

Drought related impacts on Human & Ecological Communities Below Lock 1: Results of Community Consultation

Submission to: Paul Harvey , Project Leader
Drought Recovery Strategy for the River Murray in South Australia
(a Water Security Task Force Project), SA Government

From the Lower Murray Drought Reference Group Sub-committee on Recovery
(LMDRG-Recovery SC)

6th June 2008

Executive Summary

1. The Results of community consultation are reported herein & the views are not necessarily those of the LMDRG-Recovery SC. The list of issues is not necessarily an exhaustive list.
2. This initial Report has been provided as an input to the draft “Issues Paper on the Allocation of Water under Drought Conditions” open for comment until 6/6/08. The Drought Water Allocation Strategy proposed therein would appear to concentrate on how to best allocate the available water to deal with priority issues & prevent further deterioration in the States Assets. We think that this report will provide valuable input specifically regarding the issues that need to be considered.
3. The methodology used in this report to rank impacts (of issues) & therefore priority issues to be dealt with under drought conditions is worthy of consideration for adoption as part of the Drought Water Allocation decision tree proposal contained in the Issues Paper. It should assist in transparency and leave less room for accusations of bias.
4. The submissions have highlighted priority concerns for water quality in lower lakes & the Lower Lake Wetlands & therefore the LMDRG-SC recommends that these be included in the list of Assets & Activities in the Issues Paper.
5. The impacts relating to loss of cultural economy for the Ngarrindjeri people were included by the Steering Committee to flag the need to further consult with the Traditional Owners of the site on how the drought is affecting them and what their priorities for water during recovery would be.
6. The LMDRG-SC will make further submissions on the broad strategies for recovery of the River when the drought breaks & sufficient flows become available.)

Introduction

The Lower Murray Drought Reference Group Sub-committee on Recovery were charged with the tasks of 1) preparing a Factsheet on the Murray below Lock 1, including the Lower Lakes and 2) consulting with the community on recovery strategies and priorities for this area as water becomes available. The sub-committee's findings and reports on the second task will feed directly to the Water Security Task Force's project *Drought Recovery Strategy for the River Murray in South Australia* (see Attachment 1 for details).

The sub-committee's objective was, thus, to use recognized risk management processes to compile community input into a succinct and useful list of significant risks that need to be treated and/or mitigated in the region below Lock 1 under drought and recovery scenarios, to assist Minister Maywald and other decision makers in determining best use of water as it becomes available.

Methods

To ensure that the process was robust and as useful as possible the sub-committee used risk assessment methods compliant with ISO14001 and AS/NZS 4360 as a means of compiling and evaluating the email, verbal or fax submissions received from the community. The sub-committee prepared a risk assessment spreadsheet using a Pressure, State, Response and Impact model assessing the following condition:

Pressure: Sustained low River Murray flows from drought plus over-allocation

State: Pool/Lake levels below -0.5mAHD in June 2008.

A series of Responses and Impacts from being in that condition were then recorded from community submissions (email, verbal or fax) and the knowledge of the sub-committee members. Each impact thus identified was scored in terms of likelihood and consequence of occurrence in order to rank them from extreme to low risk. The following descriptors were used:

<i>Likelihood (A-E)</i>	<i>Consequence (1-5)</i>
A – certain	1 – catastrophic (negative), monumental (positive)
B – likely	2 – major
C – moderate	3 – moderate
D – unlikely	4 – minor
E – rare	5 – insignificant

Positive impacts were coloured light blue and impacts that scored either A1 or A2 were coloured light orange. The key distinction that needed to be made in applying this scoring system was between consequence scores of 1 or 2 and it was decided by the sub-committee that impacts would be scored as 1 if the impact was irreversible (e.g. death, loss of species, loss of generations of work). Another factor describing the Confidence that the sub-committee had in each score was also applied as follows:

Confidence (1-5)

- 5 – local info available, documented process, experts agree
- 4 – regional info available, documented process, experts verify
- 3 – limited info, documented process, elsewhere in region or similar region, experts differ
- 2 – perception based on some info that is not local or regional
- 1 – perception only, no supporting info

The source of each impact was also described in the spreadsheet with a unique number given to each email or fax submission (E1 to E16). Annotations of “SC” were used to show where the impact came from the sub-committee members and “verbal” to show where the impact came from a personal communication. Capitals were used to show where the sub-committee had qualified their risk assessment scores. Abridged versions of the community comments appear in another column to qualify some of the risk scores and the scope of the impact. Sub-committee members were trained in the risk assessment technique by Dr Kerri Muller at their

meeting in Murray Bridge on 20th March 2008. Community comments were compiled by Dr Muller into the spreadsheet and then risk scores were applied by the sub-committee at their meeting on 29th May in Strathalbyn and via email following on from that meeting. Where the committee members had differing opinions the resultant score was determined by going back to the source documents and applying a conservative approach.

Any comments from the community that did not easily transcribe to the risk assessment sheets were collated into a report under the headings of Community comments on water level impacts, Community priorities for water, Other comments about recovery, Proposed Actions and Threats. It was considered extremely important that the risk management documents allowed for collation of comments for ease of interpretation and decision making without losing any information or comments.

