

**IMPACTS OF THE WATER AMENDMENT (RESTORING OUR RIVERS) ACT
2023 ON NSW REGIONAL COMMUNITIES**

Organisation: Central Murray Environmental Floodplains Group Inc
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Central Murray Environmental Floodplains Group Inc

Submission to the

**Inquiry into the Impacts of the Water Amendment (Restoring our Rivers) Act
2023 on the NSW Regional Communities.**



Monday 14th April 2025

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Introduction

Central Murray Environmental Floodplains Group Inc is making this Submission at the invitation of The Legislative Assembly Committee on Investment, Industry and Regional Development Parliament of NSW and their Chair Mr Roy Butler.

Who are we

Central Murray Environmental Floodplains Group Inc is a not-for-profit voluntary water and environmental advocacy and community-based research group with unique qualities coming from a diverse array of backgrounds and experiences working for the regions greater good. We are open, transparent, and accountable in our work and deliberations. Our home Cohuna is in the centre of the Southern Basin of the Murray Darling Rivers system the largest river in a system in Australia.

Opening Remarks

The original premise of the Basin Plan was to support a connected river system and environmental outcomes while protecting the social, economic values of the community.

As a result of a poorly implemented plan, we are seeing the collapse of Australian irrigation industry, dramatically impacting our nation food production capabilities leaving us vulnerable to being able to feed ourselves into the future. This will be accentuated by the next drought or pandemic.

The loss of generational farming families has increased at a rapid rate. The young seeing the stress, the strain and anxiety being placed on their mothers and fathers no longer want to farm in the future. They also see the cost of water as prohibitive to entering the farming business.

It needs to be recognised that 82 per cent of this water recovered under the Basin Plan has come from the Southern Basin, putting at risk a combined \$24 Billion Agricultural Industry.

With a massive volume of 4622.5 gigalitres of environmental water currently stored in our dams, a detrimental consequence has emerged. This surplus of idle water can no longer be utilised for the production of food and fibre, which has traditionally contributed to the national and international markets, thereby playing a critical role in maintaining economic equilibrium. This water also takes up vital airspace in our Dams needed for seasonal inflows. Authorities' choice to retain so much water in the dams has already proven that future severe floods are a real and looming threat.

Government's senseless destruction of the Australian food bowl with the removal of irrigation water has left a train wreck ripping the life out of our countries families and businesses bordering on genocidal. It is simply food security sabotage impacting on our nation's ability to sustain our population.

Governments move to take this water has led to the destruction of our food and agricultural sector, taking away the right of people to a healthy and cultural appropriate food that has been grown sustainably directly undermining our food sovereignty. Government has forgotten food is the cornerstone of a staple and prosperous society and the security of which should never be taken for granted.

Australia, the driest inhabited continent on Earth, is now watching vital freshwater wash out to sea, wasting a resource essential to farming and food production. The consequences are mounting, disrupted supply chains, rising grocery bills, and a worsening cost of living crisis.

In a *Weekly Times* article published on December 19, 2024, the MDBA confirmed that delivering 80,000 megalitres a day to the South Australian border, as targeted under the Water Amendment (Restoring Our Rivers) Act 2023, is not a feasible operational target. Yet, the Federal Water Minister continues to push ahead, taking more water from the hands of farmers and productive agriculture. It simply doesn't make sense.

In fact, why do we need another 450 Gigalitres of water when the Commonwealth Environmental Water Holder has stated it can only use 78% of the amount of Environmental Water Entitlements 2750 Gigalitres of which it presently holds.

In a media release published by NSWIC on February 26, 2025, it was revealed that ABARES figures show past and planned water recovery has reduced the potential farmgate value of irrigated agriculture by between \$602 million and \$914 million annually.

Over the last 13 years the Basin Plan has delivered unnatural and unseasonal volumes of water downstream to support unachievable environmental outcomes which have killed the upstream environment.

The river is now operated outside natural constraints and is managed like a water super freeway, resulting in massive bank erosion, the loss of natural sandbars and upstream habitat.

General

Over 2/3 of available water in the system is now allocated to the environment with more to come. 82% of environmental water recovery has come already from the Southern Basin farmers, we have no more to give and our systems are on the brink of collapse and closure forever.

The Government environmental water strategy is senseless when the main problem stems from within the Northern Basin and Darling-Baaka River. Would someone tell the Minister and her advisors that water cannot run uphill no matter how hard she tries, the Murray River water will never run up the Darling River because it is on a lower gradient.

The Northern Basin extractions since 1980 have progressively reduced the flows down the Darling River meaning the Murray River has had to shoulder the brunt of the burden to deliver most of the South Australian entitlement flows of 1850 Gigalitres under the River Murray Agreement.

With every megalitre taken out of an irrigation district and its operating system the price of water for those who remain must increase. With NSW Murray General Security and MIL holdings buy-backs, they are losing 30% of their productive water. Therefore, Government charges over the next five years will increase by 184%. This is significant.

This is also mirrored in Victoria with Torrumbarry irrigators losing close to 70% of the productive water the impact has already been substantial.

On both sides of the Murray River water has left the Riverina and Northern Victoria and Rates and Government Charges have continued to rise to cover the maintenance of the infrastructure and delivery by Water Providers. While this is making it harder for the remaining farming families to stay in business it is also doing the same to the Water Providers. The cost price squeeze for water is pushing many farmers out of their industries they love.

This transitional change comes with the loss of demand for localised services and supplies, financially stressing businesses that support the industry of generations of farmers, causing closures across the region including local markets.

We are being forced to travel longer distances on deteriorating roads just to access the basics. The loss of vital infrastructure is leaving our agricultural sector more vulnerable to both economic and logistical pressures including access to supplies and markets. This is just placing further strain on businesses to continue.

What Happened

If ever you needed proof of the negative impact of buybacks look no further than an MDBA case study on Wakool published in October 2017 where 34.5 per cent of the available water in Wakool was purchased (103.9GL) through buybacks resulting in:

- a reduction in the maximum area irrigated of around 37% to 39%.
- milk production dropped from around 7 million litres to approximately 5.5 million litres
- total employment fell by around 54% between 2001–16.

Buybacks were just the beginning of the demise of Wakool. The Burraboi School closed while Wakool Primary School enrolments dropped from nearly fifty to around eight. The local tennis, football and netball clubs all closed.

From 2012 when the Murray Darling Basin Plan was introduced until June 2022 Murray Dairy Riverina Milk Production fell 89,721,555 litres.

In Northern Victoria just over the Murray River border they have seen

The Goulburn Murray Irrigation District was a vibrant irrigation system growing capacity with agricultural innovation and the Region was buzzing with enthusiasm and excitement using 2200 Gigalitres of water. Then the Murray Darling Basin Plan hit.

The loss of 50,000 dairy stock (1.6 billion litres of milk production), 228,000 prime lamb market and a 34,000 head beef cattle market in the Northern Victoria's irrigation region of Gannawarra has accumulated in an annual loss of \$1.3712 Billion. During this time, we also saw a reduction of over 684 less children in schools. The dwindling losses upsetting our social and economic fabric that held our communities together. A Region which was the third most productive in the State of Victoria at year 2000 is now just a shimmer of its former self.

