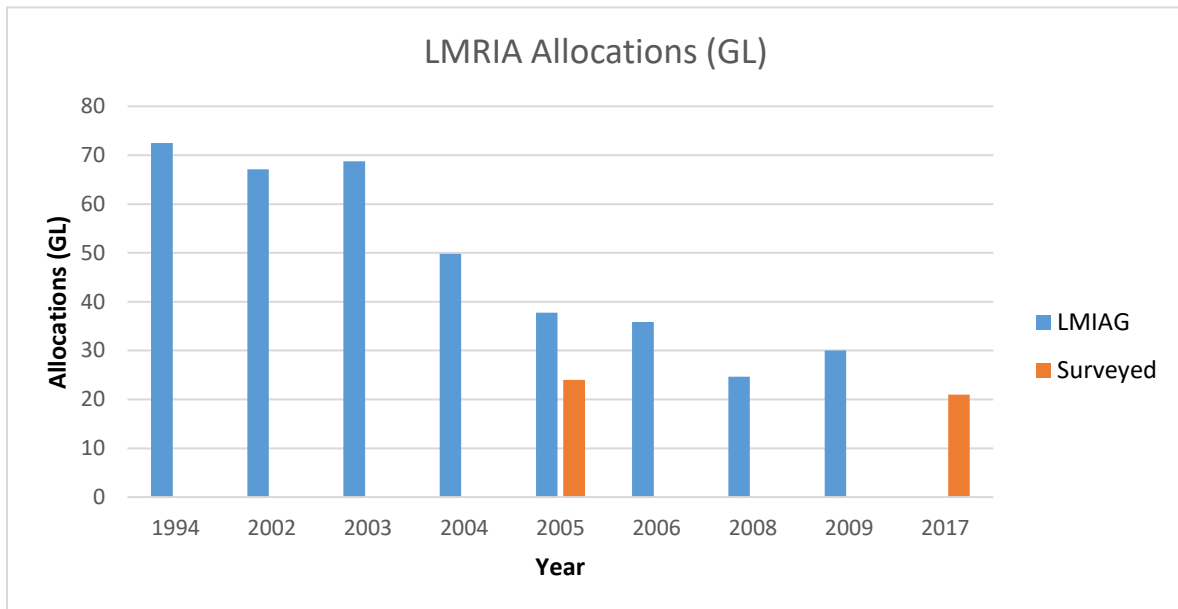
The MDBA provided information to the July 2017 River Murray Advisory Committee (RMAC) meeting that summarised recovered volumes from SA, shown in the table 1 below. From this data 21,960ML left the LMRIA prior to the *Basin Plan* (Lower Murray Irrigation (LMI) 1994 volume of 72,481ML – 50,521ML MDBA pre Recovery Volume for Mannum, Murray Bridge and Taillem Bend). Note: it is impossible to ascertain the volume of water from other (non-dairy) enterprises that may be included in these figures. A further 11,655ML has been recovered from the LMRIA (Mannum, Murray Bridge and Taillem Bend) by the *Basin Plan*; 3,570 ML has been removed from the Lakes as a result of the *Basin Plan*.

Nominal 3a entitlements	Basin Plan Recovered Volume (ML)	MDBA Pre-recovery Volume (ML)	(%) Reduction in volume
Mannum	4,260	11,386	37
Murray Bridge	5,508	31,037	18
Tailem Bend	1,887	8,098	23
Lower Lakes	3,570	29,077	12
Total	15,225	79,598	19

Table 1: *Recovered volumes under the Basin Plan*

Lower Murray Irrigation Action Group records provide LMRIA Allocations (including ELMA) from 1994 to 2009. In 1994 there were approximately 120 dairy farms in the LMRIA irrigating approximately 4200 ha. Philcox and Scown (2012) identified that by 2012 there were approximately 47 actively irrigating enterprises comprising 3,192 ha in total; 25 of these enterprises were dairy farms. Since 2012 there has been less change in the LMRIA than prior to 2012.

The LMIAG data shows that the volume of water allocated to the LMRIA decreased by 58.6% from 1994 to 2009. Graph 6 compares the LMRIA data with allocations noted by the 20 surveyed farmers who provided water allocation information for the period 2005 to 2017.