Results of Risk Assessment

Sixteen (16) email and fax and eight (8) verbal comments from community members were received by Mike South, Chair, and other members of the sub-committee. These were analyzed and transcribed onto the spreadsheet that appears in Attachment 2. A total of 102 impacts were identified from 24 Responses and were scored across 12 risk categories (Table 1).

Table 1: Breakdown of risk scores by category for 120 drought related impacts

Category	Number of impacts	Category	Number of impacts
A1	26	C1	1
A2	36	C3	3
A3	22	C5	2
B1	2	D2	1
B2	3	D4	1
B3	4	Total	102

As can be seen from this breakdown, most of the impacts scored A1 (25.5%), A2 (35%) or A3 (21.5%) indicating very high likelihood and consequences from occurrence. Twenty-nine (28%) of the impacts were ranked as Catastrophic in terms of Consequence indicating irreversible negative change in human and ecosystem health. Only one impact was considered to be positive in terms of human and ecosystem health and that was *improved access for undertaking clean up, vegetation management and maintenance work*. The 62 impacts that scored either an A1 or A2 are presented in consolidated tables and require close scrutiny (Tables 2 and 3). They will not be repeated here in the text because each impact stands alone and the list cannot be further compressed. The fact that so many of the impacts scored such high scores for Likelihood and Consequence is reflective of the current very poor condition of the Lower Murray, Lakes and Coorong environment and its poor capacity to provide ecosystem services such as supply of irrigation, stock and domestic water.

Use of Risk assessment in Recovery decision making

It is envisaged by the sub-committee that these risk assessment spreadsheets now developed could be used for assessing the relative merit of different recovery scenarios proposed by Government and others in terms of the capacity of each proposal to exacerbate, mitigate or treat the risks identified here and thus reduce the negative impacts of drought and over-allocation of water resources in the Murray Darling Basin. It is recommended that in using this spreadsheet to assess different recovery proposals that a column be inserted for which part of the system the risk score applies to as appears in the Ramsar Ecological Character Description (ECD) report for the site ie. RM = Lock 1 to Wellington, LAx=Lake Alexandrina, LA=Lake Albert, MME = Murray Mouth Estuary (Goolwa barrages to Pelican Point), NL = North Lagoon, SL = South Lagoon. Several timeframes should be considered for the recovery of the Lakes as follows: short = 2008/09, medium = up to 5 years (Dartmouth full?), long = beyond 5 years.

Scenarios to be tested should include both pool levels and flow rates because 1) flow rates are the “currency” of the MDBC and 2) the community will tend to talk in terms of Lake Levels. The two sets of scenarios can be combined in that the flow

required to bring pool level up to a given height in mAHD can be calculated from predicted flows over a given period. It is also recommended that community consultation documents be prepared to communicate the results of this study to the community below Lock 1 and elsewhere including answers to the questions: 1) what is risk assessment?, 2) what risks were raised by community members? and 3) what actions could we take to treat the A1 and A2 risks? It is important also that the costs of the impacts of drought identified and evaluated here are calculated so that they can be compared with the cost of buying water for the system (email E13).

Table 2: Highest ranking risks (A1) for human and ecological communities below Lock 1 in the current conditions (-0.5 mAHD).

Pressure	State	Responses	Impacts	L'hood	Conseq'	Confidence
Sustained low River Murray flows Drought plus Overallocation	Pool/Lake levels below -0.5mAHD in June 2008	Loss of access to water (reduced allocation and capacity to pump)	Increased development pressure on good quality waters of the EMLR	A	1	3
			Increased pressure to intervene more in River and Lakes operations	A	1	5
			Despair that generations of hard work is being lost because of external factors (e.g. MDB management)	A	1	5
		Loss of functional wetland ecosystem	Loss of ecosystem services	A	1	5
		Further declines in living standards for Ngarrindjeri people	Loss of Ngajtis and thus spiritual practices associated with those entities	A	1	5
		Highly saline water in Lakes that is still rising (evaporation and accumulation)	Loss of species Yarra Pygmy Perch, Southern Pygmy Perch, Southern Purple Spotted Gudgeons	A	1	4
			Adversely impacts on all ecosystem components, processes and services	A	1	5
		Exposure of acid sulfate soils	Creation of toxic substances	A	1	5
			Acidification of water	A	1	5
			Acidification of soils	A	1	5
			Mobilization of acid	A	1	4
			Mobilization of toxic substances	A	1	5
			Uptake of toxins by reeds	A	1	4
			Fish kills from low pH and DO	A	1	5
		Large scale loss of freshwater habitat	Ongoing loss of species	A	1	5
			Simplification of and loss of reed beds	A	1	5
			Failure to meet Ramsar obligations	A	1	5
			Irreversible collapse of Lakes and Coorong ecosystem	A	1	5
			Loss of channel habitats for fish	A	1	5
			Loss of previous drought refugia	A	1	5
			Loss of wetland species	A	1	5
		Increased groundwater discharge to Lakes	Increased Lake water salinity	A	1	4
		Reduced resilience of human and ecological communities	Decreased capacity for ecosystem to adapt to changing climate	A	1	4
Increased perception that some experts and irrigators think that Lakes and Coorong need to be sacrificed to manage drought responsibly	A		1	4		
Perception that things will get worse not better	Concern that we cannot solve the problem under current political system	A	1	4		
Lack of barrage flows	Affects all ecosystem processes, components and services	A	1	5		

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Table 3: Second highest ranking risks (A2) for human and ecological communities below Lock 1 in the current conditions (-0.5 mAHD).