Now

In Gannawarra over 80% of our dairy industry has left the region accumulating in losses of over 55,000 milking dairy stock. We have just 750 gigalitres of water left.

Murray Dairy's rule of thumb gives a snapshot of this impact: For every 200 cows; earnings are \$1Million, of that an estimated \$780,000 goes back to the Community which in turn employ 6 full time workers.

To help understand the full impact of the loss of farming families and their income Latrobe University did a study in 2002 on the movement of finance gained out of the Agricultural industry and the study stated for every \$1 a farmer makes it goes around the Community four times.

On September 10, 2024, Australian Consolidated Milk (ACM) CEO Jason Limbrick stated in a Country News article ‘since the introduction of the basin plan in 2012 dairy farm numbers have fallen by 47% and raw milk production had dropped 35 per cent’.

He also stated Australian dairy processors create more than 70,000 jobs with about 20,000 of these directly employed with 60 per cent of these jobs in regional Australia.

“Over the past 18 months, 11 processors have announced a closure due to various reasons and we cannot have further reductions.”

Rice Industry

Rice growing in Australia is concentrated in the Murray and Murrumbidgee Valleys of the Riverina in Southern NSW. Including rice production mills at Deniliquin and Leeton the industry is one of the primary employers of staff throughout the Riverina.

Rice needs water to grow so the more access to irrigation water, the more area is sown and harvested and the more employees needed for the process.

Since 2008 the Riverina has lost a third of its water due to the Murray Darling Basin Plan dramatically reducing the tonnes of rice now grown and has heavily impacted job availability and security.

With the uncertainty of further water buybacks, the question surrounds the viability of the rice industry and Sun Rice’s two mills at Deniliquin and Leeton, putting the job security of 400 workers and their family’s future at risk.

Rice production in the Riverina along with Dairy and Horticulture make up 75 to 90% of farm businesses many of which will not survive if government continues to take water away under “Restoring Our Rivers”. Profitable irrigation farming in the Riverina and Northern Victoria is under serious threat of extinction.

Economics & Food Safety

It seems senseless to import what we can easily grow. Economically our country's debt is fast approaching a Trillion dollars. How then will we balance our share of international trade when our Gross Domestic Product (GDP) continues to diminish with loss of exportable agricultural product?

Investing in the highest priced commodity "like olives", building a monoculture will lead to ultimate failure and collapse overtime. This single industry is not a staple food that is needed on a daily basis for human survival therefore the system is flawed and set to fail.

Having an irrigation industry that supports a number of agricultural products even those lower priced commodities that are staple foods needed for human survival will balance a system over time.

With Volume producers of lower valued commodities like dairy, rice, beef, lamb and cereal the staple foods we eat every day now consistently leaving the industry, how will government cover the shortfall in supplies of food to our Australian population in the future?

The continued loss of access to Australian production will enviably push food product manufacturers offshore to survive or buy overseas supplements to place in Australian products.

Australia has a reputation in the ability to grow clean green food at the highest safety standards in the world under vigorous protocols. While this gives our population peace of mind when buying Australian product off the supermarket shelf, it also gives us a competitive advantage when selling into world markets. Buyers overseas recognize the integrity of our systems, the traceability of our supply chains, and the premium quality that comes with the Australian brand.

The last thing we need is to import food that causes a biosecurity risk like foot & mouth or mad cow disease that would destroy our reputation and industries overnight but more importantly put our nation's population health at risk.

When are politicians going to use some common sense. If COVID didn't teach us a vital lesson nothing else will. No one else is going to look after Australia other than us-ourselves.

Health

Business closures, farmers walking off the land and job losses have been substantial, Anxiety, depression, mental health, domestic violence, and suicides are real being caused by the Government poor policy destruction of a once vibrant healthy irrigation industry.

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Cohuna Dr Peter Barker OAM recently wrote that, “I can comment on the many interactions I have with landowners and towns people over that time. Many suicidal farmers have passed my door, and we have discussed causes of stress in their lives. A lot of the anguish with the MDB plans results from a feeling the farmers are disempowered, and they see damage occurring to the thing they hold sacred land and its management”.

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Cohuna Dairyfarmer Jodie Hay also wrote “There is obvious generational Trauma as we have witnessed many of our long-term Dairy Farming Families exit the industry and indeed the district. The insecurity around water availability and affordability and the stress this causes has resulted in many of the next generation of farmers to choose not to continue in the industry”.

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Former CEO of Northern District Community Health Mandy Hutchinson gives a snapshot of the impacts in Northern Victorian of the Murray Darling Basin Plan below. Nothing has changed since the introduction of the Water Amendment (Restoring our Rivers) Act 2023 it has only got worse both in Victoria and NSW. There has never been any form of socio-economic help for families in either region. The help that that was so badly needed as pointed out in the independent assessment of social and economic conditions in the Basin Sefton Report 4th September 2020. Government even closed down its Rural Financial Counselling Service.



19 July 2023

The Productivity Commission
Murray-Darling Basin Plan: Implementation Review 2023

RE: Impact of escalating price of water and infrastructure costs on our community

As you know there is now evidence that dairy farmers in northern Victorian are significantly worse off as a result of the Murray Darling Basin Plan: 'Analysis of the Murray Darling Basin Authority's (MDBA) community profiles reveals Victoria has lost over 2220 more full time agricultural jobs than any other state in the southern connected system. The data shows Victoria has lost a staggering 5,116 full time agricultural roles compared to New South Wales' 2877 and South Australia's 2287. This is only 48 less than both NSW and SA combined.' Victorian Farmers Federation (VFF)/United Dairyfarmers of Victoria (UDV) Media release.

The MDBA has encouraged and enabled a radical restructure of water, and yet has shown little attention to addressing the social and community pain. Given the goal of the MDBA was to provide a triple bottom line outcome for communities, there has been little investment in community building and capacity building and individual strengthening.

The flow on effect of these decisions has and continue to have an impact on mental health. Alongside an increase in Rural Financial Counselling services, on farm psychological support is also needed as farmers grapple with their future. Supporting farmers to make peace with the tough decisions they are making and to look to alternative careers takes significant expertise, and there has been little investment and employment of psychologists and mental health clinicians across the region to support transition and to develop new pathways and options for rural communities. Practical assistance for our families like education costs, school excursions, kindergarten fees and sporting/arts club memberships to take immediate pressure off. It is essential that children are able to continue to actively participate in their school and community, it will take pressure off farming families and businesses effected by the dry conditions.

We desperately need to develop a long term strategic plan designed to strengthen and make sustainable the Goulburn Murray Irrigation District for the long term. The focus of this plan could be on:

- A sustainable dairy industry- protecting the investment already made by government, business and farmers

- A partnership between agriculture and environment to work together to sustain the environment and farming land
- A vibrant resilient community

The local community is deeply concerned that the current economic lens upon which water has been treated and that this combined with water availability and affordability and climate change will lead to market and community failure. We need to rebuild hope.

