Central Murray Environmental Floodplains Group Inc

Submission to the

Australian Government Productivity Commission

Murray Darling Basin Plan Implementation Review 2023

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Submission Contents

Author

Geoff Kendell is a fourth-generation Australian farmer. Our family has a 170-year history in Australian Agriculture of which 130 years in the Kerang Region and me 46 years as a practising dryland and irrigation farmer. We grew 800 hectares of grain and ran 100 head of beef cattle and 4600 sheep and lambs. While farming I have represented the farming industry and their interests' chairing positions with VFF, NFF, & SEABAC. I'm a Graduate of the Australian Institute of Company Directors, presently chairing CMEFG in my farming retirement.

Geoff & wife Fiona have been married 33 years. Fiona is a former Primary School Teacher.

Introduction

The Australian Government's Productivity Commission are conducting a Murray-Darling Basin Plan Implementation Review 2023
We believe the Murray Darling Basin Plan has made a significant impact to our Region and this is why Central Murray Environmental Floodplains Group Inc is making a Submission.

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 from a diverse array of backgrounds and experiences, working for the region's greater good.
We are open, transparent, and accountable in our work and deliberations.
Our home, Cohuna, is located in the centre of the Southern Basin of The Murray–Darling River system, the largest river system in Australia.
Our region holds important social, cultural, economic and environmental values, once supporting strong rural communities and economies. **By 2000 it was the third most productive agricultural region in Victoria, the productive status has diminished dramatically due to the effects of water reform and the Murray Darling Basin Plan.**
Our region includes diverse ecosystems, internationally recognised Ramsar wetlands, significant floodplains and internationally renowned river red gum forests. It is home to many species of wildlife, birdlife, reptiles, insect life, native plant species and marine life which includes the iconic Murray Cod and Golden Perch.
It is the cultural and spiritual home of the aboriginal communities of the Barapa Barapa, Yorta Yorta, Wemba Wemba, Wadi Wadi and Dadi Dadi. Our Region encompasses parts of the floodplains of the Murray, Loddon and Avoca Rivers in Victoria and the Wakool, Edwards Rivers in NSW.
Our region encompasses Shire of Gannawarra in its entirety, parts of the Shire of Campaspe, Rural City of Swan Hill, Loddon Shire, Murray River and Edward River local councils.
We are also part of the Southern Connected Basins Communities (SCBC) which is a Tri-State Southern Basin Water Group of NSW, Vic & SA businesspeople, farmers, community members and retirees concerned with the impacts of the present Murray Darling Basin Plan.

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, it has delivered unnatural and unseasonal volumes of water downstream to support unachievable environmental outcomes which is killing the upstream environment.
The river is now operated outside natural constraints and is managed like a water super freeway, resulting in massive bank erosion and loss of habitat upstream.
We now have underuse in the southern basin significantly impacting productivity and over-allocation in northern NSW valleys through floodplain harvesting licencing, which is severely impacting our ability to viability function financially.
It needs to be recognised that 83 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.

Our Concerns

In making this submission we are clearly demonstrate the impacts of the loss of water to our Victorian Region's productivity since the introduction of the Plan.
As previously stated, this was the 3rd most productive region in Victoria at year 2000.
With the loss of 1450 GL out of our Regionals Consumptive Pool it has affected the ability for many businesses to remain financial, including Goulburn Murray Water who deliver the commodity. This loss has meant for farming families, either leaving agriculture forever or moving to another region to continue. Many businesses have faced the same dilemma, some of which are also generational. For those remaining the cost of operation has increased as the price of Permanent water has continued to increase. With the loss of local service providers many are now travelling 1000's kms further a year to source help. Freighting of supplies and taking produce to market is also 1000kms more than when it had been local. This is creating a large financial impediment to business, but also destroying many roads with more vehicles travelling on them.
For the young the opportunity to enter agriculture and especially irrigated agriculture is really diminishing. The cost is prohibitive and even generational farming families are finding it hard financially to support a younger member or members who want to continue.

Below is a table that demonstrates of the number of young students so far lost in Gannawarra Shire Council Region over the time of the Murray Darling Basin Plan

Gannawarra Schools	2006 2007	Today 2023	Loss
Kerang Technical High School	496	261	235
Kerang Primary School	160	48	112
St Joesph's Primary Kerang	140	117	23
Kerang South Primary School	223	110	113
Cohuna Consolidated	247	153	94
St Mary's Cohuna	108	110	+2
Lake Charm Primary School	25	0	25
Murrabit Primary School	28	43	+15
Cohuna High School	270	171	99
Total	1697	1013	684 **Loss**

684 students are a significant loss!

Demise of Local Production

A major impact of the Murray Darling Basin Plan has seen the demise of Kerang Prime Lamb & Sheep Market the third biggest in Victoria and the Kerang's Prime Beef Market the eighth biggest.
With spiralling water prices, the insecurity of allocation and dry seasons these industries haven't been able to cope financially, so many farmers have left the region.
With figures obtained from Stock & Land they show the Kerang Prime Lamb & Sheep Market annual throughput was 227,921 head. It is estimated if this market was still operating at today's prices the lost to the Region annually would be in the vicinity of $30,911,673.
Similar figures show the numbers for the Prime Cattle Market annual throughput prior to the Plan at 34,213 and again estimated at today's prices a loss to the Region of $41,055,600. Both succumbing to the unstable irrigation industry caused by the Murray Darling Basin Plan.
The above figures total an estimated combined loss of both markets of $71,967,273 to the local economy.
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If we add the direct loss of 50,000 dairy stock with a present-day value of $132,000,000 it starts to demonstrate what is causing such a dramatic regional downturn. The annual value from milk would have been $210,000,000 adding this to the two prime market losses a loss of $342,800,000 annually.
Murray Dairy's rule of thumb: 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.
During this time, we have also seen a reduction of over 684 less children in schools.
In 2002, Latrobe University did a study 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. So, in this case an annual loss to the Gannawarra Community totalling $1.3712 Billion. While this is only a snapshot of 3 industries it does not account for irrigated cropping, wool, horticulture, fodder, and seed etc industries.
The add on loss of $100s of millions of dollars to the local community businesses has been substantial.
After last year's flood events another 12 dairies are now closing down the farmers saying they have just had enough being strangled financially by increasing price for water and supplies, working long hours in difficult conditions they are mental and physically exhausted. Families are struggling to cope. This also means pressure will be placed on the community with loss of critical mass for social engagement, impacting schools, sporting clubs, commercial business etc.

Shops and businesses continue to close the latest being the Bendigo Bank Branches in Cohuna and Barham and Interstate Pickering's Transport depot in Kerang. The loss of Country Target in Kerang is still hurting in the community. The impacts of extra costs for freight and the downtime and travel away from business are being felt. We are now travelling further out of the Region for many supplies and repairs and having to freight produce 1000s of extra kilometres.

An innovative local doctor started a venture some years ago in our Region growing freshwater mussels producing pearls in the Gunbower Creek. The venture had been successful until last year's flood event. This saw blackwater; that had been produced in the Gunbower Forest due to North Central Catchment Management Authority (NCCMA) continually flooding of the forest for 2 years, wipe it out. The blackwater flooded backwards over Hipwell's Regulator into the Gunbower Creek killing the freshwater mussels and native fish. During the 2011 floods the freshwater mussels survived. Last year's event also shut down the Coliban Water supply for the Cohuna Township and rural water supply. Cohuna for the first time ever having to cart in freshwater from outside the Region. Dairies were also thrown into chaos with little notification.

Environmental Water

In 2004, COAG announced the National Water Initiative (NWI), an agreement between the States and the Commonwealth to separate land and water, remove barriers to trade and address over allocation. In 2007, Victoria met its commitment under the NWI by unbundling water shares, thereby separating land and water.

The ownership of water over this time has substantially changed mainly due to State and Commonwealth policies seeking to separate land and water, and free up water trade.

By June 30 2018, the Commonwealth Environmental Water Holder held 620 gigalitres (GL) of Victorian High Reliability Water Shares (HRWS). Environmental contributions have largely been achieved through water buybacks, modernisation of Goulburn Murray Water through the Connections Project and the Sunraysia modernisation project.

Under the 2007 Water Act and Basin Plan an annual supply of 2750 Gigalitres of water was to be returned for the health of the River. South Australia successfully argued this was not enough and they needed an extra 450 Gigalitres making a total of 3200 Gigalitres. Of course, this water is to be supplied regardless of whether it is a wet or dry year.

The first thing you need to know about Environmental Water is that it is "Modelled not measured" so Government never knows how much water they have. There are no gauges to measure the amount of water going out the Murray River mouth at Goolwa into the Great Southern Ocean.
The Government is currently pursuing the acquisition of the additional 450 Gigalitres of environmental water through discreet buybacks.
Murray Darling Basin environmental water holders already hold 4622.5GL of water entitlements in our Dams. The MDBA Water Take Report is the point of truth. This acquired water is far more than the 3,200GL volume that was stated as needed under the Basin Plan. If you take into account, the 49GL from Bridge the Gap plus approximately 320GL SDLAM shortfall (estimate anywhere between 300- 370GL) plus 450 Gigalitres buyback water means a TOTAL of 5441.5GL will have been acquired.

Of the 2750 gigalitres Government procured, they say they can only presently use 78%, and they are struggling to fit this down the Murray River without causing environmental degradation and flooding events.

The 2007 Bipartisan agreement of the Water Act has unfortunately led to political and financial opportunism at the expense of food and fibre production which was the original premise of our forefathers building an irrigation industry to sustain supplies in times of drought. Separating land and water has allowing for unfortunate pillaging of the system allowing those in the know to make sustainable financial gain. It has also given the South Australian Government the opportunity to continually expand their use of environmental water from the Murray River for commercial and domestic needs, ie the recent announcement to use this water for their new hydrogen plant being built in Whyalla.

Throughout the rest of this Submission, you will come to understand the nightmare being endured by our river communities and their environments with this flawed Plan.

Water Buybacks

Water buybacks are divisive as they severely impact our economy, environment, and the population. As you can now start to understand the MDB Plan has had a severe impact on our Region of Victoria. Any future plans by Federal Government to continue with any type of Water Buybacks scheme must be fought vigorously. Any loss of water out of our Victorian Consumptive Pool for their 450 GLs buyback proposal would spell the end of irrigation in Northern Victoria. Simply put, for each megalitre that is lost from Agriculture the price for those who remain must go up. But this also means there is less food and fibre produced increasing the price on the supermarket shelf but also affecting the ability to trade and therefore our Victorian and Australian economies.

Under the Basin Plan 83% of water recovery has come directly from Victorian & NSW allocation. The reality with the loss of so much water being taken out of our system and so much ground now out of production the cost of everyday sample foods like milk, butter and meat must go up. This is major contributor to the present cost of living squeeze.

To better understand the annual production loss of 450 GLs of water in layman terms it equals, 1.3329 Billion litres of milk or 1.6859 Billion loaves of bread.

Dry Seasons

In 2018 and 2019 on the 15th of August, the start of the irrigation season we were being forced out of an industry by high water prices and the non-guarantee of supply, to irrigate crops and pasture to finish their growing season and maximise production. Agronomically this is the time of year is where we maximise our production.

In 2019, Water Speculators who were charged only $13.26 a megalitre for their water entered the market pushing water to a $1000 a megalitre by the 28th of October. Making a ridiculous profit on their investment for their shareholder's benefit. Where I was producing food for our nation's population and being charged $2065,88 a megalitre for allocated water, a 14,805 % mark-up!

On top of that farmers must pay for their full water allocation **whether they receive it or not!** We started our irrigation season with 26% allocation finishing with 66%.

The loss of a financially viable secure supply of water delivered in a timely manner has meant that many have left agriculture for good.

While we were experiencing a water shortage, the forests along the Murray River were inundated with floods, attempting to provide 726 gigalitres to fulfil Victoria and NSW obligations under the Murray Darling Basin Plan, compensating for the unavailability of water from the Darling River for South Australia.

Water Speculators & Unprecedented Water Price Rises in the Dry Seasons

We believe there needs to be an immediate investigation into who owns our farming industry water.
In the 2018- 2019 season during January 2019 Temporary Water Prices rose $120 in 6 days from $410 on the 16th of January to $530 a megalitre by the 22nd of January.
The market was again bounced in the 2019-2020 season by $170 in 17 days from $620 to $790 between the 15th of August to the 2nd of September 2019, and in 3 days from the 19th of October to the 22nd of October rose a further $100 from $800 a megalitre to $900 a megalitre and then jumped again 6 days later on the 28th of October 2019 to hit $1000 a megalitre.
If this had happened in the business world there would have been an immediate investigation. Obviously, the perception is speculators are manipulating the market.
We believed they artificially hold back water supply only releasing water when seasonal demand becomes desperate thus generating a spike in the market price.
The present Carryover rules for Water allocation also give Water Speculators the ability to hold water in the Dam for an annual charge of $11.75. This tool allows them to hold large parcels of water from the market pushing the price up, especially in times of heavy demand thus distorting the marketplace prices but worse still, holding water that could be used for growing food by farmers. Measures should be taken in the future in an effort to stop this practice. It is now also believed that when cheap parcels of water hit the market, they are snapped up very quickly by these speculators within seconds using a process of algorithms before any farmers can attempt to buy it.
People who do not own irrigation land should not be allowed in the market as it heavily distorts the marketplace for the farmers who need the water to grow crops and pasture to produce food for this nation.
An immediate Royal Commission should be held.

During the 2019-2020 season Water Speculators were only charged a Storage Fee of $13.86 a megalitre for their water in the dam, where a farmer, producing food for our nation's population was charged $2065.88 a megalitre for allocated water to use.
A 14 805 % mark-up! What for? Administrative fees which include access fees/delivery shares. Why are we disadvantaged? What have farmers done wrong in looking after our environment and producing high quality clean green food at the highest food safety standards in the world for our population to eat?

Farmers Loss of Water Security

Farmers and River Communities confidence is at an all-time low as the Murray Darling Basin Plan has all but destroyed our existence. While water floods forests along the Murray River and the Wakool River and Mulwala Channel runs to capacity farmers are left looking, unable to comprehend why they can't get a secure consistent supply for their farms.
Farmers need security of 100% allocation by the 15th of August to be able to water planted crops and pastures for their best financial return. Not like in seasons when it was allocated on the 17th of December 2018; on the 15th of February 2020 and only 56% by December 2019.
I will say this again because I don't believe a bureaucrat understands agronomics. "Farmers needed security of 100% allocation by the 15th of August to be able to water planted crops and pastures for their best financial return". For example, in layman terms, if your employee dies of thirst on the 20th of August 2023, it is no good giving him a litre of water to drink on

the 17th of December 2023. You are not going to bring him back to life to make an income for you, so…

"Farmers need security of 100% allocation by the 15th of August to be able to water planted crops and pastures for a financial return.

In 2019 the season started on the 15th of August 2019 with only 26% water allocation. This meant an investment had to be made to top up allocation with Temporary Water being $620 a megalitre, to ensure all crops and pastures received water to finish their growing cycle and maximise production. Water Speculators quickly pushed this figure to close on $800 a megalitre within 17 days of trade. Needing 1.5 to 3.5 megalitres a hectare to irrigate this investment was significant for many, quickly ending up well above a financially viable option.

Not obtaining 100% security in water supply by the 15th of August dramatically reduces the enthusiasm to push ahead and invest in our irrigative industries.

Banks & Debt Recovery

Farmers were made to sell their permanent water by Banks to pay back accumulated debts from the 10 plus years of the millennium drought, then told they could buy Temporary water to replace it. It was during this water buybacks also happened.

It caused a shark (Water Speculators) feeding frenzy as they circle, waiting to rip off another desperate farmer now in need of Temporary water.

Government sells water back to the farmers while withholding allocation.

At the start of the 2021 irrigation season 15th August 2021 farmers in both Victoria and NSW Murray were desperate to get water allocation as we had come through a dry winter and pastures and crops needed watering to help with survival and help with securing a good production season. Government Water allocation wasn't good with NSW 30% and Victoria 52% which meant that farmers would have to enter the Temporary Water Market for needed supplies. We couldn't believe the low allocations as the Murray water storages were at excellent levels. The Temporary water market was $90 a megalitre but quickly rose to $135 which placed a further stress on families and their businesses. Peter Hunt from the Weekly Times investigated the problem as to why? Was Government withholding allocating forcing the temporary water price then selling off their supply?

E- trade: NSW Minister sells $441,000 of environmental water.

The NSW Environment Minister has sold $441,000 of his excess Murray and Murrumbidgee environmental water in recent weeks.
Peter Hunt

The Weekly Times

The sale of 3875ML of environmental water has surprised irrigators.

