



Senate Inquiry into water management of the Lower Lakes and Coorong

Submission to Senate Rural and Regional Affairs and Transport Committee

The Inland Rivers Network (“IRN”) appreciates the opportunity to comment on the Senate Inquiry into water management of the Lower Lakes and Coorong, and would like to extend its congratulations to the Senate Rural and Regional Affairs and Transport Committee for its swift action in establishing this inquiry to seek this critical information in the face of the unprecedented stress being experienced in the Lower Lakes and Coorong.

IRN has supplied a number of options and recommendations below. However IRN’s key recommendation is for **a major and immediate targeted water purchase in the Murray and Darling systems by the Commonwealth Government to avert the ecological and social crisis** unfolding in the Ramsar-listed Lower Murray Lakes and Coorong. This approach may also help avoid the irreversible ramifications of other potential options, such as the ‘do nothing’ option, which leaves the wetlands at high risk of ‘run-away’ ecological collapse, or lowering the barrages.

It is of incredible importance to save and protect the internationally significant Lower Lakes and Coorong for its conservation and environmental values, for the people who live in the area and depend on the health of the system for their livelihoods, for the Ngarrindjeri Traditional owners, and for other industry and tourism in the area.

The Committee also needs to be cognisant of how much of the wetlands and their wildlife has already been lost in this incredibly important and internationally significant wetland when considering options that may cause further loss and damage, and also in prioritising efforts to save the high value areas remaining.

Options for sourcing and delivering freshwater to the Lower Lakes and Coorong

Please see attached two proposals containing options for sourcing and delivering water to the Lower Lakes and Coorong. These proposals will be supplemented by additional information detailed below.

Volumes of freshwater required for the Lower Lakes and Coorong

IRN has seen evidence that argues the point that the quantities of fresh water required are variable depending on the season and possibly are less than many might estimate and therefore may be available, or become available from upstream sources. IRN understands that the volume required could range from tens of gicalitres to hundreds of gicalitres of water. If necessary IRN can seek to provide the Committee with this evidence on notice.

Given this variability & the strength of the current season locally about the lakes, IRN strongly recommends that any decision to use seawater to maintain lake level above the acid sulfate trigger point be delayed for as long as possible in combination with a significant effort to return freshwater to the Lower Lakes and Coorong through the purchase of water entitlements or if necessary temporary water allocations.

This also provides a strong argument for a plan that involves a significant buy back of water entitlements in both the Murray and Darling systems in 2008 *so that when it does rain there is water available to be delivered* to the Lower Lakes and Coorong.

Darling system options - permanent water entitlement purchase

One option is to purchase water entitlements and/or properties in the Darling River system. When six potential properties were identified by IRN they currently had at least 300 gicalitres (GL) in storage. There was potential to access a significant quantity of this water if these properties or their water was purchased, but it is now unclear how much of that water remains or could be accessed, and what change in climatic and antecedent conditions has occurred, which will impact the volume of 'transmission losses'. In addition, note that over 400 GL could be recovered each year on average for the Darling and Murray Rivers for years to come. It should also be recognised that the properties identified were not an exhaustive list, and there is likely potential for such purchases to be made across the Murray-Darling Basin for both short and long term outcomes.

Transmission losses should not necessarily be viewed as a 'loss' or wasted water. If environmental water were to be delivered through the Darling system that flow will benefit other parts of the Murray-Darling environment that are also in need of more environmental flows.

Whilst retrospective evaluation cannot fix the Lower Lakes ecological crisis, it can provide a clear indication of required approaches for the future. If these properties had been purchased prior to the summer rains and floods in the Darling Basin, the Lower

Lakes and Coorong would not be in the condition they are in now, or there would be more water in Menindee available for release for the Lakes.

Clearly the purchase of water entitlements and/or properties needs to be greatly accelerated to provide both short term and long term benefits and solutions.

As many of these properties occur outside of defined irrigation areas the restrictions imposed by the retention of the 4 per cent cap on market trade¹ will not be an impediment to purchasing water entitlements in these areas.

Options for leasing contracts, with an option to buy, with a number of companies or businesses should also be examined, which will provide an opportunity to gain some water allocations in the short and medium term with the potential for long term purchase.

By way of useful background information, it should also be noted that in the MDBC's State of the Darling Report it is stated that:

“More recently, there has been major private investment in large storages on irrigation farms. The total volume of these storages now rivals that of the headwaters dams, and they capture much of the water that enters the Basin's rivers downstream of the dams... The total surface area of these shallow on farm storages is large, and evaporation rates in the Basin are high. The result is that evaporation from them is now a major cause of loss of water from the system. There are also large losses from Menindee Lakes. The end result is that evaporation from water storages is now estimated to be about 2,000,000 Megalitres per annum, which is equal to about 25% of the average flow in the Basin's rivers.”

Murray system options – permanent water entitlement purchase

There is nothing to lose and everything to gain from a major buy back of water entitlements for the environment in the southern Murray system.

The acquisition of a significant number of licences will have long term benefits for the health of the southern river systems and the quality of water that communities along the rivers depend on. There is also significant potential for these entitlements to gain water allocations when water flows into the system, providing the critical freshwater needed for the environment in the Murray River, its wetlands, and the Lower Lakes and Coorong.