Please do not hesitate to contact me if you would like to discuss this further.

Yours sincerely



Mandy Hutchinson
CEO
Northern District Community Health
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The Federal Government Removes Critical Human Needs Water for the Environments Use

In 2023 the Federal Government and Water Minister funded a \$14 million taxpayer funded TV commercial aired on the Commercial Television Networks which was disgustingly insidious and totally misrepresented the truth.

It stated, “Water’s being overused We have to make sure there’s enough water, otherwise the rivers may run dry.” It insinuates that farmers are to blame for the state of our water supplies when the Government actually ran them. In 2007 with low water supplies in the Murray Darling Basin, after 6 years of the Millenium Drought, John Howard’s department said that there was overextraction of water occurring in the Murray Darling Basin which needed fixing. We didn’t run out of water then and haven’t since on the Murray system. Since that time Victorian farmers have returned over 1450 Gigalitres (just on 3 Sydney Harbors) to the rivers system and with NSW Murray farmers have done 82% of the heavy lifting of water recovery for the environment to their detriment.

It stated, “If we don’t act, it could threaten our food supply”. Since 2012 the Government with their Water Reforms have managed to halve our Northern Victorian Dairy supplies from 3.2 billion litres to 1.6 billion litres. This has meant in our local region of Gannawarra a loss of over 50,000 dairy stock, closure of over 70 dairies, the loss of over 1500 jobs, added to this an annual loss of 228,000 head prime lamb market and 34,000 head prime beef cattle market. A massive food production loss. Yes, the Government and their water reforms have had a profound effect on our Australian food supplies being seen on our supermarket shelves and being felt by our consumer’s pockets.

The biggest mistruth in the Commercial is the “Affect (on) the drinking water of more than three million Australians”. With adoption in Parliament of the Water Amendment Restoring our Rivers Bill 2023 to gain an extra 450 gigalitres for the environment, it has taken this water out of the consumptive pool which holds water for food and fibre production. The water has been placed into the Environmental Water Account, thus removing 450 gigalitres of drinking water for the three million Australians that rely on this river system.

With the Government now holding 4622.5 Gigalitres of Environmental Water Entitlements and carryover in storage it is creating a much larger problem for the Murray River communities and their environment, now constantly enduring large scale flooding events. This is while farmers continue to leave the industry as there is no longer a secure water supply left to base a viable financial business on, for themselves and future generations.

On Farm Environmental Watering initially not considered in the Murray Darling Basin Plan.

Northern Victorian Dairy Farmer Jodie Hay says, “The introduction of Environmental Watering of our region was something as an irrigator I supported. I believed the Environmental Irrigations would be done in consultation with locals and implemented by qualified scientists who would apply and adapt the watering programs according to the season and the outcomes of previous Irrigation or drying phases.

Unfortunately, this is not what has occurred in the Gunbower Forest since the implementation of the Murray Darling Basin Plan and the Environmental outcomes have been far from desirable. I have also been extremely disappointed about the complete lack of interest from authorities to acknowledge the Environmental potential of privately owned land in the first 12 years of the implementation of the Murray Darling Basin Plan. However, over the past 18 months I am encouraged that there may be a shift in the thinking of various Authorities responsible for the delivering of the Commonwealth Water.

The interest in rehydrating Wetlands on Private land has increased, I believe this has been sparked by the fantastic work of the Murray Darling Wetland Working Group (MDWWG) who have worked collaboratively with private land holders rehydrating remnant wetlands throughout the Murray Darling Basin for the past 30 Years.

A model that is highly successful as it utilizes the landowner’s knowledge of their land and water delivery skills and the MDWWG’s staff’s expertise is Wetland Ecology and Monitoring. The MDWWG also use the existing Irrigation Infrastructure to deliver water making it an economically efficient method of delivering water The model used by MDWWG is one that should be considered by the Murray Darling Basin Authority (MDBA) as one to consider as part of delivering the Murray Darling Basin Plan (MDBP).

The MDBA and the Commonwealth Government must understand that without a regulated, viable, sustainable irrigation system they cannot deliver a single drop of Environmental Water. The purchasing of more water from the Productive Pool by the Commonwealth will increase the already heavy pressure on Irrigating Primary Producers to remain viable. As Farmers abandon irrigation the Commonwealth will require substantially more water and more money to be able to deliver Environmental Water and sustain the Irrigation System. I hope the powers that be understand this !!!!”



C & J Hay's Farm dam 26th May 2023 Micro Wetland

Jodie's passion for her industry and her environment like many others is unwavering and gives a great incite to what can be achieved through well throughout and properly processed management

Environmental Water Flooding

Our Group continually points out that there is too much environmental water now being held in our storage systems and it is creating a problem with continual downstream flooding. The modelling concept of regions needing flooding 7 to 9 out of 10 years is a fantasy not based on any factual information. Ramsar listed iconic Gunbower Forest was environmental flooded for three years in a row during two major flood events because Murray Simulation Model Big Mod Run Number 22061 says it had too. Someone must have played pin the tail on the donkey to come up with this scenario. Historical data and river levels show flooding of this level could have never happened.

Through present Government mismanagement we have seen forest drowning, the loss of ground cover and midstory vegetation, the explosion of European carp breeding, blackwater events causing not only fish kills but making human consumption for many towns dangerous. Japanese Encephalitis has also emerged as a new threat to human health in our river communities as mosquito populations have also ballooned through environmental water mismanagement.

There is no way that farmers and River Councils are continually going to repair flood levee banks every 12 months so Government can run environmental water down their so-called imaginary systems. We are not going to endure increased economic loss because of constant flooding and damage to major infrastructure disrupting our businesses. This is what is going to happen under their proposed amendment changes.

Government Bred European Carp using Environmental Water



A Better Way For The Murray Darling Basin

Investigative Journalist in Marine and Aquatic Ecology Ken Jury points out below the simple solution to addressing the loss of 2700 Gigalitres of valued freshwater taken from food production and a return to the historical estuarine environment of Lower Lakes while addressing the Murray River Mouth.

Handbill: by Ken Jury, Investigative Journalist in Marine and Aquatic Ecology.

The document titled **"A Better Way for the MDB"** of 16-pages that was initially released in 2015 and updated in 2022. It was written by Senior Investigative Journalist, Ken Jury of GOOLWA in SA following the production of his **Muddied Waters For A Clear Solution** documentary and his extensive investigation across the Murray Darling Basin. Providing a basin-wide solution to the country's largest food growing region while facing the likelihood of reduced freshwater availability, and the onset of climate change and sea level rise.