Pressure	State	Responses	Impacts	L'hood	Conseq'	Confidence		
Sustained low River Murray flows Drought plus Overallocation	Pool/Lake levels below -0.5mAHD in June 2008	Loss of access to water (reduced allocation and capacity to pump)	Loss of irrigation water/severely reduced allocation	A	2	5		
			Loss of perennial plantings	A	2	4		
			Loss of stock water	A	2	5		
			Loss of stock	A	2	4		
			Loss of tourism	A	2	5		
			Failure to provide suitable water to all users	A	2	5		
			Loss of primary income (low capacity to diversify and aging producer population)	A	2	5		
			Agitated community	A	2	5		
			Community left feeling "unvalued" by Government	A	2	5		
			Community feeling that upstream States are more valued by Government	A	2	3		
			Loss of capacity to move boats through Goolwa Lock	A	2	5		
			Problems for marinas below 0.4 mAHD (not specific)	A	2	5		
			Positive impact			Improved access for undertaking clean up, vegetation management and maintenance work	A	2
		Loss of functional wetland ecosystem	Despair for the loss of native species and ecosystem changes	A	2	5		
			Agitated community	A	2	5		
		Loss of cultural economy	Further declines in living standard for Ngarrindjeri people	A	2	5		
			Highly saline water in Lakes (evaporation and accumulation)	Loss of suitable irrigation water	A	2	5	
					Inequitable sharing of water between irrigators	A	2	5
					Too salty for stock and domestic supplies	A	2	5
					Death of stock from saline water	A	2	5
					Salinisation of land upon which water is applied	A	2	5
		Cracking clays			Stock and human injury	A	2	5
					Damage to water supply infrastructure	A	2	5
					Loss of riparian vegetation willows and red gums	A	2	3
		Exposure of acid sulfate soils			Frightened community	A	2	4
					Large scale loss of freshwater habitat	Non-trade tariffs (e.g. salt in wine, loss of clean, green image)	A	2
		Increased sedimentation			Sand covering wetlands and streams around Murray Mouth	A	2	5
					Increased groundwater discharge to River	Increased River water salinity	A	2
		Disconnection of fringing wetlands			Increased wetland water salinity from evapoconcentration of saline groundwater	A	2	5

Table 3 cont.: Second highest ranking risks (A2) for human and ecological communities below Lock 1 in the current conditions (-0.5 mAHD).

Pressure	State	Responses	Impacts	L'hood	Conseq'	Confidence
Sustained low River Murray flows Drought plus Overallocation	Pool/Lake levels below -0.5mAHD in June 2008	Disconnection of fringing wetlands	Build up of decaying vegetative material	A	2	4
		Construction of regulator on bottom of Finnis River	Prevent freshwater entering Lakes	A	2	2
		Loss of amenity	Low water in marinas and at boat ramps	A	2	5
		Reduced resilience of human and ecological communities	Sense of hopelessness for Coorong and Lakes ecosystem	A	2	5
		Loss of ferry transport	Reduced spending in the community	A	2	4
		Reduced availability of water for sporting clubs	Loss of activities that give social cohesion and pride	A	2	4
		Perception that things will get worse not better	Concern that in recovering the MDB the Lakes will be the sink for "waste" from upstream	A	2	5

Community comments

The following section contains community comments that should be read in conjunction with the risk assessment spreadsheet. In some cases the issues raised below were easily transcribed into the Pressure State Response Impact model and in other cases the only place the comment appears is in the following section. See original emails and risk assessment spreadsheet for more community comments pertaining to issues other than Recovery.

Comments on water level impacts

- 1.2 mAHD Trigger point for Wellington Weir, acidification of Lakes (E01)
- 0.6 mAHD Lake Albert disconnects from Lake Alexandrina (E01)
- +0.3 mAHD Barrages begin to be operable again, flushing can begin (E01)

Community priorities for water

- Maintain pool level above -1.2 mAHD (E01)
- Use Lake Alexandrina water to top up Lake Albert and keep above -0.6mAHD, at least until Lake Alexandrina approaches -1.2 mAHD (E01)
- Use water from above Lock 1 to keep Lakes above trigger points for letting in sea, building Wellington Weir or permanent acidification (E01)
- The River will recover from the bottom up so we need to prioritize flows through the barrages/fish passages and out the Mouth over increased allocations from consumptive pool until lake water quality targets are reached (RMWAP 1000 EC) and remedial works undertaken (E01)
- Flush pollutants that have accumulated during low flow period out to sea by having flow through barrages (E01)
- Get Lakes to level where the barrage can be operated to flush out pollutants before undertaking remedial works or other recovery work (E01)
- The lowest priority should be given to developing more marinas and gated communities in this Lower Murray area. It is a waste of water and the jobs created are at the cost of riverside communities forced into recession E05
- Highest priority for additional water should be directed to the environment in particular preventing long-term irreversible damage (species extinction and acidification) E10
- Highest priority is pumping water into disconnected wetlands to reduce impacts when rewetted (acid, blackwater, salinity) and restore habitat for wetland dependent species E12
- Highest priority should be maintaining environmental flows, if we don't maintain health of the river there is no future for reliant industries E14
- Maintenance of Lake level of at least -0.5mAHD at all times to protect us from local algal blooms and acid sulphate damage. (E11)
- Reinstatement of Lakes water level above -0.10m AHD to allow my (extended) pump line access to river water to reinstate fire fighting storage (E11)
- Flushing of existing salt water from Lakes to maintain salinity 2km downstream of Clayton below 2,000 ppm to allow cell grazing and the operation of those septic tanks that receive toilet water sourced from the river (E11)
- Further flushing of salt water from Lakes to maintain salinity 2 km downstream of Clayton safely below 700 ppm to allow for basic subsistence irrigation (50% replacement of orchard now required(E11),