The NSW Environment Minister Matthew Kean's department has sold $441,000 of his excess Murray and Murrumbidgee environmental water to brokers and Victorian licence holders in the past three weeks, as Hume and other southern Basin's storages spill.
The sale of 3875ML of environmental water has surprised NSW Murray irrigators, who are still sitting on general allocations of just 30 per cent, despite the Murray Darling Basin Authority reporting it had almost 7.2 million megalitres of active storage in Dartmouth, Hume, Lake Victoria and the Menindee Lakes.

NSW Murray Irrigation Limited chairman Phillip Snowden said "on one hand the Minister is trying to recover more water for the environment and then turns around and sells it back. The question is – Why?"

Minister Kean's office said he was "not involved in the day-to-day decisions regarding use, movement or temporary trade of the water held on these licences.

"These decisions are made by the NSW Department of Planning, Industry and Environment via a clearly documented annual planning framework and transparently communicated."

The Minister's spokesman said the water was sold to earn the revenue the department needed to cover the cost of charges associated with the use of environment water and to buy more of it when needed to deliver annual watering priorities.

In the meantime NSW Murray irrigators are wondering why they are still sitting on such low allocation, when storages are brimming with water.

MIL analysis shows that over the past 20 years its Murray general security irrigators' allocations had always reached 100 per cent when the combined storages had reached 7 million megalitres.

"We want to know why it isn't happening this season," Mr Snowden said.

"Especially when there's nowhere to put more water. This was not supposed to happen in years like this," Mr Snowden said.

More Coverage

Murray meter loophole allows water borrowing Murray River choked by inaction

Mr Snowden said MIL had written to Inspector-General of Water Compliance Troy Grant asking him to investigate why allocations have remained so low.

NSW Irrigators Council and the Rice Growers Association have issued a statement blaming overly conservative policies for delays in lifting allocations.

"The rules and accounting for water are complex and variable but the assumptions for future inflows are exceptionally conservative and are severely impacting the planning and decisions water users make," the statement said.

PETER HUNT

Senior Reporter

The Weekly Times

Relaxation of Constraints

Constraints relaxation has us deeply concerned for the health of the river and our environment. A muted 80,000 megalitres a day to be delivered to South Australia is impossible to fit down the river without major destruction. While this amount of water is held in our Victorian Storage Dams, we face the constant threat of flooding and the loss of available space for the production of food and fibre being detrimental to the Australian population. Why is Victoria responsible for storing this water for South Australia in our dams? Why can't South Australia store their own water?

Irrigation Water moves to highest valued crop.

Yes, water has gone to the highest valued crop Almonds forming a monocultural using 15 megalitres a hectare far more than dairy rice etc. whilst losing all other Agricultural industries and their rural scientist (the farmers). Almond prices were $8.50 a kg but what happens when they are $2.50 with adjustment of oversupply.

We need to seriously rethink our Nations future food security and how we address its needs especially if climate change analysts are right. Taking all your eggs and putting them into one basket is fraught with danger ie building a one industry monoculture with irrigation water while we have lost our staple food production of milk and meat.

Taking water out of traditional flood country and placing it on Mallee Sandhills to irrigate almonds will be to the long-term detriment of the Environment. Six million years ago this area was the original seabed. Placing this amount of water will eventually lead to salting the region out and impacting waterways and land further afield.

Pauls Road, Boundary Bend, Victoria in the middle of the Almond plantations

Dr Peter Barker OAM

The Central Murray Environmental Floodplains Group has asked me to comment on the effects of the Murray Darling Basin Plan and its effects on my community.

My name is Peter Barker. I came to Cohuna in 1983 as a rural doctor with no past connection to this area. So now I have lived here for 40 years practicing medicine in the only practice in the town. I have also held land and irrigated for the last 36 years.

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.

The process to get control of water rights which were originally linked to irrigation infrastructure involved removing water ownership from land ownership. There was a boon as water prices rose and money was made in trading. This allowed organisational ownership of water. The outcome for the food bowel regions has been water has moved without infrastructure being maintained and a fundamental mind shift occurred thinking of water as a tradable commodity. No longer does a farmer need to use water to make money in scarce years he can just sell it. Land management and productivity have been affected. Many farms are now managed with less water but what is grown is changing and long-term planning has been affected as water may not be available or affordable. Overall irrigation areas have less farmers and less production. This is affecting population as young people see cost of water as prohibitive to entering farming.

New farm ownership is moving from family owned to corporate due to who can afford water. Corporate owners often focus more on returns and less on local environmental protection so the myriad ecosystems on farm waterways is reducing again giving local wildlife less living options. The last few years has seen huge reduction in ibis numbers in the rookeries on farms. Similarly, water rat numbers, tortoise populations, freshwater mussels have all declined as irrigation channels have become industrial conduits lined in plastic rather than being an extension of the natural waterways, they have been for the last 120 years. In summary how water is owned and moved has reduced the biodiversity surrounding irrigation towns and the population number and skill mix in our towns is declining.

Transfer of water from storage to user especially environmental users has assumed rivers and creeks are drains - high flows are pushed thru natural waterways. I do not believe any modelling on effects of this were done or if they were they were not used to control volumes of water. We are seeing bank erosion and movement of sandbars. The organisations involved in water movement are not having overview of environmental effects. There are many photos of damage to the Murray in our area.

The local result has been disastrous damage locally in the Gunbower Forest where environmental watering has been followed by natural flooding and the excess water has back flowed into the Gunbower Creek. The Blackwater in Gunbower creek never happened before North Central Catchment Authority created a channel into the Gunbower Forest. The natural flooding pushed their

environmental water into the walls of their channel, and it back flowed into Gunbower Creek. This has happened two years in a row.
Blackwater made human consumption for many towns dangerous. Huge fish kills have also occurred. As the water receded mosquitoes populations have ballooned. The coinciding warming of eastern Australia saw Japanese Encephalitis emerge as a new threat to human health and recreational use of Gunbower Forest is at an all-time low as Japanese Encephalitis cases have popped up. Medical resources have been diverted to vaccinating populations along the river. I would expect further environmental flows into areas near the Murray Darling will lead to Japanese Encephalitis becoming endemic.

Legislation to allow unused but purchased water to remain in storage has led to a reluctance to release water in winter as once it is spilled it is no longer owned. I do not believe there are equitable rules about who maintains water in storage. There is no doubt agricultural planning on water use needs planning up to a year before production. Hurried, late or wasted land preparation for irrigated crops has increased under the MDB plan due to allocation announcements. Long term crops like olives and almonds require reliable water but increasing requirements as trees grow.
Planning to allow establishment of these crops appears ad hock with corporates allowed to commence production with unrealistic profit and cost projections. The big issue is eventual water usage is far higher than initial and the Murray isn't capable of supplying what will be needed in a few years and if that happens corporates investing will fail but not before they have damaged the established irrigation areas by buying water at higher prices than fodder, dairy and crop farmers can afford. The point is farm production related to irrigation is now unbalanced by water trading and essential crops with less profit may suffer leading to an issue of food security.

There has been a lot of hype from environmental water users on the improvement they are causing in the region surrounding the big rivers. The results we have seen are the reverse which does not mean the plan is wrong but the current implementation is not working. The reason land use groups are concerned is we are seeing environmental damage from timing and amount of watering and social damage from water policy. Gunbower forest in now a less diverse and more dangerous place for humans and we who live here are quite worried continual flooding will kill the old growth treasures of the forest eventually making our forest somewhere to avoid rather than a place to commune with nature and regenerate.

Sorry if this is disjointed it is just a few points commenting on what is upsetting my community on the changes which have occurred in the local implementation of the MDBP.

Dear Commissioners

I write to you in my capacity as a landholder, water advocate and journalist based in the Murray Darling Basin.

Water is one key fundamental of life that must be managed in a sustainable and balanced way to ensure a healthy environment and prosperity of our communities but also the nation. While I feel the basin plan started with noble intent, I continue to see the impacts of a plan out of touch with on ground impacts and long-term survival of the basin.

The stretch of river I live on is a narrow section of the Murray River that was prior to the Cadell Fault was the path of Goulburn River. In the last ten years we have seen an explosion in the rate of river erosion as downstream demands far exceed historical practices. Sections of our river have lost over 10 metres of riverbank since 2012. While all earthen do erode to a degree the sheer scale and rate of the erosion is failing the protections under the 2007 water act damaging sensitive ecosystem and causing significant property damage.

The trade and delivery of water, including environmental holding, do have caveats on its delivery enshrined in the 2007 water act.

Schedule 3 section 3, Basin water market and trading objectives state the water market and trading arrangements for the Murray-Darling Basin are (d) to recognise and protect the needs of the environment; and (e) to provide appropriate protection of third-party interests.

Section 4 goes on to state (4) Restrictions on extraction, diversion or use of water resulting from trade can only be used to manage:

(a) environmental impacts, including impacts on ecosystems that depend on underground water; or

(b) hydrological, water quality and hydro-geological impacts; or

(c) delivery constraints; or

(d) impacts on geographical features (such as river and aquifer integrity); or

(e) features of major indigenous, cultural heritage or spiritual significance

The irony of a plan to save the Murray that now seeks to hydraulically land clear the very same river with no protections in place. We are witnessing impacts in water quality (turbidity), hydro-geological impacts, impacts on geographical features and culturally significant features. And yet the MDBA seek to increase flows through the constraint's relaxation program.

The other concern I wish to raise is the decimation of family farmers who for generations had farmed the land here in a manner I consider more in tune with a natural state. While flood irrigation may not be the most water efficient delivery method it's low carbon footprint, low delivery cost and ecological benefits cannot be understated. One classic example of this the recent Victorian irrigation upgrade scheme in which thousands of kilometres of earthen channels were piped or plastic lined. The earthen channel that can see water efficiency as high as 92% do suffer losses, though also provide valuable wildlife corridors and breeding and feeding grounds for many native species. Now sadly those plastic lined channels are a death trap for anything that attempts to water there and the plastic lining excluding rehydration completely. A mere 20km from the Victorian channel modernisation NSW regeneration of the Pollack Swamp found their stock of endangered hard bodied fish to repopulate the swamp in the earthen irrigation channels.

This efficiency or highest return per megalitre at all costs carry's many perverse outcomes. The moving of water further down the system to green field sights on sand hills is one prime example. Never have I witnessed such a blatant disregard of the teaching of our immediate past, salinity management. These former dryland cropping properties are now irrigated and fertigated mere kilometres from the Murray as the saltwater table now sits above the ground chocking out native Mallee scrub and killing almond trees. These farms killing off large areas of basin farmland and polluting the Murray with salt can do so freely, in fact we encourage it under highest return per megalitre.

Our sustainable farming practises that have produced staple food crops and ecosystem function now find themselves competing in a race of the almighty dollar. To quote a farming friend of mine "it is hard to be green when you are in the red". In my opinion the increased competition for water has done more to white ant stable food industries, increase habitat loss and wipe out multigeneration farmers than any other government policy in the last 50 years.

Thank you for your time, and I hope your latest recommendations make it further than the bookshelf I imagine the last ones sit on.

Lloyd Polkinghorne

My name is Lindsay Schultz and I'm a third generation farmer (and flood warden for the last 20 years)in the Benjeroop and Murrabit West communities.Although I was too young to remember the 1956 floods,I was was involved in the floods in the 1970's,80's,90's, 2011,2016 and 2022. In 1956 we had more rain than any other flood but our property did not get flooded.Things have changed now with more reservoirs having been built but we have still been flooded out twice in 11 years,2011 and 2022. Both times everything was under water except our house and sheds. I know there was a lot of rain but both floods could have been better managed by all the government authorities including NCCMA, GMW and MDBMA.

Within this time I have also witnessed several droughts with rivers drying up and reservoirs empty. This is why managing this precious commodity of water is so important. Management so far has been appalling!

It is so important that the MDBMA get this right. I have been heavily involved in trying to get governments to listen. Senator John Madigan (who has now sadly passed away)came up to see us after the 2011 floods ,sitting down and listening to what we had to say. He was the only one that listened and could see what governments were doing wrong. Many politicians including Ted Baillieu (Premier in 2011) flew up to our property. Mr Baillieu did help after the 2011 flood to get things repaired but from an MDBMA perspective, when I spoke to him he was happy to leave it to his ministers. This was a disaster as Peter Walsh (then Water Minister)took all the irrigation water from our districts and gave it to the environment .This was the beginning of the end for the Benjeroop and Murrabit West communities.

The authorities need to employ or get practical people like myself involved. We have been through the wet and dry times and understand it. Computer modeling just keeps getting it wrong. GMW need to distribute the water earlier so farmers can plan to grow crops instead of making the water available out of season, leaving it in the dams. NCCMA need to listen to locals instead of just wasting money and water, and in most cases doing more damage to the environment in the future.

I could go on about many things that could be done to improve this country. I would be more than willing to donate my time to an advisory committee as I'm retired now and really care for the country.

Sent from my iPad

Mals Observations of the Forest and Gunbower Creek

In 1975 I often went out to the forest at Cohuna and Gunbower to help my father cut 5-foot red gum logs to fuel the boilers at the Kraft Cheese Factory in Leitchville. My father was a wood cutter and worked with others to cut railway sleepers or firewood. The forest was a thriving ecosystem.

Cherry Ballart grew everywhere. It is a member of the sandalwood family and is semi parasitic, relying on the river red gum as a host tree. Cherry ballart grew beside red gums as well as other native understory, such as hedged salt bush, ruby red saltbush, grey gerrymander. The Grey Crowned Babbler used the cherry ballart for nesting in.

The section of the forest that has been flooded for the last three years has no understory, no cherry ballart and looks barren and dead.

What was once a healthy ecosystem with understory, that in turn created a healthy soil which contained mycelium and other important fungi for decomposition for soil health has been lost due to excessive water sitting on the forest floor for so long.

The forest needs to be managed as it was when my father was alive, otherwise it becomes a huge fire risk.

When NCCMA and GMW built the regulator at Hipwell Road for environmental flooding of the Gunbower National Park, there was a campaign to remove the weeping willows as they claimed they spread and choked the waterways.

However, we knew this was not the case as we had salix babylonica (weeping willow) on the banks of our land at Gunbower Estate for the last 75 years and they had never spread and become a weed. These willows stopped erosion of the bank from occurring as well as being the best place to catch shrimp. It was where the platypus fed and lived. Not only at Gunbower Estate but on other properties around the district. NCCM and GMW were told this, but they NEVER LISTENED to local knowledge.

They set about poisoning all willows and removing them if they could. Large numbers of platypus were killed, or their homes were destroyed. When they kept the water in the Gunbower Creek too high, platypus burrows were drowned.

Metres of land at Gunbower Estate has been eroded away because NCCMA and GMW keep the creek too high or try to push too much water down it to put through Hipwell Weir. The Creek is getting shallower and shallower because of all the silt. Over the years we have had so many authorities and the media out to show them the damage, but still nothing ever happens. Still the damage continues. NCCM and GMW have caused excessive amounts of damage to our beautiful environment and all the species that live in our area. They must be made accountable. The forest needs a rest from being flooded. It must stop now.

Mal and Vicki Johnson. July 2023

Jodie Hay's Observations **23/06/23**

I am writing to you in relation the Murray Darling Basin Plan and its implications to our farming communities here in Cohuna North West Victoria.

My Husband Colin and I run a 400 cow Dairy Farm with our 2 adult children in the Torrumbarry Irrigation district. I am a fifth-generation farmer whose family on all four sides have farmed this land since selection.

I have been an active participate in water issues over the past 12 years, meeting with formers ministers both State and Federal during this time. Minister Lisa Neville proved to be one of the most productive of Ministers I have dealt with as she had a genuine understanding and compassion for the communities and the Environment that are affected by the MDBP. She worked hard to implement strategies to reduce the catastrophic effects the plan's implementation was having on the communities and the Environment of Northern Victoria at times going against her Party's viewpoint. I sincerely hope in her hand over to you that she stressed the importance of continuing this stance in order to protect Victoria's Irrigation Food Bowl.

The MDBP was created as a way to "save "the Environment' from a proposed drying climate!

However, it seems a huge component of the Environment was not taken into consideration in the plan's creation, this component being Privately owned farmland. A land mass that involves 70% of the Murray Darling Basin and 86% of the North Central Catchment Management region. There was no data collected in relation to what Natural Capital existed on these farms or the Native Flora and fauna they supported, hence no ability to record the impact of the MDBP's impact on these areas. The reduction in the water used for irrigation on these traditional floodplains, the decommissioning of 2000km of 100-year-old open channels and the plastic lining of many others have drastically changed the landscape that both man, beast and vegetation adapted to rely on. Yet despite comprising the majority of landmass the 13.4 billion Dollar MDBP pins its hope for Environmental, Social and Economic positive outcomes on delivering water to 6 Icon sites totally less than 10% of the Murray Darling Basin Landmass and continues to ignore privately owned farmland.