For example, there has recently been another allocation of water in NSW for some licence holders in the Murray and Murrumbidgee valleys on the basis of inflows into those systems. Murray Valley high security water licence holders can now access 50 per cent of their licensed water entitlement, and Murrumbidgee Valley high security license holders can now access 75 per cent of their entitlements. Needless to say there

¹ NWI Section 60 iv) b) commits the parties of the NWI to the “immediate removal of barriers to permanent trade out of *water irrigation areas* up to an annual threshold limit of four percent of the total water entitlement of that area, subject to a review by 2009 with a move to full and open trade by 2014 at the latest, except in the southern Murray-Darling Basin where action to remove barriers to trade is agreed as set out under paragraph 633...”

is further potential for ongoing inflows and allocations into the Murray system from snow melt and/or rain.

It should be noted that unfortunately to date none of this water has been set aside as part of a strategy to avert the Lower Lakes crisis.

Water entitlements can also be acquired quite quickly. It is also widely known by water brokers and agencies that have been involved in the purchase of water for the environment that water entitlements can be permanently purchased within 6-8 weeks, though can range from 4 weeks through to several months.

This option is completely in line with the intentions and plans of the existing Commonwealth national water plan but simply involves bringing forward spending in recognition of the crisis in the Lower Lakes and Coorong.

However the Committee should note that the effective implementation of this option may be undermined by the continued existence of the 4% cap on permanent trade out of irrigation areas. Hence the validity and reasoning behind the retention of this impediment must be assessed to determine whether the impediment must be removed in light of this environmental and social emergency.

Should limitations arise from the existing budgetary allocations, money allocated in the budget for infrastructure should be used for water entitlement purchase in recognition of the Lower Lakes crisis. Furthermore, investment in infrastructure typically takes years to yield uncertain results, and in any event should occur after water entitlements have been purchased to ensure public money is not invested in disused or unviable areas.

Clearly a large scale buy-back of water entitlements for the environment is an option that must be implemented, though can potentially be done alongside other options to reduce the risk of zero inflows into the southern system.

Water held in Menindee Lakes, NSW

Information from NSW Department of Water and Energy suggests that there is currently approximately 529GL in Menindee.

A great deal of the water in Menindee appears to be earmarked to underpin conveyance losses that NSW would otherwise meet with water in Hume Dam. It would appear that there is potential to seek to take the usual approach of fulfilling those commitments to supply that conveyance water from Hume Dam, thus releasing some of the water in Menindee for the Lower Lakes and Coorong.

If water can be recovered from the Darling system there is also the opportunity to use water in Menindee in the short-term to benefit the Lower Lakes and then replaced, in part or whole, with water purchased and transmitted from farther north in the Darling Basin. This approach still offers significant potential given the recent tender opened by the Commonwealth government for water purchase in this system on Monday 15 September. Dr Bill Young, principal research scientist CSIRO Land and Water,

recently stated that more than 50 per cent of water released from Menindee would reach the Lower Lakes².

Use of water from the Murrumbidgee Valley

There has also been a significant amount of environmental water – at least 113 billion litres - that has been borrowed and not repaid in the Murrumbidgee system for almost two years (though potentially far more water as the environment should have received allocations over the last few years at the same time as irrigators). This water could be replaced immediately as inflows come into that system, and borrowed to assist the environment in the Murray system. However it should also be recognised that there are important and struggling environments in the Murrumbidgee system as well.

Alternatively water from the Murrumbidgee and Goulburn could be earmarked to cover some of the conveyance losses that NSW and Victoria have to supply in combination with inflows to Hume Dam, thus making it easier for the water in Menindee to be released for the Lower Lakes and Coorong.

Opening the barrages

IRN strongly recommends that the option of opening the barrages and allowing sea water to flow into the freshwater units through Lake Alexandrina is not taken. It should only be considered as a last resort option after all opportunities for water entitlement purchase have been tried and exhausted.

Further, if this last resort option is used it must only be done if there are reasonable flows coming down the Murray River to minimise and undo as much of the damage caused by opening the barrages as possible, and so that the sea water stays localised near the barrages and is diluted by River Murray water. Again this emphasises the importance of a major purchasing program of water entitlements in the southern connected system as well as the Darling system as soon as possible, with much of it completed by the end of 2008 if possible.

This recommendation is made on the following reasons:

- Letting in the sea may neutralise the acid that has been generated from exposure of acid sulfate soils in the areas it could reach. It would however bring with it a large fresh supply of sulfate ions ready to be converted to sulfuric acid. The promotion of the production of toxic sulfide minerals may pose *enhanced* future risk during drought periods unless they remain permanently inundated.
- While sea water may neutralise the acid generated from the exposure of acid sulfate soils, it is unlikely to reach most parts of the lakes currently affected by acidification because of the low energy transferred by the tide and waves and the topography of the lake bed, leaving vast areas of acidified wasteland;