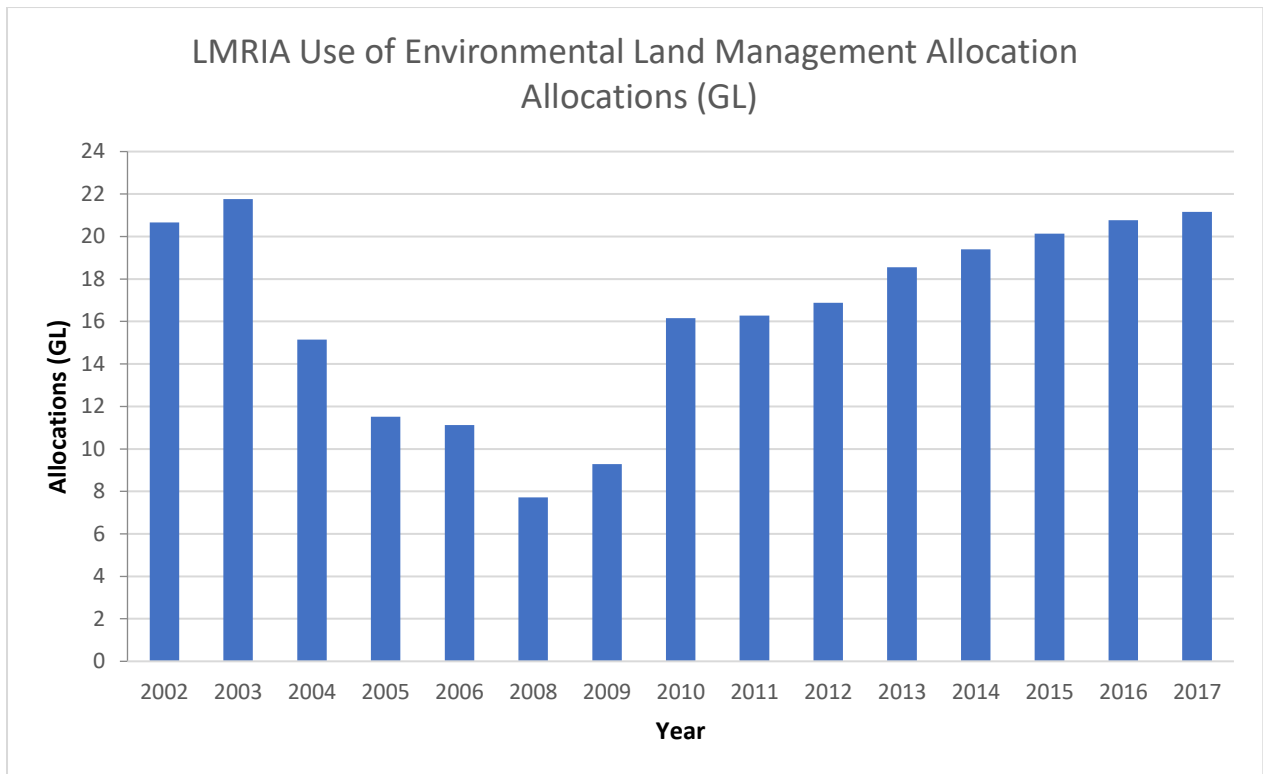


Graph 6: LMRIA Allocations

As ELMA is a separate water class (Class 8), water licencing data was able to be queried with respect to ELMA use.

Water licencing data was only available post 2009 due to changes in records management however the graph below when combined with Lower Murray Irrigation Action Group (LMIAG) data does provide an indication of the change in use of ELMA from 2009 until 2017 as the region has returned to irrigation following the drought. It also highlights that ELMA is now almost fully utilised.





Graph 7: Source Data 2002 -2009 LMIAG and 2010-2017 River Murray Prescribed Watercourse usage summary 2015/2016 and 2016/2017 (until 21/03/17) by Department of Environment, Water and Natural Resources is licensed under Creative Commons Attribution 4.0

### Farmer Survey Water Holding and Allocations Results

The 20 LMRIA farms surveyed in 2017 held approximately 17.12 GL of water (not including ELMA) across 1932.5 ha of reclaimed areas in 2005/2006. In 2011, Philcox and Scown (2012) surveyed 21 dairy enterprises identifying 1696 ha of reclaimed area representing approximately 16 GL of allocated water (not including ELMA). In 2017, the 20 LMRIA dairy enterprises surveyed by DairySA for this report held approximately 12.0 GL of water (not including ELMA) across 1895.5 ha of reclaimed area. Thus, for the surveyed farmers that remain in dairy water holdings in the LMRIA have decreased by approximately 40% since 2005/2006.