Key points from the document:

- The proposed solution does not require a massive budget. Estimated costs for infrastructure should be far less than the A\$13 billion initially estimated with the Plan.
- It does not involve damaging floodplain farms or forcing farmers from their land. Water entitlements will be improved, while reductions to meet government objectives should not occur.
- The solutions only require a portion of the current freshwater volumes in the Lower Lakes, with the remainder becoming available to upstream growers for productive use.
- To avoid costly over-bank flooding and the effects of sedimentary water quality. The proposal improves growth in food production and exports without grower disruptions.
- By returning the lakes back to estuarine, sulphuric acid mobilisation below Lock One will be dealt with due to improved water coverage and benefit Murray River environments.
- It emphasises the importance of a working estuary in line with all other estuaries around Australia's Coast and will help with challenges of climate change and sea level rise.
- It calls for the construction of **"Lock Zero"** between **Wellington** and **Tailem Bend** in **South Australia**. Founded on friction piling, this new Lock will regulate freshwater flow into Lake Alexandrina to create and maintain an estuarine environment, while allowing control of the pool height between **Lock One** at **Blanchetown** and **Lock Zero**.
- This solution will save up to 2700GL of freshwater for food production. The barrages are necessary to hold freshly mixed estuarine water within the Lower Lakes where flushing opportunities will prevail to clear silt and sand from the areas between the barrages and the Murray Mouth. Reduced L. Lake levels by 20cm provides 150GL flow during ebb tides with replenishment of clean ocean water in the Lakes during rising tides.
- Upgrades to the Goolwa Barrage logs are warranted while Bird Island sand knoll opposite the Murray Mouth requires removal to improve water access to the Murray Mouth.
- The solution reduces freshwater use from the Lower Lakes to 40% of the current 2018GL while allowing for seasonal adjustments. It emphasises the benefits of estuarine water and the potential for the return of a historically productive fishery and tourism in SA's Lower Lakes. **The document presents a comprehensive proposal for managing water resources in the Murray Darling**

A full 16-page copy of the Better Way For The Murray Darling Basin has been attached to this Submission with Ken's approval.

Closing comments

There is no way the Water Amendment (Restoring our Rivers) Bill 2023 will not continue to devastate our community and its environment as we have continually sustained untold damage since the conception of the Murray Darling Basin Plan which our Region will never recover from.

As farmers reel from the costs of a poorly managed Murray Darling Basin Plan Government policy and Water buybacks have created a divisive dysfunctional system which has severely impacted our environment, economy and population.

What have been the real outcomes of the \$13.4 billion Murray-Darling Basin Plan?

And now, what does the Water Amendment (Restoring Our Rivers) Act 2023 hope to achieve?

Is it just another step toward draining the life out of Basin communities, families whose passion is to grow the food and fibre that feed and clothe this country? Water is being taken from them under the guise of “environmental flows,” only to be flushed out to sea. It’s senseless government policy, especially in the world’s driest inhabited continent.

The Murray Darling Basin Plan was based upon flawed modelling and assumptions. It has compromised our regions prosperity and resilience.

Basin families with long histories and a wealth of generational local knowledge and experience were never heard. Shiny arsed suited up bureaucrats with no desire for change of bureaucratic ways came to listen so they could tick the consultation box but never heard or wanted to hear what was said by the local knowledgeable generational voice forged through years of on ground life experiences.

There was no collaboration here. No respect shown, just contempt from a Minister with a legacy to take as much water as she can, while destroying the nations irrigation communities and their ability to grow and process Australian food and fibre.

A Ground up approach with genuine Community Engagement must be implemented with any future projects. The Tick A Box Community Consultation process is not cutting it!

Environmental Watering Projects must include a continual maintenance component in their planning budget as opposed to the current system where licenced Irrigators become responsible for the maintenance of the structures.

Any Water that spills from the Storage Dams must be allocated against the Commonwealth Water Account as Environmental Water.

The Government must bear the cost of any damage caused by environmental water flooding, including on-ground mitigation efforts.

All owners of water need to contribute the sustaining the Irrigation system not just landowners.

In Victoria the fixed infrastructure costs permanently attached to our land by the way of Delivery Shares is an added financial burden to landowners. It seems we are forced to subsidise the running of the Irrigation system whilst those who own water but don't own land get a free ride!

Many now suffer physical and mental exhaustion from writing copious submissions which are basically ignored and archived to gather cobwebs and dust. Is this to be another one?

The Government was never truly committed to supporting communities through any meaningful socio-economic initiatives. This is clear in its decision to scrap the socio-economic neutrality test, replacing it with a token \$300 million assistance package spread over four years, as part of the Water Amendment (Restoring Our Rivers) Bill 2023. That's just \$25 a year for each of the 3 million people living in river communities, an insignificant sum compared to the billions lost annually at the farmgate due to the mismanagement and flawed design of the Murray-Darling Basin water recovery plan.

The only purpose Government has ever had of implementing The Water Amendment (Restoring our Rivers) Act 2023 is to strip even more water from irrigators. The Government mechanism being used for this is Water Buybacks a cursed plague wiping out Australian Irrigated Agriculture and its Generational Existence.

Irrigators no longer have a security of supply to base their businesses future upon. They can no longer risk mitigated against the unknown.

The Southern Basin Irrigation farmers have done all the heavy lifting regarding water recovery, 82% of it but no mention has been made of irrigated Agriculture in "Restoring our Rivers".

Let's get this straight **over extraction of our government mandated water supply has never occurred in the Southern Basin.** It was a mystical myth politically conjured up to help sell the need to return water to the environment to gain four South Australia Senators votes in a Federal Government election that was lost. The fact is we consistently underutilise our allocated resource.

No more water recovery is needed!

Investigative Journalist in Marine and Aquatic Ecology Ken Jury's "A Better Way For The Murray Darling Basin", gives a commonsense approach solution to saving 2700 Gigalitres of freshwater for food production while fixing the estuarine environment of the SA Lower Lakes. Apart from the insidious amount of unmetered freshwater that pours out the SA Murray River mouth to sea each year 860 Gigalitres of this freshwater evaporates annually off the Lower Lakes. Only 29 Gigalitres of this freshwater is used by 166 water users.

To give a clearer example of what we are discussing above let's build a set of barrages across the Heads of Sydney Harbour and say we're going to turn it into a freshwater region because it's always been freshwater and say we will use the Hawkesbury River to fill it. That is how stupid the present system in the Lower Lakes region of South Australia is.

Government also needs to understand No amount of freshwater will ever keep the Murray River mouth open because the great Southern Ocean will not allow it to do so in an estuarine environment.

Government's present policies are already impacting our supermarket shelves with the availability of high-quality Australian food and fibre grown under strict food safety protocols, forcing the cost of living up and it's also impacting our countries economic equilibrium.

The Just add freshwater approach to saving the environment doesn't work.

Irrigated farmland must be acknowledged as part of the environment and recognised for the native flora and fauna it sustains and protects. Commonwealth water could be allocated to these properties to enhance natural capital, fauna and flora or a percentage of water used for irrigation could be accounted for as having an environmental outcome therefore reducing the amount of water required by the Commonwealth.

Dual purpose water is the most efficient use of a Nation Asset.