Over the past 30 years we have planted thousands of Native trees on our property to form shelter belts and Wildlife corridors. 57 Bird species have been identified by Department of Agriculture staff during 2 on farm bird counts of these birds identified only 5 species were introduced. I have observed an additional Native 20 species of birds over the past 2 years resulting in almost 80 species of birds that call our farm home. The Wildlife corridors, permanent water and feed sources provided by our dams, channels and pastures have obviously created eco systems that support vast number of Native Birds, insects, reptiles, fish, and mammals. Complimenting this food and habitat source is our pest management strategy that ensures vermin like foxes, hares, rabbits and cats and noxious weeds are controlled.

Our Irrigation dairy farm provides this safe habitat for Native Flora and fauna whilst also generating 3.5 million dollars annually. 80% of this income is spent in the local economy and employs the equivalent of 12 full time staff. Hence highlighting the opportunity of "Duel purpose Water "as a way forward to achieve positive Environmental, social and Economic outcomes.

Irrigated Dairy's importance as an economic engine cannot be underestimated. The drastic and continued reduction in the number of Dairy farms in our region has had a dramatic effect on our local community and businesses. The millions of dollars that are no longer generated and shared through our local businesses has resulted in businesses closures, School enrolment numbers

halving, reduction in sporting club participants and domestic violence increasing by almost 50 % since the implementation of the Murray Darling Basin plan. Whilst the selling of almost 66% of the Torrumbarry Systems permanent water has allowed some farmers to recover debt and maintain some dignity after enduring the Millennium drought and the severe milk crisis of 2009 and 2016 it has compromised our regions prosperity and resilience. 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. 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! So our district has not only losing its Economic Engine, its farming future but the skill set that will no longer be passed down through generations and will be lost for ever!

Water security and historic irrigation infrastructure, 300 days of sunshine annually, fertile soils and close access to the largest volume of Dairy processing plants in the Nation created the Torrumbarry Irrigation region as the perfect place to milk cows!! The past 15 years have changed all of this. The reduction in the productive pool has seen water go from a reliable and affordable tool used to grow affordable pasture for dairy cows to instead being a complexed expensive commodity available to the highest bidder resembling a speculators toy at the expense of food and fibre production and Rural communities.

The reduced number of active irrigators in the district has put financial pressure on Goulburn Murray Water resulting in reduced services for those remaining as active irrigators. An example of this was seen in the 2022 Spring flooding where poorly maintained community drains resulted in 5 blocked culverts over a 3-week period on our property, hence large crop loses, financial and personal stress. It is important to note the GMW staff were fantastic during this period however these issues would have been avoided if proper weed control and drain maintenance was done prior to the flooding event.

The Murray Darling Basin Plan in its current form cannot be delivered in full and on time whilst still adhering to the Neutrality test! It is well past the time to revisit and reset the MDBP objectives and Strategies.

Here are some of my suggestions as solutions to ensure that the plan will achieve positive Environmental, Social and Economic outcomes.

***Irrigated farm land must be acknowledged as part of the Environment and recognised for the Native Fauna and flora 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 the most efficient use of a National Asset**

***The engagement of landowners as Environmental stewards on their land reduces the Nations cost of Environmental projects as they are available 24 /7 and have a deep understanding of their land and surrounding landscapes as opposed to public servants carrying out these projects who will cost the commonwealth a huge amount more and often come with little local or irrigation knowledge.**

*** No more water to be recovered from the productive pool. The Commonwealth cannot deliver the water it already has, storing large volumes in the dams is increasing the risk of flooding to our regions as seen in 2022 and very likely again in 2023!**

***Environmental Watering Projects and objectives must be assessed by independent bodies. As the current systems allows implementing organisations such as the North Central Catchment Authority (NCCMA) management to assess their own projects with absolutely no accountability, the community is left to suffer the consequences of their poor planning and implementation of projects. An example of this being the Hipwell Regulator that was built in 2013 to water the Gunbower Forest. The community warned the NCCMA that the Gunbower Creek did not have the capacity to deliver the proposed water to irrigate the forest and satisfy the Irrigation needs of the system. However, despite these concerns the NCCMA insisted that 1650 Megalitres could be delivered via the Gunbower Creek and installed the Regulator. The Creek was not able to deliver the modelled water and now struggles to deliver 800 Megalitres. As a result of this failed planning NCCMA is now restricted to irrigating the forest from May to August whilst the Irrigation season is closed. Watering in winter has resulted in poor Environmental results in the Gunbower Forest and creates anxiety in the community as our natural protection from flooding is artificially flooded prior to Natural Events. The Hipwell Regulator is also built below flood level as seen last year when toxic Black water flowed from the forest into the Gunbower Creek through the regulator resulting in the water becoming unsuitable as a raw water source for our Domestic town water production , killing a population of Mussels in a Pearl Farm, caused stock illness and caused tourists to leave the district in droves as the waterways they had come to visit were unusable . The Regulators fishway also malfunctioned allowing millions of carp that had bred in the forest to enter the creek for weeks. This resulted in irrigation water being contaminated with millions of carp entering pastures to die and cause health risks to grazing cattle. This malfunction was only rectified when NCCMA staff were notified by members of the public. Remote Irrigation Management does not work. Environmental Irrigating staff must be on the ground at all times.**

***The Hipwell regulator has created a breach in our districts levee system and puts our land and our water source at risk!!**

***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 GMW {hence Irrigators} become responsible for the maintenance of the structures.**

***A" single Trade rule "needs to be implemented where a temporary megalitre of water can only be sold once. This would restrict water being used as a "Speculators Play thing" The only people that would be buying Temporary Water would be those who intend to use it irrigate . The ability to govern this is basically already available using the Victorian Water Register as it clearly documents Water Allocated, Traded in and out! Basically, any account that Trades out more water than it traded in has traded that water more than once!**

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

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

In closing I will never accept that the MDBP was ever truly designed as an Environmental plan as it is inconceivable that we would implement a plan that has enable over 2000 km of a 100 year old gravity irrigation system within a Natural flood plain to be shut down whilst 65000 hectares permanent plantings further downstream on Sandhill was established!!

I wonder what future generations will think of those who governed during this time when they see a Polical Plan, "The Murray Darling Basin Plan", ha spen 13.4 billion Dollars of Taxpayers money that resulted in Salt water being turned into fresh water whilst sending billons of litres of fresh water out to Sea!!!

As a food producer in one of the most diverse Food Bowls in Australia I urge you to act on these issues immediately.

Ausralia's Food securiy depends on i!!

Yours Sincerely

Jodie Hay
Cohuna 3568

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

Farm Environment Koondrook Road 18th May 2023

Black Swamp 23rd May 2023 Where are NCCMA's 15,000 Birds?
Just toxic blackwater!

GJ Appleby and MJ Proper

To whom it may concern,

My husband and I run an organic and sustainable dairy farm in McMillans in Northern Victoria.

The enterprise consists of a 320-acre home farm and a 180-acre outblock on which we run our young stock and cut all our own hay. The outblock fronts onto Pyramid Creek.

In Oct. 2022 Kow Swamp filled due to run off from the Bendigo and surrounding creeks. GM Water opened the weir sending excess water down the Pyramid. Alas no notification was given thus breaking their promise from 2011 of keeping us informed.

Careful monitoring by ourselves occurred but by Oct 22nd we had frustratingly lost about 60 acres of quality hay which was ready to cut.

Assessment was made of the amount of water still to come from the natural flood plain of Know swamp and hence the Pyramid creek and it was deemed that the flood had peaked, and no further land (and hay) would be lost.

Alas sometime in the next few days, the Macorna Channel was cut by GM water, again with no notification.

This sent a vast amount of water down the Pyramid.

Luckily, we were still monitoring the situation and upon identifying this second rise we moved our young stock home.

By Oct 27th all 180acres with ready to cut organic hay was 4 feet under water. Only the tops of the fence posts were visible.

Farming is a challenging life, and we realize we are competing against Mother Nature however, these manmade exacerbations by GM water with no communication is distressing and costly.

We appreciate we would have lost 60 acres and 50 tonnes of hay but this extra act of artificially deviating flood water into the Pyramid meant we lost close to 200 tonne of hay and important grazing land for our young stock.

Market value of $250/t equates to an approximate $50,000 loss. However, it is very hard to source and replace and as such we decided to reduce numbers by 5% thus reducing our milk income by a further $25,000 to $30,000.

Flood waters took around 6 weeks to recede and, due to pasture saturation, stock could not return till April 2023, 7 months post flooding. This obviously affected our management plan at home and more destocking was required causing further loss of income.

Our stock yards were demolished and a lot of fencing needs to be replaced costing another$40,000 to $50,000.

Aside from the monetary loss, the stress of having limited control over the situation is debilitating. As we stated, natural disasters are frustrating, but we accept they are part of life.

What we find unacceptable is the deliberate redirecting of flood water without communication. This allows no ability to plan or prepare and no evasive or asset saving action can be taken.

The time leading up to the flooding was extremely stressful and tiring, physically and emotionally. Monitoring the situation three or four times daily and making decisions when all the facts were unavailable was difficult.

The fact that the current policy of artificially flooding the bush 7 years in every 10 rather than the natural occurring 1 in 10 years will result in our outblock being repeatedly under water and thus unusable for 6 months of the year. Not only is this economically and emotionally unsustainable but also causes destruction of the natural vegetation. Remnant box tree stands which are over 100 years old are slowly dying due to the excess water.

These have been large contributing factors in deciding, as of June 2023, to retire from dairy farming after 50 plus years. We plan to sell the outblock

mainly due to the fact it is being used as a sacrificial dumping ground for flood water resulting in huge economical and production losses and GM water failing to fulfill their promise of better communication.

Yours sincerely

Dr Megan Proper BVSc(Hons)

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
Kerang

Central Murray Environmental Flood Plains Group Inc

Report into the 2022
Flood Event in Victoria

4th June 2023

Written by

Geoff Kendell

Chairman

Contents

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 from a diverse array of backgrounds and experiences, working for the region's greater good.
We are open, transparent, and accountable in our work and deliberations.

Our home, Cohuna, is located in the centre of the Southern Basin of The Murray–Darling River system, the largest river system in Australia.

Our region holds important social, cultural, economic and environmental values, once supporting strong rural communities and economies. By 2000 it was the third most productive agricultural region in Victoria, the productive status has diminished dramatically due to the effects of water reform and the Murray Darling Basin Plan.
Our region includes diverse ecosystems, internationally recognised Ramsar wetlands, significant floodplains and internationally renowned river red gum forests. It is home to many species of wildlife, birdlife, native plant species and marine life which includes the iconic Murray Cod and Golden Perch.
It is the cultural and spiritual home of the aboriginal communities of the Barapa Barapa, Yorta Yorta, Wemba Wemba, Wadi Wadi and Dadi Dadi.

Our Region encompasses parts of the floodplains of the Murray, Loddon and Avoca Rivers in Victoria and the Wakool, Edwards Rivers in NSW.

Our region encompasses Shire of Gannawarra in its entirety, parts of the Shire of Campaspe, Rural City of Swan Hill, Loddon Shire, Murray River and Edward River local councils.

Overview

Central Murray Environmental Floodplains Group Inc (CMEFG) produced this report for the Inquiry into the 2022 flood event in Victoria.

In our Report we called on our community for help to construct an overview of occurrences prior, during and after the flood event. The Gannawarra Shire is unique. It has three river floodplains and several prominent creek floodplains in its midst which impact its communities, their families, their businesses, and their infrastructure, all taking its eventual toll of their livelihoods.

The flooding event was consuming and the impact substantial. Now eight months on visual signs of damage to infrastructure still remain, but it's the mental anguish and stress which is hidden that lingers for many years and impacts family life and business behind closed doors.

We were hoping through this Report we could construct a picture of what contributed to this event, who was helpful, what was needed during the flood, what needs to be addressed now and what was the solution to stopping this occurrence in the future.

Foreshadowing the 2022 Flood Event

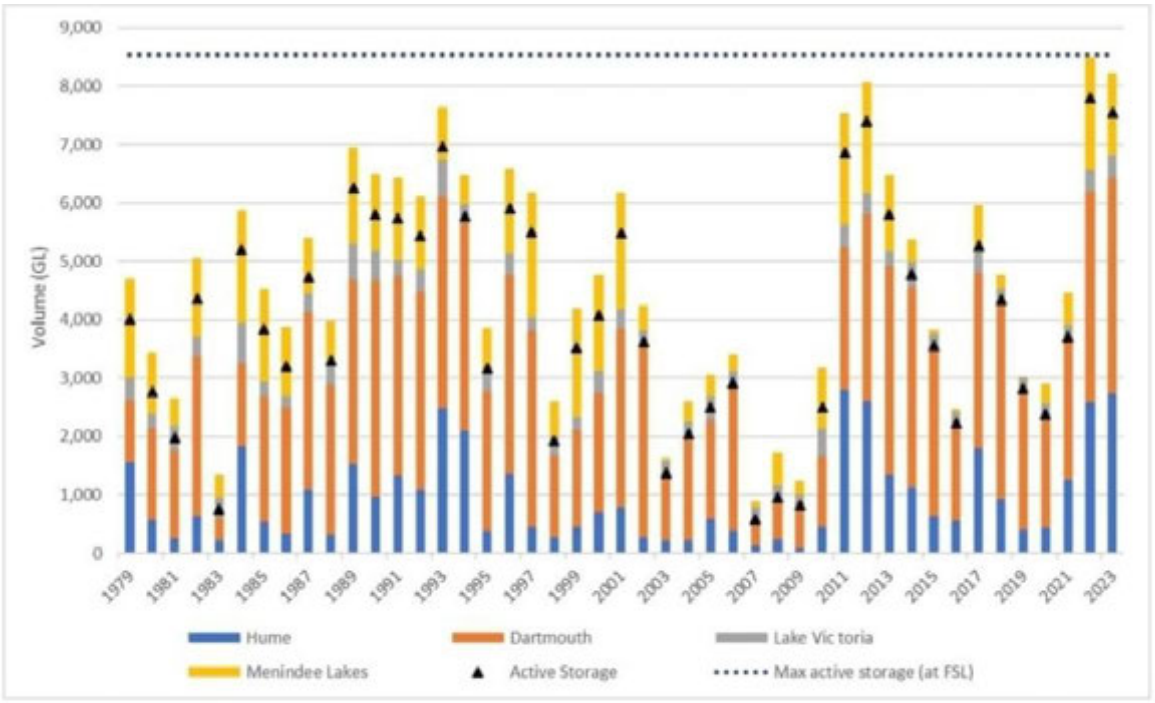
CMEFG wrote to the Federal Water Minister Tanya Plibersek on Friday 5th August 2022 foreshadowing the imminent catastrophic disaster.

I quote **"Our system has been so poorly managed in recent years we believe this spring we are under threat from a catastrophic disaster with major flooding of large parcels of land and infrastructure".** Finishing the letter, we wrote **"In closing we again thank you for your time and consideration and hope that some common sense will finally start to prevail with your intervention".**

Unfortunately, there was no intervention, and the rest is history.

Many believe in their long histories, of 70 years plus of irrigating, they have never seen dams so full so early on in the season. This has only happened because of the introduction of the department's decision to manage our storages conservatively based on 1:100-year dry case scenario.

The question could be asked right now: Why were the Dam's over 90% full before the end of the watering season (15th May 2023)?



MDBA total storage (showing contribution from individual storages) and active storages as at 1 May each year since Dartmouth Dam was completed in 1979.

Victorian Water Storage Levels as at 21st July 2023

Storage	% Full	Current Volume	% Full Same Time Last Year	Volume presently being released ML/Day 22/7/23 am
Dartmouth Dam	97	3753000	95.24	6000 19/7/2023
Hume Dam	95.87	2881081	93.47	23080
Yarrawonga Weir	93.09	109377	17.19	43467
Torrumbarry Weir	98.51	36263	94.13	39735
Lake Eildon	96.87	3229682	83.54	21134
Waranga Basin	86.50	373970	78.07	unknown
Lake Eppalock	100.47	306085	48.82	900
Cairn Curran Res	96.30	131683	54.23	unknown
Tullaroop Res	101.24	73858	60.65	unknown
Laaencoorie Res	87.25	6980	42.00	unknown

Presently in our Region the Murray River is flooding. Its present height at Barham is 5.89 metres, 410 millimeters under last year's peak during the major flood of 6.3 metres.