These dairy enterprises also held 439 ha of irrigated highland with 1.582GL of allocation in 2005/2006. Scown and Philcox identified approximately 344 ha of irrigated highland in 2012. By 2017, it was 287 ha and 1.057 GL of water, demonstrating that area irrigated and water holdings for highland irrigation have also continued to decline.

The four remaining dairy irrigators on the lakes surveyed for this project held 4219 ML in 2005/2006 and in 2017 1198ML.

## Volume of dairy water sold

A total of 6,763 ML has been sold by 18 of the 32 farmers surveyed.

		2005/2006	2017	Change	Total Change
<b>LMRIA</b>					
	Swamp	15,389	12,935	-2,454	
	ELMA	7,696	7,733	37	
	Highland	1,582	1,057	-525	-2,942
	Stock and Domestic	106	106	0	
<b>Lakes</b>					
	Irrigation	5,025	1,204	-3,821	-3,821
	Stock and Domestic	85	85	0	
<b>Total SA River Murray Region</b>		29,883	23,120	<b>Nett Change</b>	-6,763

Table 2: *Permanent Water Holdings* (survey participants) ML

Water was sold the following ways:

- Six irrigators sold water to other irrigators,
- Two sold water to companies or individual water holders,
- Four to the SA Government or environment without infrastructure upgrades,
- Seven to SARMS 3IP (South Australian River Murray Sustainability Program, Irrigation Industry Improvement Program)
- Five to the OFIEP (On farm Irrigation Efficiency Program).

The final round of SARMS 3IP projects has yet to be announced and some farmers are also interested in the COFFIE (Commonwealth On Farm Further Irrigation Efficiency) Pilot program so further sale of water from the region is likely.

## Water Allocations through the Drought

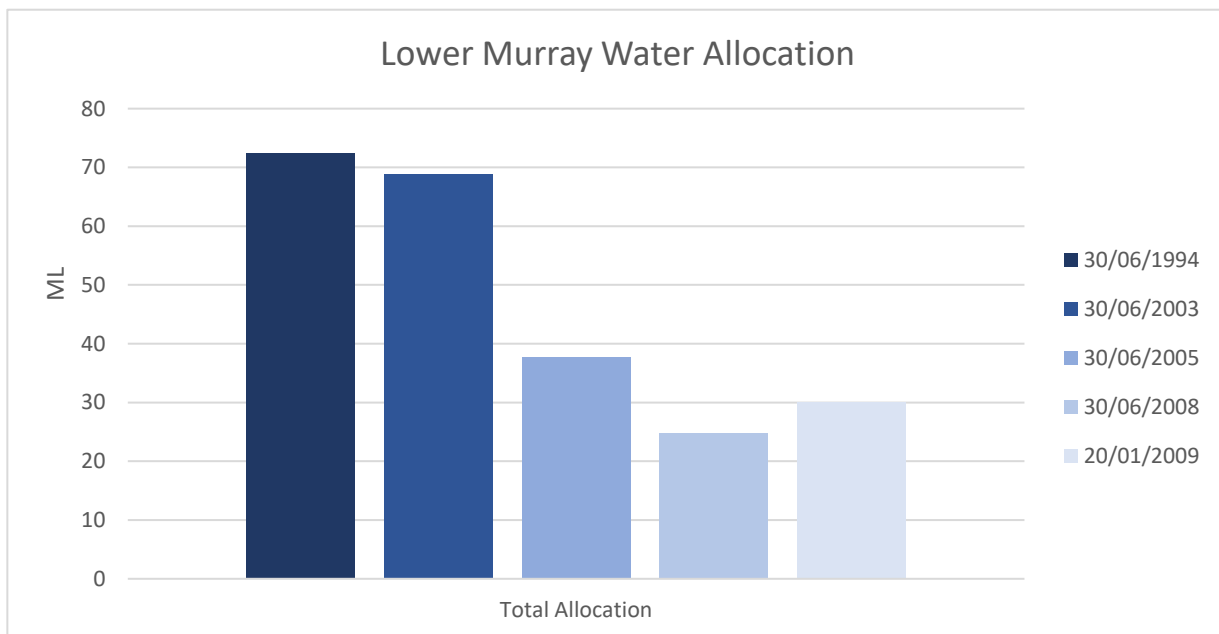
For South Australia it is important to note that the impact of the Millennium Drought was first felt through dryland areas in the region in 2002/2003. The following water year was the first occurrence of water restrictions with allocations starting at 65% and finishing at 95%. Table 3 shows the South Australian River Murray Irrigation Allocations from 2002/2003 until 2016/2017.