The engagement of landowners as Environmental stewards on their land reduces the Nations cost of Environmental projects as they are there 24/7 and have a deep understanding of their land and surrounding landscapes.

Given the direct correlation between water availability and agricultural production in the Riverina and Northern Victoria, we expect to see a further reduction under **"Restoring Our Rivers"** putting more out of business.

We continue to lose our Rural Scientist (the producers) at alarming rates, their wealth of knowledge and experience in irrigated agriculture and their respective industries will not be replaced overnight. It will take years to rebuild what has already been lost if ever.

Government has no idea of the pain and suffering the Plan has inflicted on our region, our community, and our environment. They haven't lived through the hell it has created and now they trying to force more change to make the situation even worse.

Therefore, we do not support this Water Amendment (Restoring our Rivers) Bill 2023



This submission is dedicated to the memory of all the families who have suffered the loss of loved ones as a result of the devastation inflicted on our farming communities, their industries, and our region's agricultural and environmental wellbeing, caused by poor government policies and the Murray-Darling Basin Plan.

Please accept our Submission.

Geoff Kendell
Co-Chair
Central Murray Environmental Floodplains Group Inc
12th April 2025

“A Better Way” for the Murray Darling Basin!

Supplementary to the documentary *Muddied Waters - A Clear Solution*.
2015 - with minor updates in 2022.

And:

- It won't cost the earth – certainly not A\$13 billion dollars.
- It won't damage floodplain farms and force farmers from their land.
- No need for water entitlement diversion reductions to service a government wish.
- Will use a portion only of the freshwater volumes to be used for the Lower Lakes etc. for an estuary with provisions for handing back the balance for productive upstream use.
- No need for costly over-bank flooding and subsequent property damage.
- No disruption for growers - improved growth in Australian foodstuff production and export.
- Growers and communities throughout the basin and the nation will benefit.
- Massive sulphuric acid mobilisation below Lock One will be checked.
- Murray River environments, aquatic life and biota will benefit.
- A working estuary will reward immeasurably with huge benefits because:
- The MDB Lower Lakes are within a highly variable system; the Lower Lakes will always be a reversible system – [fresh on rare occasions during natural flooding and estuarine at all other times](#).

However: Early signs of Climate Change with sea level rise, is already upon us! This will make change inevitable, well before(circa) 2050. This will affect the 7.6km barrages and barrage embankments. There's time to raise barrage embankment heights so long as we plan and act now ! Improve our ailing food security upstream asap by saving our freshwater resource for the growers; not so much for the Lower Lakes, but for our food production, rather than waiting for the inevitable. Assist our growers by improving our nation's precious freshwater distribution today!

Please make this “[Today's urgent priority for tomorrows Future!](#)
Anything else may become a poor and costly alternative!

Very much in brief:

To keep the Murray Mouth open nine out of ten years, a former Federal Water Minister in 2014-15 ordered large volumes of fresh water flushed down the 2,500km Murray River system. Much is lost along the way! Upwards of 60% evaporation loss alone is possible across the basin (fmr.*MDBC ref data*), and that's without the additional river floodplain constraints issues where additional evaporation and seepage from forcing shallow water over dry, fertile floodplain land will occur, with an extreme likelihood of extensive top soil loss and sediment damage in the water column.

Historically, minimal water flows have been maintained throughout the length of the Murray River since the 1936 completion of the Hume Dam. The Murray system since then is regulated through this storage to assist in avoiding over-bank flooding in narrow sections of the Murray system at all times, save for rare natural flooding occasions. Similarly with large volumes of water released from the Murrumbidgee River storages in recent years, although recent flooding already caused extensive damage, while heightening the concerns for growers.

Given the government proceeds with its "constraints" issues, there is no doubt whatsoever it will cause extensive damage to flood plain property and soils located in these extensive areas where narrower river sections occur, particularly in NSW and Victoria, where fencing, crops, stock, farm infrastructure and bridges etc. will suffer various levels of damage, some will be permanent. Councils throughout river regions including the **13 Ramroc Group Councils** are very concerned, while compensation and insurances alone will be difficult for all parties.

There are potential threats to upstream holiday homes in South Australia; notwithstanding a possibility of damage on reaching the lower Murray flats further downstream. There're increasing concerns from among ordinary Australians with little basin connection who are learning about the ways of the authority with its constraints issues. Many are venting their dis-belief that a government and its agency would pursue such a course of destruction and waste.

A waste that would increase with an extra 450 gigalitres proposed in Goolwa SA by the former Prime Minister Julia Gillard as additional to the 2750GL/yr designated up to 2019, to be increased to 3200GL and forced down the Murray and Murrumbidgee systems by about 2024. Reduced volumes have since been discussed during August 2015. Besides, there is no way of sending 450GL into South Australia without property damage.

The *Murray Darling Basin Authority (MDBA)* had proposed to increase the flows from the current maximum of between 25,000ML/day and 40,000 ML/day through several severely restricted river flood plain reaches, farms and other properties, including extensive public and private holdings found along these systems.

As an example, flows three years ago (2012) through the Millewa and Barmah Chokes were controlled at 10,500ML/day and about 8500ML/day respectively.

The original *MDBA* proposal was to fulfil a flow-rate of 2000GL/yr over the Lower Lakes barrages for 95 per cent of the time with a minimum 650GL at all times, in line with what the agency announced in its first ***Guide for the Basin Plan***. Simply though, the MDB system and subsequent rain runoff into the catchments doesn't provide enough for additional flows of river water over riverbanks and floodplain expanses, to service a political whim of over-bank flooding as the means to additionally cater for the Lower Lakes and the Murray Mouth at the very end of system! It's quite apparent, even today how this nonsense will be thwarted by a lack of freshwater.

An important Quote:

From a fact sheet (undated); the former *Murray Darling Basin Commission (MBDC)* advised its concerns with the *Barmah Choke* on the Upper Murray River system when it wrote, "*there're other environmental challenges in river management with the Barmah Choke. Operating the river for long periods at top-of-bank levels leads to notch erosion and bank instability.*" "*The Barmah Choke also limits the ability to target the delivery of environmental flows from upstream storages to downstream icon sites,*" the *MDBC* said.

Seriously:

None of the proposed, man-forced over-bank flooding impulses down the Murray, the Goulburn and Murrumbidgee systems need occur, notwithstanding the likelihood of extensive property damage and massive water loss. Certainly not when attempting to keep the Murray River mouth clear. Distance and evaporation alone will defeat such a destructive notion!

There is a Solution:

In brief for now, all it will take is one more river Lock; we'll call it ***Lock Zero*** given the current first lock, ***Lock One*** is located some 275km upstream of the Murray Mouth at Blanchetown in South Australia. The Goolwa Barrage will require adjustments while its imperative that civil works remove (or partly remove) an unwanted island that grew from post-barrage times to where it restricts the Mundoo Channel outlet opposite the Murray Mouth by as much as 70%.

Importantly:

History reveals much about the interaction of the Murray River with the Lower Lakes, the Coorong and the Great Southern Ocean.