The Gunbower, Gutterum and Benwell Forest's are all full of floodwater and water had been entering farmland at Koondrook Thursday.

The Loddon and Avoca Rivers are both pushing out across the floodplains.

Why are these storages being held so full? Dr Mark Bailey Northern Victoria Water Resource Manager was asked in a Meeting at Kerang on the 13th of July how much rain is needed to push the Hume Dam 1% higher at present levels. His answer was it depended on the ferocity of the rain event. A heavy downpour of 25mm in 2 hours or 50mm of soaking rain over a weekend but did depend on how wet the soil profile was.

The Dams are now holding huge amounts of Environmental Water and Carryover (Hume Dam 20% Carryover 13 July 2023), With the need for 30% airspace for seasonal inflows and the major inflow months to come this ringing huge alarm bells that something is drastically wrong.

If SA wants all this environmental water in the future maybe the Government needs to consider another Dam instead of costly water buybacks that severely affect the security of the nation's food production. **We should have learnt a golden lesson during COVID that we need to secure our future supplies as we can't rely on other countries to do this for us.**

The Floodplains

I will now endeavour to breakdown the impacts and stories on each floodplain for you from upstream to downstream of too much environmental water poorly managed.

Loddon River Floodplain (October 2022)

Serpentine, Bears Lagoon, Western Waranga Channel, Durham Ox, Penny Royal Creek, Nine Mile Creek.

Flooding in the Loddon Shire on the Loddon River was rapidly intensifying, causing extensive damage to farmland it passed through. As the situation worsened, concerns among the community grew. Unbeknownst to them, Goulburn Murray Water (GMW) had accidentally left the doors open on the regulators at White Pits Road on the Western Waranga Channel and the Bears Lagoon waterway outfall. This allowed water from Waranga Basin and the Goulburn Weir to enter the system, exacerbating the situation and significantly increasing impact. The duration for which these doors had been left open was unknown. When the issue was discovered, it took a considerable amount of time on Saturday, October 15th, to close them, especially considering GMW did not respond to the messages left on their emergency number.

Water started to run in places never seen before. While the gauges on the Loddon River at the Loddon Weir, Fernihurst and Appin didn't indicate the proper size of the flood. The choke area in between at Durham Ox was swamped. There is more than 60 kilometres between both gauges and officials had no idea of the impact in between.

Locals had to drive through floodwater to the bridges on Serpentine Creek and Loddon River on the Boort Durham Ox Road to try to ascertain how big the flood was, and what impact there was going to be.

In the future there must be gauges at Durham Ox on both the Creek and River and reported on daily as done at the Fernihurst Weir and Appin.
Presently the report at Fernihurst Weir and Appin may be moderate, but in reality, the Choke at Durham Ox could well be severe.

At Durham Ox on the east side of the Loddon River the Serpentine Creek finishes and splits three ways into the Penny Royal on the west, the No 12 Channel in the middle and the Nine Mile Creek on the east.
The Penny Royal traditionally takes the main volume of water as it is deep and wide but due to lack of maintenance works by GMW the much smaller Nine Mile Creek took the volume of water. The Nine Mile Creek continued to run two and half months much longer than ever before. A lack of maintenance accentuated flooding problems.

The immense quantities of water forcefully channelled through a narrow system resulted in water surging over the Murray Valley Highway, damaging the highway, and also inflicting substantial harm to farmland and structures in its path. Simultaneously, a significant flood was also descending along Calivil Creek.
The Calivil Creek's banks, already weakened by excessive flows, proved inadequate and breached in numerous locations. A similar situation unfolded along the Pyramid Creek, stretching from Kow Swamp to the Loddon River, where vast expanses of farmland and infrastructure experienced unprecedented inundation.

Infrastructure failure, regulators left open, box culverts blocked, poor management of the system, poor communications, main storage dams left too full with no airspace were all the recipe for a major flood disaster.

There were terrible stock losses where sheep drowned and 1000s lost through disease. Stock suffered from coccidiosis, Barbers pole worm, a type of scarlet fever, and an infection caused by mosquitos. There was a huge worm burden. There is still a percentage of stock suffering the aftereffects of the flood. They may never properly recover.
There is nothing more demoralising than seeing dead livestock. Some farmers are still waking in the night dreaming of the tragedy.

Farm dams were impacted by filthy blackwater rending them unfit for stock consumption. Farms were inundated by up to 90 percent.
The Loddon Valley Highway cut by floodwater stopped farmers from shifting livestock to higher ground which had non contaminated fresh drinking water and better feed.
Veterinarians' bills were huge one quoted at over $12 000.
In one of the best spring seasons ever, pastures set up for hay production and crops were lost; including the potential of high valued canola crops. Water ponding on this country has turned the ground sour and everything is dead just like it has been nuked.

Floods unfortunately create twice as much work with only half as much potential to make an income.

Trying to get sheep out of a beautiful flowing clover paddock as the flood hits.

The only place left for the sheep to go on a high channel bank.

Trying to move sheep down the flooded road to higher ground.

That’s it, nowhere to go, Hopefield road flooded in for 12 kms.

What’s left of the beautiful clover paddock after the man-made flood.

In the future

There have been three generations of flood studies done in the region but not much achieved on ground. Old infrastructure is not big enough to handle the volumes of floodwater moving down the floodplain, but the flows have also been impeded by poor management and maintenance. Lignum with its prolific growth now blocks creek lines and waterways, some of which should be removed.

It would be beneficial to conduct a comprehensive examination of floodplains with the objective of finding effective strategies to enhance the movement of floodwater and mitigate its impacts.

Infrastructure needs to be upgraded, cleaned and maintained in the future.

Communications and flood warnings must improve.

There needs to be adequate airspace left in storage dams for seasonal inflows.

Wandella Creek Lake Meran

Flooding in the Wandella Creek was exacerbated by North Central Catchment Management Authority over filling Lake Meran with environmental water prior to the major flood. This did not leave any room for floodplain storage thus impacting downstream of the outfall. Normally with airspace available the flood would have stayed inside the flood course and eventually arrive at the Kerang Lakes system at First Reedy Lake. Neither the NCCMA or Gannawarra Shire adhered to the rules put in place to operate Lake Meran outfall during this time. This action resulted in above average damage over a much larger area creating massive destruction.

Wandella Back Creek

Flood flow down this old watercourse was evaded by only centimetres as the levee didn't breach as it did in 2011, However we raise this concern once again as a future issue. The Quambatook Road now acts as a 2-metre bank across the floodplain. When the road was raised in the mid 1960's the two bridge pipes were removed. In 2011 floodwater that crossed the road finishing in Duck Lake had disappeared off the floodplain and properties in three weeks. However, water on the upstream side of the road had to be pumped off properties for 3.5 months causing massive financial loss and destruction to infrastructure. This problem needs addressing.

Wandella Creek Murray Valley Highway

This is where the Wandella Creek outfalls into the Kerang Lakes at First Reedy Lake. The floodplain's floodwater is funnelled through a small 33 metre bridge into the lake. It has a floodway to its north on the Highway.

It is ludicrous to think a floodway could shut down a major Victorian highway for a number of days with only 150mm of water passing over it at its deepest point. To keep this major link open in the future another bridge should be installed if not then some box culverts. A sensible solution during the flood would have been to set up some traffic lights on both ends of the floodway with signs reducing the highway to one lane and a 10 kilometre an hour speed limit to keep services flowing.

Upstream of the Loddon Bridges at Kerang

The two bridges on the Loddon River at Kerang form a bottleneck for river flows in times of floods.

The two bridges are only allowing a flow of 122 metres whereas upstream at Appin the river is six kilometres wide. Over the years the river beneath the bridges has silted up originally from 440 cm deep to 220cm deep now. In fact, between mud rock spoils and water weed only 57 metres would be clear. The mud and weed must be cleared to help future river flows.

Patchell Bridge, Loddon River, Kerang

A spillway could be constructed on the West Bank of the Loddon River opposite the Kerang Township levee on Jan Wilde's farm to alleviate the problem of the western bank blowing out and inundating farmland and infrastructure. It could be constructed 150mm lower than the west side bank to reduce the threat to the Kerang Township levee on the east side of the river. It would allow water to come out slowly in a designated position onto Jan's property and be pumped back into the river on the other side of the Murray Valley Highway.

The stinking black floodwater here also created a health problem with sheep dying and another percentage not recovering enough to be sold.

In the future the bottleneck at Kerang needs to carry more volume. The bridges could be raised, or another bridge installed. In the 1960's the third bridge was taken out of the highway and never replaced.

Downstream of the Loddon Bridges at Kerang

On the Loddon River Floodplain downstream of Kerang the major problem was the Sheepwash Weir which was 60-70% blocked by cumbungi backing up floodwater. While clear now the cumbungi is quickly growing back and will create a major problem if flooding occurs in the future.

Adding to the problem downstream of Kerang was Goulburn Murray Water's initial refusal to lower the water level in the Kerang Lakes thus giving time to create airspace.

While SES were asked to approach GMW; GMW refused action until the SES became the Incident Control Centre, this must be addressed sooner rather than later. The SES worked well.

Kow Swamp is fast becoming a major problem with the expansion of housing estates in Bendigo pushing more water than ever into the Bendigo Creek and thus Kow Swamp. Consideration and future planning will be needed to reduce further downstream problems.

With respect to flood water entering the Murray River, the Outlet at Fish Creek needs upgrading to a minimum capacity of 1500 megalitres a day. It is far too small with all the upstream development that has occurred in recent years.

Of major concern in our Gannawarra Shire Region right at this moment is none of the 50 or so levee bank breaches are fixed. They extend from Kow Swamp to Benjeroop where the Loddon River enters the Murray River. This is causing a huge amount of stress and angst in the community as we could be facing another major flood this year.

Nine Mile Creek East of Kerang

Kenny Road has caused a major blockage to the flow of floodwater down the floodplain. Several years ago, the Gannawarra Shire replaced a concrete bridge with a spillway consisting of 3 x 1 metre pipes that have far less carrying capacity. The road is also 61 centimetres above the spillway. With Kenny Road being blocked and not allowing water into the Pyramid Creek, levels rose 2 metres at the road and back up the floodplain into Stuart Keatings farm, blowing his levees and pushing water down the Calivil Creek Drain causing massive devastation to properties. Most of this water was just left to pond and evaporate. There is also a massive amount of lignum that has growing between Kenny Road and the Pyramid Creek blocking the waters entry into Pyramid Creek. This needs removal. The Nine Mile Creek floodway at Kenny Road needs to be opened wider in the future.

When the Nine Mile Creek gets too high the door into the Piccaninny Creek should have been closed otherwise it flows backwards upstream towards the Murray Valley Highway causing more damage. In the future more doors are needed here.

The Piccaninny Creek & Calivil Creek Drain flume is far too small to carry the current flows of water. In the future either the flume has to be increased in size or a door and pipe could be placed here on the upstream side of Kenny Road that could be opened into the Pyramid Creek after the main flood flow had passed down the Pyramid Creek.

The Calivil Creek Drain is blocked at the Koroop Road as pipes have been removed and not reinstated. This must be reinstated so floodwater can make its way downstream to the Barr Creek.

In the future it would help if flood level indicators were placed along the length of the Pyramid Creek at bitumen road intervals to allow landholders to plan accordingly.

The farming communities outside the township of Kerang have suggested the Gannawarra Shire invite 4-5 people that have balanced views about a forth coming flood event into a meeting so they can put together an informed strategy. The consistent view is the Shire Office have no idea what happens outside the Kerang Township flood levee.

Also, if the Incident Control Centre based in Swan Hill 50 minutes up the road from Kerang received a call to have things done it was too slow in responding. In cases the distress calls needed fixing before tomorrow not in 7 to 8 days' time. It was miles too late. In most cases privately owned flood banks saved their communities time and time again, unfortunate the financial cost and upkeep of these banks are borne by the landholders.

Pyramid Creek upstream Samson Bridge

In the Hird Swamp area, the Pyramid Creek fed by Kow Swamp completely inundated large parcels of land. Kow Swamp along with other local water storages were near full leading into October early November. If there had been some managed airspace in these storage dams, the flood water could have been slowly released without much damage to farmland. There is still settled flood water on farmland at Murrabit and Benjeroop, 7 months later!

After the impacts of the 2011 floods landholders thought Goulburn Murray Water would have improved its decision making and communications to the public, but there was no warning that a release of water of such a magnitude from Kow Swamp was being made. Many had to rely on updates from neighbours further upstream.

GMW can communicate quickly via text message warnings. This didn't happen.

For farm staff and those in intensive production operations the only way to and from work was one at a time on the back of a tractor through floodwaters.

Kerang Township

Kerang again faced another flood event like 2011 but were able to withhold the water from entering the township. Once again it became an inland island with Patchell Bridges on the Loddon River across the Murray Valley Highway sandbagged closed. Residents were given the option to leave town before this occurred.

Goulburn Murray Water again were blamed for the mess as they failed to release enough water to create airspace in their dams to alleviate the severity of the flood event.

In town Mawsons became the saving grace as they supplied unlimited materials and help especially filling sandbags. There was a fair bit of community dissension with the Gannawarra Shire and SES and it wasn't until two retired former GMW water bailiffs were asked for help that common sense finally prevailed. It just showed to help mitigate flooding impacts you need to listen to good locals who understand the region and can give good direction.

Once again, a band of selfless community minded people put themselves their gear and finances out there to save their community.

Murray River Floodplain

Upstream of the Torrumbarry Weir the situation was becoming dire. Locals who had lived through floods before could see the river continually rising. It was decided a historic community levee from Richardson's Bank to the Torrumbarry Weir needed urgent maintenance as it had fallen into disrepair. The bank which stretched 18 kms from the Weir to Young Road protected a vast amount of land and infrastructure including Torrumbarry, Patho, Gunbower, Leitchville, Cohuna and Koondrook from being flooded.

The urgency of the situation was evident to a small number of locals who had been through previous floods. They immediately mobilised members of the community to present the criticality to government agencies for approval of works. The Campaspe Shire staff & SES were occupied so the local community mobilised. It took over a week to get approval from appropriate authorities, so locals had to initiate works before approvals were obtained and by that stage the river had risen dramatically.

Local contractors were engaged who had machinery that could be quickly mobilised and initial groundwork completed. Surveying was engaged assessing the levee to mark out build goals, including heights and what could be practically completed in the time allowed.

There was difficulty in liaising with the Incident Control Centre (ICC) in Bendigo due to the nature of resource allocation. It was understood there were immediate issues in Rochester and Echuca and a skills shortage so appropriate skills and resources were sourced locally. Locals ran co-ordinated 24 hours monitoring of the levee as it was being built, identifying seepage, weak spots/emergency repair areas. Locals continued this levee monitoring after the build.

Forest Fire Management were great with the limited resources and as they had local knowledge understood the gravity of the situation. North Central Catchment Management were great and responsive in providing modelling data and advice. City of Bendigo were able to supply engineering support. Forest Fire Management were able to supply crews to pump where required.

The reconstructed levee held with only 125-150mm free board.
Once the levee was up attention turned to downstream of the Torrumbarry Weir. A poor decision to run water down Baggots Creek into the Upper Gunbower Lagoon and into the Gunbower Creek, flooded the new housing estate in Cohuna. This water was redirected into Taylors Creek and into a full capacity Kow Swamp, impacting land downstream of Kow Swamp.
A flood recovery program was established from the Campaspe Shire to liaise with the local community. Parts of the levee have been removed for road safety and the community is anxious regarding its reinstatement process.

Due to high storage levels, the community remain extremely frightened about the possibility of major flooding again later this year.

In the future, management might be best handled by Forest Fire Management who have the on-ground resources and full-time staff to handle a large-scale works like this.

Future work must be undertaken to review the levee, its appropriateness and most advantageous location.

Torrumbarry Headworks / Kow Swamp

The headworks on the Murray River at Torrumbarry has had a bent door for four years. When the flood was at its peak 480 megs of water was leaking through it and down the Gunbower Creek causing an overfull Creek to be diverted into an already full Kow Swamp. Of course, when the flood hit, it was too late to do anything but watch the water flow. Kow Swamp was already receiving 8000 megalitres from an overflowing Bendigo Creek. 3500 megalitres was going out at Box Bridge which inundated farmland all the way to Mount Hope then met up with Bullock Creek coming from the west side of Bendigo. The other weir at Kow Swamp outfall that goes into the 2 of 2 channel which is part of the Macorna No2 was fully open, and the channel had to be cut just west of the flume which caused flooding of the farms and farmland in its path all the way to Kerang.

