



MURRAY **FUTURES**

Lower Lakes & Coorong Recovery

The Coorong, Lower Lakes and Murray Mouth
Socio-Economic Report and Scenario Planning For
CLLMM Project

October 2009



Government of
South Australia

WATER  GOOD

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1. Introduction

The following report is a snapshot of some of the socio-economic issues that currently affect the Coorong Lower Lakes and Murray Mouth region of South Australia.

The purpose of the document is to present a mixture of quantitative and qualitative information from a wide range of sources as at April 2009 to inform the suite of management options for the planning of responses to the current crisis in the region.

It then presents threats to the current socio-economic baseline of the area via a range of long term management scenarios.

Benefits to the LTP of a socio-economic profile/investigation:

- Informs planning process by reporting non-environmental issues
- Provides baseline and snapshot information which identifies changes and trends
- Builds on the consultation strategy
- Informs the communication strategy
- Summarises current quantitative research
- Includes qualitative information from primary and secondary sources
- Contributes to scenario planning

2. Demographic Information

This section deals with the communities of interest that make up the CLLMM area. Most of this information is based on the current social and economic climate as at the 2006 Census.

Appendix 1 table presents this information in an easy to read format.

2.1 Local Government Areas

The Coorong Council- At the 2006 Census, the Coorong Council's population was 5,670 persons. The Indigenous population was higher than SA average at 5.5%. It had high proportions of people in the 0-4, 5-14, 55-64 and 65+, age groups. The median age was 40. The Ngarrindjeri language was spoken by 1% of the population. A higher proportion of the population than the State average was married or widowed. The unemployment rate was 4.6%, with a slightly higher proportion of those employed on a part time basis. The main occupations held were as managers (farm), labourers and technicians/trades people.

Sheep, beef cattle and grain farming comprises 26% of all industry in the area. Other industries include dairy cattle farming and school education. The income levels are lower than the State average. There are a higher proportion of couple families without children. There are a higher proportion of separate dwellings and "other" (caravans etc) dwellings. Residents pay low rents and low housing loans. A higher proportion of dwellings are fully owned, and there were a higher proportion of lone person households than the State average.

The Alexandrina Council is divided into two components, Alexandrina Coastal and Alexandrina Strathalbyn.

Alexandrina Coastal This area of the Alexandrina Council area covers the coastal portion of the council. This area's population was 11,510 persons at the 2006 Census. It is an area with an older age cohort, with the highest numbers of people in the 55-64 and 65+ age groups. Its median age was 48. The adult population had higher proportions of people married, separated/divorced and widowed. There were more people not in the labour force than in the labour force. These reasons may include they are retired, or looking after family. There was a higher part time employment rate than full time. The unemployment rate was reasonably high at 6.2%.

The main occupations were technicians/trade workers, labourers, managers (farm) and professionals.

The main employing industries were school services, cafes and restaurants, takeaway food, and residential care. The residents had low incomes. A high proportion of residents were couple families without children- reflecting the high proportion of older people. A high proportion of dwellings were separate houses with a high proportion fully owned. Reflecting the older age group, a higher proportion of living arrangements were as lone person households.

Alexandrina Strathalbyn is the area in the hinterland of the council region of Alexandrina Council. Its population at the 2006 Census was 9,203 persons. There were high proportions of

persons aged 5-14, 55-64 and 65+. The median age was 42. Adults tended to be married or separated/divorced. There was higher part time employment than the state average. The unemployment rate was low- at 3.7%. The highest proportion of employment was as managers, labourers, and professionals. Major employing industries were fruit and tree nut growing, sheep, and beef cattle and grain farming. The income levels were low, but not as low as some towns/areas in the region. There were a higher proportion of couple families without children.

14% of dwellings were unoccupied private dwellings. These could be holiday homes. Most dwellings were separate occupied houses. Both the rents and mortgage repayments were lower than SA average. A higher proportion of dwellings was fully owned or being purchased. Household structure was mainly family households.

Murray Bridge Council is a council area with strong links to the Coorong and Alexandrina councils. At the 2006 Census it had a population of 17,678 persons, making it the largest community in the Murray region. The Indigenous population made up 4.2% of the population. The highest proportions of residents were in the 5-14, 55-64 and 65+ age groups. The median age of the population was 39. Murray Bridge is a multicultural community. At the Census, the main languages spoken at home were English, Mandarin, Italian, Turkish, German and Arabic. More adults were separated/divorced and widowed than the SA average. There is a higher proportion of employed persons working part time. The unemployment rate was low- 2.8%. Over 40% of those eligible were not in the labour force- i.e. they are not looking for work – these reasons include they are retired, or looking after family.

The main occupations were labourers, managers, technicians/trade workers and clerical workers. The main employing industries were meat/meat product manufacturing, school education and supermarket/grocery retailers. The population had low incomes. There were a higher proportion of couple families without children and one parent families than the State average. Dwellings were mainly separate houses, but there were more semi-detached houses and flats than the surrounding areas. The population pays low rents and low mortgage repayments. There were equal numbers of dwellings owned, being purchased and rented. There were a higher proportion of lone person households than average. There was a higher proportion than State average of dwellings rented from the Housing Trust, which was 33% of all rentals.

2.2 Towns in the region

Lake Alexandrina Communities

Clayton is a small community of 463 persons, with no Indigenous population counted at the 2006 Census. It is an older community with a median age of 52. It has a higher proportion of the adult population either separated or divorced. The unemployment rate was 6.1%. A higher proportion than the State average work part time. Main jobs held are as labourers, managers (farm), and professionals. The main employing industries are sheep, cattle, and grain farming. The residents have low incomes. A high proportion of the population are couple families without children. The dwelling type is all separate houses, although almost half were unoccupied as many of these are holiday homes or rental properties. The residents pay low rents, and low mortgages. A high proportion of dwellings were fully owned or being purchased.

Goolwa – At the 2006 Census, Goolwa had 5,882 persons. It is the largest town in the CLLMM region. It has a small Indigenous population, with only 1.5% identifying as Indigenous. It is an older community, with a median age of 53. A high proportion of persons are married, separated/divorced or widowed. The majority of residents are not in the labour force- i.e. they are not looking for work – these reasons include they are retired, or looking after family. The unemployment rate was high- at 8.7% (the State average was 5.2%), more people were employed part time rather than full time. The highest proportions of jobs in the town were technicians/trade workers, labourers, community and personal service workers.

The main employing industries were school education, cafes, takeaway, residential care, and supermarkets. Employed people and the industries they work in are not necessarily in the Goolwa area. In comparison to SA, it is a low incomes area. There were a high proportion of couple families without children (empty-nesters). Most housing stock is separate houses, but there are some units/flats. Approximately 1/3 of dwellings at Census night were unoccupied – many of these are holiday homes or rental properties. A high proportion of dwellings were fully owned. The town had a higher proportion of lone person households, reflecting the older age group.

Hindmarsh Island is a small community with 689 persons counted at the 2006 Census. It has an older population with a median age of 55. There were no Indigenous persons counted. It has high proportions of people aged 55-64 and 65+. It also has high proportions of people who are either married, separated/divorced. Half of the residents were classified as not in the labour force i.e. they are not looking for work – these reasons include they are retired or looking after family. Of those employed, high proportions were employed part time. Main occupations were technicians/trades workers, professionals, managers, and clerical/administration.

Main industries people were employed in were building/installation, cafes, takeaways, and accommodation. Employed people and the industries they work in are not necessarily on Hindmarsh Island. The residents tended to be in the low income bracket, although their incomes were not as low as residents of Milang or Clayton. Seventy percent of the residents were couples without children, but in a family relationship, reflecting the older population. More than half the dwellings were unoccupied many of these are holiday homes or rental properties. Residents paid a high median rent, however most dwellings were fully owned.

Milang is a small community of 512 persons at the 2006 Census. Two percent of the population identified as Indigenous. It is an older community with a median age of 47. A higher proportion than the State average were separated or widowed. A higher proportion of residents were not in the labour force than in the labour force. This could mean that people have ceased looking for work, or they are retired or looking after family. The unemployment rate was high- 7.5% compared to the State rate of 5.2%.

The main occupations people were employed in were labourers, technicians, managers (farm). The main employment was in the fruit/ tree nut growing, hotels, taverns and bars, vegetable growing industries. The average income was very low. There are a high proportion of couple families with children. The dwellings are mainly separate houses. They pay low rents and have low mortgage repayments, with a higher proportion of dwellings either fully owned or being purchased. There were a higher proportion of lone person households than the State average.

Lake Albert Communities

Meningie is one of the largest towns in the CLLMM area with 1,502 persons counted at the 2006 Census. It had a high proportion of Indigenous people- 8.1%. Its age profile showed higher proportions aged 5-14, 55-64 and 65+. The median age was 40, slightly higher than the SA average of 38 years old. The Ngarrindjeri language was spoken by 2.6% of the population at home. There was a high proportion of the population married or widowed. A similar proportion of workers were employed full time and part time. The town had a low unemployment rate of 2.4%. Main occupations were as (Farm) managers, labourers, clerical/administration and technicians/tradespeople.

The main employment was in the sheep, cattle, grain farming, and dairy farming industries. The community had low incomes (but better than some) and higher proportion of couple families without children. The dwelling type was mainly separate houses. People lived in a higher proportion of "other" dwellings- e.g. caravans. Dwellings were mainly fully owned. There was a high proportion of lone person household and a higher proportion than the SA average rented dwellings from SA Housing Trust and from private landlords.

Narrung is a small community with 276 persons counted at Census 2006. It has a very high proportion of Indigenous people with 42% of residents identifying as Indigenous.

Unlike other communities in the region, it has high proportions of younger residents aged 0-4, 5-14 and 15-24. The median age of the community was 31. Ngarrindjeri was spoken at home by 7.6% of the population. A higher proportion than the SA average has never married. A high proportion of employed people worked part time. Unemployment rate was low, at 2.3%. One quarter of adults were not in the labour force- this could mean that people have ceased looking for work, or they are looking after family.

The main occupations were (farm) managers and labourers. The main employing industries were dairy cattle farming, sheep, beef cattle and grain farming. The population had low incomes. A high proportion of the families were couple families with children. They lived in mainly separate houses, but there were some "other" (caravans) dwellings counted. The average household size was higher than average (2.9 persons per dwelling), reflecting the family structure. A high proportion of dwellings were rented (52%), mainly rented from private landlords. There were slightly more lone person households than average.

Raukkan / Point McLeay (Indigenous) - Limited information available as 98 Indigenous persons counted at Census- 44 males and 54 females.

2.3 Other communities

Finniss - fewer than 200 people so no statistics were retrieved for this study.

Langhorne Creek - This is a medium sized town of 1,198 persons at Census 2006. It had higher proportions of persons aged 5-14, 25-54 and 55-64. It has a higher proportion of married persons than SA average. It had high employment with the unemployment rate at only 1.5%. The main occupations were managers (farm) and labourers, reflecting the rural nature of the area.

The main employing industries were fruit and nut tree growing, sheep, beef cattle and grain farming as well as beverage manufacturing. It had a higher proportion than the SA average median individual and household income levels. There were a high proportion of couple families without children. Family households comprised 76% of households in the area. Most dwellings were separate houses and the highest proportions were fully owned or being bought. Household size was slightly higher than average.

Wellington - This is a small town with 295 persons counted at 2006 Census. It had higher proportions of persons than SA average aged 5-14 and 65+. The median age was 40. The adult population were mainly married or separated/divorced. Most employed persons worked part time. Unemployment was average at 5.8%. The highest proportions of occupations were as managers (farm), labourers, technical/trades workers. The industries employing were dairy cattle farming, and hotels, bars, and taverns.

The income levels were low but not as low as some communities in the region. Family structure was mainly as couple families. There were approximately the same proportions with children as without children. The household structure was mainly family households. People lived mainly in separate houses, but there was a slightly higher than SA average living in "other" dwellings (caravans etc). Household size was slightly higher than average. A high proportion of dwellings were owned.

Wellington East – This is a small community of 252 persons at the 2006 Census. There were 6 Indigenous persons counted -(2.4% of the population). The main age groups were 55-64 and 65+. It is an older community with a median age of 49. Adults were mainly married. A higher proportion of the employed were part time. The unemployment rate was quite low at 4.0%. Main occupations were labourers (farm) managers, professionals and machine operators. The major industries people were employed in were road freight transport, dairy product manufacture and agriculture product wholesaling. The population had low incomes. Family structure was a high proportion of couple families without children. Dwellings were predominantly separate and semi-detached housing. They were mainly owned or being purchased.

In addition, there are approx 100 shacks under Crown Land in the Milang area, approx 100 in Coorong National Park and approx 20 in Ewe Island/Mundoo Island (Sourced from David Haslam Crown Lands manager River/South-East 29/4/09). These are of interest as they are located on the waterfront.

2.4 Summary

This region is reliant on just a few industries and occupations outside of the main urban centre of Goolwa.

The main industries are centred on agricultural production and processing, food and beverage retailing and education.

Occupations tend to be as agricultural managers or in the semi-skilled area (labourers and tradespeople) and are reliant mainly on the agricultural industry and the retailing industry. Both agriculture and retailing (tourism) are industries significantly impacted by low water level.

2.5 Summary Table of Communities

This is an easy to read guide with baseline information about the communities.

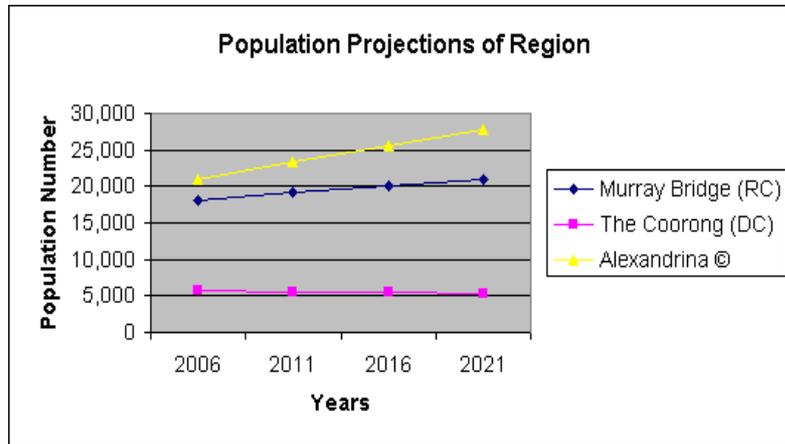
Area	Pop.	%Indigenous	Median age	Unemployment Rate %	Main Occupations	Main industries	Individual Median Income	Main Family Type	Main Dwelling type	Interesting Points
Clayton	463	0	52	6.1	Labourers Farm Managers Professionals	Sheep/cattle/grain farming	\$359	Couple family with children	All Sep houses, 1/2 unoccupied	Low rents, low mortgage repayment
Goolwa	5882	1.5	53	8.7	Technicians/Trades Labourers Community and Personal Service	School education Cafes /Restaurants Takeaway Residential care Supermarket/ Grocery	\$323	Couple family without children	Sep houses, 1/3 unoccupied	High proportion housing fully owned. Lone persons households
Hindmarsh Island	689	0	55	5.8	Technicians/Trades Professionals Managers	Building/Installation Cafes/ Restaurants Takeaway Accommodation	\$383	Couple family without children (70%)	Sep houses, more than 1/2 unoccupied	Most houses fully owned, high rents being paid
Milang	512	2	47	7.5	Labourers Technicians/Trades Managers (farm)	Fruit/Tree Nut growing Hotels, Taverns, Bars Vegetable growing	\$297	Couple family with children	Sep houses	Low rents, low mortgage repayment
Meningie	1502	8.1	40	2.4	Farm Managers Labourers Clerical/Admin	Sheep/cattle/grain farming Dairy Farming	\$387	Couple family without children	Sep houses, but higher proportion "other"	Higher proportion renting from Housing trust
Narrung	276	42	31	2.3	Farm Managers Labourers	Dairy Farming Sheep/cattle/grain farming	\$328	Couple family with	Sep houses, some "other"	Over half dwellings were

								children		rented. Mainly from private landlords
Raukkan	98	100	-	-	-	-	-	-		
Langhorne Creek	1198	1.7	39	1.5	Farm Managers Labourers	Fruit/Tree Nut growing Sheep/cattle/grain farming Beverage manufacturing	\$511	Couple family without children	Sep houses	Slightly higher household size than average
Wellington	295	1.0 (only 3 persons)	40	5.8	Farm Managers Labourers Technicians/Trades	Dairy Farming Hotels, Taverns, Bars	\$336	Equal Couple family with children and without children	Sep houses	Housing mainly owned
Wellington East	252	2.4 (only 6 persons)	49	4.0	Labourers Farm Managers Professionals Machine Operators	Road Freight Transport Dairy Product Manufacturing Agriculture Product Wholesaling	\$362	Couple family without children	Sep houses and semi-detached	Housing mainly owned or being purchased
Coorong Council	5670	5.5	40	4.6	Farm Managers Labourers Technicians/Trades	Sheep/cattle/grain farming Dairy Farming School Education	\$368	Couple family without children	Sep house plus a few "other"	Lone person households, high proportion of dwellings fully owned
Alexandrina Coast SLA	11510	1.2	48	6.2	Technicians/Trades Labourers Farm Managers Professionals	School Education Cafes/ Restaurants Takeaway Residential Care	\$352	Couple family without children	Sep houses	Lone person households, high proportion of dwellings fully owned

Alexandrina Strath SLA	9203	0.9	42	3.7	Managers Labourers Professionals	Fruit/Tree Nut growing Sheep/cattle/grain farming	\$416	Couple family without children	Sep houses, 14% unoccupied	Rents, mortgage payments below average.
Murray Bridge LGA	17678	4.2	39	2.8	Labourers Managers Technicians/Trades Clerical/Admin	Meat/Meat product manufacturing School Education Supermarket/Grocery	\$369	Couple family without children And one-parent families	Sep houses, semi-detached and flats	Multicultural , Lone person households, 1/3 rentals from Housing Trust
SOUTH AUSTRALIA	1,514,337	1.7	39	5.2	Professionals, Clerical/Admin Technicians/Trades Managers Labourers	School Education Hospitals Cafes/Restaurants/Takeaway Food	\$433	Couple family with children, without children and one-parent families	Sep houses, Semi-detached	1/3 fully owned, 1/3 being purchased

2.6 Population Projections

It is important to look at the projected population for the region, as there will be infrastructure issues associated with these changes. The following projections were made by Planning SA, based on the 2006 Census and in-house modelling.