- Reinstatement of lakes water level to at least +0.50m to allow safe and reasonably convenient small boat/canoe access (E11)
- Maintenance of sufficient permanent environmental flows through the Murray mouth to ensure sufficient head pressure to keep salinity at bay in the future and a management structure that ensures excessive upstream ignorance or greed never causes this to happen again (E11)
- Maintenance of Lake level of at least -0.5m AHD at all times to protect all remaining users from health risks (E11)
- At least three months notice of any substantive increase in Lake level to allow for development (E11)
- Reinstatement of Lakes water level to a level that allows the operation of the Goolwa lock chamber on all long weekends, school holiday periods and from December 20 to February 28th each year. This would require a level of approximately +0.25m AHD unless pumping has been provided at the lock (if so, the level might be nearer 0.00m AHD or even lower). (E11)
- Reinstatement of Lakes water level to a sustained minimum level of +0.35m AHD to allow the reuse of dredged wet berths in the marina, access to some boating destinations, and give sufficient confidence to boaters that it is worth coming back to the marina (E11)
- Reinstatement of Lakes water level to a sustained minimum level of at least +0.60m AHD with some over barrage flow to allow access to remaining boating destinations, allow the restoration of the majority of the program of traditional boating events around the Lakes, the normal operation of both the Goolwa and Tauwicheirie lock chambers, and passage past the Murray mouth at all times of year (E11)

Other Comments about Recovery

- Coorong needs a healthy Lakes and River system feeding it to be healthy (E01)
- Recovery of Lakes and Coorong will require more than SA Entitlement flows (E01, E01.4))
- It will take a number of years to recover the Lakes (E01)
- We should be maintaining continual flushing flows through the River and Lakes to reach and then maintain Water Quality Targets rather than just focusing on Lake levels. (E01)
- Very Important to continuously flush effects of drought out to sea (E01, E01.5)
- No equity between irrigators, we need to manage for quality before access (E01.1)
- Overallocation of River resources prevents recovery (E01.3)
- the condition of the Coorong and Lakes is a National issue and decisions must be made to ensure long term recovery E03
- environment must be given a strong priority, ignoring the health of the river is why it is currently degraded E05
- need to prioritise water for sporting communities: people are losing the battle for their farms and their sporting clubs at same time E06

Proposed Actions

- Recover the Lakes and Coorong by:
 1. maintain Lake Alexandrina above -1.2 mAHD trigger points
 2. fill the Lakes to flushing levels above +0.3 mAHD before increasing consumptive allocations
 3. maintain adequate flushing flows until Lake Alexandrina salinity drops to 1000 EC, some increase in allocations during this period provided that water can be accessed at reasonable cost
 4. flush system to remedy the River above Lock 1 ensuring enough water is flowing through to keep the Lakes salinity level below 1000EC. The lower the Lake level during this time the better but need adequate barrage flushing therefore recommend Lake levels of 0.4 to 0.5 mAHD. Pulses of flow maybe better to pass pollutants through Lakes and out to sea (E01)
 5. managing the River in a sustainable way by allowing Lakes to fill to reach target levels that include capacity to meet Lakes and Coorong ecological needs as well as peak irrigation extractions. More variations in Lakes within each year and year-to-year than in past (suggest 0.5 to 0.85 mAHD). Vary MDBC Agreement to allow SA water to delivered unequally across the 12 months whilst recognizing limitations of Barmah Choke (E01).
- fix saline groundwater entering at Tailern Bend E01.15
- favour opportunity cropping when water available over perennial crops E01.24
- revisit Twin Lakes proposal E01.36
- install Wellington weir, cut-off Lake Albert and pump to it and open barrages to let sea water into Lake Alexandrina E01. 42
- promote the term “estuary” for the site and that it is an integral part of River system, doesn’t have to be sacrificed to manage drought E02
- determine minimal flows required to flush out annual salt load past Pomanda Island (600,000 tonnes) E02
- evaluate risks in spreadsheet against:
 - at least three barrage flow rates: <1,000 GL/y, 1,000 to 2,000 GL/y and >2,000 GL/y
 - with salinity estimates at key points
 - and using ‘traffic light’ assessment in Coorong and Lakes ECD (Phillips and Muller, 2006) to track ecological character changes E02
- consider climate change scenarios as part of the risk assessment on recovery strategies E02
- increase importation of goods from countries with more water and use our water to preserve natural wonders and derive income from ecotourism E03
- widespread promotion of problem with Lakes and Coorong to ordinary people in Eastern States E03
- hold public forums regularly for community to take part in recovery process E03
- promote increased safety of area for boating at low Lake levels because of better navigational beacons to bring money into community. Govt PR as in case of Kangaroo Island fires E04
- need boating access to Coorong through Goolwa lock E04
- Education of all River Murray water users to reduce their own use and share fairly is the highest priority action E05