The headworks water could have been let down the Gunbower Creek but the weir on the lower creek below Cohuna coming out of the Little Gunbower Regulator, was over topping so the creek was already full. This weir was built too low.

The community are always affected by these events, some people more than others.
The Murray system needs another storage and there should be no carry over of environmental water to ensure there is ‘headspace” in the Hume dam.

Cohuna

Building a levee around the Cohuna Water Plant showed a total lack of local knowledge.

The main problem at Cohuna was caused by Hipwell's Fishway being left open and Hipwell's Regulator being constructed too low allowing blackwater to infiltrate the Gunbower Creek. The blackwater caused low oxygen levels in the creek killing fish.

During this time a heavy water weed infestation, which had blocked two bridges descended on Cohuna with the blackwater and dead fish causing the Coliban Filtration Plant for domestic water supply and rural use to close in Cohuna. This incident closed the Plants supply of water for approximately 9 days and for the first time ever Cohuna had to import water, for domestic and rural needs. It affected peoples' reliance on water for basic human needs. Families, health services, businesses, farm production, animal health, tourism and mental health of the community were all affected.

In the future

Hipwell's regulator needs to be raised and its fishway operation needs to be fixed.

The excessive water weed infestation in the Creek needs to be cleared.

A detail contours survey needs to be done to determine the actual land levels throughout the district for future flood planning.

Gunbower Creek Golf Links Estate Cohuna

While the flood at the Estate was mainly caused by stormwater, attempts to increase the flood flow in the Gunbower Creek were stalled when banks were breached, caused by tree blockages. With high flows of environmental water now moving down the Creek twelve months of the year, the banks have been badly eroded causing an increasing number of trees to collapse into the Creek. Warnings of flooding were driven by the Incident Control Centre (ICC) who did not refer to local knowledge. The Army was engaged to sandbag houses in the Estate, unfortunately this was ineffective because often the bags were placed in the wrong positions. Residents were doorknocked one night during the flood between 8.30pm to 10.30pm by non-local members of the Victorian Police Force, who stated if told to go, residents would have an hour to get out because there would be a metre of flood water hit the Estate – inaccurate information caused considerable unnecessary stress and anxiety. In the future ICC need to engage with local personnel before this type of procedure is put into action.

Gunbower Creek

Water flows in the Gunbower Creek have continued at a very high level for 12 months of the year undermining the banks which have seen a number of trees falling into the water. Excess trees within the creek need to be removed to allow the natural flow of water.
Water weed has thrived in this environment blocking up the system including two bridges during the floods.
The Little Gunbower Creeks Regulator has been installed approximately 81 cm too low allowing a high flood in the Murray River to pass right over it and back into the Gunbower Creek accentuating the impacts downstream at Koondrook.

In the future the water in the creek needs to be lowered over the winter months allowing frost to kill off the water weed naturally. The Little Gunbower Creek Regulator needs lifting.

The Gunbower creek was supposed to be a safe refugee for native fish breeding. However, because of their poor management during the floods and not shutting off at Hipwell Regulator has allowed millions of carp to infiltrate the Gunbower Creek.

Koondrook

The main problem at Koondrook was there was too much water in the Gunbower Island Forest. There was the Environmental water plus floodwater which pushed straight out the forest at the twin bridges across the Koondrook Kerang Road then tried to breach the levee, some going over at the Koondrook Primary School on the Murray River.

There was a real concern if the bank at the Benwell Guttrum had been compromised, the Township would have flooded but thankfully the farmers stopped that from occurring.

In the future, no environmental watering of the Gunbower Forest and the Koondrook Township need to have its full levee banks reinstated.

Also 25 sandbags were handed out per household which people took home. Next time it would be better if those bags were used on the breach to save everyone's homes.

Guttrum Benwell Forest Myall & Murrabit

A North Central Catchment Management Authority staff member said at a meeting "We will never put water in the forest if there was going to be a flood!"

Yet they still went ahead and put environmental water into the Gunbower Island Forest, even though all the indicators were saying they were wrong. They flooded the Forest knowing we were going to have a wet winter!

Higher river levels compromise the bank structure of the Murray River which in turn place pressure on existing levees that it had no maintenance.

The Koondrook-Perricoota Forest in New South Wales acts as a floodgate for Victoria. The Government Authorities were reluctant to act on getting the water away in that region, putting excess pressure on the Victorian side of the Murray River causing untold damage.

Excessive water coming out of the Gunbower Island Forest was putting extra strain on an already compromised system.

A small bank normally holds the pressure off the larger inner bank up against the Benwell Guttrum Forest, holding water in the Murray River. If the larger inner bank is compromised, with irrigation modernisation now completed in the area, it would lead to the inundation of Myall and Murrabit and the farmland in between. Because the small bank was in disrepair the locals took it upon themselves to block 24 breaches in the small bank. Once the breaches were blocked it dropped the water 10 centimetres pushing the water back to the little Murray where it should have been flowing. Also, a cut had to be put in a the bottom end of the Guttrum Forest to allow the flood water back into the Murray River.

Locals had to deal with lots of constraints. Local Member for Murray Plains Peter Walsh was contacted, who contacted the SES, then a State of Emergency was put in place and an Incident Control Centre set up in Bendigo. Once again not local, so things didn't happen straight away. Two weeks later it was put in the hands of the Gannawarra Shire who relayed messages from Koondrook. North Central Catchment Management Authority (NCCMA) did nothing. They were reluctant to do anything and there certainly was no sense of urgency. They sent a staff member out to fill out a Permit on a Levee that had to be constructed outside the owner's land, but the process took two weeks to complete which was all too late.

No-one took ownership of the levees not Parks Victoria, not the Gannawarra Shire not NCCMA. When the flood was fully on, outside Government Authorities just went and hid, they didn't want to know the community, but as soon as the flood subsided they were back sticking their fingers in the pie. The community is questioning how the Shire can navigate a cultural heritage area during a flood and bring about changes without any consultation or facing consequences, while individual landowners are held accountable for similar actions.

Unfortunately, once you stepped outside the Township of Koondrook it was all left to a few farmers to resource and man the battle against the floods.

They had some warning, but the level of information was shocking, they had their water levels all wrong and the direction it was going to run. There was a lot of uneducated people on local conditions giving out media views.

They received warnings that the Murray River was going to peak at 6.23 metres, higher than the highest on record, yet the level of water at the Torrumbarry Weir never changed and in fact had started to recede. School warnings were a week behind the event.

Inundated farmers lost their fodder, pasture, and milk production. One farmer stating his milk production was down 32% for the spring plus the unknown costs left by the floods.

While losing fodder that could have been grown for $180 per dry tonne, they had to buy in fodder for between $300 - $350 a tonne plus pay freight on top of that.

Many lost infrastructure fences, laneways etc. Animal health became a huge issue. Mastitis became a problem which equalled loss of milk quality which meant a financial penalty.

The cost of running pumps, fuelling them and relocating was physically and financially horrendous. Trying to get infrastructure to work that had no maintenance, unplugging pipes, topping levees, plugging breaches often working outside your mandate just to fix them.

The local community were fantastic and local surveyor Neil Carmichael did a great job. Contractors working under the Incident Control Centre (ICC) direction did a great job but unfortunately were last to be paid after the Gannawarra Shire. There is still the Forest clean up to be completed but it's believed there is no money left. Material will have to be found from outside the area to repair levee banks as most of the dirt has been washed away.

In the future we need to define who owns and is responsible for the levee banks, including who pays for the ongoing maintenance.

The River Regulators need to be made more responsible for imposing these flood events on Communities. The Murray River now continues to run high all year. Higher than ever before.

There is a proposed levee to be built in Cassidy Lane from the Murrabit Koondrook Road to the Guttrum Forest entrance, but it is not going to be completed with approximately 1 kilometre being left open. If this is left open it will flood the Koondrook township.

In previous times floodwater used to be able to be pumped into the No4 Channel and it would run to Murrabit then back into the river, however with modernisation it has been filled in.

There is only one true spillway left in Hinkson Road which could send floodwater in the future back to the river.

Government Authorities are running around in the Benwell Guttrum Forest putting up banks. This needs to stop as it is only causing logs and debris to be caught up impeding floodwater flow.

The forest is too thick and needs thinning and cattle need to be reintroduced to lighten the fuel load to mitigate against future fires.

The small outer bank on the Victorian side of the Murray River needs to be properly reinstated and repaired for the future, thus taking the pressure off the larger inner bank and pushing water back to where it should go.

Avoca River Floodplain

On the Avoca River upstream of Quambatook Township floodwater ran in reverse direction to normal and it wasn't a big flood this time.

The Mosquito Creek outlet was so jammed up with logs and floating debris it couldn't get out so pushed the water along the river which was in a similar condition after storms. Some locals finally managed to get the Mosquito Creek open, and this relieved the pressure built up in the blocked River immediately.

On the west side, the Back Creek became the river and ran first for a considerable length of time which wasn't normal. Many farms on the west side of the river were unable to be entered or exited for weeks halting operations.

NCCMA have pulled out several Weirs along the River, but the Community fought to keep theirs at Quambatook, so the Gannawarra Shire put in a new one which worked well.

On the Kerang Lalbert Road the Back Creek floodway water was only 100mm at its deepest point but the road was shut. This road is the back road out of Kerang to Swan Hill.

Further downstream Bael Bael and the Marshes filled, and crop was flooded with some losses from the Avoca River and Back Creek. The worst part was the Bael Bael Boga Road as it became impassable until well after the harvest was completed, so grain had to be freighted kilometres more at extra cost. The floodwater has only just stopped passing through the Avoca Outfall on the Murray Valley Highway about 8 weeks ago.

The community around Mystic Park were fantastic with around 100 volunteers chipping in at different times during 15 call outs. State Emergency Services were good organising an Excavator and the Mystic Hotel had supplied food for the volunteers.

In the future the fallen timber blocking the waterflow in the river needs clearing and the Mosquito Creek outlet needs to be clean. The Avoca River levee downstream of Quambatook to Lake Bael Bael also needs repairing and some lignum and timber cleared.

Not Listening to the Community

The North Central CMA say, **"they manage water for the environment flows to a range of regulated rivers, wetlands, swamps and lakes across our region".**

Are they responsible for any of this water and its impacts? Have they delivered untimely environmental water to a regional Lake and Forest causing untold community heartache and stress against the communities wishes in a time of flooding? Yes. Have they done anything to alleviate the suffering and reduce further pain from such impacts? Are they now intending to deliver environmental water into the Gunbower Forest that saw heavy flooding last year for the third consecutive year against the communities wishes? Yes. This is just a prime example of how Government Authorities and Departments continually ignore the communities that live in these areas, causing untold damage and set up for another major disaster. Worst still, they have consistently made statements in publications and the media that when challenged about, can't produce any evidence to back up their statements. In doing so they have misled the general public and those who rely on honest research. When challenged by local community members, they are just palmed off as not knowing what they are talking about.

NCCMA has failed in their duty of care to warn the public of the pending flood events. They have for 15 years sent a staff member out to the Region to assess these areas of concern and yet very little has been fixed. Victorian Environmental Water Holder says**" Water for the environment protects rivers and wetlands".** This is certainly not visually occurring and has only accentuated the impact of this event.

There are too many Government Agencies that are roadblocking an emergency situation ie flooding that have no line of sight to make decisions with good governance authority.

Unfortunately, common sense has been overtaken by nonsense.

Damage

Damage was caused to many flood levees many of which haven't been repaired. Local Governments do not have the funding, will not have the funding, do not have grant money to run the repairs needed.

Some funds for private levees have been forthcoming to a very cash strapped community. However it takes time and material to do this and much has been washed away. So, with limited supplies it is creating problems to find material and source supplies whilst battling now the wet winter conditions.

The flood certainly brought livestock issues associated with disease and nutrition problems. Weather damaged hay also cause botulism poisoning and cows stopped cycling impacting their ability to calf. There was the added extra cost of freighting in fodder just to keep stock alive.

The damage to roads bought challenges of getting access to properties, making it difficult to get supplies in and produce out to market much of which is perishable.

There are the challenges of getting access for staff, milk tankers, livestock, grain and hay transports, veterinarians, service and repair providers, school buses and postal services during these times.

One of the many flood bank breaches that needs fixing.

Trying to get a skeleton staff into a major piggery operation for work. Staff were ferried in and out by tractor one at a time. Much of the staff were land locked by the floods stuck in either Kerang or Cohuna creating a huge problem. There are Roads here still not fixed.

Road damage Macorna

Floods also bring the problems of an imported and unwanted seedbank of weeds some never seen on farms before. There are infestations from plants like thistles, Patterson curse, Bindi eyes etc all of which must be sprayed out. Also, years of nitrogen build up in the soil from good farming practices was lost through floodwater ponding.

Once the flood had past and begun to dry up the clean-up began, but coming into the Autumn many wanted to irrigate as water was cheap but couldn't because of the destruction left by the floods. This has added to the mental stress throughout the communities as it was a lost opportunity to recover some of the financial loss. This will not occur until the spring if repairs can be made in time for the start of the new irrigation season (15th August 2023).

Services

It is essential during these times of flood essential services remain fully operational and maintained, electricity, water, mobile phone coverage, hospital and medical services, food supplies, veterinarian services, internet, sewage, banking, and postal services.

Insurance

It is extremely concerning that our whole Region since last year flood event has seen an increase of up to 110% on last year's insurance premiums. One farmer quotes his 2022 account of $13000 has risen this year to $27000.

In fact, because there is so much environmental water been poured into our Region and the Murray River is now flooding there has been a freeze put on writing insurance cover notes. No insurance company will cover anyone in our region until the Murray River drops.

The needs locally on ground Now!

Better one on one communications all round between the people who live in the affected communities and Government Departments and Authorities.

There should be extra funding support for the agriculture sector as they try to recover from this major flood event.

Serious upgrading of our local telecommunications system is needed as many people became totally isolated during this kind of flooding event. Some for weeks at a time. It is very serious if this does not happen as it can quite easily mean the difference between life and death.

Our roads are in desperate need of repair they are again presently in what could be called life threating condition.

Urgent repairs to our levee banks on Crown and Private land before the next flood event which could be in the winter or spring of this year with our Dams so full.

The Gannawarra Shire urgently needs considerable funding from State & Federal Governments to have our roads and levees repaired and infrastructure upgraded.

The urgent addressing of the rapid expansion of housing estates in Bendigo and its rainwater run-off which is impacting our already fully laden water courses.

Big Picture Solutions

While in The Floodplains section of this Report we have highlighted many solutions that can be made to reduce the localised impacts to a large area of our catchment we now intend to elaborate on the big picture problem of the Murray Darling Basin Plan (MDBP) that has continually failed our community.

The Murray Darling Basin Plan is responsible for significantly increasing the flood devastation.

The modelling of Environmental Water and the requirement under the Plan to deliver 3200 Gigalitres of water to SA by June 2024 has led to a poorly managed Basin, causing mass devastation of river communities and their environments.
Changing the primary purpose of water from a land-based asset to a commodity-based asset has also allowed corporate entities, including government bodies, speculators, international monetary and superannuation funds, to purchase and store unused water in the dams for shareholder and business profit opportunities creating a dysfunctional system.

The main problem everyone faced last year and now this year is our storages are too full heading into winter months because we now base management on 1:100-year driest scenario.

The necessity to store far more environmental water has caused a major problem in our storage capacities.

Put simply there was not enough airspace in the dams to cope with the inflows. Then the Authorities panicked and released far more water into the system than it could ever handle.

The original perceived intention of the basin plan was to support a connected river system and environmental outcomes while protecting the social and economic values of the community. Instead, the unbundling of water allocation for environmental political favour in conjunction with shifting water resources to the highest financial gain has led to a divisive dysfunctional system. This has culminated in the death of numerous small businesses and local communities in favour of promoting monoculture conglomerate corporate operations.

Our Group has invested in years of collective research in forming several solutions that will help fix many inadequacies of the present Plan and help alleviate the severe impacts of future major flood events. We would like to share them below now:

- One Trade Rule for Water (acts as a disincentive for those other than bonafide irrigators to store water in our Dams)
- Only bonafide irrigation primary producers be allowed to own water in the Murray irrigation system.
- No carryover of any water (frees up the Dams airspace as 30% is needed for average seasonal inflow)
- All Environmental water must be measured.

A Plan developed for rotational annual environmental watering, leaving some forest areas dry to act as a safeguard to run excess water in a flood event. (Our forests are continually flooded year in year out. The native mid storey and ground storey in these areas needs a drying event and time to recover. They are presently being drowned out).