Council Area	Year				Change	%Change
	2006	2011	2016	2021		
Murray Bridge (RC)	18,171	19,177	20,062	20,887	2,716	14.9
The Coorong (DC)	5,721	5,587	5,425	5,248	-473	-8.3
Alexandrina (C)	21,014	23,444	25,641	27,724	6,710	31.9
South Australia	1,553,201	1,608,358	1,649,833	1,688,240	135,039	8.7

Source: Planning SA Population Projections Enquiry System medium series accessed 7/4/09
Based on 2006 Census

Alexandrina Council area is expected to grow by almost another third in the next 15 years; this is a very large increase, given that the State is expected to only grow by 8 per cent. Murray Bridge is expected to increase by almost 15 per cent. These areas have strong links with the Murray and Lower Lakes systems.

The population of The Coorong Council area is expected to decrease by over 8% in the 15 years from 2006.

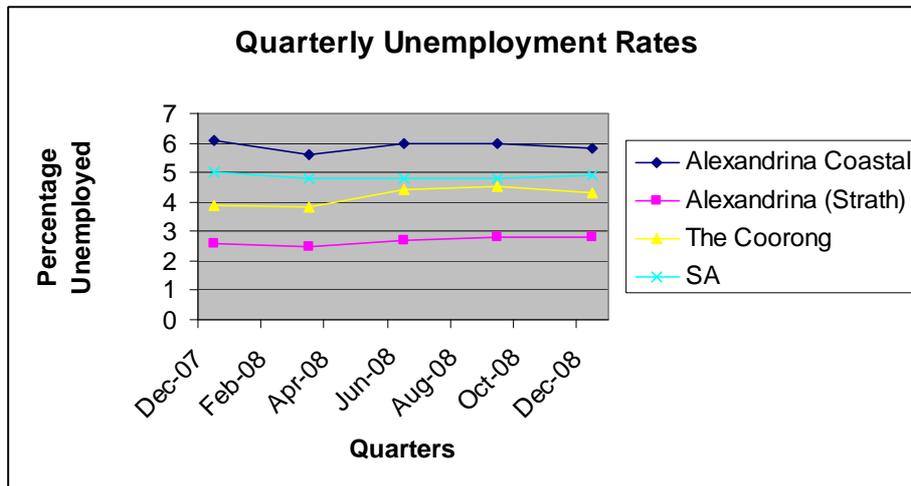
However, these population projections were made in early stages of drought, and before the Global Financial Crisis.

2.7 Latest Quarterly Unemployment Rates Dec 07-Dec 08

Unemployment Rates	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08
Alexandrina Coastal	6.1	5.6	6	6	5.8
Alexandrina (Strath)	2.6	2.5	2.7	2.8	2.8
The Coorong	3.9	3.8	4.4	4.5	4.3
SA	5	4.8	4.8	4.8	4.9

Source: Australian Government DEEWR Small Area Labour Markets Australia Dec Quarter 2008.

<http://www.workplace.gov.au/workplace/Publications/ResearchStats/LabourMarketAnalysis/SmallAreaLabourMarkets/>



The unemployment rate for these small areas has remained fairly constant for the year Dec 2007-Dec 2008. However, the Coorong Council area is showing signs of an increase. This could be a seasonal effect and needs to be closely monitored.

Sometimes it is more important to look at the number of people in the labour force- i.e. either employed or unemployed. Sometimes people drop out of the labour force because they see no hope (more traditionally it is retirement or looking after children).

These rates need to be factored in to discussions on scenarios as Commonwealth and State Governments are predicting unemployment to increase significantly in 2010.

2.8 Property Prices in the Region

The following information is from Domain www.domain.com.au. The information is based on Postcode areas in the region.

A good indicator of the economic health of a community can be reflected in the average house price.

At March 2009, the information below shows that several communities in the region have too few sales for meaningful analysis (SNR), however, the median house prices for Goolwa and Hindmarsh Island are above the region's median.

Milang and Meningie's median house prices are below the area's median price.

Property Prices 12 months to March 2009

Name	Median Price Houses	Median Price Units	Median Price Region House	Median Price Region Unit	Long Term Trend Houses %	Long Term Trend Houses Region %	Long Term Trend Units %	Long Term Trend Units Region %
Clayton 5256	SNR	SNR	n/a	n/a	n/a	n/a	n/a	n/a
Goolwa 5214	\$255K	SNR	\$245K	\$185K	12.1	11.7	SNR	9.5
Hindmarsh Island 5214	\$430K	SNR	\$245K	\$185K	14.8	11.7	SNR	9.5
Meningie 5264	\$151.75K	SNR	\$245K	\$185K	9.3	11.7	SNR	9.5
Milang 5256	\$199.75K	SNR	\$245K	\$185K	11.4	11.7	SNR	9.5
Narrung 5259	SNR	SNR	n/a	n/a	n/a	n/a	n/a	n/a

Anecdotal evidence from Clayton is that house prices have fallen by 25% since the Lake levels have fallen recently (Sunday Mail 12/4/09 page 24 "Price on Jetty to nowhere"). Other anecdotal comments state there is generally a 10% drop in houses located close to the river and Lake Albert.

3. Social Capital in the Region

3.1 Definition of Social Capital

The ABS has adopted the Organisation for Economic Cooperation and Development (OECD) definition of social capital:

"...networks together with shared norms, values and understandings which facilitate cooperation within or among groups".

This OECD definition is emerging as a common basis for international comparability.

The ABS Social Capital Framework conceptualises social capital as a resource, drawing on and feeding back into other types of resources. These other resources are grouped as natural, produced economic and human capital. The four sets of resources interact in a context of cultural, political, institutional and legal conditions, and contribute to a wide range of wellbeing outcomes. Social capital resources are presented as attributes of networks organised as network qualities, structure, transactions and broad types (bonding, bridging and linking). Potential network participants (such as families, friends, and organisations/groups) are indicated by network composition.

Source ABS Catalogue 1378.0 Measuring Social Capital – An Australian Framework and Indicators 2004.

3.2 Social capital anecdotal research for the Coorong, Lower Lake, Murray Mouth region

(Material gathered through CLLMM anecdotal reports, community conversations and consultation processes.)

The community has had high social capital. Residents have a strong sense of community. Local doctors have bought houses in the region and have become part of the community. Many have chosen to retire to these regions, particularly in Goolwa, but also in Meningie, Clayton and Milang. This region has been viewed as an area desirable to move to. Despite the low water levels, many people are choosing to stay (particularly older members of the community).

However, the social capital of the region is being eroded by the impacts of low water levels. More young people work away from the home during the week and come back to the town on weekends. This has an impact on family and community life. There is less time available for volunteering and community service which results in a breakdown of supportive networks and services that the communities have become to rely upon. However, all communities are able to identify community leaders who continue to support and bring communities together. Community action groups have formed to deal with the water crisis and provide a platform for dealing with Government. In many instances the hard times have galvanised the community to come together, identify a common cause and advocate for their town and their community.

Community values

- The beautiful environment, the fresh air and the birdlife
- The strong sense of community, the sense of place
- The feeling of safety
- The history – families have lived in the area for generations

Community Assets

- Schools
- Service clubs
- Local Government – Mayors and staff working for the community
- Sporting clubs – football, bowling, golf
- Senior citizens groups
- Community centres – MOSHCC, Clayton Community Hall
- Environmental Action groups

Essential services

- Health services, local GP's and hospital
- Pharmacist
- Hardware
- Courier service
- Schools
- Shops

The Clayton Bay store is currently for sale (current owners are selling due to dramatic drop in income resulting from reduction in tourist numbers). This café, apart from the Caravan Park, is the only business in town and is also the local post office and general store which is an essential service for people in the town, particularly retirees.

Young people

- A teacher from one local school reported that children have been observed as withdrawn, distracted and anxious largely due to family concerns over money and employment. 'Grandpa was a fisherman, Dad was a fisherman and I was always going to be a fisherman too'
- The young men move out of the region to find work further a field and only come home on the weekends; or families need to move away all together.
- School numbers have dropped at Meningie area school from 350 -220. This is also due to a number of children going to private schools in Murray Bridge now that a school bus service was provided.
- Milang School introduced an environmental action initiative with their turtle rescue program.

Health and Wellbeing

- Community members and local doctors are reporting some immediate health impacts in particular eye irritation and respiratory problems with dust.
- More significantly is the impact of low water levels, drought, economic hard times, rising unemployment and agricultural downturn on the mental health and wellbeing of families primarily living on the land and now secondarily those with associated businesses.
- General residents and people who have moved to the area to retire report feeling disenchanting, depressed and demoralised by loss of the beautiful environment that they treasured and found much enjoyment in.
- The process of campaigning, contributing to consultations and planning and lobbying Government for action on the low water levels over what is now several years has also contributed to a sense of betrayal, disgust, cynicism and the sense that nobody cares about them.

3.3 The Social impacts – extracts from Sobels study

*Reference: Social Impacts of the Drought – Lower Murray
A scoping study for the Lower Murray Drought Impact Community Reference Group by
Jonathon D Sobels Feb 2007*

- Wives are taking on increased responsibilities on farm and outside of the farm – Family impacts
- Psychological impacts with loss of funds for retirement and hit to succession planning.
- Staff lay off- impacts on transport industry
- Loss of skilled workers to other regions due to loss of job security
- Longer work hours, increased anxiety
- Less children playing sport due to travel costs
- Less time for volunteering and community service
- Increased demand on mental health services for those in the agricultural industry, associated businesses and now with lakeside retirees.
- Increase in chronic health conditions due to not taking medications.
- Hesitancy accessing support services due to embarrassment.
- Social – cultural impact of the weir on Indigenous communities resulted in increased health issues and accidents.
- Announcement of the weir caused universal fear and uncertainty in all Lower Lakes communities.

3.4 Key principles for Government working with CLLMM community

- Coordination between Government Departments to reduce doubling up of public meetings and consultation processes.
- Build on existing services and initiatives within communities rather than attempt to introduce new structures.
- Language is important e.g. people do not want to pick up a brochure or attend a meeting about mental health, refrain from use of the term experts.
- Governments need to support and strengthen a cohesive community not inflame divisions and pit various groups against one another – don't add to the blame game.
- Be mindful of sensitivity to the use of tax payer money. Communities count the cost of all the workers in the room, the food and the flashy brochures.
- Respect and acknowledge local knowledge and expertise.
- Support local jobs and local businesses as the first option.
- Sensitive to media that focus on impact on tourism, recreation and Adelaide residents watering their gardens rather before considering the impacts on landholders and lakes communities.

4. Economic Profile

4.1 Background:

The region has a high proportion of older people, with only a few communities with a significant proportion of young people and those in the teenage/early 20's age groups.

This means that labour force replenishment may be difficult, as younger people will need to be attracted back to the area to backfill jobs that retired people held.

Median incomes in the region are low, however, this information does not take into account any savings people may have, or assets they own. The region has a high proportion of houses owned outright, which can be a buffer against economic slowdown.

However, it makes the community less resilient to the Global Financial Crisis or an economic slowdown due to drought issues.

An area's Gross Regional Product (GRP) is one of several measures to determine the size of a region or area's economy. GRP is defined as the market value of all final goods and services produced within an area in a given period of time.

4.2 Coorong Economic Profile

Sourced from *COORONG DISTRICT COUNCIL POPULATION and ECONOMIC PROFILE 2008*

Economic Activity to November 2008

The Agricultural sector is the major contributor of the Coorong District Council economy contributing to 48% of total economic output (\$211 million), 71% of Regional Exports (\$173 million) and over 40% of employment.

- Manufacturing contributes 8% of output (\$34 million)
- Retail 7% of output (\$29 million)
- Transport and Storage 6% (\$27 million).

Breakdown of Agricultural Sector

The breakdown of the Agricultural sector indicates that:

- Grains contribute \$75 million towards output and 174 jobs.
- Beef Cattle contributes \$37 million towards output but employs 240 persons
- Sheep contributes \$29.5 million and 222 jobs.
- Dairy Cattle is the other major section of the Agriculture sector contributing \$27 million and employing 143 persons.

Gross Regional Product (GRP)

The GRP for the Coorong District Council in November 2008 was \$43,179 per capita. The Gross State Product (GSP) for South Australia is \$44,281 per capita (Source, SA Centre of Economic Studies). The GRP for the Coorong District Council increased by 14% from November 2007 to November 2008.

4.3 Alexandrina Council Economic Profile

The region is supported by diverse industries including tourism, viticulture, general farming, dairying, fruit production, manufacturing, engineering and boat building, and is close enough to Adelaide to make it an easily accessible and desirable holiday and tourist destination. (*Alexandrina Council Community Strategic Plan 2009-2013*)

The region has diverse primary production and industry (*Fleurieu Regional Development Board*). The region also continues to be strategically significant for primary industry in South Australia with approximately 20 per cent of its working population engaged in this sector. Diversified agriculture and viticulture also provide a large part of the region's income. Conversion of traditional beef and sheep properties to various forms of horticulture is a major trend. Other growth crops include wine grapes, olives, vegetables and berries.

Milk provides more than 40 per cent of the region's gross value of agricultural production with sheep, pig and poultry meat contributing another 20 per cent. The bulk of South Australia's late (January) lamb production comes from the Fleurieu. Crops grown include barley, wheat, oats, lucerne, potatoes and vegetables. Other produce includes apples, pears, almonds and strawberries.

[Langhorne Creek wine region](#) and, to a lesser extent, [Currency Creek wine region](#), [Victor Harbor](#) and [Yankalilla \(Southern Fleurieu Wine Region\)](#) are areas of significant growth in viticulture. At Langhorne Creek, strong demand for local wine processing facilities has led to the establishment of several new grape-crushing plants in an attempt to reduce transport time and costs. Some of the larger wineries also have plans to establish bottling facilities in the region.

Boat building and maintenance are also considered to have considerable growth potential. The industry is focussed almost exclusively at Goolwa, where the town's favourable location on Lake Alexandrina provides a natural advantage. The lake is also popular for recreational boating and fishing. Professional fishing operates around much of the peninsula, in the lakes and along the Coorong.

The district borders three distinct bodies of water, the Southern Ocean, The Coorong and The Lower Murray River, all of which are commercially exploited for a variety of fish and crustaceans. The coasts produce shark, Mulloway and Australian salmon, as well as huge numbers of Goolwa cockles which are exported all over South Australia. The Coorong holds large numbers of Salmon, Mulloway, Shark, Bream and Mullet, all of which are caught commercially.^[6] Commercial fishing above the Locks has become highly regulated to conserve native fish species but Golden Perch and Murray Cod are still caught, and a number of operators have found markets for the invasive European Carp.^[7]

The area also has a significant tourism industry, particularly based around the Murray River at Goolwa and the beaches of Port Elliot and Middleton.

4.4 "Economic Profile of the Lower Lakes Region of SA 2006/7"

Source: *EconSearch Report- Economic Profile of the Lower Lakes Region 2006/7- A report prepared for PIRSA 30/5/08*

The top five contributors to total employment in the region (The Coorong, Alexandrina Coastal and Alexandrina Strathalbyn) in 2006/07 were:

- retail trade (14.1 per cent);
- health and community services (8.8 per cent);
- accommodation, cafes and restaurants (7.0 per cent);
- education (6.9 per cent);
- beef cattle (5.8 per cent).

The top five contributors to value of output were:

- residential building construction (10.9 per cent);
- wine and beverages (9.2 per cent);
- ownership of dwellings (8.3 per cent);
- machinery and equipment (5.6 per cent); and
- property and business services (5.5 per cent).

- the top five contributors to GRP were:
- ownership of dwellings (11.0 per cent);
- residential building construction (9.4 per cent);
- property and business services (4.9 per cent);
- wine and beverages (4.8 per cent); and
- beef cattle (4.1 per cent).

5. Economic Impacts of Drought and Low Water Levels

(Rural Solutions SA Report Jan 2009)

5.1 Dairy

In 2005/06 there were 22 dairy operators below Wellington relying on Lake Alexandrina and Lake Albert water for irrigation, stock and domestic purposes and for dairy operation. The Lakes dairy irrigation region covers around 3,000 ha of irrigated pasture from an allocation of 18 GL of River Murray water (drawn from the Lakes). These irrigated Lakes dairies consist of about 9,900 milking cows, with irrigated dairy production totalling approx. 64ML of milk. This production was valued at approximately \$20 million in 2005/06.