Year	Date	Jul (%)	Aug (%)	Sep (%)	Oct (%)	Nov (%)	Dec (%)	Jan (%)	Feb (%)	Mar (%)	Apr (%)	May (%)	Jun (%)	Annual Flow to SA (gigalitres)
2002-03	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	1,798
2003-04	15 <sup>th</sup>	65	65	75	75	95	95	95	95	95	95	95	95	2,080
2004-05	15 <sup>th</sup>	70	70	90	90	90	90	95	95	95	95	95	95	1,850
2005-06	15 <sup>th</sup>	70	70	82.5	100	100	100	100	100	100	100	100	100	2,397
2006-07	15 <sup>th</sup>	80	80	80	80	60	60	60	60	60	60	60	60	1,404
2007-08	15 <sup>th</sup>	4	13	13	16	16	32	32	32	32	32	32	32	960
2008-09	15 <sup>th</sup>	2	2	6	11	15	15	15	18	18	18	18	18	1,180
2009-10	1 <sup>st</sup>	2	5	10	25	46	48	48	48	55	62	62	62	1,692
	15 <sup>th</sup>	2	5	16	34	48	48	48	55	62	62	62	62	
2010-11	1 <sup>st</sup>	21	31	41	67	67	67	67	67	67	67	67	67	15,217 (drought broken by high flows)
	15 <sup>th</sup>	24	34	63	67	67	67	67	67	67	67	67	67	
2011-12	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	10,250
2012-13	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	6,972
2013-14	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	3,568
2014-15	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	2,886
2015-16	1 <sup>st</sup>	100	100	100	100	100	100	100	100	100	100	100	100	2,520
2016-17	1 <sup>st</sup>	36	89	100	100	100	100	100	100	100	100	100	100	
	15 <sup>th</sup>	52	100	100	100	100	100	100	100	100	100	100	100	

Table 3: South Australian River Murray Irrigation Allocations from 2002/2003 until 2016/2017, Source: DEWNR

At Jervois, 2003/2004 saw significant levels of water trade out of the district occur which continued through the drought. A similar level of trade was experienced by other districts at this time.

Graph 8 shows that change in water allocation in the LMRIA from 1994 until 2009 (source LMI).