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- Abolish water buybacks (They will lead to further problems in dam storages and thus flood events).
- Lock Zero must be established (So the waste of water which evaporates off Lake Alexandrina at 870 gigalitres of water annually can be negated and redirected to keep River Murray Mouth open. At the moment that excess water is being held in our upstream Dams for that purpose)
- The Murray Darling Basin Authority should acknowledge recent major flooding of the River Mouth at Goolwa has failed to keep it open.
- A commitment made to retain and maintain all levees recently constructed along the Murray River to safeguard river communities in the future.

Adopting the above solutions will take the pressure off future occurrence of major Flooding happening in Northern Victoria.

You need to support our efforts in asking for positive change to help support our communities our families and our farmers giving them the confidence to continue.

Summary

Northwest Victoria and its farmers contribute a huge amount of food and fibre production to Victorian and Australian economy! Many farmers in our area have been adversely affected by the floods as have town residents that have lost their homes. At year 2000 Gannawarra Shire was the third most productive region in Victoria but since the introduction of the Murray Darling Basin Plan, we are but a shimmer of this.
The destructive nature of this Plan needs to be addressed, otherwise farmers will continue to leave their industries causing substantial loss of food and fibre production.

The very high levels of water presently being held in our Victorian Water Storage Dams for whatever reason need to be seriously addressed as they threaten continued flooding.

The attitude towards what we say needs to change. We have been living this insulting nightmare of not being listened to for far too long, demonstrated so clearly again by this flood event and its impact.

We are the ones that live here and yet we must endure the decisions that adversely impact our environment and future.
We are available to host an interactive tour of our Region anytime.

In the past, inquiries have been held and nothing has changed.
Will this be the same?
As the person reading this submission you can act on our behalf for the benefit of our communities and future generations. We hope in the future you will listen and finally hear what we are saying.

"As we foreshadowed, with our call to action on the 5th of August 2022, this man-made catastrophic disaster could have been avoided with sensible planning and good management"!

Gunbower Forest Environmental Water Management, Historic Weather Data

Gunbower Forest, which covers 19,450 ha, is bounded by the Murray River to the north and Gunbower Creek to the south. It is an internationally significant site under the Ramsar Convention and forms part of the Living Murray Gunbower-Koondrook- Perricoota forests icon site. River regulation and water extraction from the Murray River and Gunbower Creek have reduced the frequency, duration and magnitude of flood events in Gunbower Forest. This has affected the extent and condition of floodplain habitats and the health of plant and animal communities (such as river red gum and black box communities, native fish, birds, platypus, frogs and turtles) that depend on those habitats.

Gunbower Creek is a natural creek that has been modified to supply irrigation water from the Murray River to the Torrumbarry Irrigation Area. There are 12 lagoons, largely located in the upper reaches of the creek system, that are permanently or seasonally connected to Gunbower Creek. Water for the environment is used in Gunbower Creek to improve habitat for native fish, especially Murray cod.

The Living Murray environmental works program in the middle and lower forest was completed in 2013. The works allow up to 4,500 ha of the wetlands and floodplain to be watered with considerably less water than would be required if the watering infrastructure was not in place. The works enable efficient watering through Gunbower Creek and the forest to maintain the wetland and floodplain condition and provide connectivity between the creek, forest floodplain and the Murray River. Frequent connections between the river and floodplain habitats allow animals to move between habitats and support critical ecosystem functions (such as carbon exchange) [Ref: https://www.vewh.vic.gov.au/rivers-and-wetlands/northern-region/gunbower-creek

To state that “river regulation and water extraction from the Murray River and Gunbower Creek have reduced the frequency, duration and magnitude of flood events in Gunbower Forest and also affected the extent and condition of floodplain habitats, health of plant and animal communities “is an ignorant statement. These and many other statements are to be found in publications produced by the North Central Catchment Management Authority (NCCMA) and the Victorian Environmental Water Holder (VEWH).

Fact 1. Gunbower Creek is a 120km anabranch of the Murray River which departs the Murray River channel downstream from Echuca and rejoins the Murray at Koondrook/Barham. 19,450ha of land between the river and the creek is Gunbower Island Forest. The edge of the forest abuts freehold land in some reaches along the creek. Geological and historical data reveals pre 1900 Gunbower Creek would flow only when the Murray River level was high enough to spill over into the course of the creek channel as the creek inlet was higher than the river bed. During dry times the creek was reduced to pools and billabongs.

Fact No 2. Torrumbarry Weir Pool and Torrumbarry Headworks at the Murray River supplies flows to Gunbower Creek. Gunbower Creek supplies irrigation and stock and domestic and town water supply for the Torrumbarry Irrigation Area (TIA).

In 2012 the Hipwell Regulator ($13,45 million) was constructed and completed in 2014 to deliver E/water from Gunbower Creek to Gunbower Forest. The regulator was designed to deliver a capacity of 1600ML/day to Gunbower Forest, In reality the capacity of Gunbower Creek is only 900ML/day [NCCMA Gunbower Creek Flow Report 2007] which is further reduced to 858ML/day through Gunbower Weir to prevent inundation of private land in a short section of the creek [Jacobs Pty Limited, Gunbower Creek Capacity Constraints 2019].

Fact No 3. Climate in this area is Semi-arid with an annual average rainfall between 350mm-400mm per year.

According to the NCCMA Environmental water plans (EWPs)are applied for the reason that the Murray River flooded Gunbower Forest at least 7 out of 10 years before weirs and dams were constructed.

Rivers will create a flood if there is sufficient rainfall and runoff into the system. In the case of the Murray River Catchment, data from the 1850s show it takes the Murray, Ovens, Kiewa, Goulburn, and Campaspe Rivers flooding at the same time to create overbank flows into Gunbower Forest.

What influences the weather in Eastern Australia?

Extract**:**

Multi-century cool- and warm-season rainfall reconstructions for Australia's major climatic regions. School of Earth Sciences, University of Melbourne, Melbourne. https://doi.org/10.5194/cp-13-1751-2017

Australian seasonal rainfall is strongly affected by large-scale ocean–atmosphere climate influences. Australia's climate varies between extreme states of severe dry conditions and devastating wet episodes affecting large areas of the continent (Nicholls et al., 1997). Shaped by high variability and persistence, floods, heat waves and droughts. Australia is highly vulnerable to changes in the climate system. One reason for the diversity in climate states is the influence of, and interactions among, large- scale ocean–atmosphere modes of variability. These include the El Niño–Southern Oscillation (ENSO), the Indian Ocean Dipole (IOD), the Southern Annular Mode (SAM), and atmospheric characteristics such as the strength and location of the subtropical ridge (STR) and the presence of atmospheric blocking (BLK). Critically, these tropical and extra-tropical modes of variability operate at and across different temporal scales and their individual and interacting influences have strong – and diverse – seasonal and regional effects on Australia's climate (Cai et al., 2014; Drosdowsky, 1993; Larsen and Nicholls, 2009; Maher and Sherwood, 2014; McBride and Nicholls, 1983; Oliveira and Ambrizzi, 2016; Ummen- hofer et al., 2011; Wang and Hendon, 2007; Watterson, 2009, 2011).

Over the 20th century many regions in Australia have experienced prolonged pluvial and drought periods that are documented in the gridded, instrumental records starting in 1900.

Rainfall variations over the Australian continent show a large degree of spatial coherence at seasonal and longer time steps, due to the relatively simple terrain geometries and orography. The Climate Change in Australia report (CSIRO and Bureau of Meteorology, 2015) applied a regionalisation scheme to define eight natural resource management (NRM) regions with similar climatic and biophysical features. The NRM clusters and their abbreviations are listed in Table 1 n this study, we use a di- verse network of local and remote paleoclimate proxies to perform a reconstruction of cool- and warm-season rainfall in these eight NRM regions of Australia.

The aims of this study are as follows:

1. To consolidate relevant hydroclimate-sensitive paleo- climate records.
2. To assess the sensitivity of the paleoclimate records to the influences of large-scale climate influences and test the stationarity of these relationships.
3. To exploit the sensitivity of paleoclimate proxies to large-scale climate influences and develop skilful paleoclimate reconstructions of seasonal rainfall in eight NRM regions for several centuries into the past.
4. To compare the occurrence of wet and dry periods in the past to those in the instrumental period to provide a longer-term context for recent observed events and trends.

Table 1. Summary of climate drivers, regions and droughts. (a) Climate indices and references for computational information; (b) mean, minimal and maximal seasonal contributions to annual rainfall totals (in %) for natural resource management (NRM) regions of Australia; and (c) instrumental and historical droughts.

(a) Climate Indices			(b) NRM Regions			(c) Droughts	
Climate index	Name	Ref	Region Abbrev.	Region name	Annual rainfall Cool: C; warm: W Avg (min–max)	Drought name	Period
SOI	Southern Oscillation index	BOM	MN	Monsoonal North	C: 10 % (5–25 %) W: 90 % (75–95 %)	Millennium Drought	1997–2009
NCT	Niño Cold Tongue index	Ren and Jin (2011)	WT	Wet Tropics	C: 18 % (7–39 %) W: 82 % (61–93 %)	World War II Drought	1935–1945
NWP	Niño Warm Pool index	Ren and Jin (2011)	EC	East Coast	C: 33 % (14–62 %) W: 67 % (38–86 %)	Federation Drought	1895–1903
EMI	El Niño Modoki index	Ashok et al. (2007)	CS	Central Slopes	C: 37 % (14–66 %) W: 63 % (34–86 %)	SE Drought	1836–1845
BLK	Blocking index	Pook and Gibson (1999)	MB	Murray Basin	C: 56 % (35–77 %) W: 44 % (23–65 %)	Goyder Line Drought	1861–1866
STRI	subtropical ridge	Drosdowsky	SSWF	Southern and South-	C: 72 % (43–87 %)	MD Basin	1797–1805

	intensity	(1993)		western Flatlands	W: 28 % (13–57 %)	Drought	
STRP	subtropical ridge position	Drosdowsky (1993)	SS	Southern Slopes	C: 56 % (44–66 %) W: 44 %(34–56 %)	Great Drought	1809–1814
DMI	Indian Ocean Dipole	Saji et al. (1999)	R	Rangelands	C: 32 % (9–55 %) W: 68 %(45–91 %)	Sturt's Drought	1809–1830
SAM	Southern Annual Mode	Marshall (2003)				Black Thursday	1849–1866
						Settlement Drought	1790–1793

The Federation Drought (1895–1903) was one of the first multi-year periods of below average rainfall since Euro- pean instrumental data collection began in Australia. There were also pronounced rainfall deficits during the World War II Drought (1939–1945) and the Millennium Drought (1997– 2005), with devastating effects on regional agriculture and the broader economy (van Dijk et al., 2013) [Ref: Multi-century cool- and warm-season rainfall reconstructions for Australia's major climatic regions 2017.]

Below: Chart compiled from https://trove.nla.gov.au/ newspapers and Journals, Flood and Drought records to question the reasoning behind flooding Gunbower Forest 7 out of 10 years. The table has been set out in ten- year periods to align with NCCMA planning of flooding the Gunbower Forest.

Year	**Floods**	**Droughts Duration**
1790-1793		Settlement Drought 3 yrs.
1797-1805		MDB Drought 8yrs.
1809-1814		Great Drought also affected MDB 5yrs. 5yrs.
1836 -1845		South Eastern Drought 9yrs.
1849 -1866		Black Thursday Drought 17yrs.
1867	90yr Flood 2nd Highest at Echuca	
1870	100yr Flood Echuca Wharf 96.20m	
10 Year Time frame		
1870 to 1880	1 Flood (1870)	
1880 to 1890	1 Flood (1889)	
1890 to 1900	No Floods	
1900 to 1910	No Floods	1885 to 1903 Federation Drought 8yrs.

1910 to 1920	2 Floods (1916 & 1917)	1908 to 1915 Drought in Victoria 7yrs.
1920 to 1930	No Floods	
1930 to 1940	No Floods **1936 Hume Dam completed**	1937-1945 WWI Drought 7yrs.
1940 to 1950	No Floods	
1950 to 1960	2 x 100yr Floods (1955 & 1956)	
1960 to 1970	No Floods	
1970 to 1980	2 x 100yr Floods (1974 & 1975)	
1980 to 1990	1 Flood (1983)	
1990 to 2000	4 Floods (1992, 1993, 1995, 1996)	
2000 to 2009	No Flood	Millenium Drought 10yrs.
2009 to 2019	3 Floods (2010,2011, 2016)	
2019 to	2022 1 /100yr Flood	

The above table and information confirm Droughts & Floods recorded between:

- 1790 and 1890 (100 Yrs.) there was 42 years of Droughts recorded
- 1890 and 1990 (100 yrs.) there was 22 years of Droughts recorded
- 1990 and 2022 (32 yrs.) there was 10 years of Droughts recorded
  Total of 74 years of Drought in 232 years.
- 1790 and 1890 (100 years) there was 4 Floods recoded
- 1890 and 1990 (100 years) there was 7 Floods recorded
- 1990 and 2022 (32yrs) there was 8 Floods recorded
- **Total of 19 floods recorded in 232 years = 12.105 floods per 100 years.**

NCCMA E/ water plan is to flood Gunbower Forest 7 times in 10 years. This equates 70 floods in 100 years!

Myall Family Picnic in the Bottom of the Murray River at Myall 5th April 1915.

Myall Picnic Party in the Dry Bed of the Little Murray in 1915 –photo Myall Heritage Centre

Both photos taken the same day

Below: Extract taken from-

M. Freund et al.: multi-century cool- and warm-season rainfall reconstructions **to compare data with Floods and Droughts along the Murray River recorded between Echuca & Gunbower from 1867 to 2011.**

Table 2. Extreme years. Summary of the driest and wettest seasons for the Murray Basin region for different baselines. Different baselines refer to the instrumental period (Instru: 1900–2014) and the extended reconstruction period (pre-Instru: 1200–2014). Years highlighted in bold are among the 10 highest/lowest values for the entire reconstruction and instrumental period and therefore referred as extreme. Note the reconstruction period starts for verified periods only and differs for regions and seasons.

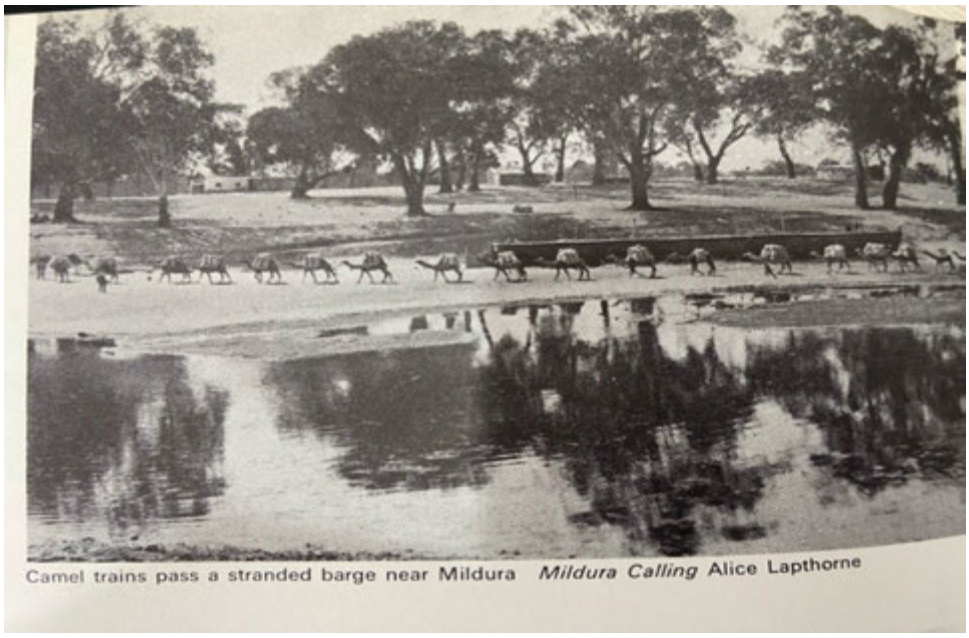
Region	Extreme	Period	Warm season	Cool season
Murray B	Driest	Instru	**1902**, **1900**, 1905, 1901, 1931, 1918, 1925, 1932, 1963, 1951	**1982**, **1976**, **1994**, **1966**, **2006**, **1980**, 2002, **1925**, 1936, 1914
		Pre-Instru	**1540**, **1691**, **1251**, **1695**, **1542**, **1485**, **1543**, **1394**, **1900**, 1899	1778, 1779, **1811**, **1838**, 1480, 1817, 1885, 1481, 1607, 1780
	Wettest	Instru	**2010**, **1992**, **2011**, **1950**, 1973, 1971, 1955, 1983, 1970, 1956	**1915**, **1916**, 1922, 1973, 1956, 1970, 1974, 1968, 1975, 1917
		Pre-Instru	**1694**, **1668**, **1588**, **1751**, **1340**, **1750**, 1298, 1795, 1693, 1732	**1572**, **1516**, **1706**, **1495**, **1649**, **1532**, **1523**, **1575**, 1537, 1721

Dates highlighted correspond with previous chart: Wettest years

Driest years

1902 Royal Commission

The 1902 Royal Commission into the Murray River used the long-standing River boat trade going back to the 1860s to calculate that the river boats could only operate for 6 to 7 months of the year because the water level was greater than 4 feet. This then logically means that for 5 to 6 months of the year the river level was less than 4 feet, and it is not rocket science to understand that during the peak of summer the water level was little more than a trickle. The peak of the flows was the snow melts that disappeared by mid-December at the end of the Murray River system due to the lagged flows.