Regional Dairy Farm Statistics for Lower Murray Lakes and Swamps, 2002 to 2007

	2002	2003	2004	2005	2006	2007
Total number of milk cows	37,360	36,888	31,901	28,511	26,913	10,933
Average annual production per cow - litres	6000	6000	6000	6000	6000	6000
Annual production of milk - litres	224,160,000	221,328,000	191,406,000	171,066,000	161,478,000	65,598,000
Average annual price paid per litre	0.32	0.3	0.28	0.3	0.33	0.32
Value of output - \$m	71,731,200	66,398,400	53,593,680	51,319,800	53,287,740	20,991,360

Source: SA Dairy Association and Dairy Australia

As a result of drought conditions and lack of quality water in the region, the dairy operation around the Lower Lakes has decreased by 70% since 2002. It is interesting to note that PIRSA Livestock Industries have recorded a much more drastic reduction in cow numbers and output for the year 2008/09 and have projected a further 20% decline in 2008/09 as shown in the following table.

PIRSA Regional Dairy Farm Statistics for Lower Lakes, 2007/08 to 2008/09

	2007/08	2008/09 a
Total number of milk cows	4650	3720
Average annual production per cow - litres	6100	6100
Annual production of milk - litres	28,700,000	23,000,000
Average annual price paid per litre	0.49	0.50
Value of output - \$m	14	11.5

(a) PIRSA Livestock projection of 20% decrease

Source: PIRSA Livestock Industries and SA Dairy Association and Dairy Australia

5.2 Livestock Usual Operating Environment

The Lakes irrigation region also comprises around 52,000 ha of dry land livestock production. These livestock rely on lake water for drinking. This dry land is used for:

- 5,000 dry cows and heifers (requiring a peak of 90 l/day drinking water);
- 29,575 beef cattle (90 l/day);
- 17,035 sheep (10 l/day);
- 44 horses (55 l/day); and
- 1,200 adult pigs (50 l/day).¹

The value of the region's other livestock production was approximately \$19 million in 2005/06.

These other livestock require a total of about 3.3 ML/day, or around 1.1 GL/year, of drinking water.

For a number of reasons including reduced water allocations, access and quality, livestock numbers have declined in 2007/08 as follows: dry cows and heifers by 11% (to 4,450); beef cattle – by 8% (to 27,100); sheep – by 14% (to 14,650). Irrespective of that decline, the GVP is estimated to stay the same (around \$20m), but farm incomes will be severely impacted because farmers are required to spend more on alternative feed and water for their animals.²

5.3 Fisheries

The Lakes and Coorong Fishery includes the waters of:

- The Lower River Murray Lakes;
- The Coorong lagoons; and
- Coastal marine waters adjacent to the Sir Richard and Young Husband Peninsulas, out to three nautical miles from the low water mark.

The Lakes and Coorong fishery comprises 36 licences held by 33 licence holders.

Key species in the fishery are Goolwa cockles (ocean beach), golden perch (lakes), yellow-eye mullet (Coorong) and Mulloway (Coorong). In 2005/06, total catch was 2,400 tonnes and GVP was approximately \$5 million. Total catch for 2006/07 has not changed, but GVP generated approximately \$7 million mainly due to growth in prices.

Market value of fishery licenses is estimated between \$75,000 and \$125,000, depending on access provided by gear endorsements. The fee per license in 2007/08 was \$6,621.

Production levels in the Lakes and Coorong Fishery are primarily driven by variation in natural environmental conditions, in particular flows through the lower lakes and into the Coorong via the Murray barrages. Flows through the system drive the underlying ecology that supports the major targeted species (Golden Perch, Mulloway and Yellow-Eye Mullet). The Goolwa cockle fishery is believed to have a linkage to outflows from the Murray system. The frequency of flooding within the SA Murray-Darling Basin is a primary driver of stock structure.

¹ **Tony Morbey's updates**

² **Tony Morbey's information for 2007/08**

The Lower Lakes and Coorong act as the only route between the ocean and the upper basin for diadromous fish species (fish that migrate between freshwater and the sea) such as Lampreys, Eels, Congolli and Galaxiids.³

Economic Impacts of Low Water Levels and Drought

Reported catch of the Lakes and Coorong Fishery, 2001/02 to 2006/07 (tonnes)

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Australian Salmon	1	1	2	4	3	4
Black Bream	8	12	10	6	7	4
Bony Bream	298	212	279	340	318	382
Callop	36	38	82	103	123	152
European Carp	210	404	579	567	737	697
Goolwa Cockle (Pipi)	783	1086	1070	1066	1052	989
Flounder	26	6	6	9	7	5
Yellow-Eye Mullet	155	167	111	110	126	141
Mulloway	109	45	31	39	38	44
Redfin	10	6	n.a.	n.a.	n.a.	n.a.
Other Species	4	2	10	14	29	25
Total	1640	1979	2180	2258	2440	2443

The River Fishery was closed from July 2003. There are 6 River Fishery licences with access to non-native species and their production is included in this Table.

Source: EconSearch Analysis (2008)

Gross value of production of the Lakes and Coorong Fishery, 2001/02 to 2006/07 (\$'000) ^a

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Australian Salmon	1	1	3	5	4	6
Black Bream	70	110	100	55	69	51
Bony Bream	564	227	234	286	318	382
Callop	271	583	1176	1464	1094	2297
European Carp	463	748	1030	960	952	884
Goolwa Cockle (Pipi)	1315	2013	2305	2092	2757	2662
Flounder	183	53	49	78	62	51
Yellow-Eye Mullet	795	392	257	245	310	401
Mulloway	736	306	192	256	231	286
Redfin	80	25	n.a.	n.a.	n.a.	n.a.
Other Species	24	7	35	54	127	123
Total (Nominal)	4,502	4,465	5,381	5,495	5,924	7,143
Total (Real) ^b	3,649	3,480	4,071	4,063	4,180	4,955

a) GVP estimates for 1992/93 to 2001/02 are based on re-estimated SARDI values using readjustment factors outlined in Baker and Pierce (1998). As these readjustment factors were derived from 1996/97 data. SARDI's GVP estimates for 2002/03 and 2003/04 have been revised using updated readjustment factors derived from a weighted average of 2002/03 fish prices from the Adelaide, Sydney and Melbourne fish markets. The market weightings were derived from the EconSearch survey of licence holders.

b) In 1992/93 dollars.

³ Information provided by Alice Fistr, Manager, PIRSA Fisheries

Source: EconSearch Analysis (2008)

The gross value of output from the Lakes and Coorong Fishery has **not** been affected by the reduced water level in Lake Alexandrina. This is primarily attributed to the fisheries licence holder's ability to shift effort between environments and species and therefore contributing to the long-term viability and sustainability of the resource.

However, the low lake levels are causing difficulties for boat access and maneuverability. The ocean fisheries for Mulloway and Pipis are not affected by the primary conditions in Lake Alexandrina but Garry Hera-Singh, President of the Southern Fishermen's Association (pers comm January 5, 2008) advised that one fisherman's daily catch of carp and bony bream has been reduced from 1,000 kg to about 300 kg as the boat cannot move over the mud and close to shore to unload the greater weight.

5.4 Tourism

(Rural Solutions SA Report)

In 2007, the Fleurieu Peninsula tourism industry attracted an estimated 652,000 overnight visitors that stayed more than two million nights in the region. Eighteen per cent of all overnight visits in regional South Australia (excludes Adelaide tourism region) include a stay in Fleurieu Peninsula and the region accounts for nearly 17% of all visitor nights in regional SA.

On average overnight visitors to the region stayed 3.1 nights; length of stay varies from 2.7 nights for South Australians to 4.8 for interstate visitors and 6.6 for internationals. Seventy per cent of all overnight visits to the region are for holiday/leisure purposes, 24% for visiting friends and relatives (VFR), 4% for business and 2% other.

Fleurieu Peninsula also attracts more domestic same day visitors (2.1 million) than any other region except Adelaide. Adelaide residents account for the majority (78%) of these day trips to Fleurieu Peninsula, followed by the Adelaide Hills (9%) and Fleurieu Peninsula (8%). Holiday/leisure was the main purpose for 64% of day trips and VFR the main reason for 26%.

Spending by domestic overnight visitors to the region in 2007 was estimated by Tourism Research Australia (TRA) to be \$189 million or an average of \$99 per visitor night and domestic day trip visitors to have spent \$128 million or an average of \$60 per day trip.

The beaches and the desire to 'visit friends and relatives' attract ninety six percent of visitors to the Fleurieu region. Total tourism spending in the Fleurieu region is around \$326 million per annum.

There will be a full report in mid-July funded by 3 states into tourism effect of drought-perceptions may drive low tourism- contact will be Pauline Coates.

5.5 Recreational Boating Industry- Situation as at 2008

Mr. Glen Jones, General Manager of the SA Boating Industry Association has reported that the boat sale, boat maintenance and related tourism is worth \$100 million to the Goolwa and Lower Lakes economy. However, a recent submission to the Commonwealth Department of Fisheries, Food and Agriculture by Mr. Peter Kenny, Social Policy Analyst indicates the extent of economic stress being suffered by the boat related industry in the Goolwa and Lakes area.

The 2008 submission reported that:

- Forward (commercial) houseboat and charter bookings have never been worse, and the fleet is presently operating at around 50% of normal capacity. This delivers a negative impact of around \$15 million annually (includes Riverland).
- The use of the (privately) owned houseboats and cruising fleet is also down by at least 50% delivering a negative impact of around \$25 million annually (includes Riverland).
- General holiday, leisure and recreational boating is way down in the Lakes and Coorong areas as people anticipate “no water at all” within the Lower River, Lakes Albert and Alexandrina and the Coorong.
- The economic loss, incorporating aspects of boat servicing/fuelling and provisioning is estimated to be in the order of \$5 million annually.
- The loss of revenues on moorings/berthing is estimated to be in the order of \$2 million annually.
- Boating and other ‘water based’ day trippers and holiday makers numbers are down with a loss to the economy of at least \$200 million annually

This is their information, not validated independently.

6. Socio-Economic Scenarios Moving Forward

6.1 Irrigators

The impact on the Lower Murray and Lakes region during 2007-08 of another year of low river flows.

(Lower Murray Drought Impact Study Reference Group Feb 2007)

If irrigator's allocations are restricted to:

- Scenario 1-60% allocation, the resulting distress is expected to be significant, especially given the current pressures on families, communities, crops and the environment due to low flows in 2006-07.
- Scenario 2 – 20% allocation, the effects on the regional economy will likely be severe with a substantial potential for large scale environmental damage and deep psychological and social distress.
- Scenario 3-10% allocation, the regional economic, environmental and social impacts must be thought of as extreme.

6.2 Tourism

At the request of the South Australian Tourism Commission the information relating to tourism impacts is unavailable.

7. Socio Economic Implications of the Long Term Plan

To provide an outline to the Commonwealth outlining the scope of investigation of socio-economic issues:

- CLLMM socio economic report of current data and publications.
- Cross government workshop on S-E impacts of management options
- Consultation with key industry and community organisations of SE impacts of management options.
- Development of benefit-cost analysis as part of the business case

Contribution to the EIS Seawater Socio Economic Study to determine the Impacts of:

- Do nothing option
- Bio-remediation and /or revegetation of acid sulphate soils
- Provision of freshwater
- Lakes segregation
- Provision of seawater
- And possible combination of options

(Timeline expanding to early 2010, therefore findings will not be available for Long Term Plan)

The key objectives of the consultation are:

- To assess and document the social and economic impacts of the different management options
- To identify and document the social and economic costs and benefits associated with each management option and the distribution of these costs and benefits to different groups, industries and communities
- To identify potential mitigation strategies to address identified social and economic costs arising from each management option
- To identify additional strategies to maximise the social and economic benefits arising from each management options

8. ATTACHMENTS

Attachment 1a: Invitation to Comment

Invitation to Comment

Assessing the Socio-Economic Impacts

What are the possible socio-economic impacts of the proposed management actions of the long-term plan for the Coorong and Lower Lakes?

The South Australian Government has started work on developing a long-term plan for the Coorong, Lower Lakes and Murray Mouth region in partnership with the community, scientists and industry.

This is part of the South Australian Government's \$610 million [Murray Futures](#) program, funded by the Australian Government's [Water for the Future](#) program.

Seeking your feedback on possible management actions

Feedback from the public on the '*Directions for a healthy future*' **document**, released in May, and the latest scientific information has been used to prepare a preliminary long-term plan, due to be released for public comment soon.

The preliminary long-term plan includes a range of management actions that will be considered to manage the environmental issues affecting the region.

Prior to the release of this document, we are starting to seek feedback from local community groups, business and industry on how the possible actions could impact the social and economic well-being of the local community.

Your local, expert knowledge is important and will help influence what management actions are included in the final long term plan.

Providing your feedback

The list of management actions and a **feedback form** is attached for you to complete.

Feedback should include:

- Positive and negative impact statements
- Direct impacts of the proposed management actions
- Comment on the impact if no action was taken in comparison to the impacts if the proposed management actions were implemented
- Ideas and opportunities for community involvement in projects and decision making.

Please send the completed feedback form to us by **7 August**, via email or post:

Email: cllmm@deh.sa.gov.au

Post: Reply Paid 1047, Adelaide SA 5001

Further information

If you have any questions or would like to speak to a member of the Coorong, Lower Lakes and Murray Mouth Projects team, please contact us at:

Email: cllmm@deh.sa.gov.au

Phone: 1800 226 709 (free call during business hours)

Postal: Reply Paid 1047, Adelaide SA 5000

Website: www.environment.sa.gov.au/cllmm

Attachment 1b: Management Actions Table to Stakeholders

What is our goal for the Coorong Lower Lakes and Murray Mouth?

The goods and services that drive the regional economy and support local social systems stem largely from a healthy and functioning environment. It is therefore critical that our primary focus is to conserve the species, ecological communities and ecosystem services of the site. In doing so, our actions will contribute significantly to regional social and economic wellbeing in the long term.

Our goal therefore is to secure a future for the Coorong, Lower Lakes and Murray Mouth as a healthy, productive and resilient wetland system of international importance.

How this goal translates to outcomes at the site will depend on the future climate, how the extent of freshwater availability affects the ecological character of the site and what is realistic to achieve. A more precise goal for the site based on the predicted climatic scenarios will be developed through consultation with the community and scientists and form part of the long-term plan.

The table below provides a preliminary description of the possible implications to the Ecological Character of the Coorong, Lower Lakes and Murray Mouth for each of the three CSIRO modelled future climatic scenarios (wet – median – dry) and the extreme dry situation currently being experienced.

It should be noted that this table is based on the current water allocation arrangements and does not incorporate water recovery targets being achieved by the Living Murray initiative or arrangements being considered through the development of the Murray Darling Basin Plan. For example, it may be possible to improve outcomes in terms of Ecological Character by improving water allocation arrangements for the dry and/or median scenarios.

Climatic Scenario	Overview	Possible implications to Ecological Character of the Coorong, Lower Lakes and Murray Mouth	Implications for the Coorong, Lower Lakes and Murray mouth
Wet 2030 Model Scenario (CSIRO 2008)	mean total end of system flow = 5,550 GL/yr	<ul style="list-style-type: none"> • Water levels in Lake Alexandrina maintained between 0.3 and 0.85mAHD in most years. In some years water levels may be higher due to the sheer volume of water available. • Wetland systems (including Lakes Alexandrina and Albert, the Coorong, the Murray Mouth and Estuary, the Goolwa Channel and the Tributaries) connected, healthy, resilient and productive. • <i>Ruppia</i> species present in both the North Lagoon and South Lagoon of the Coorong. The salinity gradient present in the lagoons promotes the survival of the diversity of biota the Coorong is renowned for. 	<ul style="list-style-type: none"> • 117.3% of mean flow under current development and historic climate at Murray mouth
Median 2030 Model Climate (CSIRO 2008)	mean total end of system flow = 3,482 GL/yr	<ul style="list-style-type: none"> • Water levels in Lake Alexandrina maintained between 0.3 and 0.85mAHD for more than 50% of the time. • Wetland systems (including Lakes Alexandrina and Albert, the Coorong, the Murray Mouth and Estuary, the Goolwa Channel and the Tributaries) connected during these periods. Outside of these times, the Coorong, Murray Mouth and Estuary could experience periods of disconnection. • Dredging required to maintain an open Murray Mouth sometimes. • <i>Ruppia</i> would start to disappear from the South Lagoon of the Coorong 	<ul style="list-style-type: none"> • 73.6% of mean flow under current development and historic climate at Murray mouth • severe drought inflows to the lower lakes (i.e. < 1,500 GL) increase to 13% of years • slightly increased the average period between flood events that flush the Murray mouth • maximum period between flood events that flush the Murray mouth increased to nearly 1 in 8 years • average annual volumes of environmentally beneficial floods close to halved
Dry 2030 Model Scenario (CSIRO 2008)	mean total end of system flow = 1,417 GL/yr	<ul style="list-style-type: none"> • Water level in Lake Albert dropped to levels close to the acidification trigger of -0.5mAHD with water being pumped from Lake Alexandrina into Lake Albert to avert acidification of the latter i.e. these wetland systems would be artificially connected • Water levels in Lake Alexandrina dropping • Flows over the barrages would occur approximately every three years in ten. • Dredging would be required to maintain an open Murray Mouth most of the time. • The ecology of the Coorong would likely be significantly altered, with <i>Ruppia</i> species almost absent from the South Lagoon and contracting from the North Lagoon. 	<ul style="list-style-type: none"> • 29.9% of mean flow under current development and historic climate at Murray mouth • increase in cease to flow frequency at Murray mouth to 70% of time. • severe drought inflows to the lower lakes (i.e. < 1,500 GL) increase to 33% of years • increased the average period between flood events that flush the Murray mouth to 1 in 3 years • maximum period between flood events that flush the Murray mouth

Climatic Scenario	Overview	Possible implications to Ecological Character of the Coorong, Lower Lakes and Murray Mouth	Implications for the Coorong, Lower Lakes and Murray mouth
CLLMM Extreme-Dry Scenario	mean total end of system flow = 336 GL/yr	<ul style="list-style-type: none"> • Lake Albert disconnected from Lake Alexandrina • Lake Alexandrina a shallow water body disconnected from Lake Albert, the Coorong, Murray Mouth and Estuary, the Goolwa Channel and the Tributaries • Large areas of exposed acid sulfate soils in Lakes Alexandrina and Albert, the Goolwa Channel and Tributaries • No flows over the barrages most of the time. • Coorong becomes hyper-marine, and the salinity gradient that supports the diversity of species characteristic of the Coorong non-existent in the South Lagoon and parts of the North Lagoon. 	<p>increased to over 1 in 16 years</p> <ul style="list-style-type: none"> • severe drought inflows to the lower lakes (i.e. < 1,500 GL) increase to 100% of years

Management response to a 'wet, 'median', 'dry' and 'extreme dry' future climatic scenario

Presented below is a table of draft management actions that have been developed based on the best currently available scientific information and with the advice of local community members. The actions presented here do not represent a final management response, nor do they represent a formal South Australian Government position, rather they are provided as a prompt for further discussion with the community, scientists, industry groups and other government agencies (i.e. local government and the Australian Government).