Dredging the Murray Mouth with two dredges continues, while *Great Southern Ocean* water continues to push inwards against Murray River freshwater on the upside of the Murray Mouth. Pix by Ken Jury- May 2022.

In **pre-barrage times**, it was a variable Lower Lakes when low flows meant the remaining fresh water had to compete with regular Southern Ocean intrusions, as the latter pushed fresh water back into the upper end of the Lower Lakes and on occasions, into the river resulting in a mix of ocean and fresh water, becoming estuarine as naturally found upstream in most global estuaries.

Importantly, the estuarine lakes in pre-barrage times contained extensive water bodies that were extremely useful, with high value outcomes.

Records from these times reveal how estuarine fish populations flourished high up in Lake Alexandrina to where it supported major commercial fishing operations for 44 or so commercial fishers out of Milang and Goolwa, some of whom regularly fished towards the top of Lake Alexandrina area, where they harvested freshwater Murray Cod, Gallop (Yellowbelly or Golden Perch), and Mulloway from tidal prism water, often in the same hour, in a nearby location on the same day.

Prior to the barrages (pre-barrage times), each of the fresh and estuarine species were almost plying the same water column save for the natural stratification of fresh water accompanied nearby by mixed estuarine water, at times the fresh still stratified but expected to gradually mix into estuarine water, at which stage the

Murray Cod would follow freshwater trails for survival while Mulloway remained in estuarine water. Often within close proximity; sometimes found in areas less than a few hundred meters apart. History reveals how Pioneer; Captain Charles Sturt discovered stratified lakes water during his arrival out of the River Murray at the top of Lake Alexandrina.

Commercial fishers primarily established their grounds by taste-testing for fresh water and saline water in the often stratified water columns. These details are provided from an interview by the author of this paper with one of the few remaining Lower Lakes Commercial Fisher identities, Mr Victor Woodrow (in his nineties today) who fished with his late father during pre-barrage times, during school holidays near the top of Lake Alexandrina, in the area described above until the completion of the Goolwa Barrage that signalled the end of estuarine this fishery in the Lower Lakes. (Mr Woodrow resides in Adelaide today).

Records reveal how flourishing estuarine fish populations in the Lower Lakes came to an abrupt end when the barrages were completed. Following the introduction of the barrages, estuarine fish, invertebrates and general biota once found in the Lower Lakes and sometimes as far upstream at Swan Reach during low flows in pre-barrage times, were shut out from what was previously a magnificent estuarine system. A system that supported a major South Australian fishery supplying SA state fish needs with surplus fish being railed into Victoria, for almost five decades.

Today, fish species including Mulloway and Black Bream continue to be guided into the Coorong part of the estuary due to their DNA, but the barrages thwart them even though these fish come right up to these concrete structures with a view to reaching the lakes and channels to breed.

It is known through recent fish tagging that Mulloway entering the Glenelg River in Victoria, where this river also meanders slightly into South Australia, that these fish do not breed in the Glenelg river. Science tells how they rest and feed in the Glenelg River and then make their way to the Coorong with the notion of entering and breeding inside the Lower Lakes.

Some suggest that the basin ends at the real mouth of the river just below Wellington at the head of Lake Alexandrina **and not 45km downstream** at 'the bottom of the lakes, on the south-west outer edge of the Coorong, at the Murray Mouth where the river spills into the Great Southern Ocean.

Significantly:

So long as the barrages are open to exhaust flooding freshwater, with regular high tides and even during neap tides, together with regular, strong prevailing westerly winds, it's inevitable that Southern Ocean intrusions on occasions will reverse out-flowing fresh water back through the river mouth, and through the open barrages, pushing fresh and by now, ocean and fresh (estuarine) flows

back upstream into Lake Alexandrina, towards the entry point of the Murray River into Lake Alexandrina.

The threat of sea level rise is real so that we can with some certainty expect increases in Ocean intrusion into the Lower Lakes! There're already noticeable signs along Australia's southern coastline during winter.

NASA said in its extensive August 26th, 2015 “Global Climate Change” data, “Warming seas and melting ice sheets,”

“For thousands of years, sea level has remained relatively stable and human communities have settled along the planet's coastlines. But now Earth's seas are rising. Globally, sea level has risen about eight inches (20 centimetres) since the beginning of the 20th century and more than two inches (5 centimetres) in the last 20 years alone.”

“Scientists estimate that about one-third of sea level rise is caused by expansion of warmer ocean water, one-third is due to ice loss from the massive Greenland and Antarctic ice sheets and the remaining third attributed to melting mountain glaciers. But the fate of the polar ice sheets could change that ratio and produce more rapid increases in the coming decade,” NASA said 10/09/2015. Footnote: NASA, BOM and the CSIRO share their data on climate change.

In the Lower Lakes, Murray Mouth region, evidence has been collected from officially located automatic, real-time beacon probes located across the Lower Lakes and Coorong, streaming out ‘real time’ probe data and plot readings.

This data is accrued in a central computer storage, where ECu (electrical conductivity unit levels), otherwise known as salinity levels taken from the in-water probes, provide plot readings accurately describing in ‘real time,’ ocean water ingress as its recorded across the Lower Lakes and Coorong system, as monitored and recorded by government electronic monitoring systems.

These computer findings are regularly monitored by others on hard copy in an exercise to report that water in the lakes is often estuarine. A series of plot data collected by the author and a colleague scientist also reveal ocean ingress occurrences when southern ocean water actually circumnavigated Hindmarsh Island.

There's a huge waste of expensive freshwater entering the lakes with much of this becoming highly saline and wasted. The Lower Lakes aren't lakes but leaky, shallow depressions of sand, silt and river debris culminating in the formation of extensive acidic soils **(500 million tonnes plus, throughout the Lower Lakes and lower river regions)** with high levels of seepage and evaporation. They were formed by receding ocean water about 7000 years ago, leaving remaining sand, silt and calcareous ridges that border the lakes and the SE natural drains today. The Lower Lakes combined hold 2018GL of water.



NE **Lake Albert**, the smaller of the two lakes at the peak of the Millennium Drought. The fine black dots are cattle seeking water from an ever-receding lake. They gave up and turned around! Pix by Ken Jury

The 4,500GL annual average of freshwater used in the Lower Lakes, the Goolwa Channel and Murray Mouth region, would have been valued at more than A\$10 Billion dollars, had the lakes been full during the peak of the Millennium drought.

The figure of \$2.4 million dollars per gigalitre was likely the absolute top tender buyback figure during the Millennium drought, when water was scarce! The average tender price for High Security water (for SA) **during 2012-13** stood at a massive \$1.675 million per gigalitre. Water markets today have affected growers badly. Many growers and dairy operators 's have packed up and left!

This figure puts a value on Lower Lakes stored and used water for an average year at around \$10 plus Billion dollars, while the previous Govt. said at the time, they'll continue to send river water towards the river mouth for 9 out of every 10 years.