Camel trains pass a stranded barge near Mildura *Mildura Calling* Alice Lapthorne

Delivery of E/Water to Gunbower Forest

Torrumbarry Weir Pool and Torrumbarry Headworks supply flows to Gunbower Creek.
Gunbower Creek supplies irrigation and stock and domestic and town water supply for the Torrumbarry Irrigation Area. Gunbower Creek supplies E/ water to Gunbower Forest through the Hipwell Regulator.

In 2012 to 2014 the Hipwell Regulator was constructed to deliver E/water from Gunbower Creek to Gunbower Forest at a cost of $13,45 million. The regulator was designed to deliver a capacity of 1600ML/day to Gunbower Forest in reality the capacity of Gunbower Creek is only 900ML/day [NCCMA Gunbower Creek Flow Report 2007] which is further reduced to 858ML/day through Gunbower Weir to prevent inundation of private land in a short section of the creek [Jacobs Pty Limited, Gunbower Creek Capacity Constraints 2019].

Flood 2022

During the last week in June 2022, E/water delivery commenced to Gunbower Forest through the Hipwell Regulator. There was community concern due to 3 years of good winter rains had saturated the land and the floodplains in the catchment indicating a flood was likely. Murray River flows were on the rise from 12,557.35 ML/day on the 1/07/2022 increased to 14,603.92ML/day on the 7/07/2022 at Torrumbarry Weir.

At the height of the flood 55,236.3ML/day- 7.832m AHD flow at Torrumbarry Weir on 25/10/2023, there was so much flood water on top of E/water in the forest the flood water began to flow back over the regulator into Gunbower Creek carrying with it toxic black water which cause fish kills.

Above: 24/10/22 Hipwell Regulatior showing blackwater flowing from the forest into Gunbower Creek.

Above: 23/011/2022 -Dead Murray Cod at the Hipwell Regulator

Conculsion:

- **Hipwell Regulator was not designed to resist a 1/100 year Flood.**
- **Contraints on Gunbower Creek prevent Hipwell regulator operating at full capacity.**

1. Summary

The North Central Catchment Management Authority (North Central CMA) and its project partners engaged Jacobs to undertake this *Investigation into the capacity of Gunbower Creek* in response to observed changed in hydraulic efficiency since 2010. The project is funded through Stage Two of The Living Murray (TLM) Gunbower Environmental Works and Measures Program.

The focus area for the project is the stretch of Gunbower Creek between Gunbower Weir and the Hipwell Road Weir, the major diversion point for environmental flows into Gunbower Forest. However, other parts of the Creek where changes have been observed, Gunbower Creek downstream of Cohuna Weir and Spur Creek within Gunbower Forest, have also been considered.

The two key objectives of the project are to:

1. Investigate the changes in the hydraulic efficiency of Gunbower Creek, including the impact on flows into Gunbower Forest.

2. Consider what may be causing the changes in hydraulic efficiency in Gunbower Creek, how these might change over time and the implications for the Gunbower Creek system.

This project has considered whether the capacity of the Gunbower Creek is declining and what may be contributing to these changes over time. In summary, it considers the following questions:

- What are the issues posed by changed hydraulic capacity in the creek?
- What processes may be influencing the hydraulic efficiency and how might these be affected by short and long term management of the creek?
- What are the broader management objectives for the creek, and where do these issues sit in the context of current policy and legislation?
- What are the next steps and monitoring priorities to better understand what is causing the reduction in channel capacity?

It was found that an evidence-based assessment of the changes in hydraulic efficiency of Gunbower Creek over time and the likely future changes was problematic because:

- The creek is a dynamic system and its hydraulic characteristics vary seasonally and between years; and due to complex relationships between aquatic vegetation, treefall and perhaps silting.
- There is limited water level monitoring data available, with measurements taken only in 2014 and for a short duration in 2018. This does not provide a good representation of change over time. Additionally, the water level monitoring in 2018 was constrained by current operational limits of approximately 850 ML/d at Gunbower Weir to prevent inundation of private land in a short section of creek and does not represent the actual flow rates possible if this constraint did not exist.
- There is a lack of repeat cross-section surveys to enable assessment of changes in stream form and sedimentation over time.
- There is a lack of historical information on woody habitat and the rate it was extracted from Gunbower Creek, making it difficult to determine if the rate of tree fall into the channel is accelerating.

It was found that effort would be better spent in identifying a future monitoring program so that capacity changes can be measured; rather than doing an assessment using the currently available data that would have a low level of certainty. Hydraulic modelling could also be undertaken to further explore the relationship between increased stream roughness (woody habitat and hornwort) and capacity within the creek. However, to have confidence in these predictions requires good data to calibrate against. As such, a range of additional activities have been proposed in order to gather this data prior to any further modelling being undertaken, including:

- Monitoring obstructions within the creek under a range of flow conditions (including high flows) to establish the effect on local and upstream water levels, to observe build-ups of aquatic vegetation and to compare the effect on water levels before and after works to remove obstructions on water level.
- Improving flow monitoring at Hipwell Road by installing continuous flow monitoring at the regulators.
- Improving water level monitoring at Deep Creek to use as a control to compare with other locations impacted by drawdown effects.
- Surveying the creek channel and mapping bed materials, channel geometry, submerged woody habitat and aquatic vegetation to establish a baseline dataset that could be compared with future repeat surveys to study the trajectory of change.
- Monitoring hornwort to study the effects on flow.
- Mapping reed beds downstream of Cohuna Weir.
- Undertaking hydraulic modelling of the Gunbower Creek through the Narrows.

Undertaking these activities will enable a more accurate evidence based assessment of the changes in the hydraulic efficiency of Gunbower Creek over time, the causes of this, the likely future changes and recommendation of effective management actions to address these causes or changes.

Central Murray Environmental Flood Plains Group Inc
Environment Committee's
Report into the State of the Gunbower Forest
and its present Management

Geoff Wakeman
Chair, Environmental Committee

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27th June 2023

Contents

Report prepared by

Geoff Wakeman & Gaell Hildebrand
Chair, Environmental Committee

Geoff and his wife, Dr Gaell Hildebrand (PhD - Science Education), both grew up in Cohuna.

Geoff graduated with a Diploma of Applied Science before obtaining a Graduate Diploma in Business Administration.
His working life consisted of management roles in Australia and Hong Kong before returning to Cohuna as General Management of a local construction materials business.

Gaell was an Associate Professor at Monash University before she returned as Principal of the Cohuna Secondary College

Geoff has had a lifetime of interest in the Gunbower Forest

Cover photo Koondrook Track at 5-mile Break in the Gunbower Forest. Flooded country to the left of the track no vegetation. Natural Rainfall country to the right of the track.

Can you see the difference?

“Natures Tea” (Blackwater)

A report titled:

“Establishing a monitoring program to determine carbon exchange during managed flood events in Gunbower Forest (2018)”

has been prepared by Darren S. Baldwin
for North Central Catchment Management Authority.

The recommendations in this report have not been carried out resulting in false conclusions being promoted and negative consequences for the waterways.

As a result of the Natural Flood being added to the already present Environmental Watering, extensive blackwater occurred throughout Gunbower Forest in 2022-23.

In the 2020 Basin Plan Evaluation (page 16) it mentions:
“A certain amount of flooding is required so that floodplains receive water; importantly, this flooding also ensures that wetland plants can “filter’ the water by extracting carbon and nutrients, for the benefit of plants and aquatic animal species and to provide downstream environments and water users with good quality water”.

With the significant reduction in wetland plants (see elsewhere) little to no ‘filtering’ is being achieved

At the Hipwell Regulator, due to poor design (see elsewhere) the water then flowed from the forest back into the Gunbower Creek.

Hipwell Regulator (Dec 2, 2022)

Blackwater flowed over the top of the regulator gates and also through the fishlock leading to a large vegetation growth in the creek (Dec 2, 2022).

An additional effect of this blackwater was fish kills. The following photo shows four dead Murray cod between the regulator and the Gunbower creek. (Dec 20, 2022).

The extensive growth of Duckweed/Azolla and other vegetation resulted in a massive build-up at the Cohuna Township Bridge (Dec 27, 2022). This rotting material was very smelly over the peak holiday period.

This build-up, adjacent to the town water supply, resulted in the water processing plant being unable to produce water of a suitable standard resulting in some consumers being denied water.

In turn this meant water had to be trucked from Echuca (a distance of 64 kilometres).

This vegetation was mechanically removed, eventually.

Unfortunately, it returned, and this time was removed by a machine specifically designed for this type of operation (Feb 14, 2023).

Damien Cook, (North Central CMA, Consultant Ecologist) claimed "Azolla usually only gets really dense and persists as a problem if there are too many nutrients in the water **caused by poor farming practices** … ". However, this event was poor environmental watering practices.

Numerous articles appeared in local newspapers during October and November 2022 warning of the dangers to Crayfish, Yabbies and Fish of blackwater with the Country News article (Nov 1, 2022) summing it up:

"Water authorities have warned of the danger of blackwater events in rivers and streams following widespread flooding across northern Victoria".

When North Central CMA were asked "What else will benefit from the forest watering …?" one of the answers was:

"Support carbon and nutrient cycles in the forest and wetlands and periodically deliver carbon and nutrients from the forest to adjacent waterways to support food webs".

Baldwin in his report (page 14) mentions:

“The flood-return water will obviously deliver nutrients and carbon to the Murray River” with a postscript saying:

“Although it may not be detectable. A BRAT modelling run, assuming 1600 ML inflow into the forest, starting in July and lasting 60 days, with the Murray River flowing at 5000 ML/day, suggests that at most there would be an increase in DOC concentration in the Murray River of about 0.1 mg/L, which, given the accuracy of the DOC analysis and the temporal variability in the Murray River, may not actually be detected.”

The slight black smudge in the centre of the photo (Aug 20, 2022) is the full inflow of blackwater from the Gunbower Creek - As suggested by Baldwin it is diluted almost immediately.

We have a situation where North Central CMA are claiming significant benefits “to support food webs”, with no supporting data and ignoring the very serious damage being done blackwater as a result of environmental watering.

Little Gunbower Regulator failing 13-07-2023 Blackwater polluting the Gunbower Creek

Birds

In The Koondrook-Barham Bridge newspaper
(May 25, 2023) a “Community Update” from North Central CMA makes the following claims:

“Thankfully there is plenty of water in our region’s lakes and wetlands to help thousands of waterbirds survive the coming months, but different species need different habitat. There are some waterbirds, such as the great egret, that prefer Gunbower Forest’s floodplain habitat.

Monitoring during spring 2022 to autumn this year, recorded more than 1,000 juvenile waterbirds at Gunbower Forest alone, including little pied cormorants, nankeen night herons, Australasian darters, ducks, swans, herons, grebes and sea eagles.

Over 15,000 birds were recorded during 69 surveys, including 41 species of waterbirds, 17 of which are rare or endangered. 21 of the wetland bird species were observed breeding.

Waterbirds need foraging sites and food sources nearby to increase their chances of survival and water for the environment can provide the right conditions for them to stay and thrive. Gunbower Forest can also provide better habitat for some species than open water lakes.”

The following is written based on the observations and experiences of five Central Murray Environmental Floodplain Group Inc. members who all live within 500 metres of Gunbower Forest and with four of those members living immediately adjacent to the Gunbower Creek (one lives approximately 2 kilometres from the creek).

The most waterbirds ever recorded was in 2018 by BirdLife Australia who recorded the following at the junction of the Little Gunbower Creek and Long Lagoon in Gunbower Forest.

BirdLife Australia			
Bird		**Nest**	**Young**
Description	**Count**		
Pacific Black Duck	12	No	Yes
Grey Teal	84	No	Yes
White-faced Heron	8	No	No
Australian White Ibis	8	3	Yes
Little Pied Cormorant	120	42	Yes
Australasian Darter	18	3	Yes
White-throated Treecreeper	1	No	No
Australian Raven	4	No	No
TOTAL WATERBIRDS	**250**	**48**	
TOTAL BIRDS	**255**	**48**	

Hence the claim that we suddenly had 15,000 birds is extremely dubious and needs reviewing.

69 Surveys conducted.

69 surveys work out to be approximately 1 every second working day.

To carry out a bird survey to almost all the Lagoons, Swamps and Creeks in Gunbower Forest throughout the 2022/23 waterings it would be necessary to wade through water up to 1 metre deep and for distances measured in kilometres.

Reedy Lagoon was accessible, and it was possible to kayak to Green Swamp via the Yarran Creek although the duckweed was so thick initially, kayaking was impossible.

Junction of Corduroy/Halfway Stump Tracks (July 29, 2022)

Note the track closed sign in the middle of the photo.

Wading along these tracks was considered extremely hazardous.

Corduroy Track

North Central CMA should be able to provide a copy of each these 69 surveys to explain:

Question 1
On what days were these surveys performed?

Question 2
At what sites were these surveys performed?

Question 3
Who performed these surveys?

Question 4
What bird types, and numbers of each, were recorded?

An explanation of the calculation performed to arrive at 15,000 birds will then be obvious i.e.

Did one survey identify 15,000 birds or did 69 surveys identify 217 and hence 69 times 217 equals 15,000?

Nesting

The following was reported by Damien Cook (NCCMA Consultant)

Gunbower Forest Bird Nests (2022-23)		
Description	**Location**	**Number**
Little Pied Cormorant	Little Gunbower	124
Little Pied Cormorant	Black Swamp	121
Australasian Darter	Little Gunbower	6
Australasian Darter	Black Swamp	15
Nankeen Night Heron	Little Gunbower	35
Total Nests		**301**

At two adults and four juveniles per nest we have 1,806 birds. This leaves 13,194 birds unaccounted for!

Local Observation

The five members with a close physical association with/to the forest and creek all support the following:

1. There was no noticeable change in the number(s) of birds seen in, or flying over, Gunbower Forest.

2. With Gunbower Creek being an excellent food source for waterbirds no noticeable change in the number of birds frequenting the creek was observable.

It is incredulous that 15,000 birds can be present in Gunbower Forest and not noticed by members living along 70 kilometres of creek frontage.

Community Update(s)

Gannawarra Times newspaper (March 14, 2023), Community Update from North Central CMA.
“Vulnerable magpie geese spotted at McDonalds Swamp. Although common in the Australian northern tropics, this large, distinctive black and white waterbird was once a regular sighting in permanent and seasonal wetlands in Victoria …”

Magpie geese have been present at Kow Swamp for at least six years and breeding regularly. McDonalds Swamp is approximately 30 kilometres from Kow Swamp.

Magpie Geese at Kow Swamp (May 1, 2017)

Gannawarra Times newspaper (April 25, 2023), Community Update from North Central CMA.
“In late 2022, there was another significant waterbird breeding event at floodplains and wetlands in northern Victoria. Across the region, more than 18,000 adults were counted with actual numbers expected to be about 40,000.

In Gunbower Forest alone, more than 1,000 juvenile waterbirds were recorded including little pied cormorants, nankeen night herons, Australasian darters, ducks, swans. Herons, and grebes, and sea eagles. We expect these numbers to be a lot higher.

Despite the recent wet conditions, floodplains in our region and further afield are drying out and young waterbirds leaving the protection of the nest will soon be spreading their wings looking for places to forage and shelter over the coming months.

The lagoons, swamps and creeks have remained full but only minimal waterbirds are currently present at these sites.

When floodplains and wetlands receive the right amount of water for the environment at the right time it goes a long way toward creating habitat to help waterbirds survive - deep wetlands surrounded by healthy trees, with shallow water for waders with plenty of fish, yabbies, shrimp and other waterbird food.