Guided by the ideas put forward by scientists, the community and government agencies, the *Directions for a healthy future* document proposed core elements which need to be in place to ensure that the Coorong, Lowe Lakes and Murray Mouth can deal with any future climatic scenario. These Core Elements also retain, to the maximum extent practicable, the ecological values which make this area a wetland of international importance, and promote the intention to manage this site as one interconnected system.

For ease of presentation only, the actions listed here have also been grouped according to the components of the site (Coorong and Murray Mouth, Lake Albert, Lake Alexandrina, Tributaries-Finniss River and Currency Creek). This is so that those with an interest in a particular location can see which actions are proposed for these locations.

As a result of feedback received during public consultation on the *Directions for a healthy future* document in May 2009, the six Core Elements have been refined. These are reflected in the headings used in the table below.

In the tables below, Y = Yes (the action would be undertaken under a particular scenario) and N = No (the action would not be undertaken under a particular scenario).

A. Management Actions: Coorong and Murray Mouth

Core Element: Freshwater provided to the Lakes and Coorong and managing variable lake levels								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
A1	Increase diversion of the water from the South East Drainage system	Restoration of surface water flow path from wetlands of the Upper South East to the South Lagoon of the Coorong	Reduction of salinity in South Lagoon	Reduction in salinity dependent on volume, quality and timing of inflows Requires further investigation/consideration. Contribution of freshwater inflow may not be significant. Water quality issues and implications. Need to consider possible impacts on Upper South East wetlands. Feasibility assessment underway.	N	Y	Y	Y
A2	Increased freshwater provided from upstream in the MDB (Basin Plan, Water for the future, buy backs etc)	Secure freshwater from upstream of the Coorong, Lower Lakes and Murray Mouth – through buybacks, the Basin Plan, Water Allocation Planning processes [Links to B1, C1 and D1]	Short-term – Reduces salinity within the wetland system, including the Coorong. submerges Acid Sulfate Soils Long-term - Delivery of freshwater to the site is the preferred option for establishing a healthy, productive and resilient wetland of international importance. Re-establishes salinity gradient within the Coorong that makes it a productive	Requires feasibility assessment	Y	Y	Y	Y

			estuarine system, Secures the future of communities and industries dependent on the wetland system.					
A3	Connect Lake Albert to the North Lagoon of the Coorong	Construct a channel linking Lake Albert to the North Lagoon of the Coorong and discharge water from Lake Albert to the North Lagoon. Return flows would be prevented by design.	High River Murray flows from Lake Alexandrina could be delivered directly to the North Lagoon via Lake Albert.	Would only be possible when sufficient flows were available. Impacts on ecological character of the Estuary, the Murray Mouth?	W	M	D	ED
					Y	Y	N	N

Core Element: The Murray Mouth Open and connecting the Coorong, River and Lakes to the Sea

No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
A4	Dredging – existing strategy	Dredge the Murray Mouth in accordance with existing procedures.	Murray Mouth needs to be kept open when insufficient river flows are available to flush the Murray Mouth. This is to maintain system connectivity, which is critical for a healthy, productive and resilient wetland.	** Needs to be in accordance with an existing agreement with the MDBA Feasibility assessment underway.	N	Y	Y	Y
A5	Dredging – increase channel dimensions	Dredge the Murray Mouth to establish and maintain mouth channels that are larger in	Murray Mouth needs to be kept open when insufficient river flows are available to	Increased penetration of tidal flows along the Coorong may help to re-establish the salinity gradient	N	Y	Y	Y

		size, and to get greater penetration of tidal flows along the Coorong.	flush the Murray Mouth. This is to maintain system connectivity, which is critical for a healthy, productive and resilient wetland.	critical to maintaining estuarine productivity. Feasibility assessment underway				
A6	Dredging with sand fluidisation	As an adjunct to dredging, fluidise sand (by using pump and pipe infrastructure to inject water or air into the sand to cause re-suspension) to use the natural flow and enhance its capacity to move sand seawards.	Murray Mouth needs to be kept open when insufficient river flows are available to flush the Murray Mouth. This is to maintain system connectivity, which is critical for a healthy, productive and resilient wetland.	Feasibility assessment underway	W	M	D	ED
					N	Y	Y	Y
A7	Channel dredging with River Mouth Training Walls	Construct River mouth training walls to stabilise and maintain the entrance channel and improve navigability through the Murray Mouth. Dredge the Murray Mouth and inner channel to establish a good starting environment.	Murray Mouth needs to be kept open when insufficient river flows are available to flush the Murray Mouth. This is to maintain system connectivity, which is critical for a healthy, productive and resilient wetland.	Would need a comprehensive understanding of longshore sand transport over an extended period of time to determine the need to install an ancillary sand bypassing system. Benefits for the tidal regime of the Coorong would need assessing. Feasibility assessment underway	W	M	D	ED
					N	Y	Y	Y
A8	Sand bypassing with River Mouth Training walls	Construct River mouth training walls to stabilise and maintain the entrance channel and	Murray Mouth needs to be kept open when insufficient river flows are available to	Would need a comprehensive understanding of longshore sand transport over an extended	W	M	D	ED
					N	Y	Y	Y

		improve navigability through the Murray Mouth. As an adjunct, install infrastructure to bypass long term net sand transport.	flush the Murray Mouth. This is to maintain system connectivity, which is critical for a healthy, productive and resilient wetland.	period of time to determine the need to install an ancillary sand bypassing system. Feasibility assessment underway				
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Core Element: Maintaining system connectivity and ecological function								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
A9	Fish passages through to the Coorong at Goolwa	Fish passages (eg. vertical slots/rock ramps) will be installed in all structures (existing and proposed) to optimise fish passage between the lakes and the Coorong.	Fish passages are essential structures to enable fish to move between different parts of the Ramsar site that have been disconnected through barrages, regulators and other devices.	Can be provided either as a structural change to the Barrages, and/or through provision for freshwater flows through the Barrage (in the order of 5-10 GL/day) during wetter scenarios. Will be constructed to work at future water levels of the Lakes, Coorong and Sea.	Y	Y	Y	Y

Core Element: Managing localised threats, especially acidification								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
A10	Pumping out of the South Lagoon	Pumping out water from the South Lagoon at a set rate every day for one year. Requires completion	Will lead to a reduction of salinity in the South Coorong - salinities are currently above the threshold for keystone species, such	Assumes practical application options. Questions about pump locations, pumping rates, practicalities of disposal of hyper-saline water (how to pump offshore), possible	N	N	Y	Y

		of actions A4-A8 (as an open Murray Mouth is essential to the success of this action).	as <i>Ruppia</i> . Complementary action to A11.	implications for North Lagoon are being investigated. Feasibility assessment underway				
A11	Clearing of sills near Parnka Point	Channel through the Needles (North Parnka Point) to be widened and/or deepened through dredging.	Complementary action to A10 – essential to increase mixing between the North and South Lagoons and enhance the salinity gradient within the South Lagoon and to ensure the success of A10.	Geo-technical limitations Dredging impacts Feasibility assessment underway	W	M	D	ED
					N	Y	Y	Y
A12	Transplanting of <i>Ruppia</i> sp.	Propagate and plant out <i>Ruppia megacarpa</i> into the North Lagoon and <i>Ruppia tuberosa</i> into the South Lagoon.	<i>Ruppia</i> spp. are keystone species for the ecology of the Coorong Lagoons and are in extremely poor condition. Existing populations are not self-sustaining. Revegetation will increase their cover and thereby improve overall ecological health of the Coorong lagoons.	Assumes that the system is operable within required ecological (salinity) limits and that we have a good knowledge of the <i>Ruppia</i> salinity tolerances (currently being investigated) and ability to transplant. Feasibility assessment required	W	M	D	ED
					Y	Y	Y	N

B. Management Actions: Lake Albert

No seawater, no connection to the Coorong, retain Narrung bund until sufficient freshwater flows

Core Element: Freshwater provided to the Lakes and Coorong and managing variable lake levels								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
B1	Increase freshwater provided from upstream in the MDB (Basin Plan, Water for the future, buy backs etc)	Secure freshwater from upstream of the Coorong, Lower Lakes and Murray Mouth – may be through buybacks, through the Basin Plan, through Water Allocation Planning processes [Linked to A2, C1 and D1]	Short-term – Reduces salinity within the wetland system, including Lake Albert. Submerges Acid Sulfate Soils Long-term - Delivery of freshwater to the site is the preferred option for establishing a healthy, productive and resilient wetland of international importance. Secures the future of communities and industries dependent on the wetland system.	Assumes we have a good understanding of existing ecological responses. The means of delivering water to Lake Albert will depend on the quantities available and may include removal of the bund at The Narrows, or recommencement of pumping from Lake Alexandrina.	W	M	D	ED
					Y	Y	Y	Y
B2	Pumping from Lake Alexandrina	Pump water into Lake Albert from Lake Alexandrina to avert acidification in Lake Albert.	The acidification trigger level for Lake Albert is - 0.5mAHD. Pumping water from Lake Alexandrina to Lake Albert would avoid reaching this	While pumping has ceased, there may be some potential to periodically pump some water from Lake Alexandrina to saturate high risk acid sulfate soil areas. Only possible when flows into Lake Alexandrina are at	W	M	D	ED
					N	N	Y	N

B4	Reduce reliance upon Lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc (note that this action does NOT include the irrigation pipeline to Langhorne Creek, which is an existing action)	Extend existing potable pipelines and the irrigation pipeline currently under construction to include all users of water extracted from the lakes. Undertake a regional water use and wastewater budget from Lock 1 to the Murray Mouth to identify 1) ways in which River Murray and tributary water use can be reduced or changed to benefit the wetland system and 2) opps for wastewater re-use to replace current River Murray and tributary water use. Options may include rainwater tanks and piping of treated wastewater to users. [Linked to C3]	Will remove reliance of all water users from the lakes and increase the reliability and quality of water supply to these users. Allows for greater flexibility in managing water levels in the lakes for wetland health.	Feasibility assessments required	W	M	D	ED
					Y	Y	Y	Y

Core Element: The Murray Mouth open and connecting the Coorong, River and Lakes to the sea

The requirement to maintain an open Murray Mouth is addressed in the Coorong and Murray mouth section above.

The requirement to maintain the natural variable salinities in the Coorong in this future is addressed in the Coorong and Murray Mouth section above.

Core Element: Maintaining system connectivity and ecological function

No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
B5	Narrung Narrows remedial works (applies to wetter scenarios only) – remove bund, dredge narrows, undertake remedial works including modifications to ferry causeway to provide for natural flows through The Narrows	Remove the bund between Lake Alexandrina and Lake Albert, dredge the Narrung Narrows and modify the ferry causeway to provide for natural flows through The Narrows	Improve connectivity between Lakes Alexandrina and Albert to improve the water quality and water regime in Lake Albert.	Need to consider costs of cartage and dumping of spoil etc. The ferry causeway built in 1966 reduces the funnel effect at this point, inhibits flow through The Narrows and limits the movement of water through this area.	Y	Y	N	N
B6	Alternative to Narrung Narrows remedial works (applies to dry scenarios only) - Installation of permanent regulator at Narrung	Construct a permanent regulator at the location of the bund between Lakes Alexandrina and Albert that can facilitate two-way wind-driven flow between the Lakes.	Allows for greater flexibility in varying water levels in the two Lakes. This has the potential to result in better water quality in one or both Lakes. May provide water savings Provides the opportunity to implement actions in one of the Lakes	Assumes that this will help to be able to regulate water flows in/out of Lake Albert under dry scenarios. Regulator would be high and dry under an extreme dry scenario.	N	N	Y	N

			without impacting on the other Lake.					
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Core Element: Managing localised threats

No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
B7	Prevention of acidification	Install low permeability sub-surface barriers in strategic locations parallel to the shoreline to permit groundwater mounding and partial submergence of acid sulfate soils. Mound water behind shallow terraces along contour lines and distribute over sediments via perforated pipes.	Prevention is preferable to treatment.	Best means of installing barriers needs to be investigated. Permanent impacts on groundwater flow within the sediment banks may be undesirable. Some of the exposed sediment banks are of permeable sandy sediments that may not permit sustainable surface water mounding behind terraces. Need to avoid breakdown of terraces by wind or wave action.	N	N	Y	Y
B8	Hot spot Acid Sulfate Soil mitigation (e.g. cracking clays, sands, Mono-sulfidic Black Oozes)	Apply finely ground limestone to exposed lakebeds. This may be surface application or subsurface application. [Linked to C8]	Application of finely ground limestone will neutralise acid that has been generated.	Assumes practical application options are sufficiently effective. Questions about off site impacts, source materials. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment underway	N	N	Y	Y
B9	"Bioremediation basin"	Allow Lake Albert to drawdown to a level that will be	Application of finely ground limestone will neutralise acid that has been	Assumes practical application options are sufficiently	N	N	Y	Y

		<p>sustained with groundwater or surface water inflows, noting that the groundwater may be highly saline. Remediate the lake by, applying organic matter, carbonate and iron, as required for sulfate reduction to pyrite.</p> <p>[Linked to C7]</p>	<p>generated. Bioremediation will help to manage the effects of acidification.</p> <p>Provides approximately 170GL per year of water savings, through ceasing to pump water from Lake Alexandrina.</p> <p>Lake Albert converted to an ephemeral wetland, which can facilitate bioremediation.</p>	<p>effective. Questions about off site impacts, source materials. Positive and negative socio-economic impacts will need to be considered.</p> <p>Feasibility assessment underway</p>				
B10	Revegetation for Acid Sulfate Soil remediation around Lake edges	<p>Exposed acid sulfate soils will be direct seeded with crops or native vegetation.</p> <p>[Linked to C4]</p>	<p>Revegetation using crops and native plants will help to promote conditions that do not encourage the formation of acid and will reduce mobilisation of heavy metals.</p> <p>This will prepare the Lake for other management options such as saturation of exposed soils with freshwater, native revegetation (reeds, rushes, trees).</p>	<p>Assumes practical application options. Questions about what species to plant where for best outcomes. Need to ensure no introduction of weeds or other future issues. Positive and negative socio-economic impacts will need to be considered.</p> <p>Feasibility assessment underway</p>	W	M	D	ED
					N	N	Y	Y
B11	Planting of annual crop type species on exposed areas to contain wind erosion	<p>Areas exposed to wind erosion will be planted with annual crop species, initially to</p>	<p>Promotes resilience within the wetland system as it minimises the exposure of new acid sulfate soils to</p>	<p>Assumes practical application options. Questions about what species to plant where for best</p>	W	M	D	ED
					N	N	Y	Y

C. Management Actions: Lake Alexandrina

Management and mitigation of acid sulfate soils (includes treatment of eastern end of Hindmarsh Island), no seawater

Core Element: Freshwater provided to the Lakes and Coorong and managing variable lake levels								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
C1	Increased freshwater provided from upstream in the MDB (Basin Plan, Water for the future, buy backs etc)	Secure freshwater from upstream of the Coorong, Lower Lakes and Murray Mouth – through buybacks, the Basin Plan, Water Allocation Planning processes	<p>Short-term – Reduces salinity within the wetland system, including Lake Alexandrina. Submerges Acid Sulfate Soils</p> <p>Long-term - Delivery of freshwater to the site is the preferred option for establishing a healthy, productive and resilient wetland of international importance.</p> <p>Secures the future of communities and industries dependent on the wetland system.</p>	Approach and feasibility to be scoped	Y	Y	Y	Y
C2	Develop a framework to manage water most effectively within the site	Develop and implement a framework to manage water most effectively within the site. Will incorporate a Lakes and Barrages	Water levels within the Lakes have traditionally been managed to provide for take by irrigators from the water bodies. Managing	Plan for developing a framework required	Y	Y	Y	Y

		Operating Strategy.	water levels primarily for ecological outcomes will allow for greater variation in lake levels and should lead to improved wetland health.					
C3	Reduce reliance upon Lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc	Extend existing potable pipelines and the irrigation pipeline currently under construction to include all users of water extracted from the lakes. Undertake a regional water use and wastewater budget from Lock 1 to the Murray Mouth to identify 1) ways in which River Murray and tributary water use can be reduced or changed to benefit the wetland system and 2) opportunities for wastewater re-use to replace	Will remove reliance of all water users from the lakes and increase the reliability and quality of water supply to these users. Allows for greater flexibility in managing water levels in the lakes for wetland health.	Feasibility assessment required	W	M	D	ED
					Y	Y	Y	Y

		current River Murray and/or tributary water use. Options may include rainwater tanks and piping of treated wastewater to users.							
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Core Element: The Murray Mouth open and connecting the Coorong, River and Lakes to the sea

The requirement to maintain an open Murray Mouth is addressed in the Coorong and Murray mouth section above.