From a personal written inquiry with the SA Dept. Environment & Water, concerning 2019-2020 usage of Lower Lakes water; there were 166 licensed irrigators across the region who combined, used a total of only 21GL for the year. We're informed that the average loss to evaporation from the lower lakes per

year can be as low as approx. 800 GL evaporation reaching well past 1000GL during the Millenium drought.

Basically, precious freshwater is being sent down to evaporate, to service a small amount into the Northern Lagoon of the Coorong to maintain its estuarine feature, to secure its valuable marine commercial fishery, with the balance being wasted in the ocean! This is ludicrous! One wonder's what the return would realise with our food security, when using the same volume of water for additional food grown in the basin over the same period?

There's a much better way:

To make better use of our basin and its limited fresh water, and with the help of free, highly oxygenated Southern Ocean water, another lock (Lock Zero), should be built upstream of Wellington towards Taillem Bend.

A more practical foundation opportunity for another Lock is available today!

As Scientist, Ian *Rowan* BSc Hon. points out, in today's world it's no longer a problem when not locating sound bedrock for river footings, when the use of friction piling has very much become the accepted alternative.

One recent example of friction pile engineering is the ***Hindmarsh Island Bridge*** where friction piling was successfully used to hold this massive structure in place.

As old as it is, the Goolwa barrage also sits on a footing using friction piling!

There're benefits to be gained from preventing uncontrolled use and loss of River Murray water in Lake Alexandrina:

An additional lock, Lock Zero should be built and used to regulate minimal freshwater flow into Lake Alexandrina to mix with ocean water, forming and maintaining an estuarine environment, and for the first time, to provide for the control of the pool height between Lock One at Blanchetown and Lock Zero, while providing the means to greatly assist in clearing the Murray Mouth.

This in itself would rid this section of the river of acid mobilisation during drought, so bad at times, that even the authorities openly admitted defeat with treatment of mobilised, acid-laden water, notwithstanding a possible threat to the intake pipes that feed water back to Adelaide hills storages.

Return the Lakes to their former estuarine system and stop the freshwater waste! In what would have been a natural occurrence in pre-barrage times, the use of clean, highly oxygenised water from the Southern Ocean, mixed with a percentage of stored fresh water gradually released from upstream through a

new Lock Zero; the Lower Lakes system would again become estuarine to inundate the lakes and deal with any drying lake or channel mud while limiting acid sulphide development and mobilisation throughout the estuarine environment. All without using massive volumes of expensive irrigation water, year after year, which should otherwise be better used to produce Australia's food .

By retaining the barrages, freshly mixed estuarine water could be held within the lakes system for extended periods, and released out of the lakes/channels, from selected barrages to provide strong scouring/cleaning flows and to regulate the removal of silt and sand from the areas between the barrages and certainly that found in the Murray Mouth outlet to the sea.



Liming highly acidic water and acidic soils exposed in Currency Creek that flows into the Goolwa Channel. Pix by Ken Jury.

By using Lower Lakes estuarine water, the 840 sq km system can be cleaned and flushed at will, while replenishment for the lakes with free ocean water will greatly supplement much smaller qualities of freshwater from behind Lock Zero!

By allowing lake levels to recede by 10 to 20cm only by selective use of barrage gates, estuarine water from the 840 sq km surface of the lakes will provide ample flushing and scouring water for the river mouth.

Scouring those channels and the mouth:

Upgrading the barrages will enable restriction of the outgoing flows to elected channel(s), to bias the movement of sand and silt during outflows, and time regulated to suit falling tides.

To enable selective flushing, there should be an upgrading at the Goolwa Barrage where the lifting of multiple barrage compartment concrete logs stacked on top of each other is both cumbersome and time consuming as they're handled individually- one by one by a crane as commonly seen at this barrage today.



Currency Creek succumbs to drought; oxygen reaches cracked acidic soils leading to the mobilisation and formation of sulphuric acid to a dangerous pH 1.5. Nearby Lake Alexandrina contains at least 500 million tonnes plus of acidic soils.

This is an extremely costly and time wasting exercise to continue with when it's necessary to reach the desired scouring out-flow swoosh effects from some of the barrages.

Lifting single concrete logs this way is far from practical and it's outdated.

There are alternatives for the barrages today, with tests underway using stainless steel devices to fit into the existing slots in a few of the bays in the Goolwa and possibly the other Barrages. To either operate in one single lift and fall motion to enable necessary strength in water outflows to clear the mouth and keep it clear, while equally affording gate opportunities to direct outflows of estuarine water towards the mouth from the northern lagoon of the Coorong. We understand that the Department of Environment & Water is trialling these stainless steel gates.

The lakes themselves should gradually become estuarine again, to develop channels and flats, quickly becoming colonised with estuarine biota associated with the cycles of inundation and exposure to inter-tidal zones.

The savings would be massive:

During average river flow years, the use of ocean water mixed with a 40% portion of freshwater would free up a minimum 2700 gicalitres/yr of freshwater being part of what was previously used in the lakes and the channels, now to be re-directed back upstream as surplus freshwater for food production with some towards environmental flows for up-river environments. **There's more, but first:**

Remove this sandy, highly vegetated knoll, shown on page eleven.

Bird Island as its known, faces the river mouth, is located downstream of the Mundoo Barrage and it must be removed as it directly blocks about 70% of the flow from this barrage to the mouth.

This obstruction and a minor connected peninsula gradually formed and vegetated as a result of building the Mundoo barrage. It also impedes movement both ways of Coorong water and water released from the Mundoo Barrage and 3 other barrages within the area that would otherwise clear the mouth of sand and silt.

In consideration of a future for the Lower Lakes system, we should keep in mind how these lakes and nearby channel environs regularly require at least 4500gicalitres/yr of freshwater.

This amount includes top-ups to replace and maintain evaporation and seepage from the shallow lakes, to maintain the channels leading to the river mouth by providing for scouring these extensive systems before & beyond the barrages, and currently, to sacrificially supply regular scouring flushes in failed efforts to keep the mouth open.

Current scouring success rates today are minimal, extremely wasteful and expensive.

On occasions in recent months, larger vessels have not always been able to comfortably navigate across the Coorong adjacent to the inside of the Murray Mouth. Dredging the mouth continues at great expense! That expense in one single decade was alleged to have reached \$50 million dollars.

A formula for success:

Combined, the lower lakes hold approx. 2018GL of freshwater at capacity and often it can be highly saline water.

That's approximately 750GL below the original 2,750GL amount of fresh water being sought by the *MDBA* and a former Water Minister from upstream food growers, **as its environmental saviour.**



The Murray Mouth from the west.

With change – we can do with much less:

Simplistic perhaps, but logically there's a view to reduce fresh water maintenance volumes for the lower lakes to just 40%, (about 1800GL/yr) as a freshwater allowance required to mix with barrage entrapped, highly oxygenated Southern Ocean water for the return of a healthy estuarine system within the Lower Lakes.

In order to do so, and as mentioned previously, there will be the need for retaining the barrages (with some minor and in-expensive modification) so that fast manipulation of incoming ocean water and outgoing estuarine water during cleaning the lakes can occur un-impeded.