- Imperative to keep long-term perspective and avoid complacency when water does flow again E05
- Apply a system like that used at Glue Pot Reserve where farmers are involved in restoring the Lakes and Coorong and get paid for it: they really care about the area, are in it for the long haul, need money and will feel they have made a difference E07
- Pay farmers to cut down willows and feed to animals at Monarto Zoo to save water, improve water quality and deal with a pest plant E07
- Co-ordinate NRM and farming jobs better to Save the River through education, saving water and keeping farmers on the land E07
- Great opportunity to pay farmers to undertake NRM on-ground works and improve morale. Out of something bad we could be doing good right now E08
- Stricter restrictions for SA Water urban users E10
- Seek national commitment to keep Lakes at least at -0.3 mAHD and not allow them to fall any lower E13
- Undertake a proper economic assessment of costs of technological fixes to the Lakes compared with purchase of guaranteed water for the environment which will fix current problems, quickly and maintain valuable long term asset E13
- Recover the Lakes by:
 1. take a political decision to work towards recovery of a healthy river
 2. market the values of the Lakes. Many will be willing to undergo short term pain for longer good
 3. set recovery goals and work towards them. Realistic goals for improved salinity and lake levels for next 3 years
 4. achieve goals by:
 - a. purchasing water for Lakes recovery by State and Federal Govt
 - b. Annually lease water for Lakes recovery from willing lessors
 - c. Ensure dilution flows reach the Lakes every year
 - d. Ensure Living Murray water reaches the Lakes every year
 - e. Set an end of system flow and work out how to deliver it
 - f. Ensure a proportion of water over and above Critical Human Needs is released for Lakes recovery month by month
 5. ensure an economic assessment is done comparing costs of buying water vs cost of constructing and maintaining more infrastructure. By investing in water we can have a very valuable asset rather than a wasteland.
 6. get a costed workplan to State/Federal Govt for implementation E15
- Removal of all unnatural dykes resulting from recent side-cast dredging of irrigation channels (eg: entrance to Boundary Creek, at the east end of Narnu Bay, at the Narrows, plus any other weir impeding traditional natural environmental flows or customary navigation) (E11)
- Declaration of speed zoning adjacent all main river bank marinas to protect them from wave damage and of activity zoning (particularly for jet skis, wind surfers, water skiers and swimmers) to protect wild life and other users of the waterways.(E11)
 - Completion of DoT's excellent work in preparation of new and accurate charts and repositioned beacons. Adequate stocks of charts must be distributed for immediate and continued sale. Beacon positions must be checked as the river resumes more normal flows in case of channel movement.(E11)
- Dredging of areas of recent siltation in all main channels and in passages to all official boating destinations and all public jetties around the lower lakes and to the

Milang launching ramp. This would be cheaper and quicker if done before water levels recover.(E11)

- Removal of all houseboats and other craft temporarily berthed on river to reinstate the natural scenic landscape of the shores of both the river and the lakes. (E11)
- Some form of useful, targeted and intelligible state tourist promotional campaign to tell past and potential marina tenants and regional boaters that it is now worth coming back to enjoy the lower lakes (not something on the back of a bus that mixes this area up with up-river or other Fleurieu promotions sending very different messages!) (E11)
- Construct a lock below Tailem Bend to give full control of water from State Border to barrages. Pump water out of Lake Albert into the Coorong and replace with fresh water. Keep doing this to freshen Coorong. (E16)
- Place another pump station at a new Lock near Tailem Bend (with fish ladder and boat lock) to supply fresh water to Meningie and the Narrung Peninsula. (E16)
- Breed fish and release into Lakes to boost fish stocks (E16).

Threats

Community has already been through a lot, is aging, without clear succession path, feeling unable to cope with more problems, low community (people and ecosystem) resilience is major threat to recovery.

Attachment 1: Lower Murray Drought Reference Group Sub-committee on Recovery

Lower Murray Drought Reference Group (LMDRG) Sub-Committee: Recovery

Tasks

1. To prepare a fact sheet on the Murray below Lock1, including the Lower Lakes
2. To recommend Recovery strategies & priorities for this area as water becomes available.
(How water should be used as it becomes available)

The Subcommittee's findings/reports on task 2, after endorsement by the LMDRG will feed directly to Paul Harvey, Project Manager for the Drought Security Task Force project "Drought Recovery Strategy for the River Murray in South Australia".

Community Involvement:

What should be the priorities for the use of increased river flows as they become available?

The subcommittee would appreciate your input.

This is a great opportunity:

Get your views/problems/solutions/priorities known & directed to the appropriate level in Government

Contact Mile South or any of the subcommittee members listed below.