The requirement to maintain the natural variable salinities in the Coorong is addressed in the Coorong and Murray Mouth section above.

Core Element: Accepting variable water levels, yet maintaining system connectivity

The requirement to maintain ecological connectivity in this future is addressed in the Coorong and Murray Mouth and Lake Albert sections above.

Core Element: Managing localised threats, especially acidification

No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
C4	Re-vegetation (native) for ecosystem re-habilitation around Lake edges	Revegetate the adjacent high elevation areas of the lake above +0.75m AHD with native species.	Planting these areas will increase the connection between habitats within the Lake, including between aquatic and terrestrial habitats. Additional benefit of providing additional carbon and iron to the	Assumes practical application options. Questions about what species where for best outcomes. Need to ensure no introduction of weeds or other future issues. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment underway	Y	Y	Y	Y

			Lake system.		W	M	D	ED
C5	Cropping of annual species in exposed areas to contain wind erosion, to be followed by planting natives and increasing biodiversity	Areas exposed to wind erosion will be planted with annual crop species, to be followed by plantings of native. Species.	Promotes resilience within the wetland system as it minimises the exposure of acid sulfate soils to air.	Assumes practical application options. Questions about what species where for best outcomes. Need to ensure no introduction of weeds or other future issues. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment underway	N	N	Y	Y
C6	"NRM" activities (weed control, fencing, rabbit control to ensure success of re-vegetation and cropping)	Implement integrated pest plant and animal control programs across the whole site, including both aquatic and terrestrial habitats. Develop and implement a Code of Practice for lakeshore graziers that provides for best practice for managing stock around the Lakes – would cover issues such as fencing, alternative water points, erosion control and rotational grazing.	Pest plants and animals have the potential to significantly alter the Ecological Character of the site if not controlled. Uncontrolled stock access to the Lakes threatens some components of Ecological Character through processes such as disturbance of acid sulfate soils, trampling, grazing and pugging.	Weed control, fencing, rabbit control necessary to ensure success of revegetation and cropping Feasibility assessment required	Y	Y	Y	Y
C7	Bio-remediation wetlands for areas that disconnect from main	Manage Lake Alexandrina water levels to a level that will sustain wetland	Application of finely ground limestone will neutralise acid that has been	Assumes practical application options are sufficiently effective. Questions about off site impacts, source	N	N	Y	Y

	water body of Lake Alexandrina	function. Manage acid sulfate soils in the lake by applying limestone and cover crops, and saturation.	generated. Bio-remediation will manage acidification risks and acid sulfate soils. Parts of Lake Alexandrina converted to ephemeral wetlands/ swamp, which can function as Bio-remediation Basins.	materials. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment underway. Alternative arrangements would need to be made to provide water to Lake Albert, if it were to retain water.				
C8	Prevention of acidification	Install low permeability sub-surface barriers in strategic locations parallel to the shoreline to permit groundwater mounding and partial sub-mergence of acid sulfate soils. Mound water behind shallow terraces along contour lines and distribute over sediments via perforated pipes.	Prevention is preferable to treatment	Best means of installing barriers needs to be investigated. Permanent impacts on groundwater flow within the sediment banks may be undesirable. Some of the exposed sediment banks are of permeable sandy sediments that may not permit sustainable surface water mounding behind terraces. Need to avoid breakdown of terraces by wind or wave action.	W	M	D	ED
					N	N	Y	Y
C9	Hot spot Acid Sulfate Soil mitigation (e.g. cracking clays, sand, Mono-sulfidic Black Oozes)	Apply finely ground limestone or water to exposed lakebeds	Application of finely ground limestone will neutralise acid that has been generated. It will also help to promote conditions that do not encourage	Assumes practical application options are sufficiently effective. Questions about off site impacts, source materials. Positive and negative socio-economic impacts will need to be considered.	W	M	D	ED
					N	N	Y	Y

			the formation of acid.	Feasibility assessment underway				
C10	Introduction of minimal amounts of seawater to avert acidification of Lake Alexandrina	The minimum amount of seawater necessary will be introduced to avert acidification of Lake Alexandrina.	May avoid acidification (although could make it worse)	Further research is occurring through the seawater EIS required as part of Environment Protection and Biodiversity Conservation Act approvals. It is possible that this action could result in changes to ecological character and further planning would be required to identify recovery strategies to return the site to a functional freshwater system.	W	M	D	ED
					N	N	N	Y

D. Management Actions: Tributaries - Finnis River and Currency Creek

Management and mitigation of Acid Sulfate Soils, no seawater

Core Element: Freshwater provided to the Lakes and Coorong and managing variable lake levels								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
D1	Increased freshwater provided from upstream in the MDB (Basin Plan, Water for the future, buy backs etc)	Secure freshwater from upstream of the Coorong, Lower Lakes and Murray Mouth – through buybacks, the Basin Plan, Water Allocation Planning processes	<p>Short-term – Reduces salinity within the wetland system. Submerges Acid Sulfate Soils.</p> <p>Long-term - Delivery of freshwater to the site is the preferred option for establishing a healthy, productive and resilient wetland of international importance.</p> <p>Secures the future of communities and industries dependent on the wetland system.</p>	Approach and feasibility to be scoped	Y	Y	Y	Y
D2	Reduce reliance upon Lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc	Extend existing potable pipelines and the irrigation pipeline currently under construction to include all users of water extracted from the lakes.	<p>Will remove reliance of all water users from the lakes and increase the reliability and quality of water supply to these users.</p> <p>Allows for greater flexibility in managing</p>	Feasibility assessment required	N	N	Y	Y

		<p>Undertake a regional water use and wastewater budget from Lock 1 to the Murray Mouth to identify 1) ways in which River Murray and tributary water use can be reduced or changed to benefit the wetland system and 2) opportunities for wastewater re-use to replace current River Murray and/or tributary water use. Options may include rainwater tanks and piping of treated wastewater to users.</p>	<p>water levels in the lakes for wetland health.</p>					
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Core Element: The Murray Mouth open connecting the Coorong, Lakes and the sea

The requirement to maintain an open Murray Mouth in this future is addressed in the Coorong and Murray mouth section above.

The requirement to maintain the natural variable salinities in the Coorong in this future is addressed in the Coorong and Murray Mouth section above.

Core Element: Maintaining system connectivity and ecological function								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
D3	Installation of fish passage into regulators	Fish passages (e.g. vertical slots/rock ramps) will be installed in regulators to optimise fish passage between the tributaries, the lakes and the Coorong.	Fish passages are essential structures to enable fish to move between different parts of the Ramsar site that have been disconnected through barrages, regulators and other devices.		N	N	Y	Y

Core Element: Managing localised threats, especially acidification								
No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
D4	Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5)	<p>Construct a temporary regulator from the mainland near Clayton to Hindmarsh Island, and additional low level temporary regulators at the terminal ends of Finniss River and Currency Creek to impound the first flushes from the tributaries.</p> <p>In a one off event, 27.5 GL of water will be pumped from Lake Alexandrina into the ponded area in July 2009</p>	<p>Installation of the regulators will mitigate the acidification risks within the tributaries by inundating acid sulfate soils and minimising formation/mobilisation of acid and heavy metal salts.</p> <p>Creation of a freshwater refuge area subject to operation of the regulators, and a reduction in</p>	<p>Assumes structures are required to address Acid Sulfate Soils. Questions about required height, construction, decommissioning and hydrodynamic implications. Positive and negative socio-economic impacts will need to be considered.</p> <p>An equivalent amount of water has been bought to compensate for the amount pumped from Lake Alexandrina.</p>	N	N	N	Y

		<p>following completion of the regulators. Water in the Channel to be discharged when the water level reaches 0.70mAHD.</p> <p>Discharge location could be to Lake Alexandrina (via the regulator at Clayton) (as currently advised by the Commonwealth Government) or to the Murray Mouth and Coorong via the Goolwa barrage (would need to be negotiated with the Commonwealth Government).</p>	salinity.					
D5	Revegetation (native) for Ecosystem rehabilitation around the tributaries	Revegetate along the edges of the tributaries with native species	Provides an opportunity to increase the connection between habitats within the wetland system, including between aquatic and terrestrial habitats.	Assumes practical application options. Questions about what species where for best outcomes. Need to ensure no introduction of weeds or other future issues. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment required	W	M	D	ED
					N	N	Y	Y

D6	Cropping of annual species to contain wind erosion	Areas exposed to wind erosion will be planted with annual crop species.	Promotes resilience within the wetland system as it minimises the exposure of acid sulfate soils to air.	Assumes practical application options. Questions about what species where for best outcomes. Need to ensure no introduction of weeds or other future issues. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment required	W	M	D	ED
					N	N	Y	Y
D7	"NRM" activities (weed control, fencing, rabbit control to ensure success of revegetation and cropping)	Implement integrated pest plant and animal control programs across the whole site, including both aquatic and terrestrial habitats.	Pest plants and animals have the potential to significantly alter the Ecological Character of the site if not controlled.	Weed control, fencing, rabbit control necessary to ensure success of revegetation and cropping Feasibility assessment required	W	M	D	ED
					Y	Y	Y	Y
D8	Hot spot Acid Sulfate Soil mitigation (e.g. cracking clays, sand, Mono-sulfidic Black Oozes)	Apply finely ground limestone to exposed creek beds	Application of finely ground limestone will neutralise acid that has been generated. It will also help to promote conditions that do not encourage the formation of acid, and assist the reestablishment of key plant and animal species.	Assumes practical application options are sufficiently effective. Questions about off site impacts, source materials. Positive and negative socio-economic impacts will need to be considered. Feasibility assessment required	W	M	D	ED
					N	N	Y	Y

A Responsive Management Approach Based on Robust Research, Adequate Monitoring and Extensive Community Involvement

No.	Management Action	Description	Rationale	Assumption/Risk	Climatic Scenario (Wet, Median, Dry, Extreme Dry)			
					W	M	D	ED
	An adaptive management framework is under development. Community involvement aspects will be determined through consultation with communities			Undertake a review of the current status of Ecological Character and then monitor the recovery of Ecological Character (birds, fish, vegetation, water quality) as a result of actions being undertaken. People and software requirements etc. Research example includes Coorong, Lakes And Murray Mouth Ecology under the direction of the Scientific Advisory Group. Research and monitoring will need to be in the order of 10% of the total budget. Community engagement, project managers, finance, procurement, policy, governance. This is to include policy work such as water allocation planning and other mechanisms.				

Attachment 1c: Feedback Form

Name: _____

Organisation/ Business/Community group:

Social Impacts: Health and wellbeing, community networks, volunteering, education, spiritual and cultural identity, community infrastructure
Economic Impacts: Impact on employment, gain/loss of business, opportunity/risk of investment, impact on industry, incomes and production

	Social Impacts	Economic Impacts	Environmental Feedback
<p>1. If a 'do nothing' stance was taken and the situation remained similar to now, what would happen to your production/business/service provision?</p> <ul style="list-style-type: none"> • What would you do to maintain your current production/services? • What costs would be involved in maintaining production/services? • What are the risks you would have to manage? 			
<p>2. Do you support the core elements of the Long Term Plan?</p> <ul style="list-style-type: none"> • Freshwater provided to the Lakes and Coorong and managing variable lake levels • The Murray Mouth open and connecting the Coorong, River 			

	Social Impacts	Economic Impacts	Environmental Feedback
<p>and Lakes to the sea</p> <ul style="list-style-type: none"> • Managing system connectivity and ecological function • Managing localised threats, especially acidification 			
<p>3. Do you have any ideas for creating opportunities for community involvement in projects and decision making in the Implementation of the Long Term Plan?</p>			
<p>4. Please identify impacts specific to the proposed management actions. (These are listed in the Management Actions document accompanying this template.)</p> <p>e.g. A4 Pumping out of the South Lagoon</p>			
<p>e.g. C2 Barrages Opening Strategy</p>			<p><i>*Press Tab in this box for additional lines of boxes to provide further comments on specific management actions.</i></p>

Further information

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Post: Reply Paid 1047 ADELAIDE SA 5001

To find out about the Department for Environment and Heritage's work in the Coorong, Lower Lakes and Murray Mouth region visit www.environment.sa.gov.au/clmm

All feedback will be collated into a socio-economic impact statements report which will contribute to the development of the final version of the Long Term Plan and the business case to secure funding for implementation through the Australian Government. Please note by submitting a written response that you are giving consent for your words and ideas to be used in public Department for Environment and Heritage documents. The collated impact statement report will not have personal names attached.

Attachment 2: Impact Assessments

CLLMM Socio-Economic Impact Assessments

INDUSTRY: BOATING

Contributors:

- Boating Industry Meeting
- Boating Industry Association of South Australia
- Houseboat Hirer's Association (HHA)
- Release and Retrieve Boat Latch Pty Ltd
- Clayton Bay Boat Club
- Friends of the Fleurieu Peninsula Waterways
- Milang Regatta Club
- Southern Alexandrina Business Association

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

The boating industry estimates that up to \$1 million dollars per day is spent on tourism, recreation and boating below Lock 1. Approximately 800 boats have left the Goolwa region due to low water levels. There are 8 marinas in the region. Each mooring brings in \$50 per week and thus there is a loss of \$2 million per year to marinas and to the local economy. The Hindmarsh Island Marina's business is down 19% this year with a 50% loss from the year before.

The Southern Alexandrina Business Association report that businesses directly connected to water and water tourism have had up to 80% reduction in sales (boat repairers and builders, marina operators). Some businesses have diversified or changed their marketing focus. Businesses who are at the 'discretionary purchase' end of the spectrum are reporting significantly lower sales. This has resulted in loss of jobs. The estimated loss to the local economy is \$20,000 per boat per annum. The boating industry is trying to promote recreation and boating on the River Murray to the general public, allaying fears that people are unable to boat below Lock 1.

There are 169 commercial houseboats from Murray Bridge to Renmark listed with the Houseboat Hirer's Association. Businesses of the leisure, tourism and recreational industry are being severely impacted by the drought, in particular those located in the Lower Murray and Lower Lakes. The respondents state that media coverage increases community perception there is no water in the Murray and therefore tourists are not holidaying on houseboats. The downturn on houseboat operators also impacts allied businesses such as cleaners, mechanics, the food industry, accommodation and retail. With the exception of Long Island Marina, all houseboats are now sited at emergency temporary moorings. Current figures from the HHA show a 31% downturn in bookings over the past 2 years and a total decrease in excess of 50% since the drought started having an impact 5 years ago.

The Milang Regatta Club has 12 members, down from 50 at its peak. There has been no racing since Easter 2008. The Milang to Goolwa race, organised by the Milang Regatta Club has not been held for two years. This race brought up to 500 boats into the town and provided a huge economic boost for local business. The club is almost dead and will not build again unless there is increase in lake levels allowing boating. In contrast, the Clayton Boat Club has 120 members even though currently there are no boats in the water due to low lake levels. Club membership has been maintained through an increase in social activities such as BBQ's and bocce.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

The boating industry is supportive of the core elements of the Long Term Plan and is concerned for the environmental degradation to the Lower Lakes environment. There is general support for the Long Term Plan, however, they advocate for the need to address the impact on the tourism and recreation industry to ensure ongoing viability of businesses and support for the regional economy. There is also concern that the impacts on boating, tourism and businesses on the River Murray below Lock 1 are not considered in the overall plan.

Within the boat clubs, members views are mixed but there is a general view that freshwater is the best option. However, there is concern that not enough freshwater will be able to be delivered to the lakes to enable recreational boating and therefore seawater would need to be considered as an alternative.

There is support for a connected system and an open Murray Mouth as it would also enable boating between areas.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures*

The boating industry believes that media coverage on the water crisis in the Lower Lakes is impacting negatively and the public perception is that there is no water for boating in the River Murray. They suggest that an extensive marketing campaign to address this misconception immediately. Projects may include a tri-state marketing campaign, celebrity ambassador program, a TV documentary and a national familiarisation program.

The boating industry supports the Pomanda Weir but also supports the building of a permanent weir. The industry advocates strongly for a permanent breakwater and opening at the Murray Mouth. Other initiatives to be considered include; opening the Goolwa Lock, beacons to Wellington, relocation of the Mundoo boat ramp, new boat ramps, improvements to the Goolwa pump out station, destination jetties, introduction of small islands, improvements to the Goolwa wharf, a crane pad at the Clayton regulator and Pomanda Weir, a Rat Island channel and improvements to the Milang Boat Harbour.

MANAGEMENT ACTIONS RESPONSE

A4 – Dredging-existing strategy and A7 – Channel dredging with River Mouth Training Walls not supported. The boating industry supports an open Murray Mouth; however, they feel that the ongoing expense of dredging the Murray Mouth cannot be justified. They believe that a permanent long term solution needs to be considered with a permanent fixture/ breakwater. This would be economically viable due to the saving of \$6-7 million per year on dredging. The potential cost of a permanent breakwater is \$40 million.