² See: www.news.com.au/adelaidenow/story/0,22606,24029821-2682,00.html

- Sea water would enter on high tides in winter and then would not completely exit on low tides leaving a massive salt load in the Lakes to become concentrated through evaporation and further contribute sulfate to generation of fresh acid. Salt crusts would form around the Lakes edge and highly offensive odours would be released;
- Without significant River Murray inflows, or local rainfall, it is unlikely that an effective flushing regime could be established on the tide alone. Therefore, the lakes environment would progressively increase in salinity and decrease in health;
- With increasing salinity, algae and bacteria will dominate the system, hindering rehabilitation of the system back to what it was;
- The lakes would rapidly convert to highly saline environments, and be as salty as sea water or greater as evaporation occurs;
- The wildlife and ecosystems are unlikely to be able to adapt fast enough to the rapid increase in salinity and so it would kill off the remaining freshwater biota of the Lakes including small native fish that have reproduced in the system at least every five years for at least the last 10,000 years.
- The mobilisation of acid and toxic heavy metals which would occur as a consequence of the sea water flushing and the changes it causes to the lake soils would also lead to losses of freshwater plants and animals and extensive fish kills through de-oxygenation and toxicity;
- Seawater would recharge the underlying sediments with salt, and so it would take considerable time and flushing for the system to revert to being fresh;
- Groundwater under the lakes is also likely to be extensively salinised; and
- Recharge of exposed sediments with sea water will lead to long term salinisation even if flushing volumes of River Murray water were returned to the system, especially in sediments and soils with high clay content.

All of these issues will cause:

- (a) a loss of the ecological character for which the lakes part of the site was nominated as a Ramsar Wetland of International Importance;
- (b) a transferred loss of ecological character for which the Coorong part of the site that is dependent on lake outflows was nominated as a Ramsar Wetland; and,
- (c) a likely loss of threatened freshwater biota from the system, including several EPBC and State-listed species.

- (d) widespread social and economic impacts on people that rely on the ecosystem services of the lakes as a freshwater ecosystem; in particular, irrigators, graziers and the tourism sectors.

It would be a contaminated site of some 100,000 ha that would be effectively uninhabitable requiring the permanent retiring of productive land, both irrigated and dryland and possible evacuation of lakeside communities, and the irreversible damage of the Ramsar values for which the site holds status as a Wetland of International Importance.

Look at a mix of options

IRN also recommends that a mix of options presented need to be considered, rather than simply considering each option in isolation from others.

IRN also recommends that the Committee consider the environmental implications and costs of a number of options, including the do nothing option.

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Inland Rivers Network

The Inland Rivers Network (“IRN”) is a coalition of environment groups and individuals concerned about the degradation of the rivers, wetlands and groundwaters of the Murray-Darling Basin. It has been advocating for the conservation of rivers, wetlands and groundwater in the Murray-Darling Basin since 1991. Member groups include the Australian Conservation Foundation; the Nature Conservation Council of NSW; the National Parks Association of New South Wales; Friends of the Earth; Central West Environment Council; and the Coast and Wetlands Society.



Opportunities to deliver immediate & ongoing water for the ecological crisis in the internationally significant Lower Lakes & Coorong

05 August 2008

ACF and IRN request that the Commonwealth and State Governments immediately target water entitlement and property acquisitions in the Darling system to return water to the environment of the Darling River system and lower Murray River.

There is a significant opportunity to demonstrate strong and powerful leadership on the Murray-Darling water crisis and a positive outcome for the Lower Lakes and Coorong by purchasing water entitlements and/or properties in the Darling River system.

This proposal identifies six properties¹ that could be purchased by the Commonwealth, NSW or Queensland governments which are strategically important to the Darling and Murray Rivers. They can provide at least 300 gegalitres (GL) in the short term to address the immediate crisis in the Lower Lakes and Coorong, and over 400 GL could be recovered each year on average for the Darling and Murray Rivers for years to come.

A targeted water purchase approach can be used immediately to assist governments to avert the ecological crisis unfolding in the Ramsar-listed Lower Murray Lakes and Coorong, where scientists say at least 400 GL is needed by the end of spring to avoid irreversible ecological damage².

Such action would also be very timely as there will be minimal 'losses' incurred in moving the water through the river system now due to lower evaporation rates over winter and less seepage due to recent floods.

¹ This paper does not provide an exhaustive list of properties or opportunities in the Darling Basin, rather it is intended to provide a number of examples that exemplify the opportunities that exist in the Darling Basin.

² Lakes Alexandrina and Albert Ecological Condition Progress Report, April 2008; Report by the South Australia Murray-Darling Basin Natural Resource Management Board.

However, if this water is not purchased, there will be significant volumes left in storages throughout the Darling system that will be lost. Losses of up to 40 per cent are predicted if water is retained for summer irrigation.

A range of purchase opportunities exist.

Purchasing the full water entitlements from a property, or purchasing the whole property including its entitlements, will have double benefits by helping a seller exit the industry or their business if desired, and also enabling the removal the banks and channels that are funnelling water away from the rivers. Some properties may also have high ecological value and their retention would provide valuable additions to the National Reserve System.

Options such as leasing several large commercial operations, with an option to purchase in 5 - 10 years, should also be considered. This approach will immediately recover water used by the leased properties and enable it to be used for the next few years while the Commonwealth develops the Basin Plan and the sustainable diversion limits for the Basin.

Buying properties or entering into leasing arrangements as suggested here would contribute towards solving problems in the short, medium and long term. If necessary the acquisition of these properties could be supplemented by the purchase of temporary water allocations to address the immediate crisis.

As many of these properties occur outside of defined irrigation areas the restrictions imposed by the retention of the 4 per cent cap on market trade³ will not be an impediment to purchasing water entitlements in these areas. Similarly leasing arrangements will not be subject to the 4 per cent market cap.