Subcommittee members contact Details:

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PLEASE CONTACT MIKE SOUTH OR ANY OF THE MEMBERS OF THE SUBCOMMITTEE TO MAKE YOUR VIEWS KNOWN

Attachment 2: Risk assessment spreadsheet used to evaluate drought associated risks identified by the community.

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overallocation	Pool/Lake levels below -0.5mAHD in June 2008	loss of access to water (reduced allocation and capacity to pump)	loss of irrigation water/severely reduced allocation	A	2	5	access of water for irrigation at 0.3 mAHD is possible although may be expensive for some not catastrophic if comes back	E01
			loss of perennial plantings	A	2	4	productive orchards and windbreaks are being lost (up to 50% replacement)	E11
			loss of stock water	A	2	5	loss of capacity to cell graze lake side pastures, LOCALISED AREAS MAY STILL HAVE ACCESS TO WATER AT LOW LEVELS	E11, SC
			loss of stock	A	2	4	STOCK HAVE WANDERED OUT ONTO EXPOSED SANDBARS AND BEEN TOO FRIGHTENED TO RETURN OVER MUD AND SO HAVE PERISHED OUT IN THE LAKE	SC
			loss of domestic water	A	3	5	need to provide critical human needs (e.g. flush the loo), CAN CART WATER FOR SMALL VOLUMES REQUIRED FOR DOMESTIC USE AND SUPPLEMENT WITH RAINWATER	E01.21
			loss of tourism	A	2	5	perception that below Lock 1 no longer a boating venue, cannot safely launch canoes and small craft	E11, VERBAL
			loss of fire fighting water	B	2	4		E11
			increased chance of human injury/death whilst accessing water	C	1	5	PEOPLE HAVE NEARLY BEEN LOST BY GETTING INTO QUICKSAND	E01.34
			increased competition between producer groups for water	A	3	2	favour opportunity cropping with available water over perennial crops	E01.24
			failure to provide suitable water to all users	A	2	5		VERBAL
High spatial variation within the region		inequitable sharing of water between users (financial capacity and location dependent)	A	3	2	perception that water resource development between states is unfair, irrigators in different parts have better or worse access and quality, increase Adelaide restrictions, carry over water not really guaranteed	E01.1, E01.20, E01.37, E06	
		loss of primary income (low capacity to diversify and aging producer population)	A	2	5	I am too old for this, I am worried about how much money I have to spend	E01.27, E01.28	
		reduced Local Government rate base from reduced property value	B	3	4	no water no buyer no value, marinas with rent relief	E06	
		agitated community	A	2	5	bloody Victoria, there will be weirs at Clayton and Laffins, this has been caused by upstream greed and ignorance	E01.11, E01.32, E01.43, E01.44, E11	
		decreased community will and capacity to share water (e.g., EMLR, irrigation more important than environment)	A	3	4	perception that new dams/watercourse allocations on the EMLR tributaries (dam Finniss/Currency, prevent water leaving Angus Bremer IMZ) won't affect downstream because of high salinity and low Lake levels. Irrigated production more important than wasting water on environment	E01.1, E1.13, E01.16, E01.17	

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overalllocation	Pool/Lake levels below -0.5mAHD in June 2008	loss of access to water (reduced allocation and capacity to pump)	increased development pressure on good quality waters of the EMLR	A	1	3	EMLR WAP and RMWAP need to speak to each other and the recovery plans for Lakes and Coorong. Increased allocations in EMLR WAP will further decrease Lake health	E01.1, E1.13, E01.33
			increased pressure on River Murray supplies above lakes	B	3	2	what cant we have piped water THIS IS NOT NEW ALLOCATION BUT MERELY THAT PEOPLE CAN ACCESS ABOVE WELLINGTON BUT NOT BELOW THEREFORE MORE WATER WILL BE EXTRACTED	E01.35
			increased pressure to intervene more in River and Lakes operations	A	1	5	build Wellington weir, TWIN LAKES and let in the sea	E01.36, E01.42
			community left feeling "unvalued" by Government	A	2	5	common feeling being expressed is that "Government doesn't care about us", Lake Albert will be cut off, who will speak for Coorong, below Lock 1 we are always last on the list	E01.41, E03, E06
			despair that generations of hard work is being lost because of external factors (e.g. MDB management)	A	1	5	I cant sell up, I am the fifth generation SUICIDE, HEART ATTACKS, STRESS RELATED DISEASE	E01.26
			community feeling that upstream States need to be more efficient	A	3	3	fix inefficiencies upstream before reducing allocations, cotton and rice are the problem	E01.18, E01.19
			community feeling that upstream States are more valued by Government	A	2	3		E01.41, E03, E06
			increased turbidity from dredging out to access water	C	5	4	ALREADY HIGH TURBIDITY AND NO OBSERVED PROBLEMS FROM DREDGING BY LANDHOLDERS, EXTRA CHANNELS PROVIDING HABITAT FOR Small native fish	SC
			loss of capacity to move boats through Goolwa Lock	A	2	5	want levels to be at least +0.25 mAHD from Dec 20th to Feb 28th and all school holidays	E11
			problems for marinas below 0.4 mAHD (not specific)	A	2	5	health risks to marina users below -0.5 mAHD	E04, E11
Positive impact		improved access for undertaking clean up, vegetation management and maintenance work	A	2	5		VERBAL	
	loss of functional wetland ecosystem	loss of tourism	A	3	2		VERBAL	
		despair for the loss of native species and ecosystem changes	A	2	5	how can birds, wetlands and plants have a voice?	E03	
		agitated community	A	2	5	no-one cares that we are losing a precious wetland	E01.11, E01.32, E01.43, E01.44	
	loss of ecosystem services	loss of ecosystem services	A	1	5	not enough water to flush through system and keep salinities low enough	E11	
	loss of cultural economy	further declines in living standard for Ngarrindjeri people	A	2	5	CULTURAL ISSUES ARE JUST BEING FLAGGED BY SC AND REQUIRES EXTENSIVE CONSULTATION WITH NGARRINDJERI	SC	