B1 – Increase freshwater provided from upstream in the Murray Darling Basin (Basin plan, Water for the Future, buy backs etc). Supported

D4 – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5). The Milang Regatta Club does not support the regulators as they disconnect the system and prevent boat passage. The Clayton Bay Boat Club is generally supportive as it will enable boating in the Goolwa Channel; but they are also concerned of the environmental impacts due to the lack of wind seiching. The boating industry supports the regulators as temporary measure but they are not supported as a long term option.

SUMMARY

- The boating, tourism and recreation industry has been severely impacted by the low water levels, in some cases with 80% loss of business with subsequent business closure and loss of employment.
- There is general support for the Long Term Plan, however, there are concerns whether enough freshwater can be delivered and that the plan does not directly address the impact on tourism, boating and recreation on the River Murray below Lock 1.
- General support for the Goolwa Channel regulators but they are seen as a temporary measure only.
- An open Murray Mouth is seen as a priority and many in the industry would prefer to see an investment in a permanent breakwater rather than an ongoing dredging scheme.

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INDUSTRY: FISHING

Contributors:

- Southern Fisherman's Association
- Goolwa Pipi Harvesters Association
- Lower Lakes and Coorong Infrastructure Committee
- EconSearch analysis (2008)

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

The Lakes and Coorong Fishery is comprised of 36 licences held by 33 licence holders, mainly family businesses. Some fisheries employ up to 8 people. Total catch for 2008 is over 2,500 tonnes with a total value of over \$7.5 million. The gross value of output from the region has been maintained by the fishers' ability to shift effort between environments and species. However, the low lake levels are causing difficulties for boat access and manoeuvrability and this has resulted in smaller catches. High salinity is perceived as having a significant impact on fish stocks. The change in environmental factors has seen an increase in predators (seals) that are eating fish in nets. There is a view that low water levels are impacting Pipi stocks but scientific evidence is inconclusive. Community tension is rising over debates about the best solution.

The region has been commercially fished since 1846, with a number of generational fishing families (some going back 5 generations), still conducting their activities in the area. When low water levels in Lake Albert prevent fishing, fishers identify that this will result in a halving of their income and lay-off of staff. In the short term this will be prevented by increased income through the Fish Down proposal. The objective of the Fish Down is to remove all regulation and provide assistance for fisherman to catch as many fish before a fish kill occurs. This generates income and minimises the extent and volume of the fish kill. The threat to the future of fishing in Lake Albert has had significant impacts on fishing families with teachers reporting children exhibiting distress over their families' future.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

There is strong support for a healthy freshwater system that protects ecology and maintains fish stocks with the Murray Mouth open and system connected. In the short term, fishers do not support either the sea water incursion or drying down of Lake

Albert but would prefer maintenance of freshwater flows similar to the proposed management of Lake Alexandrina.

Managing local threats for Lake Albert with reduction in water levels- seawater or freshwater will result in the end of fish stocks and commercial fishing in Lake Albert.

FUTURE INITIATIVES – *Identification of opportunities for involvement and cooperative ventures*

Commercial fishers advocate that those disadvantaged by the solution need to be financially compensated, to enable net fishing industries to exit their industry with dignity. They believe that industry meetings should be held directly with decision makers (Minister) and that the industry be involved in designing the buy-out program.

MANAGEMENT ACTIONS RESPONSE

A3 - Connect Lake Albert to the North lagoon of the Coorong. Commercial Fishers do not support the pumping of salty water into and out of the Coorong to Lake Albert to minimise acidification due to the risk of impacts on the Coorong.

A5 - Dredging-increase channel dimensions. There is strong support for the Murray Mouth being kept open to maintain a healthy system and maintain fish stocks.

A9 - Fish passages through to the Coorong at Goolwa. Fish passages are strongly supported and are seen as an absolute necessity in all barrages. Fish passages also need to be operative at much lower lake levels.

A10 - Pumping out of the South Lagoon. There is strong support for the pumping out of the South Lagoon in order to increase the health of the Coorong and prevent further impact on fish stocks in the Coorong.

SUMMARY

- When low water levels in Lake Albert prevent fishing, fishers state that this will result in a halving of their income and could result in layoff of staff. In the short term this will be prevented by increased income through the Fish Down proposal.
- However, the industry is advocating for a compensation initiative to be introduced and that they are involved in shaping it.
- There is support for the Long Term Plan in delivering a healthy and productive wetland system that supports local economies and communities.
- Concerns about the impacts on the ecology and health of the Coorong if there is an exchange of saline water between the Coorong and Lake Albert.

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INDUSTRY: HEALTH

Contributors:

- Mallee Coorong Health Service
- Meningie Medical Centre
- Meningie Hospital and Community Health Service
- Additional community representatives raising issues regarding health impacts

DO NOTHING - *Impacts of situation at present and consequences if situation remained similar to now.*

The health industry contributors state that current drought and economic impacts are resulting in an increased incidence of mental health issues, stress and anxiety. This is attributed to job losses in the dairy and agricultural industry and a decrease in property values.

Physical health impacts noted include an increased incidence of gastro-enteritis, skin and eye infections. As these health impacts have increased in the last three years and are not visible in Tintinara and Coonalpyn, they are seen as a direct impact of lake water issues and are attributed to declining water levels and declining water quality. The Medical centre has advised the community to avoid contact with all lake water.

Numerous community members expressed concern regarding the impacts of a fish kill in Lake Albert which will result in the stench of rotting fish, increased mosquito and fly numbers and the potential for unhealthy bacteria to breed. The community is concerned about severe dust storms causing respiratory distress. There is a fear of the threat of toxic dust and impact of poisonous gases on health should there be a major acidic event.

The community believes that if nothing is done about the water issues, Lake Albert will be left to die and the population will decrease.

The population decrease will impact on GP services (there are currently 15 jobs in the Medical Centre) and there is a risk that Doctors will leave without much likelihood of replacement. If this occurs, the hospital will be under threat of closure.

The Meningie hospital provides hospital and community health services to Meningie, Raukkan, Tintinara and Coonalpyn. Due to the drought there has been an increase in drought support services and other grant funded programs but there is very little coordination between the programs. However, hospital staffs have not noted significant impacts on the aged community.

The Director of the Mallee Coorong Health Service indicated that future planning would support maintenance or development of health services provided to Meningie and Raukkan.

The Meningie Medical centre provides a service to the Raukkan Indigenous Community. Low water levels and the closure of the Community Development Employment Projects (CDEP) program have had an impact on this community. It is reported that residents feel they have no job opportunities and have been 'left and dumped.'

Medical Practitioners reported there is a sense of dejection in the Indigenous community and an increase in dysfunction with an increase in incidents related to alcohol and violence. Pipeline construction provided short term employment but the community needs long term employment opportunities.

The Meningie Community Health Service Aboriginal health worker reported that the older Indigenous community feels sad that the bird life is leaving. Generally, there is community anger that the water issues are a man made problem.

SUPPORT FOR THE LONG TERM PLAN

There is partial support for the core elements of the Long Term Plan. Health and welfare workers emphasised the importance of engaging with the Ngarrindjeri

community as a key group who will be significantly impacted by the degradation to the environment.

As a priority, the implementation of the Long Term Plan should support local employment opportunities and income maintenance for Indigenous communities as this is seen as the best measure of minimising psychological health impacts.

The restoration of freshwater levels to minimise the risk of health issues from excess dust and poor water quality is the preferred option. However, if adequate levels of freshwater can not be provided, full incursion of seawater is described as the best alternative from a health perspective.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures*

Improved coordination between health and drought support services is required to ensure appropriate referrals and more effective use of resources.

Identified need for monitoring of epidemiology and health impacts to ensure that health services respond to emerging health issues. Currently there is planning for a partnership with the "Inner Country" working practice and Division of GPs Regional Co-ordination Network. The aim is to improve data collection so that evidence can support future health program planning decisions.

Communities have requested that dust monitoring occurs at Meningie, Milang, Goolwa and Clayton to test for toxic dust and risk to public health.

MANAGEMENT ACTIONS RESPONSE

B9 "Bioremediation Basin" - There is concern from Meningie health workers that bioremediation and drying down of Lake Albert will result in significant issues with dust resulting in health problems. In addition, it is viewed that the economic impact from loss of tourism and downturn for town businesses will dramatically increase the incidence of mental health issues of stress, anxiety and depression.

SUMMARY

- Increase in mental health issues due to economic impacts of low water levels.
- Increase in physical health complaints (skin and eye irritation) due to contact with lake water.
- Concern about increasing health complaints and prevalence of disease due to low water levels and water pooling with increased mosquitoes.
- Indigenous community identified at risk by medical practitioners with an increase in abuse of alcohol and incidence of violence which is attributed to loss of employment and income as well as impact of degradation of natural environment.
- General community concern regarding impacts of increase in dust storms with bioremediation approach and risk of toxic dust.
- Increased water levels - preference is for freshwater, but seawater also acceptable as the best option to minimise health impacts.

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ALEXANDRINA COUNCIL

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now*

The failure of a sustainable water allocation system for the Murray Darling Basin and the apparent majority view that climate change will result in future extended droughts leaves Alexandrina Council with great concern that there will not be an improvement in sustainable flows reaching the Murray Mouth unless the *Murray Darling Authority Basin Plan* successfully locks in sustainable flows that ensure a median flow of 3,300 GL's flows over the barrages out to the Murray Mouth (*CSIRO Sustainable Yields Project*).

The economic impacts of no action would result in business closure, loss of fishing, increased unemployment, loss of tourism and recreational pursuits. The region would continue to see further reduction in property values, increases in costs to deliver water supplies, increased costs to maintain infrastructure and an increase in prices for the community due to a reduction in critical mass and reduction in purchasing power. In addition, there would be loss of local knowledge and skills, volunteers and an increase in applications for financial support.

It stated that social impacts are already being seen; with increased access to support/counselling services, increases in individual case management support for welfare and mental health issues, loss of younger people (causing disruption to families), increased anger, resentment/distrust/depression and a risk of suicides.

The social impact already evident in the dairy industry over the past 4 years of drought is seen as an appropriate indicator to show what the wider negative effects across the region might be in the form of unemployment, lack of self esteem, broken families and mental health disorders. The negative cultural/spiritual impact on our Ngarrindjeri community is of great concern to Council.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

Council supports the core elements of the Long Term Plan. Council does not support the opening of the Goolwa Barrage to allow the free flow of seawater into the Goolwa Channel nor does it support seawater intrusion into Lake Alexandrina unless sea level rises turn it into a long term natural environment. In such a circumstance, every effort should still be made to isolate the Goolwa Channel to ensure the Finniss River and Currency Creek remain freshwater systems.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

Council is very concerned that the freshwater aquifers through the Langhorne Creek region are not only failing but are at risk of increased salinity, including the groundwater in the Upper Bremer Catchments. Council implores the authorities to resist any consideration of allowing seawater into the lakes which it is believed will cause enormous long term ecological damage.

Council supports the *Shoreline Proposal* put forward to DEH by members of the Milang, Langhorne Creek and Clayton communities to tackle the social, environmental and economic impacts of low water levels for the lakes and rivers. The objective is to build partnerships with the community, agencies and industry and to use good science to educate/train (and retrain), then deliver on ground actions to restore the health of the lakes, Coorong and Murray Mouth environment. The *Shoreline Proposal* is about combining economic benefit (job creation), and social benefit (self esteem building/mental health) to improve the environment (not just mitigation). This will be achieved through community engagement, education/retraining and funding allocations to the broader community. Council recommends that DEH give due consideration to this approach.

MANAGEMENT ACTIONS RESPONSE

C1 – Increased freshwater provided from upstream in the Murray darling basin (Basin plan, Water for the future, buy backs etc).

Council strongly advocates on behalf of its community that adequate freshwater flows be returned to the SA Murray Darling Basin through a strong Murray Darling Authority *Basin Plan* that ensures median flows over the barrages. This stance is based on the CSIRO's Sustainable Yields Project estimate of 3,300GL that allows for a healthy environment, including recreational benefits such as water craft passage through the barrages to access the Coorong.

A7 – Channel dredging with River Mouth Training Walls.

A8 – Sand bypassing with River Mouth Training Walls.

Dredging of the Murray Mouth and moving towards hard training walls is supported; provided sand flows are modelled carefully.

A9 – Fish passages through to the Coorong at Goolwa.

Fish Passages are supported and are seen as essential and positive.

B4 – Reduce reliance upon Lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc (note that this action does NOT include the irrigation pipeline to Langhorne Creek, which is an existing action).

Reduce reliance on lakes for irrigation is supported, given pipeline access.

B10 – Revegetation for Acid Sulfate Soil remediation around Lake edges.

Revegetation/Bioremediation around lake edges is supported; provided indigenous species are utilised over the medium to longer term; provided there is good science that sits behind the activities; and that the broader community is included, not just one agency and their commercial arm.

B12 – “NRM” activities (weed control, fencing, rabbit control to ensure success of revegetation and cropping)

NRM Activities are totally supported.

D4 – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5).

Council has very reluctantly supported the temporary regulators, believing that this short term solution may mitigate acid sulfate levels causing an environmental catastrophe. However, Council will lobby hard to ensure adequate freshwater flows return to the lakes and Goolwa Channel sufficient to flow over the Goolwa and other barrages. Council will demand the removal of the regulators as well as any weir that may be constructed at Wellington. Pumping from Lake Alexandrina is only supported if flows from the Finniss River and Currency Creek cannot fill the Goolwa channel.

SUMMARY

- Alexandrina Council has identified numerous social and economic impacts due to low water levels and has raised further concerns should no action be undertaken to resolve the situation.
- Council advocates strongly for increased freshwater flows as the main priority.
- Council recommends that CLLMM give further consideration to the Shorelines Proposal as a mechanism for building community partnerships leading to local employment and training .
- Alexandrina Council strongly advocates for the removal of temporary regulators as soon as there are sufficient freshwater flows.

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INDUSTRY: COMMUNITY - SOCIAL, RECREATION AND ACTION

Contributors:

- River, Lakes and Coorong Action Group
- Lakes Need Water
- Milang Progress Association
- Meningie Progress Association
- Milang Old School House Community Centre (MOSHCC)
- Port Milang Shack Owner's Association
- Lower Lakes and Coorong Infrastructure Committee
- Individual community members

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

Various community groups link low water levels with economic loss and subsequent social issues such as impacts on health and wellbeing, stress and anxiety, demand on volunteering and support services, and breakdown of social networks. This loss of tourism income has had a significant impact on town communities with the loss of family run micro-businesses and loss of families from the district. If this continues, there is the potential for the community to become unbalanced with an ageing population comprising the bulk of the community.

MOSHCC is a provider of community support services such as counselling, emergency assistance, community consultation and education. They have noted an increased demand for individual case management support services in the past year which places significant pressure on providers and volunteers. Land prices have dropped to half of the surrounding area in the Fleurieu region. This is an incentive for families of low socio-economic status to move to Milang due to low cost housing. These families often have high social needs and there are limited employment opportunities in Milang. There is concern that the community will reach a tipping point leading to increased family breakdown, violence, social isolation and suicide, which would result in burnout for staff and volunteers.

Community groups have expressed sense of loss and grief over the degradation of the environment. Community members describe it as a physical pain as well as a sense of despair and hopelessness. The "Freshwater Embassy" at Clayton, in addition to being a site of protest, was equally developed as an opportunity to share this sense of loss and grief and gain strength from others. There is a belief that this support may have reduced the risk of suicide in the community and has increased the connections between people. This grief is often interconnected with mounting anger in the community in response to the perceived lack of action.

There appears to be increasing tension between community groups, with some feeling left out and some perceived as having a bigger lobby voice. Generally, it is said that Alexandrina Council has a good relationship with its community. However, there is increasing tension between community groups who some see some groups coming out of the process as "winners" at the expense of others who are perceived as "losers" in the process.

Despite the significant pressure, there are also numerous indicators of community strength; social capital and resilience; the emergence of community leaders; the involvement of community members in taking action; the maintenance of

community programs; and the sustainability of community networks. It is these factors that the community refer to that will enable them to come through this crisis and create a viable future.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

This summary of community views represents the wide ranging community views that are represented from diverse groups in the community. The majority of community groups contacted support the core elements of the Long Term Plan. A number of groups indicate that short term interventions are not consistent with the core elements, so they question the Government's commitment. However, there are other groups that strongly oppose the plan (e.g. Lakes Need Water) who support the introduction of seawater.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures*

The community had a range of ideas for initiatives and structures that encourage community involvement and participation. The development of social enterprises was put forward to provide increased employment and includes training opportunities, increased small business start ups and improved access to support services. A social enterprise could provide environmental services such as seed collection, plant propagation, fencing, planting, acid sulfate soil and revegetation monitoring, community education and training. These businesses, once developed, would be able to tender for work and apply for grants.

Other community groups identified positives and negatives of existing community involvement structures. "Lakes Needs Water" questioned the membership of the Long Term Plan Reference Group as not having the expertise or will to explore inundation of the Lower Lakes with sea water. Other community representatives spoke highly of the Long Term Plan Reference Group and the Lake Albert Planning meetings as supporting partnership with the community and commitment to community dialogue on the issues. It was reported that this commitment to successful community engagement and communication was not evident in decision-making on the decision to build the regulators, Narrung bund, and ceasing pumping at Lake Albert.