Such purchases also need to be made in light of the high, and extremely high, levels of water extraction and estimated reductions in stream flow from climate change, contained within the CSIRO hydrology "sustainable yields" reports⁴. The need for change throughout the Murray-Darling Basin, including all valleys in the Darling system, is inevitable due to current and future water availability and needs to be part of any approach for modernising irrigation areas and developing resilient regional areas.

There is an immediate crisis in the Lower Lakes and Coorong. Currently, there is little or no water in the Murray system to release for these areas and according to official sources⁵ most of the water in Menindee is earmarked for critical human needs. However, water in Menindee could be used in the short-term to benefit the

³ NWI Section 60 iv) b) commits the parties of the NWI to the "immediate removal of barriers to permanent trade out of *water irrigation areas* up to an annual threshold limit of four percent of the total water entitlement of that area, subject to a review by 2009 with a move to full and open trade by 2014 at the latest, except in the southern Murray-Darling Basin where action to remove barriers to trade is agreed as set out under paragraph 633..."

⁴ See: www.csiro.au/partnerships/MDBSY.html

⁵ Though note no formal figures have been released to support these assertions

Lower Lakes and then replaced, in part or whole, with water purchased and transmitted from farther north in the Darling Basin. Dr Bill Young, principal research scientist CSIRO Land and Water, recently stated that more than 50 per cent of water released from Menindee would reach the Lower Lakes⁶.

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⁶ See: www.news.com.au/adelaidenow/story/0,22606,24029821-2682,00.html

Potential properties for targeted purchase

Toorale Station, Warrego system

Toorale Station is a 91,000 hectare property owned by Clyde Agriculture that sits on the junction of the Darling and Warrego Rivers, downstream from Bourke, and has six privately-owned dams across the Warrego River.

It is *on the market* and extracted 180-200 GL from the Warrego in the last flow. It is currently holding approximately 20 GL in storage.

Not only would the purchase of Toorale Station provide useful volumes of water relatively close to the Lower Murray, its purchase will provide significant environmental flow benefits in the longer term. The removal of the six dams that exist on Toorale, that currently impede flows in the Warrego's lower reaches, would be expected to greatly improve the health of the Warrego and Darling and their ecological communities. Over the *past 10 years* an average of 50GL/yr would have reached the Darling if Toorale's dams were removed. This water comes as pulses each 10 months on average.

Estimates for the purchase price of the property range from \$12 million – approximately \$6 million each for the land and the water – through to \$40 million. As only about 2,000 hectares of this property has been developed, there is still valuable and high quality floodplain in the area. If the property were retained for conservation purposes it would make a valuable addition to the Paroo Darling National Park. It should also be noted that this area falls within the Darling Riverine Plains Bioregion, which has been recently identified by WWF as one of the top priority bioregions for further protection due to both threats and the current lack of protection afforded to the bioregion's values⁷.

Darling Farms, Darling system

Darling Farms is a large irrigation property located on the Darling River near Bourke. It is currently *on the market* and estimates are that it could be purchased for approximately \$70 million. It holds entitlements for 23,000 ML/yr, which are continuously accounted (so are entitled to take far more than that in wet years that follow dry years). Currently it is holding approximately 30 GL in storage. Not only would it provide useful volumes of water in the short term, its purchase would provide significant medium and long term benefits as it takes about 10 percent of water extracted from the Darling River around Bourke.

Cubbie Station, Condamine-Balonne system

Cotton farm Cubbie Station is well known throughout the Basin as an icon of

⁷ Sattler, P.S. and Glanznig, A. (2006). *Building Nature's Safety Net: A review of Australia's terrestrial protected area system, 1991-2004*, WWF-Australia Report, WWF-Australia, Sydney

excessive water extraction and its purchase would generate widespread support across Australia. The purchase of this station would provide significant quantities of water – as much as 200GL – that could be immediately transferred to Menindee to offset water released from there to address the crisis in the Lower Lakes and Coorong. It would also recover an average of 200GL annually, though in some years it can capture as much as 460GL – equivalent to Sydney Harbour and more than Melbourne uses in an average year. Water is extracted by Cubbie both directly from the river and also diverted from the floodplain. Cubbie is often cited as an example of how agricultural wealth has shifted from downstream landholders to upstream users and its purchase would provide significant medium and long-term benefits to downstream communities and industries as well as the environment.

If Cubbie Station were purchased by governments and decommissioned, the result would be that significant amounts of water would be returned to the Culgoa River. The Culgoa in turn provides important flows into the Darling River, as well as supporting the nationally important Lower Culgoa floodplain which is a site for extensive waterbird breeding. The purchase of Cubbie would also return flows to the internationally-listed Narran Lakes⁸.

Balandool Station, Condamine-Balonne system

Balandool Station is on the Culgoa River downstream of Cubbie station. It has been on the market for some time and was one of the properties that the Queensland Government attempted to buy in 2006 (it was unable to due to a lack of support from the Commonwealth and NSW). It has been estimated that the property, of some 68,000 acres, could be purchased outright for approximately \$20 million. With levee banks and infrastructure removed, the property could be sold as a dryland property for an estimated \$7 million. While it only gets “leftover water” after Cubbie extracts its water (it gets about 20% of what Cubbie gets) it would still be an important purchase either prior to or in conjunction with the purchase of Cubbie, to ensure that its value does not increase with the retirement of Cubbie Station, or that it doesn’t extract water recovered from such a retirement.