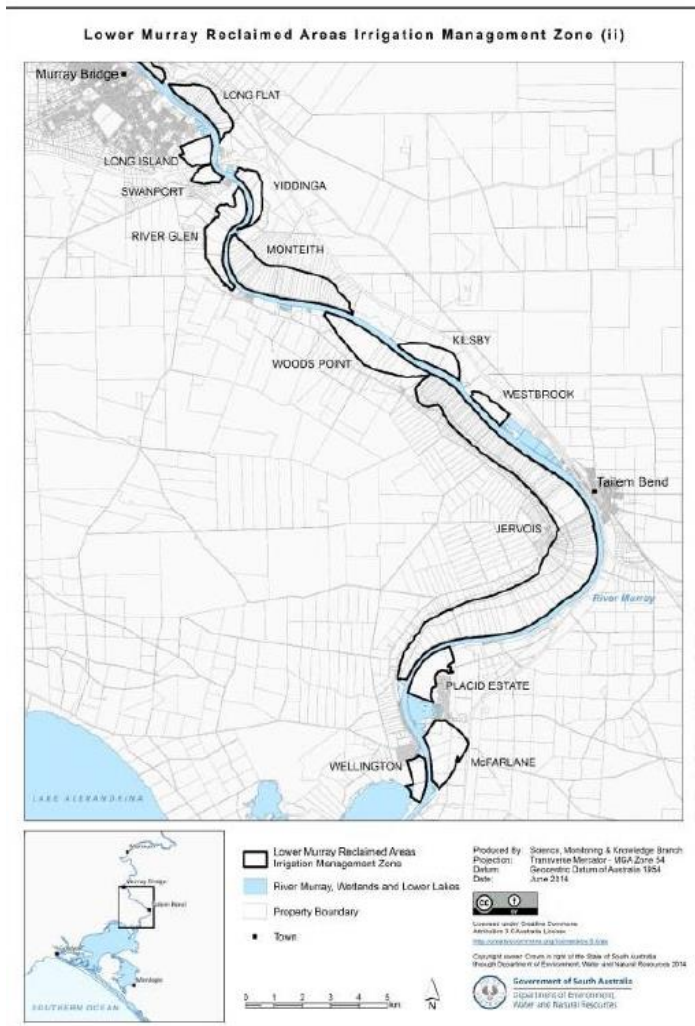


Graph 8: Change in water allocation in the LMRIA from 1994 until 2009

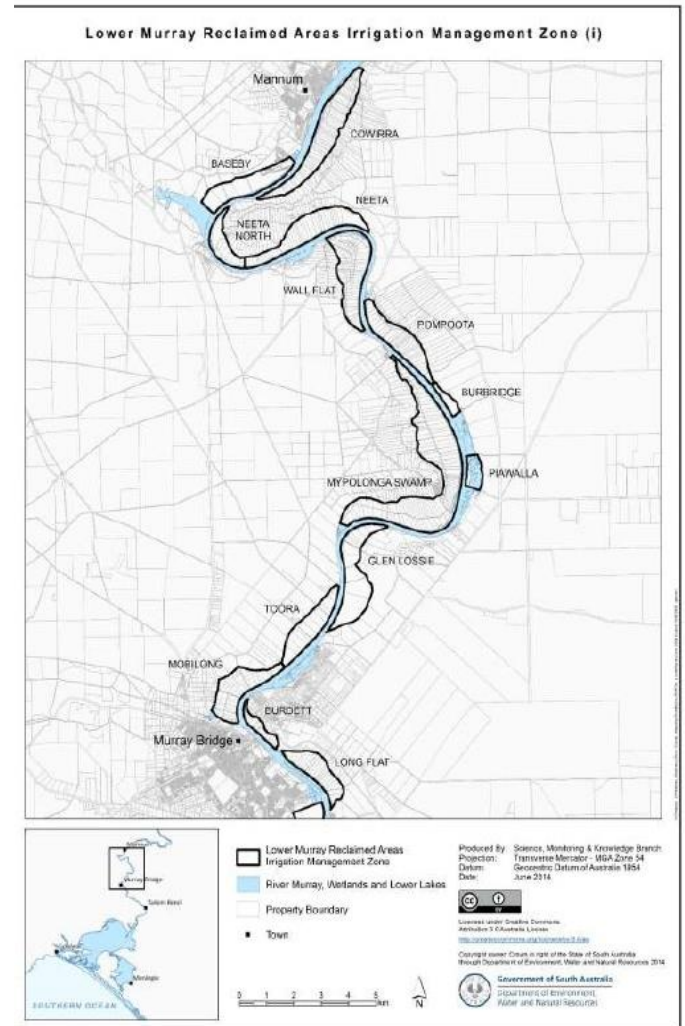


## Water Allocations

The Water Allocation Plan (WAP) for the River Murray Prescribed Watercourse (2011) describes the policy of water allocations for the River Murray in SA. The Lakes dairy industry fall within the River Murray Irrigation Management Zone while the LMRIA farms swampland falls within the Lower Murray Reclaimed Areas Irrigation Management Zone and highland in the River Murray Irrigation Management Zone.



Map 7



Map 8

Map 7 and Map 8 show the Lower Murray Reclaimed Areas Irrigation Management Zone.

In the River Murray Irrigation Management Zone, the WAP requires that water shall only be used for irrigation where it achieves a water-use efficiency of no less than 85%. In the Lower Murray Reclaimed Areas Irrigation Management Zone the WAP is more prescriptive requiring that water shall not be applied at a rate greater than 13.92 ML per hectare per water-use year over the authorised area. Water shall only be used for irrigation where it achieves a water-use efficiency of no less than 65%. In these areas the WAP also describes the use of the Environmental Land Management Allocation (ELMA).

## ELMA - Environmental Land Management Allocation.

ELMA as described in the WAP is an allocation that remains allocated to irrigation districts within the LMRIA at the volumes described in the WAP (see table from the WAP (2011) below)

Irrigation Area	Rate (ML/Ha)
Cowirra	6.49
Baseby	6.44
Neeta	6.23
Neeta North	6.14
Wall Flat	6.06
Pompoota	5.86
Mypolonga	5.50
Burbridge	5.37
Paiwalla	5.15
Glen Lossie	5.10
Toora	4.87
Mobilong	4.68
Burdett	4.56
Long Flat	4.46
Long Island	4.22
Swanport	4.15
Yiddinga	4.13
River Glen	3.98
Monteith	3.87
Kilsby	3.61
Woods Point	3.58
Westbrook	3.46
Jervois	2.96
Seymour	2.33
Finniss	1.38

Table 4: *Rates of the water referred to in Principle 4(b) ELMA, As per the 2004 amendments to the River Murray WAP to the 2002 plan*

These allocation levels saw the 22.2GL of ELMA allocated to parcels across the region. Following the sale of transferable allocations many of the LMRIA farms now rely heavily on ELMA to maintain the reclaimed areas.