MANAGEMENT ACTIONS RESPONSE

D4 – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5). There is a strong community view that the Acid Sulfate Soil risk mitigation measures could have been undertaken without the regulators and that the lobbying of Goolwa businesses, and the boating and tourism industry also had an impact in this decision at the expense of other community needs. This has been viewed as very damaging to the trust and relationships between numerous community groups and Government.

B7 – Prevention of Acidification

B8 – Hot spot Acid Sulfate Soil mitigation

B9 – "Bioremediation Basin"

C7 – Bioremediation wetlands for areas that disconnect from main water body of Lake Alexandrina. There is general support for the range of bioremediation activities and this, in particular, is where there is much scope for community involvement, employment and training. However, the sea water advocacy group see this as a waste of time and resources and potentially may fail with significant negative community impacts that would be resolved with seawater incursion.

A2 – Coorong and Murray Mouth - Increased freshwater provided from upstream in the Murray Darling Basin.

B1 – Lake Albert- Increased freshwater provided from upstream in the Murray Darling Basin.

C1 Lake Alexandrina - Increased freshwater provided from upstream in the Murray Darling Basin

D1 – Finniss River and Currency Creek - Increased freshwater provided from upstream in the Murray Darling Basin.

Sea water advocates view that an increase in freshwater is not realistic and certainly unachievable in the time required to minimise impacts on communities.

SUMMARY

- Communities identified numerous impacts of low water levels on community wellbeing which included health issues, increasing demand on community services, tensions and conflicts between community groups with competing interests and changes to the demographics of communities.
- Support of the Long Term Plan was varied with some strongly supporting a freshwater future and others strongly opposed to it. However, all strongly supported a connected system and open Murray Mouth.
- The community has responded very strongly over the development of regulators (D4). Besides the environmental concerns, the general perception is that the regulators were undertaken to appease the tourism, recreation and boating lobby groups at the expense of the environment of the Lower Lakes.
- All community groups advocate strongly for the development of strong partnerships between community and Government to enable a wide variety of community groups to be involved in decision-making and leading community engagement activities.

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INDUSTRY: EDUCATION

Contributors:

- Meningie Area School
- Raukkan School
- Milang Primary School

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

School enrolments have dropped significantly since 2005, due to the loss of dairy businesses and subsequent loss of employment. Between 2005 and 2008 families moved out of the district and the Meningie Area School lost 5-10 students per year. In 2007 the Narrung Primary School closed. A decrease in enrolment numbers meant that teachers were not replaced when they left the school (23 Meningie teaching staff is now 18).

The result is combining of year levels in one class which some parents do not like and have sought alternative education options. Over 25% of the school population is Indigenous. This number has been maintained due to low housing prices in Narrung. This percentage has increased as non-Indigenous families move away. However,

DECS only re-evaluates school socio-economic status every 5 years, so in the short term there is no increase in resources.

The Meningie School has a high level of success in SACE results and students' transition to jobs, further study and traineeships. The school has a number of employment pathways programs to assist with this. They stated that current school families have now switched off to activism and are burned out. They have moved on from anger, involvement and grief disillusionment. The children are sad about losing their aquatic and sailing program and that they cannot swim in the lake. The school has not been able to water the school oval for three years.

The Primary school is considered to be an integral part of the Raukkan community. Enrolment at the school has dropped to 13 students (25 students are required to ensure the school is considered viable). The closure of the CDEP program has resulted in a significant loss of jobs and families having to move from the area. The Principal reports that there are a number of families wishing to move to Raukkan but much of the housing requires significant repairs which is currently unfunded. The construction of the pipeline provided short term employment. Many families do not have a car or driver's licence. Students are concerned about the loss of water in Lake Alexandrina and have wondered if Lake Albert is taking it all. They have written a letter to the Prime Minister on the lack of water for the lakes environment.

There has been a minimal drop in enrolment at Milang R-6 in recent years with enrolment now at 56 students. The Playgroup is doing very well with 16 children. Affordable housing results in low income families being attracted to the area; hence 50% of school population has a school card. The formation of the Eastern Fleurieu School 13 years ago has secured the Milang School's viability. The parent advisory committee has 14 members and is very active. There are many indicators of strong social capital at the school. The school has been proactive in engaging school children in environmental action through its turtle program. This has served to counter community and family anxiety over water issues and support children in positive action and optimism for the future.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN - SUPPORT

The schools in the CLLMM region seem generally supportive of the goal and core elements of the Long Term Plan and have been involved in a number of environmental action, classroom learning, and community environment projects as well as involvement in bioremediation and acid sulfate soil monitoring opportunities.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

Any opportunities for the Raukkan community to be involved in the implementation of the Long Term Plan would be welcomed, particularly opportunities for training and employment. Provision of employment would develop the Raukkan community and retain essential services such as the school.

Meningie Area School is interested in any youth employment pathways programs that may connect in with bioremediation and eco-tourism opportunities.

The Milang School turtle program has been very successful in engaging students in their schooling and learning. They have been active in educating other children and have had communication with people all over the world. Media and political interest has provided the students numerous opportunities to gain confidence in public speaking and advocacy for the environment. The school is now seeking to develop the sustainability of their environmental learning and action program and is eager to gain further support and opportunities for involvement in local environmental issues and management.

SUMMARY

- Low water levels have resulted in a loss of jobs and families moving out of the Meningie and Raukkan region. This results in a drop in school enrolment numbers and a reduction in teaching numbers.
- Schools are supportive of students taking an interest in environmental issues and are actively involved in a number of community programs and bioremediation activities.
- The community views maintenance of strong educational opportunities as an essential service in their community and is concerned about drops in enrolment numbers and losing families with young children from the district.
- School employment pathway programs have been very successful in assisting the transition for student's post- school and opportunities to develop new pathways with involvement in the Long Term Plan would be welcomed.
- School environmental action and involvement projects demonstrate the value of children and youth involvement in issues of vital importance in their community. Student involvement leads to opportunities for powerful learning and advocacy for the care of the environment for future generations.
- The implementation of the Long Term Plan should incorporate and support children and youth involvement in ongoing projects and initiatives.

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INDUSTRY: VITICULTURE

Contributors:

- Langhorne Creek irrigator
- Langhorne Creek Wine Industry Council
- Currency Creek Irrigators Association
- Ballast Stone Estate Wines, Currency Creek
- SA Wine Industry Association

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

Water management issues have brought about emotional, physical and financial strain for the Langhorne Creek community. Financial strain has been exacerbated due to the global financial crisis and large wine corporations' not renewing grower's contracts. Irrigators are concerned for their children's future and their ability to continue to make a living from the land. There is acknowledgment that Langhorne Creek irrigators have not managed water in a sustainable way over the last 30 years with use of ground water, lake and tributary water.

There is significant concern regarding the retraction of the wine industry and resultant job losses, impacts on service providers, reduced resources for industry support, decreased economic activity, stranded assets in the long term and families moving from the region. One respondent's family employs 60 locals, with \$1.8 million in wages going into the local economy. There are also environmental concerns, if no action were taken, such as toxic dust which may impact on wine quality and infrastructure. Producers are buying in water to keep vines alive until the pipeline comes into effect. Socially, this has had an impact on a once thriving community where people feel down and depressed, no longer bother coming to meetings and are just in survival mode.

Extraction from the tributaries ceased a couple of years ago. If a pipeline had not been implemented, they would now be out of business as there would be no capacity to produce grapes at all. The pipeline will alleviate some of this uncertainty about the future but the increased cost of water will increase costs of production. 50% of growers do not live in the region and a number of growers are part-timers. It is reported that if there were no pipeline, people would be pulling out their vines and selling land at huge losses for grazing. Contractors and workers employed in the vineyards do live locally, people have downsized and employment has been cut by a third.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

There is a good level of support from the industry for a freshwater future, with more being generally supportive than not. However, there is concern by the industry representatives that freshwater for the environment would be sourced at the expense of upstream irrigators. The predominant view is that seawater incursion will cause hyper-salinity in the lakes that will lead to environmental degradation which may also impact on the vineyards. The wine industry views itself as having a strong record of environmental stewardship. Some view that that salt water is the most achievable solution to maintaining system connectivity.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

Local irrigators have developed a proposal that a percentage of all water trading be allocated to the environment, for example, 30%. One Langhorne Creek irrigator feels there needs to be better management and regulation of the catchments and tributaries that feed into the Lower Lakes, (i.e. the Angas, Bremer, Finnis and Currency). He is also concerned that private storages are not monitored and regulated.

There is a support to keep the Murray Mouth operational. The suggestion is that it could be achieved by digging a channel between Wellington and the Murray Mouth that will help to maintain a positive head to the mouth and assist with flow.

MANAGEMENT ACTIONS RESPONSE

A1 – Increase diversion of the water from the South East Drainage system - The SA Wine Industry Association has concerns for the impact on the economy of SE region, including the wine and grape industry. They ask the question who will bear the costs for construction and management of drains and that the impact of diversion on both groundwater salinity and water table height in SE region must be considered.

A2 – Coorong and Murray Mouth - Increased freshwater provided from upstream in the Murray Darling Basin (Basin plan, Water for the Future, buy backs etc)

B1 – Lake Albert - Increased freshwater provided from upstream in the Murray Darling Basin (Basin plan, Water for the Future, buy backs etc)

C1 – Lake Alexandrina - Increased freshwater provided from upstream in the Murray Darling Basin (Basin plan, Water for the Future, buy backs etc)

D1 - Tributaries-Finniss River and Currency Creek Increased freshwater provided from upstream in the Murray Darling Basin (Basin plan, Water for the Future, buy backs etc)

The SA Wine Industry Association is concerned about the impacts on upstream communities - economic, social and depopulation. It questions where this water will come from and how it will impact on existing water allocation processes. They perceive this management action could be seen as shifting impacts of overuse from one region to another.

C3 – Reduce reliance upon Lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc. Local irrigators are supportive of the pipeline as they see this as the ‘saviour’ of their wine growing area. However, there is concern from the Langhorne Creek Wine Industry Council that removing all direct water access from the Lower Lakes will open up the option of sea water incursion. The industry has committed vast resources into irrigation in the area. The existing Langhorne Creek pipeline was provided through a vast investment by growers. Converting all the licenses to the pipeline is cost prohibitive for many and they question whether financial assistance would be offered to remove reliance from the Lakes.

D4 – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5). This management action is not supported by one Currency Creek winery. They believe that the regulators are causing significant levels of social grief.

D2 – Reduce reliance upon Lakes for extractive uses-ie. installation of pipeline and/or rainwater tanks etc.

D4 - – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5).

D5 – Revegetation (native) for ecosystem rehabilitation around the tributaries

D8 – Hot spot Acid Sulfate Soil mitigation (e.g. cracking clays, sand, Mono-sulfidic Black Oozes).

The Currency Creek Irrigators Association is supportive of all four Management Actions. They believe the provision of pipelines have saved their industry, providing certainty whereby people will be able to undertake capital expenditure and future business planning. Future vintages are expected to see significant improvement from 2011. However, they believe that the increased cost of water will result in increased costs of production and thus reduced returns, ultimately leading to a 20% decrease in production in inland irrigated areas.

SUMMARY

- Local growers and irrigators have experienced significant emotional, physical and financial strain with ongoing water management issues. There is a fear of further job losses in the industry if no action was taken. These impacts are coupled with those of an over supply of grapes and industry retraction.
- Local growers are also concerned about the management and regulation of the catchments and tributaries that feed into the Lower Lakes, including monitoring of private storages.
- Support for the Long Term Plan - There is a variety of opinions with most local growers supportive of lakes with freshwater whereas the Industry Association has concerns that the freshwater will be sourced at the expense of upstream irrigators. They are also concerned about potential impacts (salinity, water table) for South-East growers if water is diverted from the South East drainage system.
- The pipelines have been welcome as it has enabled a secure water source without extraction from the lakes and tributaries. However it is noted that not all growers are able to afford this investment and the increased costs of water has increased the costs of production.

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INDUSTRY: LOCAL BUSINESS

Contributors:

- Southern Alexandrina Business Association (SABA)
- Meningie and Milang Progress Association
- All Land and Livestock
- Rural Engineering
- Meningie Veterinary Clinic
- Real Estate – Goolwa
- Milang General Store
- Lake Albert Caravan Park and Milang Caravan Park
- Meningie Business Counselling and Support
- Lower Lakes Coorong Infrastructure Committee
- Regional Development Boards

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now*

SABA reports that businesses directly connected to water and tourism have had up to an 80% loss of business and this has resulted in a loss of employment, businesses being sold and others on the market but not selling. A number of Goolwa main street businesses have sought up to 50% rent reduction in order to survive. Lakeside caravan parks have reported that they are working harder themselves and have reduced casual staff to minimise costs, as visitor numbers have dropped significantly, particularly during the busiest summer months. These businesses are reported as being barely viable and both caravan parks are for sale with no buyers. Businesses are also impacted by the economic downturn. In Goolwa some cafes, bakeries and service industries are doing relatively well, primarily due to maintenance of population growth.

In Goolwa it is reported that real estate sales are down by 70% with property values staying stable but there are minimal sales. In Meningie, Clayton and Milang, property values have been reported as dropping by as much as 30%, particularly waterfront properties. It is reported that discretionary purchases are down significantly as well as general tightening of regular supplies. In contrast, larger purchases related to machinery have been maintained, which could indicate long term confidence.

If there was no further action, it is suggested that town businesses would suffer huge economic loss through the lack of tourism income and lack of development; population and employment loss; and a reduction in human services. Local businesses are reporting significant stress from having to lay off staff for the first time. This has resulted in a drop in customer service and reduction in the amount of stock carried, which often results in people going elsewhere to shop and no longer buying local.

It is viewed that Meningie has strong social capital but there is anxiety about what is in store in the short term for Meningie. Drought counselling and business transition services are available. These services report the community's hesitancy to seek support and suggest that the full impact has not yet been realised.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

Support for the Long Term Plan is mixed, with some business representatives supporting a freshwater future. Others, however, support seawater incursion as providing a more immediate measure to restore water levels, bring back tourism, reduce business uncertainty and thus minimise economic loss. There is concern about the tourism impacts of bioremediation on lake edges, varying lake levels and impacts of an 'ephemeral swamp'. Generally, people prefer to return to a freshwater system as long as they can be reassured that there will be enough water.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

There was acknowledgement of the future planning being undertaken by Coorong Council and Meningie residents (foreshore planning and Meningie water park proposals). It was felt that the Council should be supported with resources to undertake this task but that community ownership of the process was vital. It was suggested that it is worthwhile promoting the available community and business support services available and that small business operators could be encouraged to avail themselves of this assistance.

Tourism marketing was identified to actively promote the good things to do in the region, in particular to counteract the negative media coverage that describes the area as dead and a wasteland. A number of people identified opportunities need to be developed to expand tourism that did not rely on water, such as eco-tourism (tourism drives and interpretive trails) This was identified as an opportunity to work in partnership with the Ngarrindjeri community.

MANAGEMENT ACTIONS RESPONSE

B1 - Lake Albert- Increase freshwater provided from upstream in the Murray Darling Basin (Basin plan, water for the Future, buy backs etc) and B9 - "Bioremediation Basin".

Although a freshwater solution was preferred, there was concern that bioremediation would result in low water levels and large amounts of dust during the peak tourism time in summer.

D4 - Installation of regulators to achieve soil saturation in creeks to address Acid sulphate Soils (and removal in Year 5) Milang businesses did not support the regulators as they perceived it as a means to appease the boat and tourism lobby in Goolwa at the expense of tourism and business in Milang. Goolwa businesses, however, supported the regulators as enabling some increase in tourism and recreation and reducing further economic impacts on business.

C1 - Lake Alexandrina- Increase freshwater provided from upstream in the Murray Darling Basin (Basin plan, water for the Future, buy backs etc) and A1 - Increase diversion of the water from the South East Drainage system.

There was support for the increase in freshwater flows with a view that the State Government should actively lobby the Federal Government on this matter.

SUMMARY

- Small business and town businesses are reporting business downturn, economic and employment loss similar to the business impacts of low water levels on primary industries. This is particularly evident in businesses directly associated with water activities and tourism.
- Property values are reported as having decreased and numbers of sales reduced due to impact of low water levels, population loss and employment loss.
- There was concern that further impacts are yet to be realised particularly in Meningie and Milang.
- Support for the Long Term Plan was divided. Many preferred the restoration of a freshwater system; however it was felt in that opening the barrages and allowing incursion of seawater would provide a more immediate restoration of tourism, recreation and subsequently economic activity as well as ongoing business certainty for the future.

- It was felt that towns require support in developing strategic plans for a future with less water and small business also requires support in business transitions and decision making.
- Regulators , the Management Action D4 were strongly supported by Goolwa business in order to restore tourism and recreation, however, were strongly opposed as leaving other regional areas 'out in the cold'.

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INDUSTRY: AGRICULTURE

Contributors:

- SA Dairy Farmers Association
- Dairy SA
- Lower Lakes and Coorong Infrastructure Committee
- Milang, Meningie, Point Sturt, Hindmarsh Island, Lake Albert and Narrung Landholders
- SA Farmers Federation (SAFF)
- Lower Murray Irrigators (based in Murray Bridge)
- Fleurieu Beef Group

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now*

The industry reported that in autumn 2007, farmers and irrigators in the Meningie /Narrung area were no longer able to gain water from the lakes for irrigation, stock and domestic water use. Irrigators were shut down overnight. Dairy farmers and graziers had to reduce their livestock which had been built up over 40 -50 years of genetic breeding. Other long term landholders have also reduced breeding cows from 110 to 50, feed lotted cattle, or have bought and carted water with no government subsidy.