Tandou, Lower Darling system

Tandou is located south of Menindee Lakes on the Lower Darling between Broken Hill and Mildura. It currently holds around 30 gigalitres of water in Menindee, possibly more.

It holds entitlements for up to 250 GL of high flow water and gets approximately 100 GL on average each year. Tandou is a publicly listed company and provides a good example for options such as leasing arrangements.

⁸ Even though the Narran Lakes are located on another distributary river in the Condamine-Balonne system to Cubbie Station, most flow events in that system drown out the bifurcations in the system, essentially resulting in one large flooded area. Hence when Cubbie Station extracts significant volumes of water from this flood water less water will flow into the Narran Lakes.

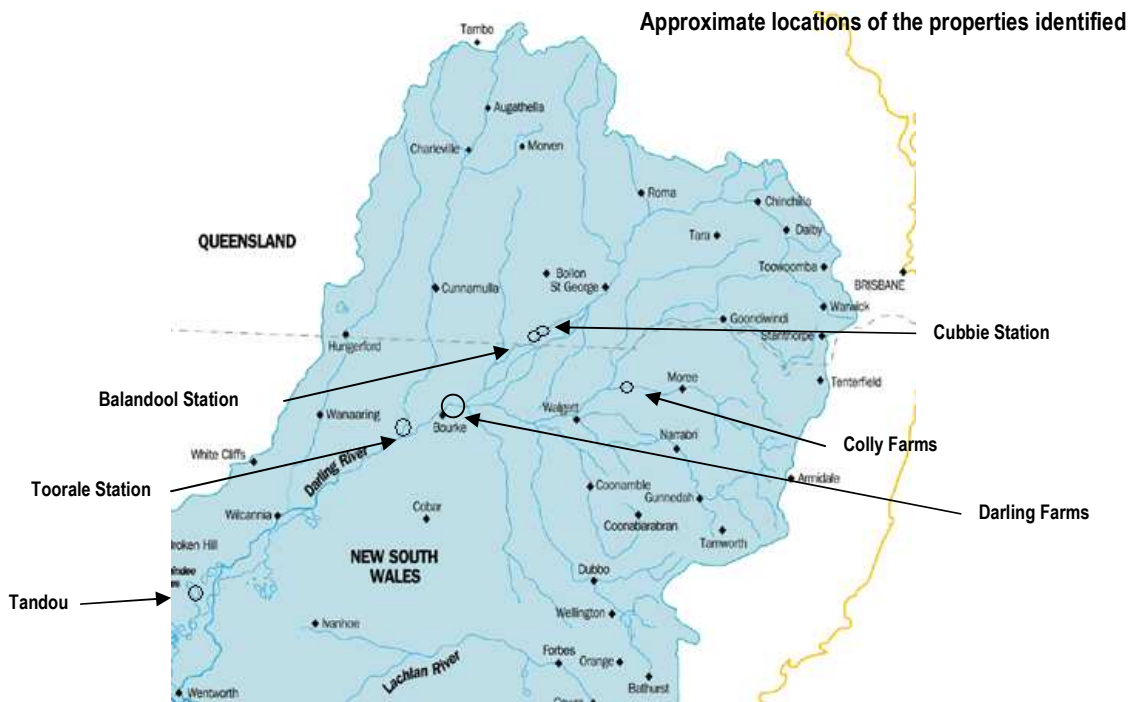
Colly Farms, Gwydir system

Colly Farms, owned by Twynams, is by far the largest cotton property in the Gwydir and is considered the Cubbie Station of the Gwydir valley.

The property has water entitlements on both the Gwydir system (via the Mehi) and the Barwon River, and has over 50 water licences. The entitlements on the Gwydir are estimated to be for about 60-70 GL, and it currently holds 10 per cent allocations on these entitlements. It is unclear as to the extent of the licences held in the Barwon, but on average the property is known to get a great deal of water out of this system via high flow licences, with large off river storages to hold water taken through floodplain harvesting or otherwise. The purchase of this property would not only supply water now, but would also deliver clear benefits to the Ramsar wetlands in the Gwydir and the Darling system in the future.

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These are only six of a multitude of strategically important opportunities to recover water to address overallocation and overuse by buying properties. IRN and ACF encourages the Commonwealth and State Governments to assess these opportunities and their capacity to provide emergency water to the Lower Lakes within the timeframe that scientists say is necessary to avoid irreversible loss of the characteristics, for which the area is an internationally significant wetland system.⁹ These actions have the potential to make a substantial medium and long-term contribution to addressing overallocation and overuse in the Murray-Darling Basin.



⁹ Lakes Alexandrina and Albert Ecological Condition Progress Report, April 2008; Report by the South Australia Murray-Darling Basin Natural Resource Management Board.

June 2008

An Emergency Rescue Package for the Coorong and Lakes Alexandrina and Albert - Internationally Significant Wetlands on the Brink of Extinction

Prepared by Dr Arlene Buchan, Coordinator of the Healthy Rivers Campaign, Australian Conservation Foundation.