**Drought related impacts on Human & Ecological Communities
Below Lock 1: Results of Community Consultation**

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overallallocation	Pool/Lake levels below -0.5mAHD in June 2008	loss of cultural economy	loss of Ngajtis and thus spiritual practices associated with those entities	A	1	5		SC
		highly saline water in Lakes that is still rising (evaporation and accumulation)	loss of suitable irrigation water	A	2	5		SC
	highly saline water in Lakes (evaporation and accumulation)	inequitable sharing of water between irrigators	A	2	5		E01.1	
		too salty for stock and domestic supplies	A	2	5		E01.2	
		death of stock from saline water	A	2	5		SC	
		Adversely impacts on all ecosystem components, processes and services	A	1	5	LOW LAKE LEVELS RESULTS IN SALINITY INCREASE IN LAKES FOR 3 REASONS: BARRAGES LEAKING AS COORONG HIGHER THAN LAKES: NO FLUSHING OF SALINITY OUT THROUGH MOUTH: EVAPOCONCENTRATION OF SALT IN LESSER QUANTITY OF WATER IN LAKES. THIS THE MAJOR DETERMINING FACTOR FOR MANY OF THE ABOVE RATHER THAN WATER LEVEL ALONE: ESPECIALLY THE ECOLOGY OF THE LAKES: ECOLOGICAL REFUGES IN LAKES AVAIL IF WATER GOOD EVEN THOUGH EXPANSE OF HABITAT IS VERY REDUCED, COORONG STILL SUFFERS THRU LACK OF FLOWS (LEVEL DETERMINATES) : STOCK WATER & DOMESTIC WATER MAY BE AVAIL TO SOME AT LOWER LEVELS BUT NOT IF QUALITY IS NO GOOD	SC	
		loss of species Yarra Pygmy Perch, Southern Pygmy Perch, Southern Purple Spotted Gudgeons	A	1	4	BECAUSE IN CAPTIVITY THEY WONT BECOME EXTINCT BUT UNCERTAIN WHEN THEY WILL BE ABLE TO BE RELEASED INTO THE WILD AGAIN	SC	
		illness/loss of pet animals	C	3	3	water scarcity is affecting pet animals as well becoming sick from drinking saline water (e.g. horses) CAN BE MANAGED EASILY	E01.22	
		salinisation of land upon which water is applied	A	2	5	close management of salt:water balance will be critical during recovery	E01.29	
		landslides	lines of trees and mud sliding into River	A	3	4		E09
			loss of infrastructure	A	3	4		E09
		cracking clays	loss of safe mooring points for houseboats	A	3	5		E09
			stock and human injury	A	2	5		
			damage to water supply infrastructure	A	2	5		
				loss of water from allocation through cracks into River	A	3	4	

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overalllocation	Pool/Lake levels below -0.5mAHd in June 2008	cracking clays	loss of riparian vegetation willows and red gums	A	2	3	opportunity to poison willows now that they are in stressed state and water line has receded away from them, opportunity for native species to re-establish because light now getting through. Easy access	E07
			severe cracking of public and private roads	A	3	3		E06
			increased chance of human injury or death from falling in cracks or driving machinery into cracks	B	1	3		E06
			increased costs for Local Government to maintain infrastructure	A	3	3		VERBAL
			increased costs for Transport SA to maintain infrastructure	A	3	4		VERBAL
			increased costs for SA Water to maintain infrastructure	A	3	5		VERBAL
			increased pressure on Governmental and Agency operational staff to co-ordinate and prioritize actions	A	3	4		VERBAL
		exposure of acid sulfate soils	creation of toxic substances	A	1	5		CSIRO
			acidification of water	A	1	5		CSIRO
			acidification of soils	A	1	5		CSIRO
			mobilization of acid	A	1	4		CSIRO
			mobilization of toxic substances	A	1	5		CSIRO
			uptake of toxins by reeds	A	1	4		CSIRO
			uptake of toxins by pasture plants	B	1	4		CSIRO
			stock licking toxic flouresences	B	3	3		CSIRO
			blowing of toxic dust onto rooves (rainwater contamination)	B	3	4		CSIRO
			reduced crop vigour in exposed acid sulfate soils	C	3	3	crops growing well in exposed ASS	E01.7
		large scale loss of freshwater habitat	frightened community	A	2	4	Meningie will have to be evacuated because of toxic gases	E01.45
			fish kills from low pH and DO	A	1	5	IF ACIDIFICATION STARTS	
			ongoing loss of species	A	1	5	Ramsar listed site already showing signs of impending collapse; declining bird numbers	E03
			simplification of and loss of reed beds	A	1	5	Will the reeds ever recover? Phragmites is sterile habitat, less common species are critical habitat	E01.23