The Fleurieu Beef Group reports that many farmers risk bankruptcy unless they significantly contain costs even though farming responsibilities such as weed control and erosion management still require action. While one farmer has sold all cattle and found other employment, others have taken on extra debt in order to survive. There are often new expenses with new farming techniques required to change production systems. Irrigators are unable to make use of current irrigation infrastructure and assets. There is now less direct employment on farms which negatively impacts town businesses. Millions of dollars of investment in dairying, horticulture and other irrigation, enhancing the viability of all businesses, have been lost to the area and the local economy. One business is reporting they will remove operations from the district as current costs have crippled business.

There is a great deal of stress and anxiety for livestock owners, dairy farmers and landholders who relied on lake water. Health and wellbeing is impacted by not being in control of external factors influencing their business. Increased work hours result in less time available for community activities and participation. Land managers are feeling a sense of loss as they are no longer able to manage land in a sustainable way.

There is tension between various industry groups when one industry receives assistance and others do not. SAFF is concerned that not all water users are treated equitably (irrigators, stock, domestic and environment). There is a community perception that those who are able to lobby hardest "get what they want". One example of this is that Point Sturt landholders have no access to the pipeline. With no

action on stabilisation of the lake bed, there would be large scale sand drift and erosion. If the lake bed remained unfenced, livestock would be impacted by acidic soil, heavy metal toxicity and they would damage cropped areas.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

The agriculture community supports the core elements of the Long Term Plan. They support a freshwater solution for the lakes, although some in the community are unsure about the ability to deliver this outcome, particularly for Lake Albert. There needs to be greater community confidence in the ability to manage Acid Sulfate Soils and this management needs to extend to river locations above Wellington.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

Many landholders have been very involved in various community representation groups and bioremediation activities. There were a number of views on meaningful, effective community involvement with Lower Lakes planning and action. It was suggested that the use of strong established community networks and identifying small representative groups of community members who can communicate with agency personnel and disseminate ideas and information back to the community and organisations such as SAFF.

Although the whole system is linked, consideration needs to be given to the individual needs of each community. The implementation of any project should maximise as much input from local businesses and people as possible. This could include the provision of physical services and expertise, materials and goods, earth moving, farming and transportation equipment, airstrip facilities, accommodation, meals etc. There is a need for research into adaptive production systems including alternative enterprises and constructive land management services that train and involve land managers in farm trialling, monitoring and reporting opportunities. The community requires help to develop a plan for maintaining the aesthetically appealing area around the Meningie township and foreshore areas. The initiative requires an engineering and science approach.

The Lower Murray Irrigators support the building of a permanent lock at the bottom end of the river so that the pool level below Lock 1 is guaranteed and available for flood irrigation. This proposal would be strongly opposed by lakes landholders. There is support for investigating cloud seeding technology.

MANAGEMENT ACTIONS RESPONSE

A1 – Increase diversion of the water from the South East Drainage system

A3 – Connect Lake Albert to the North Lagoon of the Coorong

B4 – Reduce reliance upon Lakes for extractive uses-ie. installation of pipeline and/or rainwater tanks etc (note that this action does NOT include the irrigation pipeline to Langhorne Creek, which is an existing action).

These above actions were not supported by one agricultural representative as they were perceived as having minimal value for the significant costs involved.

A2, A4, A10, A11, B3, B7, B8, B9, B10. This wide range of proposed Management Actions was supported

B1 – Increase freshwater provided upstream in the Murray Darling Basin (Basin Plan, Water for the future, buy backs etc).

An alternative plan from a Meningie landholder proposes the introduction of seawater into the Lakes when flow from the Murray falls below 800 GL. This plan expressly opposes drying up Lake Albert.

B5 – Narrung Narrows remedial works (applies to wetter scenarios only) –remove bund, dredge narrows, undertake remedial works including modifications to ferry causeway to provide for natural flows through The Narrows.

B6 – Alternative to Narrung Narrows remedial works (applies to dry scenarios only) – Installation of permanent regulator at Narrung

A local landholder advocated for the immediate removal of the existing embankment when sufficient flows returned. The landholder also suggested immediate construction of regulators in the Narrows proper and under the existing causeway to manage the variable flow regime. Two way wind driven flows would be managed by regulators and there is a need to investigate the feasibility of a permanent vehicle crossing.

C3 – Reduce reliance upon lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc.

Point Sturt landholders are very concerned that they have been excluded from the current pipeline roll out.

C6 – “NRM” activities (weed control, fencing, rabbit control to ensure success of revegetation and cropping)

The SAFF supports the fencing of water frontage but feels that landholders need to receive financial assistance for this.

C10 – Introduction of minimal amounts of seawater to avert acidification of Lake Alexandrina.

A number of landholders are strongly opposed to the incursion of seawater due to the damage to the existing ecology. They have identified that there is more information required about this management action.

D4 – Installation of regulators to achieve soil saturation in creeks to address Acid Sulfate Soils (and removal in Year 5).

The Lower Murray irrigators support the use of regulators and suggest they should be made permanent. However, the majority of agricultural representatives and landholders are not supportive of engineering measures.

SUMMARY

- Dairy farmers and graziers have had to reduce their genetic breeding livestock, are feed lotting cattle, or have bought and carted water with no government subsidy. There is now less employment on farms which negatively impacts town businesses and essential services.
- Land managers are feeling a sense of loss and anger. Some have sold, while others have undergone major changes to adapt to decreased production.
- A freshwater solution for the lakes is favoured, although some in the community are unsure about the ability to deliver this outcome, particularly for Lake Albert.
- Landholders advocate for ongoing community involvement in the implementation process and advocate strongly for using local business and local people in carrying out the work.

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COORONG COUNCIL

DO NOTHING - *Impacts of situation at present and consequences if the situation remained similar to now.*

Coorong Council reports that over the last couple of years, two thirds of the dairies have closed. Currently, significant impacts are being felt by the fishing industry. Real estate is not selling and many people have their super and retirement funds tied up in property. Many people retire to Meningie because of the provision of essential services such as the health, aged care services and hospital, pharmacy, shops and schools. There is concern that if the situation stayed as it is now, those services would be at risk. Tourism has relied on the water of the lake. Without water being available, tourists may stop for a short break but not stay overnight. The Caravan Park is not a viable business.

Narrung School once had 30 students but closed some years ago and now Raukkan also has extremely low numbers. It is difficult to attract people to Raukkan as there is no employment. There are now empty houses due to a decline in population with the loss of the dairy industry. Income is down significantly for town businesses, particularly those who rely on Tourism.

Farming land values have plummeted 40-60% as production is down due to an inability to irrigate from the lake. The sudden halt to irrigation has resulted in a dramatic change to farming with some people leaving the district within a short period of time. Others have been able to sell their water licences to support their incomes whereas town businesses have not had this asset to fall back on.

Population loss has resulted in a decrease in council rates income and this is affecting the entire council region and council's ability to deliver the same level of service.

The announcement of the proposed Pomanda Weir was a shock to the community as they found out that perhaps the Government was prepared to cut them off from a freshwater supply.

SUPPORT FOR THE CORE ELEMENTS OF THE LONG TERM PLAN

Coorong Council supports the core elements of the Long Term Plan. They would like to see further specifics on how freshwater is to be delivered to Lake Albert.

FUTURE IDEAS - *Identification of opportunities for involvement and cooperative ventures.*

Coorong Council has identified the need to gain assistance and resources to support business transition and economic development for the area as well as employing a project officer to work with the community to develop a tourism plan and strategy.

In terms of community governance and involvement in the implementation of the Long Term Plan, the Council identified the importance of involving the community in the early stages of planning prior to key decisions being made. They also identified a need to develop a structure that allows for the broader community to be involved in addition to the "select few" who are involved in closed meetings. The community also wants to hear information directly and not just through Council. The current Lake Albert planning meetings were viewed as a successful model that illustrates the ability to develop a partnership process. They are seen as successful as they are locally managed and organised and this results in community ownership and the formation of partnerships. It was also identified that it is very important to the community that leaders (Ministers and Heads of Government Departments) come to their area and meet with the community.

MANAGEMENT ACTIONS RESPONSE

B1 – Increase freshwater provided from upstream in the Murray Darling Basin (Basin Plan, Water for the future, buy backs etc).

Supported-Council would like to see more details on the mechanisms for water to be delivered from upstream.

B4 – Reduce reliance upon lakes for extractive uses – i.e. installation of pipeline and/or rainwater tanks etc (note that this action does NOT include the irrigation pipeline to Langhorne Creek, which is an existing action).

Supported-Landowners are no longer relying on the lake for land production, but this is not so with the town. The pipeline prevented massive economic loss for landholders and now is providing better quality water that supports livestock production. There may be opportunities for other industries to develop because of the availability of this water, e.g. fish farms and chicken sheds.

B5 – Narrung narrows remedial works (applies to wetter scenarios only) – remove bund, dredge narrow, undertake remedial works including modifications to ferry causeway to provide for natural flows through the narrows.

Supported.-Council would like to see trigger points as to when the bund will be removed. The removal of this bund will result in Meningie feeling less isolated from the rest of the system.

SUMMARY

- Dairy, Irrigation and Fishing industries have been severely impacted by low water levels with many businesses closing down and families moving away from the district or making significant changes with a loss of production and income.
- There is now much concern by the community of the viability of town businesses which are increasingly feeling the impacts of population loss and loss of tourism. In addition, there are concerns that if the situation continues as it is, there will be a risk to other essential town services.
- Coorong Council supports the Long Term Plan; however, they would like to see more detail regarding the Plan to increase freshwater supplies to Lake Albert.
- There is support to remove the bund so that Lake Albert is not disconnected from the rest of the lakes system.

Coorong Council has led the Lake Albert planning meetings and has been proactive in identifying a future for the region and township of Meningie. Council has significant insight and clear views on the importance and value of working directly with communities in the implementation of the Plan.

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Attachment 3: Executive Summary

Executive Summary of CLLMM Impact Assessments

Fishing

- When low water levels in Lake Albert prevent fishing, fishers identify that this will result in a halving of their income and lay off of staff. In the short term this will be prevented by increased income through the Fish Down proposal.
- However the industry is advocating for a compensation initiative to be introduced and that they are involved in shaping it.
- There is support for the Long Term Plan in delivering a healthy and productive wetland system that supports local economies and communities.
- Commercial fishers are concerned about the impacts on the ecology and health of the Coorong if there is an exchange of water between the Coorong and Lake Albert.

Agriculture

- Dairy farmers and graziers have had to reduce their genetic breeding livestock, are feed lotting cattle, or have bought and carted water with no government subsidy. There is now less employment on farms which negatively impacts town businesses and essential services.
- Land managers are feeling a sense of loss and anger. Some have sold out while others have undergone major changes to adapt to decreased production.
- A freshwater solution for the lakes is favoured although some in the community are unsure about the ability to deliver this outcome particularly for Lake Albert.
- Landholders advocate for ongoing community involvement in the implementation of the long term plan and advocate strongly for using local business and local people in carrying out the work.

Viticulture

- Local growers and irrigators have experienced significant emotional, physical and financial strain with ongoing water management issues. There is a fear of further job losses in the industry if no action was taken. In addition to impacts of low water levels growers are also impacted by an over supply of grapes and industry retraction.
- Local growers are also concerned about the management and regulation of the catchments and tributaries that feed into the Lower Lakes, including monitoring of private storages.
- There is a variety of opinions with most local growers supportive of a freshwater future whereas the Industry Council has concerns that the freshwater will be sourced at the expense of upstream irrigators. They are also concerned of the potential impacts (salinity, water table) for South-East growers of diverting water from the South East drainage system.
- The pipelines have been welcome as it has enabled a secure water source without extraction from the lakes and tributaries. However it is noted that not all growers are able to afford this investment and the increased costs of water has increased the costs of production.

Business

- Small business and town businesses are reporting business downturn, economic and employment loss similar to the business impacts of low water levels on primary industries. This is particularly evident in businesses directly associated with water activities and tourism.
- Property values are reporting as having decreased or numbers of sales reduced due to impact of low water levels, population loss and employment loss.
- Support for the Long Term Plan was divided. Many preferred the restoration of a freshwater system however it was felt in that opening the barrages and allowing

incursion of seawater would provide a more immediate restoration of tourism, recreation and subsequently economic activity as well as ongoing business certainty for the future.

- Regulators - management action D4 were strongly supported by Goolwa business in order to restore tourism and recreation however other businesses strongly opposed regulators as leaving other regional areas 'out in the cold'.

Boating

- The boating, tourism and recreation industry has been severely impacted by low water levels, in some cases with 80% loss of business with subsequent business closure and loss of employment.
- There is general support for the Long Term Plan however there are concerns whether enough freshwater can be delivered and that the plan does not directly address the impact on tourism, boating and recreation on the River Murray below Lock 1.
- General support for the Goolwa Channel regulators but they are seen as a temporary measure only.
- An open Murray Mouth is seen as a priority and many in the industry would prefer to see an investment in a permanent breakwater rather than an ongoing dredging scheme.

Health

- Increase in mental health issues due to economic impacts of low water levels and an increase in physical health complaints (skin and eye irritation) due to contact with lake water.
- There is concern about increasing health complaints and prevalence of disease due to low water levels and water pooling with increased mosquitoes. Community members are also concerned about an increase in dust storms with a bioremediation approach and risk of toxic dust.
- Indigenous community have been identified at risk by medical practitioners with an increase in abuse of alcohol and incidence of violence which is attributed to loss of employment and income as well as impact of degradation of natural environment.
- Increased water levels either freshwater or seawater seen as the best option to minimise health impacts.

Education

- Low water levels have resulted in a loss of jobs and families moving out of the Meningie and Raukkan region. This results in a drop in school enrolment numbers and a reduction in teaching numbers.
- Schools are supportive of students taking an interest in environmental issues and have been actively involved in a number of community programs and bioremediation activities.
- The community views maintenance of strong education opportunities as an essential service in their community and are concerned about drops in enrolment numbers and losing families with young children from the district.
- School employment pathway programs have been very successful in transitioning students post school and opportunities to develop new pathways with involvement in the long term plan would be welcomed.

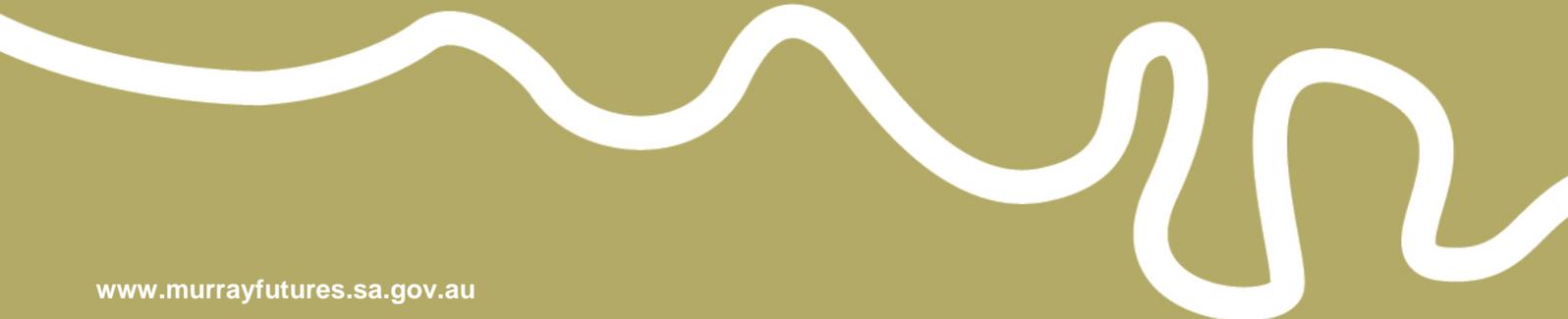
Community

- Communities identified numerous impacts of low water levels on community wellbeing which included health issues, increasing demand on community services, tensions and conflicts between community groups with competing interests and changes to the demographics of communities.
- Support of the Long Term Plan was varied with some strongly supporting a freshwater future and others strongly opposed to it. However all supported a connected system and open Murray Mouth.

- The community has responded robustly over the development of regulators (D4). Besides the environmental concerns the general perception is that the regulators were undertaken to appease the tourism, recreation and boating lobby groups at the expense of the environment of the Lower Lakes as a whole.
- All community groups advocate strongly for the development of strong partnerships between community and government that enable a wide variety of community groups to be involved in decision making and leading community engagement activities.

Local Government

- Alexandrina Council have identified numerous social and economic impacts due to low water levels and have raised further concerns should no action be undertaken to resolve the situation.
- Coorong Council identified Dairy, Irrigation and Fishing industries which have been severely impacted by low water levels with many businesses closing down and families moving away from the district or making significant changes with a loss of production and income. They also expressed concern for the viability of town businesses who are increasingly feeling the impacts of population loss and loss of tourism. In addition there are concerns that if the situation continues as it is there will be a risk to essential town services.
- Alexandrina Council advocate for increased freshwater flows as the main priority. Coorong Council supports the Long Term Plan however they would like to see more detail regarding the plan to increase freshwater supplies to Lake Albert.
- Alexandrina Council strongly advocates for the removal of temporary regulators as soon as there is sufficient freshwater flows. Coorong Council support the removal of the Narrung bund so that Lake Albert is not disconnected from the rest of the lakes system.
- Alexandrina Council supports the building of community partnerships which lead to local employment and training. Coorong Council have led the Lake Albert planning meetings in identifying a future for the region and township of Meningie. They advocate the value of working directly with communities in the implementation of the plan.



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