“The decline in ecological character [of the Coorong and Lakes Alexandrina and Albert] can only be halted and reversed if substantial freshwater inflows are received within the next six months”.¹

Objective

There is a rapidly closing window of opportunity to provide sufficient freshwater flows to the Coorong and Lakes Alexandrina and Albert to prevent irreversible ecological loss and damage, pending the development of medium and long-term management options for the area. This short paper outlines measures that can and should be evaluated for their feasibility within a couple of weeks to enable options for an emergency rescue package to be presented to COAG for decision on 3 July 2008.

The ACF requests that the Commonwealth Government asks the Murray-Darling Basin Commission (MDBC) to undertake urgent feasibility studies into the options presented below to

¹ Extract from a Report by the South Australian Murray-Darling Basin Natural Resource Management Board (April 2008) to the Murray-Darling Basin Ministerial Council on 23 May 2008.

avert ecological catastrophe at the Coorong and Lakes Albert and Alexandrina. These options could then be considered by governments at the 3 July COAG meeting.

The Scientific Reference Panel (SRP) and the Socio-Economic Reference Panel (SERP) of the MDBC are made up of distinguished, renowned, leading practitioners who are ideally positioned to draft the Terms of Reference for the feasibility studies which should then be commissioned and / or conducted by the office of the MDBC.

The Issue

The Coorong and Lakes Alexandrina and Albert were jewels in the crown of Australia's wetlands estate yet they are in immediate danger of irreversibly losing all of the values for which they are recognised as internationally significant. Decades of regulation and over-extraction of water from the River Murray has diminished freshwater flows through the Lakes and Coorong with ecologically damaging consequences that have been exacerbated by recent drought. The Lakes are now 0.5m below sea level – the first time this has happened in the 7,500 years since they formed despite frequent and intense natural droughts throughout that period – and as declining water levels expose acid sulphate soils, scientists worry that a "tipping-point" could be reached beyond which the buffering capacity of the environment is exceeded and the reversal of progressive acidification becomes impossible². All but one indicator of ecosystem health is negative and getting worse, including those for native plants, turtles, fish, frogs, birds and everything else that relies on this unique ecosystem for its feeding and breeding habitat.

Scientists say "the situation in the Lakes will worsen without intervention¹" and that "without sufficient water, ecosystem recovery from the current impacts may take years to decades depending on an individual species' ability to recolonise. Some species will not be recoverable. Many of the unique ecological attributes that make this area significant internationally will be irreversibly lost".¹

"The window of opportunity to prevent irreversible loss of the Lakes and Coorong Ramsar site will close in spring 2008".²

The Commonwealth Government is rolling out a \$12.9 bn "Water for the Future" programme, much of which will focus on redressing water overextraction across the whole Murray-Darling Basin. ACF welcomes and supports this medium to long-term programme. The scale and pace at which this programme is being rolled out is not enough however to deal with the immediate crisis facing the Coorong and Lakes Alexandrina and Albert. The risk of irreversible loss of these internationally significant wetlands is so severe and so immediate that it warrants an emergency rescue package to provide enough freshwater flows within six months to sustain the area for long enough in the short term for it to benefit in the medium to longer term from the "Water for the Future" package.

² Muller, K. (May, 2008). A Blueprint for the Survival of the Lakes and Coorong ecosystem, Indigenous peoples and farming communities.

The Solution

Winter and spring flows in the order of 400 to 450GL of freshwater are required by the end of this calendar year to return the Lakes to approximately sea level and prevent irreversible changes to the ecological character for which the site is Ramsar listed.²

Whilst recognising the severity of the ongoing drought and that major dams on the River Murray are at record lows there *is* enough water in the Murray-Darling system to provide a suite of opportunities which in combination, would provide enough water to prevent extensive changes to the ecological character of the Coorong and Lakes Alexandrina and Albert and provide a short-term reprieve from irretrievable damage and multiple species and ecosystem function loss.

The combination of measures described below is not intended, and would not be capable, of reconnecting wetlands or restoring the Coorong and Lakes to ecological health but could avert the ecological catastrophe scientists suggest will happen by the end of this calendar year without action.

Short term emergency change in the operating rules for Menindee Lakes

Complicated rules govern the control of Menindee Lakes depending on water storage levels so that below 480GL all rights to the water stored in the system go to NSW and above 640GL the MDBC assumes control and most of the water is assigned to South Australia.³

Currently there is approximately 550GL of water in Menindee Lakes, below the level required to return management of Menindee to the Murray-Darling Basin Commission. It appears that NSW is ensuring that it regulates the water levels, inflows and outflows to make sure that this remains the case as evidenced, for example, by irrigators on the Barwon-Darling, whose licences are typically low security, having 300% of their annual allocation.

Queensland tributaries provide up to 30% of Menindee inflows and can take up to three months to arrive. It is not yet clear if all the inflows from high rainfall events earlier in the year have arrived yet.

The dire state of the Coorong and Lakes Alexandrina and Albert warrant an environmental emergency situation being declared with a view to temporarily setting aside the NSW / MDBC triggers on control and the Menindee Lakes Storage Agreement with a view to managing Menindee Lakes so that as much water as possible is provided to the Ramsar listed sites end of the system. This would also benefit Victorian irrigators whose level of security would increase if water is released from Menindee to Lake Victoria.