### Types of government-funded infrastructure upgrades

Government funding for infrastructure has been used in a variety of ways through the surveyed region. This includes:

- The majority of funding has been used for drought recovery activities such as reinstating channels and relasering land to enable irrigation to resume.
- channel lining and pipe and riser systems.
- Upgrading pressurised centre pivot irrigation
- Two farms established shed based, TMR systems and compost barns.
- One farm business used the funding for a new dairy shed and feedpad.

## Reliance on temporary water market to meet current production needs

The region has taken a relatively conservative approach to water holdings with most farms holding their own permanent entitlement to support the farm business. Three of the businesses that utilise temporary trade of water noted that they had strategies in place to manage the business risk posed by their approach. One farm utilising temporary water for irrigation was concerned that demand from other industries influenced the cost of water for them and that at above \$100/ML it becomes unaffordable.

Of the farmers surveyed nine had no reliance on temporary trade and 12 others noted that they trade out unused water at the end of each season. Three farms used temporary trade for purchasing irrigation water seasonally.

In the lakes a number of farms use temporary water for stock and domestic purposes to reduce the volume of SA Water supplied potable water to the farm and the subsequent cost of stock and domestic water to the farm.

## Changes in irrigation practice and productivity

The legacy of the drought is still top of mind for many of the region's dairy farmers and their key issues relate largely to their experiences during the drought.

*"It's the effects on the district, we have less farms, fewer kids and less services,"* Lakes farmer.

*"Our area is still recovering from the zero allocation during the drought which had a dramatic impact on the environment with some fauna only just re-emerging eight years on. There was also significant damage to infrastructure which is irreparable and needs to be replaced at a huge cost to us,"* LMIRA farmer.

However, those that remain had a relatively positive view: *"There is a bit more community positivity now, but dairy will never come back. The remaining farmers are all trying to grow too so this is a positive,"* Lakes farmer

*"My son wanted to come back to the farm, it has re-energised me."*

The Basin Plan was seen to have a place in providing future water security *"We lose water under the Basin Plan to improve the reliability of the remainder; we hope that the Plan will achieve this"*

This security of water supply backed decisions to reinvest in the region following the drought. Two LMIRA farmers highlighted that allocation security was important to their business *"The Basin Plan had been agreed, we need to stick to it."*

One farmer raised concern that the Basin Plan did not consider the potential impacts of climate change.

Two Lakes farmers highlighted the need for a sustainable balance between environmental flows and irrigation water allocations, recognising that the Basin Plan is an attempt to achieve this.



## Water productivity

Most surveyed farmers did not record water productivity as t DM/ML or ML/ha used over the season. Those surveyed felt that they were confident that productivity could meet herd requirements when water was not restricted. Some noted that they were now irrigating more land with less water. Of those who were able to provide productivity estimates one farm now uses 1.5ML/ha annually in a rainfed “top-up” system. Others noted that they use between 1 and 3 ML/ha/watering. Two farms estimated that they were producing 2.5 t/DM/ha, one estimated a total of 7.5 t/DM/ha and one farm has achieved a pasture utilisation of 21 t/DM/ha.

## Critical water issues/concerns:

*“Critical issues regarding the Basin Management is that the environmental flows keep coming. River health has improved so much since the government has taken this seriously. Our family have been here since pre-barrage days and we saw the effects of continual over depletion of the critical base flow the river needs to remain healthy”.*

Water access was the most critical factor identified by surveyed farmers with 16 LMRIA farmers and six Lakes farmers specifically noting it. Related to this LMRIA farmers also identified pool level maintenance (9) as an issue for them with irrigation flow rates and consequently irrigation production efficiencies reduced when water levels drop. The manipulation of water level below Lock 1 were also of concern in relation to the potential for damage to the levee banks.

*“We can’t afford to go back to -1.5m AHD, we have had to rebuild irrigation infrastructure and relaser to repair the damage done, we can’t keep absorbing these costs or trading water for funds to do the work”*

Even the surveys of key community people identified that there is really no substitute for flow in this region. There is concern that the 10% of time when Basin Plan is unable to deliver on its objectives in the region there will be impacts not only on farmers but also on the urban community as the impacts of water level and quality are felt locally.