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overalllocation	Pool/Lake levels below -0.5mAHD in June 2008	large scale loss of freshwater habitat	failure to meet Ramsar obligations	A	1	5		E03
			irreversible collapse of Lakes and Coorong ecosystem	A	1	5		
			loss of access to International "green" markets (e.g. EU)	B	2	2		
			non-trade tariffs (e.g. salt in wine, loss of clean green image)	A	2	5		
		increased sedimentation	silting up of Mundoo channel	A	3	5		
			sand covering wetlands and streams around Murray Mouth	A	2	5		
			loss of channel habitats for fish	A	1	5		E03
		increased groundwater discharge to River	increased River water salinity	A	2	5	fix saline groundwater entering at Tailern Bend	E01.15
		disconnection of fringing wetlands	increased wetland water salinity from evapoconcentration of saline groundwater	A	2	5		E12
			build up of decaying vegetative material	A	2	4		E12
			loss of previous drought refugia	A	1	5		
			loss of wetland species	A	1	5		
		increased groundwater discharge to Lakes	increased Lake water salinity	A	1	4		
			increased water levels	D	4	2		
		sand drifts	sand covering remaining lakeside feed	A	3	5		E01.9
			raise heights of fences	A	3	5		E01.9
		construction of weir at Wellington	better quality water for users above the weir	D	2	3	OK initially but will decline in quality over a short period of time	E01.14
		construction of regulator on bottom of Finnis River	prevent freshwater entering Lakes	A	2	2		E01.10
			create freshwater refuge in Finnis for endangered plants and animals	B	2	2	THIS IS A POSITIVE FOR THE FINNISS BUT A NEACTIVE FOR THE LAKES AND THEREFORE IS NOT CONSIDERED POSITIVE OVERALL	

Pressure	State	Responses	Impacts	L'hood	Conseq.	Conf.	Community comments (Subcommittee in CAPS)	Source*
Sustained low River Murray flows Drought plus Overalllocation	Pool/Lake levels below -0.5mAHD in June 2008	loss of amenity	low water in marinas and at boat ramps	A	2	5		
			decreased capacity for ecosystem to adapt to changing climate	A	1	4	best way to prepare for climate changes is to have healthy, resilient communities	E01.38
			decreased capacity for people to adapt to changing climate	C	2	2		SC
			sense of hopelessness for Coorong and Lakes ecosystem	A	2	5	Language. Promotion of the term "estuary" and asking Australians the fundamental question "do we want to lose the River Murray's estuary?"	E02
		reduced resilience of human and ecological communities	increased perception that some experts and irrigators think that Lakes and Coorong need to be sacrificed to manage drought responsibly	A	1	4	Promote integral nature of Basin from headwaters to the sea	E02
			decreased capacity to absorb impacts of new marina and riverside development	C	2	2	MATTER OF DECIDING PRIORITIES & ALLOCATING WATER RESPONSIBLY & TO THE PURPOSE	E05
		loss of ferry transport	increased costs to communities stranded from resources on other side of River	A	3	5	Jervois extra \$2.50 per bale for delivery via Wellington	E06
			loss of access to farming land on other side of River	A	3	5		E06
			loss of access to schooling on other side of River	A	3	5		E06
			loss of access to sporting facilities on other side of River	A	3	5		E06
			reduced spending in the community	A	2	4		E06
		reduced availability of water for sporting clubs	loss of activities that give social cohesion and pride	A	2	4	losing the battle for the farm and for the sporting club GOVT SUPPORT & COMMUNITY COHESION AMELIORATE WHAT COULD BE EXTREMELY SERIOUS	E06
			Infrastructure damage from decreased quality	C	2	4		
		Perception that things will get worse not better	Concern that we cannot solve the problem under current political system	A	1	4	BUY BACK OF ENOUGH WATER UNLIKELY AND EVEN IF WAS POSSIBLE WOULD NOT KEEP IN FRONT OF PREDICTED CSIRO CLIMATE CHANGE PREDICTIONS & 5 OTHER RISKS TO INFLOWS : NEED MGT OF THE 6 RISKS NOW	SC
			concern that in recovering the MDB the Lakes will be the sink for "waste" from upstream	A	2	5	NEED TO RECOVER FROM MOUTH UP & CONSIDER AT ALL TIMES THE RESULTS OF ACTIONS TAKEN UPSTREAM & THE LIKELY EFFECT ON THE LAKES. Cannot afford for the lakes to degrade beyond recovery & for equity reasons	SC
		Lack of barrage flows	Affects all ecosystem processes and services listed above	A	1	5	NEED TO FLUSH SYSTEM & PROVIDE WATER FOR COORONG & MM OTHERWISE THE SYSTEM DIES	SC
					indicates that this impact scored A1 or A2			