This would be a low cost way of securing some of the water for the Coorong and Lower Lakes.

Purchasing temporary and permanent water from private storages on the Darling River system

³ Water sharing arrangements as specified in the MDB Agreement - CI 92, 96, 104, 119-120 and part XI of MDBA.

At least 1,200GL of water is currently held in major storages in northern NSW⁴ as a result of two recent, major rainfall events, one in late 2007 and the other in early 2008. Also, there are 2000+ turkey nest dams in the area which at a very conservative estimate would be holding at least 500GL.

Given the current price for cotton and evidence of willingness to sell from water entitlements holders, it is clear that a substantial volume of water currently stored in the system could be bought from willing sellers in the region using both the temporary and permanent markets. We have heard from at least one cotton grower with an entitlement for 18GL that they would 'prefer to sell their water to the environment this year and only if the water cannot be sold will they use it to grow cotton'.

Given that the system has seen two substantial flood events recently it should be reasonably well primed and whilst significant transmission losses will occur the local channel conditions are such that 50 per cent of releases should be conveyed to its destination⁵.

There is a successful precedent for this type of measure in the region as exemplified by the recent purchase of 11,000ML of water from entitlement owners earlier this year which sustained flood waters in the Narran Lakes to enable colonially-nesting water birds to complete their breeding cycle resulting in the most significant ibis breeding event in the Murray-Darling Basin this millennium.

Noting that temporary water was bought recently for the Narran Lakes as described below at an average \$185/ML, if water could be purchased at an average of \$400/ML it would cost in the region of \$180 million to buy 450GL of water on the temporary market with an expectation that at least half of that would be available in the Coorong and Lower Lakes within the window of opportunity identified by the SA MDB NRM Board¹.

Also, the ability to trade some or all of their stored water to the environment as part of an emergency rescue package for the Coorong and Lower Lake could provide an additional income stream to water-holders in the area who are as yet currently unable to trade water from unregulated to regulated systems.

Improved metering, monitoring and compliance in areas including the Murrumbidgee and major storages on the Darling system

There is a general feeling amongst many landholders, water entitlement holders and others interested in improving water management in the area⁶ that an effective metering, monitoring and compliance regime would generate significant water savings that could be made available to the environment and in this case to the Coorong and Lakes Alexandrina and Albert.

For example, water is metered as it is used rather than as it is captured, and thus does not account for losses of 30-40%. The current system takes all the small to medium flushes, dampening the

⁴ <http://waterinfo.nsw.gov.au/drr/darling.shtml>.

⁵ Pers comms from various landholders and water entitlement holders in northern NSW / Darling system.

⁶ For example, the recent Maunsell Report.

variability in the system as well as reducing water supply to the environment. Compliance to access is not monitored.

A compliance audit would be a low-cost, no-regrets option that could generate considerable water savings that could be used for environmental purposes and should be implemented immediately.

Loans from water in the River Murray once irrigation season starts

Whilst compulsory acquisition of water is not allowed the Commonwealth could shave-off a percentage of water from all River Murray allocations once the irrigation season starts as a 'loan' of water from the irrigation sector to the emergency rescue package for the Coorong and Lower Lakes that will be repaid to the irrigation sector when conditions improve.

'Just in time' engineering solutions that generate water savings in the southern connected basin

New technologies involving geotextiles etc could be rolled out very quickly in hot-spot areas for seepage and leakage with the water savings made available to the Coorong and Lower Lakes immediately. This could be an expensive but effective way of securing water from the Murray system.

Groundwater

Groundwater should be considered to be connected and interchangeable with surface water until proven otherwise and should be managed with surface water as a single resource and as an insurance policy against drought. There may well be opportunities however to use some groundwater, including lower quality groundwater, explicitly 'borrowed against the future' to provide additional environmental flow as part of an emergency package of measures to prevent the irreversible loss of the characteristics for which the area has been listed under the Ramsar Convention as internationally significant.

Non-flow related management issues

Other, non-flow related bioremediation and complementary management activities are important, not only for rehabilitating the area but because they would provide income streams for local indigenous and non-indigenous communities whose local economies have been severely compromised by the ongoing degradation of their natural resources. Relevant opportunities are discussed in Appendix 1 [Muller (2008)]. The same paper briefly discusses the longer-term water needs of the Coorong and Lakes Alexandrina and Albert too.

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A Blueprint for the Survival of the Lakes and Coorong ecosystem, Indigenous peoples and farming communities.