In the LMRIA eight farmers identified that access to ELMA is an important issue for them. ELMA not only provides environmental benefits in terms of salinity and acid soils management but also assists in maintaining hydration of the levee banks. When the river level falls three farmers surveyed specifically identified the need to maintain the levees as an issue for them. Five LMRIA farmers identified the need to maintain the land and three mentioned the need to maintain the environmental health of the land. One farmer noted that there needed to be incentives in place to encourage wider use of ELMA in the region to improve the health of the land.

## Water quality in the LMRIA and lakes

### Salinity concentrations in lakes

Five lakes farmers specifically identified that water quality was of concern to them. Two noted that whole of system flushing flows are required to assist the lakes. *“We need the environmental flows to keep coming,”* said another. One respondent believed that the water level manipulation in the lakes was not effective in managing water levels.

Five LMRIA farmers also identified water quality as an issue for them but rather than only salinity being top of mind they also mentioned blackwater and acidity.

### Acidity in the LMRIA

The issue of acidity in the LMRIA is linked to future water level in the river in two ways:

- Maintaining river level also maintains the groundwater table above the majority of acid bearing soils reducing the opportunity for oxidation of the soils.
- Ongoing irrigation of the land keeps the soils wet, reduces cracking and reduces the risk of oxidation of the acid bearing soils.

ELMA plays an important role in the future management of acid soils. The use of ELMA will help to maintain soil moisture levels. During the Millennium Drought ELMA use was restricted in line with class 3A irrigation allocations leading to the soils drying and acidifying.

At this stage SA drought allocations policy would see ELMA continue to be restricted in line with irrigation allocations leading to the potential for further acidification of the region in future droughts. Placing an increased value on the application of ELMA to minimise acidity during drought by not restricting ELMA use when possible has the potential to reduce soil acidification and the subsequent impacts on river water quality.

One farmer was concerned that the volume of ELMA allocated at the southern end of the region was not enough to meet the environmental needs of the land; they encouraged the consideration of redistributing unused ELMA in order to improve the land management benefits and system resilience. Others surveyed noted that ELMA needs to be applied and that there were negative impacts on their land when ELMA was not applied on neighbouring blocks.

DEWNR is currently conducting a review of ELMA.

## EIS for a canal or pipeline connecting southern Lake Albert to Coorong to improve water exchange

Six lakes farmers and one LMRIA farmer mentioned that the Lake Albert to Coorong interconnector was needed to improve flushing of Lake Albert. One farmer specifically identified that without removing the flow constraint at the Narrung Narrows there would be little additional benefit of the connector. *“The connector would only be a band aid unless the Narrows are addressed.”*

The community surveys noted that while a connector was not a politically preferred option there was a need to complete the EIS in order to in effect “put the issue to bed”. An EIS would allow the community to review the costs and benefits, and provide a basis for the finalisation of the proposals future.

### **Upgrading and automating the barrages to improve water flow to the sea, particularly when lakes are high.**

Survey participants reported the need for the barrages to be upgraded to

- address sea level rise,
- automated to allow better management of salt water intrusion,
- flush of salinity from the lakes and
- Support the passage of fish

There was a suggestion to consider upgrading the barrages in conjunction with consideration for tourists to access the barrages and travel between Meningie and Goolwa, it was felt that this would provide additional socio-economic benefits.

The community survey respondents noted that some of the barrage gates had been automated leading to improved management potential however improvements to date had not recognised the longer term impacts as a result of climate change and sea level rise.

### **Addressing impediments to water exchange through the Narrung Narrows**

Five Lakes and one LMRIA respondent identified the need to address the impediments to flow created by the Narrung Narrows.

The LMRIA farmers noted that local knowledge was needed to ensure barrages and narrows works to improve the health of the lakes were effective.

Community survey respondents reported that this issue needed to be considered in a holistic way, with other potential changes to Lake Albert level and water quality management. There was a feeling that lakes management had improved water quality following the drought but the response was slow and a comprehensive investigation of alternative options would be valuable rather than relying on experiences and actions to date.