Albeit, after retaining 40% (1800GL of fresh) for an estuarine mix behind a new lock we've named "Zero", there remains a freshwater balance of 2,700GL as a left-over from an annual average of 4,500GL/yr previously used within the lakes and for sand, silt and river mouth clearance purposes etc.

This represents a meagre 50GL of the 2750GL MDBA water claw-back figure at the time, dumped upon farmers and irrigators etc., for the environment, and to keep the river mouth clear.

We should also bear in mind a likely additional freshwater saving, over and above from not allowing freshwater into the lakes on its own, to be lost to salinity and massive evaporation and seepage, and that used for clearing the mouth. There're positives here!

A reversal of the system has many possibilities:

There're often seasonal periods when the elected 40% or 1800GL/yr of freshwater required for mixing in the lakes may be further reduced due to seasonal Lofty Ranges rain run-off reaching the lakes. There's a handful of streams that reach the Lower Lakes including Currency Creek and the Finniss and Angus River's that yield significant winter freshwater flows that often reach Lake Alexandrina.

This Lofty Ranges run-off water will again help compensate growers or it could be held as future fresh water meant for the lakes (to mix with ocean water), being held upstream of Lock Zero for this purpose.

Moreover in an adaptive way of thinking, to suit the situation at the time when ensuring the continuity of the estuary or, if additional fresh flows persist through flood or minor flood, then ocean water and river flood water would be adjusted by way of the now rejuvenated barrages and through Lock Zero to suit the situation. In all circumstances the biota throughout will adjust both ways (fresh or estuarine), as it most certainly always does in an estuarine environment!

Estuarine water:

Importantly, estuarine water can be made up of varying volumes of fresh and ocean water, as is naturally the case in most estuarine deltas worldwide. Contrary to claims, estuarine water occurs at varying salinity levels in all estuaries worldwide. It depends on the volume of fresh water flows at the time! These are generally healthy eco-systems that provide immeasurable benefits including commercial and recreational. RAMSAR is generally keen to support the values of a healthy, workable Lower Lakes estuary, as they were previously.

Returning the Lower Lakes to estuarine would once again create a very useful and beneficial environment. Estuaries 'the world over' are known for their productiveness! Such the case with viable fisheries! It's a known fact that Mulloway (one of many examples of quality commercial fish known to the region) would gradually return to the Lower Lakes again to become part of a major fishing industry, a fish nursery and breeding ground, for the return of a much larger fishery. In turn, tourism would surge ahead and so would development.

How little did the river hold during the Millennium drought?

In our worst drought in history, during the year when about 1100 GL were lost to evaporation from the lakes, a qualified individual had set-about measuring as best he could, water volumes held in the river/anabranches and backwaters between Wellington at the head of Lake Alexandrina and the border with NSW during the same year. The results concluded that evaporation and seepage claimed a greater loss of water from the Lower Lakes than what the river contained at the same time within the South Australian section of the river. Annually, these water losses alone cost multiple billions of dollars while losses during the worst millennium drought years from the Lower Lakes would have likely reached higher levels in the region.

Flushing the river mouth:

On returning the lakes to an estuary; during periods when flushing is desirable across the Lower Lakes system; carefully selected barrage gates would be opened to coincide with outgoing tidal periods with particular emphasis on directional flow towards the Murray Mouth.

In particular the operation of Mundoo Barrage with released flows moving through Mundoo channel towards its delta that faces the Murray Mouth.

Should the level in the lakes be allowed to fall only 10cm on a single outgoing tide as an example, then this would represent an approximate 75 GL of water that would flow out through selected barrage gates towards the mouth. We're aware through MDBA exercises how 75GL will never clear the river mouth.

However, a 20 cm lakes surface drop would realise somewhere in the order of 150GL that would be used in one single out going, tidal session of approximately 5 hours to successfully scour and clear the mouth.

Volumes of this dimension have only been available in previous flood times, similar to that of the 1956 Flood. Basically, the use of Southern Ocean water becomes the greater component for this estuary and its basically free, while its also provides the means for clearing the mouth region.

Replenishment of ocean water into the lakes can be done often and at will, in a few hours during incoming tidal periods as required.

Due to barrage control of water in and out, marinas should not be affected to where it would be detrimental, providing suitable but simple management strategies are agreed and exercised.

The concrete logs in the Goolwa Barrage represent gates (or logs) that either harness or release water. The Goolwa Barrage is one of five barrages spread

over 7.6km, separated by earthen embankments between the remaining four barrages.

An engineering solution is being trialled as an alternative regarding the current issue of lifting and manipulating the cumbersome concrete blocks in the Goolwa barrage.



Engineering improvements to the Goolwa Barrage would allow for the faster movement of larger volumes of water. Photo Ken Jury

In the photograph above, removed logs are shown on the top of the barrage to the right, just beyond one of two rail lines that support a crane (out of shot) used as the mobile lifting or lowering device across the barrage. The other rail line is found slightly right of the pedestrian walk. Log slots are located centrally in the structure, as seen across the top, in every bay across the barrage where individual logs are lowered down between the protective steel lined slots found at either end of each bay, to accept individually inserted or removed logs.

I believe that selective opening of the barrages in a single action will provide the necessary estuarine water outflows to clear the mouth and keep it clear while affording opportunity to direct outflows or inflows of clean ocean water or to expel outflows of ocean/freshwater towards the mouth and, to offer minimal assistance to the southern end of the northern lagoon of the Coorong.

Importantly, my colleagues and I share the belief that neither the former 2750GL/yr nor 3,200GL/yr would have made any useful difference to keeping the mouth of the river clear. There are many reasons including the fact that most of this water, when available would be sent downriver, will be lost.

Furthermore, and as an example in 2011; during the months of March to May in that year, a remnant minor flood came down the river whereby flows of up to 80GL/day passed the Goolwa wharf and through the opened barrage gates. Flows at this rate made no discernible difference to the sand bars and the depth of the channel through the Murray Mouth.

In fact at the time, prevailing wind and tides pushed much of this water back through the open barrages, as is the case on many occasions during autumn and winter. Wind Seiche in particular, (the gentle blowing of water across a saucer) plays a large part in mixing ocean and freshwater into estuarine, while it also alters the AHD 's (Australian Height Datum Levels) during windy days.

Up to two dredges currently operate 24/7 today, to keep the mouth clear.

Note to assist readers: A single gigalitre is equal to one km x one km by one metre deep.

The weight and power behind the volumes of freshwater sent downstream in recent times are hard pressed to match the weight and push of the mighty southern ocean and with water availability waning, one would seriously expect that the Lower Lakes should not be kept in a freshwater condition only.

Ken Jury, Senior Investigative Journalist (Marine & Aquatic Ecology).
Exec. Producer, ***Muddied Waters - A Clear Solution*** documentary.
Goolwa, SA 5214. [REDACTED]

Please note: My documents are generally 'Work in Progress.' Feb.2017