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- It is clear that urgent remedial action is required for Lakes Alexandrina and Albert to prevent them becoming the Aral Sea of the South. Extensive changes in ecological character have already occurred and continue to occur leading to extensive changes in the agricultural and cultural communities that depend on the Lakes' ecoservices. If the Lakes drop to a level of -1.0m AHD there will be irreversible ecosystem collapse (NB -1.2m AHD is commonly held view for acid sulfate "tipping point" the figure of -1.0m AHD pertains to the collapse of the Ramsar-listed ecosystem as a whole).
- Winter and spring flows in the order of 400 to 450 GL of freshwater are needed this year to return the Lakes to approximately sea level and prevent irreversible changes to the ecological character for which the site is Ramsar listed. Water for the Lakes is the highest priority water use in the basin if the principles of wise use are followed that dictate management should seek to prevent irreversible changes such as extensive losses of species, habitats and genetic diversity before other competing priorities. The water will benefit other Icon sites and agricultural communities on the way down to the Lakes. The window of opportunity to prevent irreversible loss of the Lakes and Coorong Ramsar site will close in spring 2008. We need to release water now to allow for conveyance time.
- This amount of water (450 GL for delivery in winter/spring 2008) is available in storage in NSW and Victoria and can be supplemented by rainfall on the Lakes and by inflows from the Eastern Mount Lofty Ranges. Failure to deliver adequate water to the site remains a matter of management priorities and cannot be blamed on the drought and lack of water in storage. This volume of water represents the difference between Lakes survival and complete ecosystem collapse in the next few years.
- In the meantime we need to bioremediate the lake bed that has been exposed and acidified with a mixture of strategies for different locations.
- Sea water whilst it is not the answer for the Lakes as a whole, does have a part to play in quenching 3km of acidified mudflats between Ewe Island and Pelican Point. A trial needs to be undertaken immediately to determine the best way in which to use sea water in terms of rates of inundation and subsequent mobilization of toxic metals (if any).
- Liming is difficult to apply because the lake bed is so large that many machines would be required and so sticky that machinery used would be rapidly bogged. Aerial applications of lime may be possible but the lime needs to be incorporated into the soils which cannot be done from the air. It may be best solution for some near shore acid hot spots but will not be the answer for the Lakes as a whole.
- River water has four times the alkalizing power of sea water and is the only answer for treating exposed acid sulfate soils of the magnitude that we see in the Lakes but before delivery, the lake bed needs to be primed over winter to receive these River Murray and Eastern Mount Lofty Ranges inflows. This priming can be done by mulching the lakebed and planting native aquatic species that can bioremediate the exposed lake bed and prevent or reduce mobilization of toxic metals.
- Mulch can be supplied by local farmers as an immediate source of income if mobilized by a Government purchase order for bulk materials. We need mulch with a high carbon and low nitrogen content and we need to develop a method for spreading it out, probably from the lake edge. This needs to be trialled immediately and quantities of mulch need to be estimated and grown to order over winter 2008.
- Ngarrindjeri people, irrigators, dryland farmers and other community members that have lost their primary incomes because they have no water, can be employed to mulch and revegetate the edge of the water with reeds and other aquatic plants to provide habitat for fish and to

provide carbon to recover the carbon cycle and fuel healthy bacterial action that does not lead to the production of sulfuric acid.

- Local farmers can also be encouraged to sell their water allocations and move into carbon forestry of mixed species of mallee and pink gum which represents high value “Gold Standard” carbon credits and can be linked to form wildlife corridors to facilitate adaptation of native species to climate change. Dairy farmers and viticulturalists on sandy soils, in particular, are unlikely to be able to return to pre-2006 farming practices and should be encouraged to investigate carbon forestry.
- Ngarrindjeri people can also be offered hope and an income stream by carbon farming at Raukkan and on other lands made available to them. Crown Land could be revegetated to meet part of the State’s carbon sink needs. SA DEH have maps of where to plant carbon forestry to meet Nature Links objectives and support rehabilitation of the Ramsar site.
- Once the Lakes have been recovered to sea level then we need to incrementally reach +0.3 mAHD and +0.6 mAHD and operate the Lakes within this range and not surcharge to +0.81 mAHD. This will require modifications of some of the fish ways to allow for water release at this level and will also represent a saving of approximately 200GL from old operation (this figure is an estimate and needs to be refined).
- The aim then is to have a formal allocation for flow through the Lakes and out the Murray Mouth that enables us to meet water quality targets laid out in the Living Murray Asset Plan, the Ramsar Management Plan (in preparation) and the Ecological Character Description for the site. This is likely to be in the order of 750 GL per annum. Flow of that quantity will rehabilitate and maintain the Lakes and the North Lagoon of the Coorong and enable them to continue to provide us with ecoservices under a future changed climate.
- The South Lagoon of the Coorong will not be fixed by River Murray flows (water cannot physically enter South Lagoon from North Lagoon) nor will it be fixed by flows from the South-East drains (too little water available). It is likely to need some intervention such as the following “soft” engineering solutions where there are no permanent modifications and the adverse impacts are mitigated.
 - pump the very saline water out of South Lagoon onto the land and treat as a contaminated waste stream
 - refill South Lagoon with a combination of fresh water that is reclaimed from the waste stream process via desalinization and sea water pumped in from North Lagoon on the high tide.
 - Once a healthy salinity gradient is re-established South Lagoon and North Lagoon could be reconnected via a low impact regulator.

it is imperative that the important that the poor quality water in South Lagoon is not drained through North Lagoon to the sea because it will damage the already very vulnerable ecosystem in North Lagoon which currently is the only refuge for Coorong biota and may contaminate near shore environments which support an important cockle industry.

If this type of long term thinking and planning is not applied to the site it will continue to deteriorate to the point where ecological collapse will occur and it will have to be fenced off and treated as a vast contaminated site. This “runaway” collapse of the system will happen very quickly if the Lakes are allowed to drop below -1.0 mAHD. We must deliver 400 GL of water in spring 2008. Collapse of the system is likely to have severe international ramifications (as the collapse of the Aral Sea did) and result in reduced tourism, investment and market access for irrigated product such as wine.