### **Maintaining minimum water levels in the lower Murray River to maintain access for pumps**

Farmers requiring water access wanted the water level to remain suitable not just for pumping but also for ongoing gravity feed of irrigation water where it had historically been available. *“In poor years we may see 0.5m AHD but we don't expect it in a good year when we have entitlement flows.”* Importantly nine LMRIA farmers and one lakes farmer noted that lower river levels in 2017 (less than

0.5m AHD) had reduced irrigation efficiencies. This has occurred through increased irrigation time resulting in significant waterlogging of pastures or reduced ability to access water. DEWNR is conducting a project to consider variable pool levels below Lock 1 but the proposals have not been communicated to irrigators in the region.

The potential construction of Lock 0 to maintain a pool in the river channel was mentioned by two farmers, one for the Lock and one against.



Photo 1: Low river levels (around 0.5m AHD) in 2017 coincided with stormy conditions seeing water levels drop significantly. Source: Lakes farmer

### **Cost of water and impact on farm businesses**

All lakes stock and domestic users surveyed highlighted the need for water access from the lake in order to supply stock and domestic water at an affordable cost. These farmers also sought to reduce their reliance on volatile temporary water prices by securing permanent allocation if possible.

### **Maintenance of the Murray Swamps and levy banks as properties fall into disuse (impacts on adjoining land owners)**

*“You don't want a salty mess, no one will maintain the land for nothing but if ELMA kicks an environmental as well as a productivity goal it is good value for money.”*

### **Potential sources of the 450 GL upwater if no more is recovered from irrigators in the southern Basin.**

*“Pure buybacks will give the farmer the money to invest without the consultants needing to take a cut.”*



Four lakes farmers and three LMRIA farmers did not have a response to this question, they felt that they were generally not well enough informed to answer. Others suggested use of the Adelaide desalination plant to reduce reliance on River Murray Water at all times not just during drought could assist. Other suggestions were enhanced stormwater reuse in urban areas, seeking savings from industrial users, achieving environmental offsets, on-farm irrigation efficiencies and buybacks.

The general feeling from respondents was that participation should be voluntary so that the landholder can choose an option best suited to the farm business: *“The water is there if the price is right”*. Some surveyed mentioned that access to funding such as SARMS 3IP had not been available to all farmers and that all farmers should have the opportunity to participate.

To date Eastern Mt Lofty Ranges farmers particularly have not had access to irrigation infrastructure improvement funding despite being part of the Basins ground and surface water system. In the past these farmers have requested the opportunity to access funding but this has not been forthcoming.

It is important to note though that for each farmer that was open to water buybacks there was another farmer that was opposed to it: *“We have already given enough”*.

Management of constraints and better use of environmental water was also raised. It is likely that as constraints are relaxed, achieving environmental flows to the Murray Mouth will become easier and result in a more resilient ecosystem. However, reducing constraints will not address the farmers’ key concerns of water availability and quality in low flow periods and this was recognised by the respondents.

A number of respondents reiterated that whatever is done, water must still flow to the lakes and the water level in the lakes must not be changed to account for the need for more water

## **The Eastern Mount Lofty Ranges**

While the Eastern Mt Lofty Ranges (EMLR) are part of the Murray Darling Basin in South Australia, dairy farmers and irrigators in this region have not had access to funding to upgrade infrastructure to this time.

In 2017 the “Flows for the Future” program commenced to recover water to contribute to the Basin Plan. This project is based on the premise that many water catchments in the EMLR are in poor condition, with some parts going without flowing water for longer periods than in the past.

Flows for the Future seeks to re-establish more natural water flow patterns in streams affected by water capture in the EMLR. The Australian Government and South Australian Government are investing \$13.48 million in the program. The investment will provide funds and technical expertise to landholders at priority sites for the supply and installation of devices designed to pass low flows through their property. The aim is to secure 560ML through the project.

While the project seeks to recover water for the *Basin Plan* it does not address the need identified by EMLR farmers for access to funding for irrigation infrastructure upgrades.

## Linkages

AACM Kinhill (1997) Restructuring and Rehabilitation of Reclaimed Swamp Irrigation Areas Report

DairySA (2102) LMRIA SUSTAINABLE SOILS PROJECT - SUMMARY OF CURRENT PRACTICES. Project: DSAadaff0212.

Water market drivers in the southern MDB: Implications for the dairy industry  
Report by Aither Pty Limited for Dairy Australia, 29 July 2016.

*Basin Plan*: GMID socio-economic impact assessment  
Report by RMCG for GMID Water Leadership Forum, September 2016

Land Use Mapping in the GMID  
Report by GBCMA, with project funding partners DELWP, DEDJTR, Dairy Australia, GMW, GMW Connections, NCCMA. Release pending March 2017.