Hipwell Regulator (Jan 28, 2023)

Blackwater resulted in the death of yabbies and shrimps, throughout the forest and associated river and creeks.

and there is a shortage of aquatic plants throughout the forest.

Reedy Lagoon (April 19, 2023)

and

Green Swamp (March 29, 2023)

Food Source(s)

We noticed in a recent publication that “To date, the occurrence of overbank flows, whether regulated or unregulated has varying effects on carp, but even in situations where carp have increased, there have still been environmental benefits, in part because juvenile carp are an important food source for waterbirds.”

Very few waterbirds survive entirely on fish! The most common food source for waterbirds is probably aquatic plants, with others including insects (both aquatic and terrestrial), aquatic animals (other than fish), molluscs and grass.

Is the suggestion now being made that the “environmental benefits of juvenile carp being an important food source for waterbirds” outweigh the environmental damage caused by carp?

Ecological Objectives

On May 17, 2023, the following was requested (by email) from Mr Brad Drust (Chief Executive Officer, North Central CMA) and Dr Sarina Loo (co-CEO, Victorian Environmental Water Holder):

“Can you please advise us of the Ecological Objectives that have been set for this watering, the associated targets and the watering regime in the format as laid out in the:

Gunbower Forest: Environmental Water Management Plan (2011).
MDBA Publication No. 221/11

NO REPLY HAS BEEN RECEIVED

European Carp

In the report titled:
“Carp movements on an inundated floodplain -
Gunbower Forest case study (2019)
J. Lieschke et. al.
and prepared for
North Central Catchment Management Authority,

It says (page 1);
“The North Central Catchment Management Authority (North Central CMA) prepared a Carp Management Strategy to inform future environmental watering in Gunbower Forest and to document complementary management actions that can be used to reduce Carp numbers. This study addressed a recommendation of the Carp Management Strategy; to identify the movement patterns used by Carp throughout Gunbower Forest, where fish remain after flooding, and the primary entry and exit pathways from the Murray River system.”

No such Plan is available.

It also says (page 3);
“The impacts of Carp have the potential to limit progress towards achieving Icon Site ecological objectives. In Gunbower Forest, there is evidence that Carp are impacting both water quality (turbidity) and the establishment of aquatic vegetation (Bennetts and Sim 2016) and that they compete with native fish populations, potentially inhibiting their recovery (Koehn et al. 2017).”

Nothing is being done to address the carp issue.

As a result of the 2022/23 flooding extensive carp numbers were noticed on the forest side of the Hipwell Regulator.

At 7:00am and 7:00pm the exit and entry gates on the fish lock operated to allow the fish (carp) on the forest side of the regulator to enter Gunbower Creek.

The above photo (Dec 31, 2022) is only a small portion of the number of carp that were entering Gunbower Creek on a daily basis.

As you can see from the following photo/sign, consideration was given to the native fish moving from the creek to the forest to “fatten up on the abundant
Food resources in the creeks and wetlands created by the flood.

As water begins to drain from the forest, water levels in the wetlands and creeks drop, signalling to native fish that it’s time to leave.

Fish then swim from the forest, up the Hipwell Road channel back towards Gunbower Creek. The fish lock on the regulator enables them to safely move back into the creek”.

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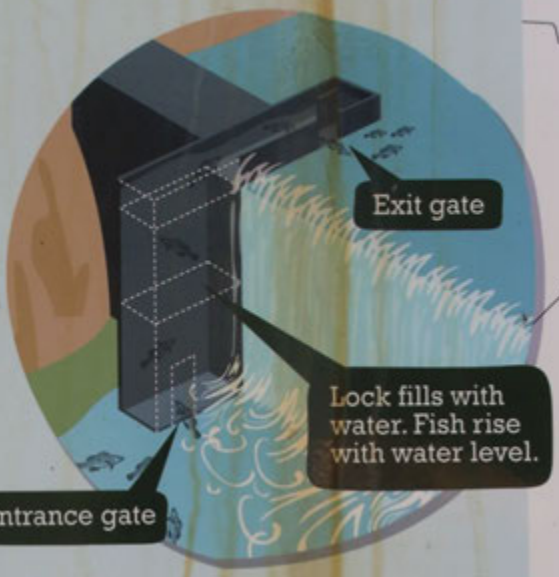


Freely moving fish

The Hipwell Road offtake regulator you see here includes a fish lock, which is type of fishway that operates in a similar manner to a navigation lock. Fish enter a downstream chamber which is sealed and the water level rises until it is level with the upstream weir pool.

When environmental water is being delivered to Gunbower Forest, fish will move from the creek into the forest, where they can fatten up on the abundant food resources in the creeks and wetlands created by the flood.

As water begins to drain from the forest, water levels in the wetlands and creeks drop, signalling to the native fish that it's time to leave.

Fish then swim from the forest, up the Hipwell Road channel back towards Gunbower Creek. The fish lock on the regulator enables them to safely move back into the creek.

*Areas shown as flooded are indicative only.
please contact Parks Victoria or DEPI via the c

There are a few problems associated with this:

1. It has now been shown that Murray cod/native fish do not move onto the floodplain (Koehn J.D.).

2. A significant drop in water level, for example, 0.3m over 48 hours, is required to cue large and medium-bodied fish to leave the floodplain. (Native Fish Recovery Plan - Mallen-Cooper et.al. 2014). This cannot physically happen across the Gunbower Floodplain.

3. There is no mechanism to prevent carp leaving the floodplain.

Thus, we have mass migration of carp from the forest floodplain, at Hipwell Regulator, into Gunbower Creek.

When this was first observed (prior to the above photo - Dec 31, 2022) North Central CMA were advised of this fact and it was suggested the exit gate be closed, whereby the reply was received “Everyone’s on holidays.”

The gate was eventually closed on Jan 6, 2023.

At the Koondrook Weir fish ladder (Jan 2, 2023) the following was occurring:

Carp that had entered the Gunbower Creek at Three Corner Hole (immediately up-stream of the Murray River junction), had moved up to the Koondrook Weir and were moving up the fish ladder.

The apparent blackness of the water in the above photo is actually solid carp.

A significant number of carp were also observed along the banks of the Murray River.

The exit gate was also closed Jan 6, 2023, some two weeks after the carp were first noticed by locals.

In “The National Carp Control Plan - Australian Government (2022)” and on page 84 it states the following for the mid-Murray Case Study:

“4.4.4. Possible pre-deployment density reduction

The mid-Murray case-study area holds generally high carp densities, Consequently, the 40-60% carp reductions expected to follow virus deployment may still leave higher densities than would occur in less resilient populations. While any carp reduction has the potential to deliver ecological benefits, such benefits may be enhanced if virus deployment in the mid-Murray is preceded by targeted, intensive harvesting to reduce carp ‘starting density’.

4.4.9 Conclusions

….. As with the lower Murray, carp biocontrol outcomes in the mid-Murray could potentially be enhanced if targeted harvesting occurred before virus deployment.”

SUMMARY

1. NCCMA do not have a Carp Management Strategy.

2. Carp bred on the floodplain in very large numbers and were allowed into the Gunbower Creek and Murray River.

3. No actions are being taken to reduce carp densities.

4. The current environmental watering will again lead to a large increase in carp entering the Murray River as no actions have been taken to reduce numbers prior to this watering.

5. Failure to close the fish lock and fish ladder gates will result in an increased number of carp in Gunbower Creek.

6. **The MDBA propose in the “Gunbower Forest Environmental Water Management Plan” (page 28) that “The operating strategy for wetlands aims to replicate the pre-regulation cycle of wetting and drying. More frequent drying phases may be adopted if required to manage carp and aquatic weed invasion” The exact opposite is occurring.**

Ecological Objectives

Although the Victorian Environmental Water Holder has set Ecological Objectives for Gunbower Forest no targets have been set resulting in no measures of the success or otherwise of Environmental Watering is available.

Historical CEWH (page 25)

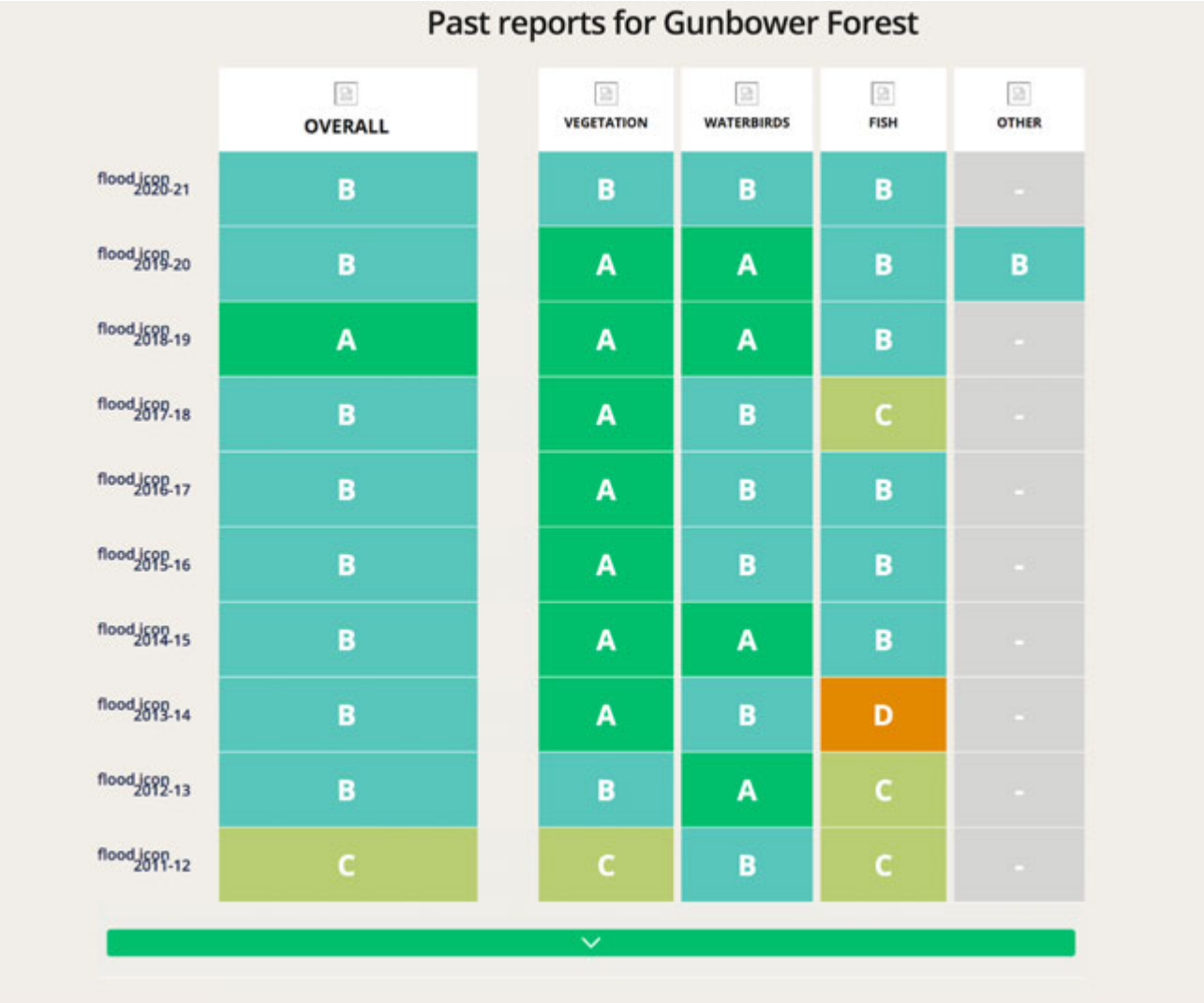
1. Maintain aquatic habitat and facilitate fish breeding, dispersal and migration in Gunbower Creek - Not met.
    - Duckweed at Cohuna Bridge (see elsewhere).
    - Carp entering Gunbower Creek from Forest (see elsewhere).
2. Facilitate fish movement to and from Gunbower Creek, Gunbower Forest and the Murray River - Not met.
    - Native fish do not move onto the floodplain (see elsewhere).
3. Maintain the health and habitat values of creek habitat and riparian vegetation within Gunbower Forest - No met.
    - Extensive Duckweed/vegetation in Gunbower Creek.
4. Restore the plant community structure and diversity of wetlands, forest and woodlands - Not met.
    - Plant structure throughout the forest is reducing.
5. Promote successful breeding events by waterbirds, fish and other fauna by providing seasonal inundation in wetland and forest habitats - Not met.
    - Breeding is principally by carp with minimal waterbirds.
6. Minimise blackwater risks - Not met.
    - Extensive blackwater produced.
7. Promote natural carbon exchange (cycle) between the river and floodplain - Not met. Carbon exchange is extensive i.e. blackwater

Historical Objectives MDBA (page 16)

Maintain and restore a mosaic of healthy floodplain communities as indicated by:
1. 80% of permanent and semipermanent wetlands in healthy condition.
2. 30% of river red gum forest in healthy condition.
3. Successful breeding of thousands of colonial waterbirds at least three years in 10 - Not met.
    - In 2018 BirdLife Australia recorded the most birds ever in Gunbower Forest with 48 nests and 146 birds.
4. Healthy populations of resident native fish in wetlands. - No met.
    - Wetlands are principally carp infested.

On (August 8, 2022) the MDBA replied by email to Geoff Wakeman that:

"The objectives outlined in the 2012 Gunbower Environmental Watering Management Plan are the current and approved TLM icon site ecological objectives for Gunbower Forest."



Hence, we have the situation were the MDBA rate the Waterbird component of the objectives as an A i.e. Excellent - Most (75-100%) of ecological objectives have been met, when there were 48 nests and 146 birds.

Clearly the objective is not being measured correctly.

Victorian Environmental Water Holder (Seasonal Watering Plans)

VEWH objectives are as set out in the following table:

Victorian Environmental Water Holder			
Environmental objectives in Gunbower Creek and Forest	**Environmental watering objectives in Gunbower Creek and Forest**	**Environmental watering objectives in Gunbower Creek and Forest**	**Environmental objectives in Gunbower Creek and Forest**
2019-20	**2020-21**	**2021-22**	**2022-23**
Maintain and increase populations of large and small-bodied native fish (such as Murray cod)	Provide feeding, breeding and refuge habitat for small-bodied native fish (such as Murray-Darling rainbow fish) in forest wetlands. Maintain and improve populations of large-bodied native fish (such as Murray cod)	Provide feeding, breeding and refuge habitat for small-bodied native fish (such as Murray-Darling rainbow fish) in forest wetlands. Maintain and improve populations of large-bodied native fish (such as Murray cod)	Provide feeding, breeding and refuge habitat for small-bodied native fish (such as Murray-Darling rainbow fish) in forest wetlands. Maintain and improve populations of large-bodied native fish (such as Murray cod)
Increase the population of frogs in the forest by providing feeding and breeding habitat	Provide suitable feeding, breeding and refuge habitat for frogs	Provide suitable feeding, breeding and refuge habitat for frogs	Increase the diversity and abundance of native frog species within the forest
Maintain connections between the River Murray, Gunbower Forest floodplain, wetlands and floodrunners and Gunbower Creek			
Maintain the population of turtles	Provide suitable feeding, breeding and refuge habitat for turtles	Provide suitable feeding, breeding and refuge habitat for turtles	Maintain the populations of freshwater turtles by providing suitable feeding, breeding and refuge habitat
Maintain the health of river red gums, black box and grey box communities	Maintain and improve the health and increase the abundance of native vegetation in permanent and semi-permanent wetlands Improve the health of river red gums, black box and grey box communities	Maintain and improve the health and increase the abundance of native vegetation in permanent and semi-permanent wetlands Improve the health of river red gums and black box communities	Maintain and improve the health and increase the abundance of native vegetation in permanent and semi-permanent wetlands Improve the health of river red gums and black box communities
Provide feeding, breeding and refuge habitat for waterbirds including colonial nesting species, such as egrets, cormorants and herons	Provide feeding, breeding and refuge habitat for waterbirds including colonial nesting species (such as egrets, cormorants and herons)	Provide feeding, breeding and refuge habitat for waterbirds including colonial nesting species (such as egrets, cormorants and herons)	Provide feeding, breeding and refuge habitat for waterbirds including colonial nesting species (such as egrets, cormorants and herons)
Maintain and improve water quality in Gunbower Creek	Maintain and improve water quality in Gunbower Creek	Maintain and improve water quality in Gunbower Creek	Maintain and improve water quality in Gunbower Creek
	Support carbon and nutrient cycles in the forest and wetlands and periodically deliver carbon and nutrients from the forest to adjacent waterways to support food webs	Support carbon and nutrient cycles in the forest and wetlands and periodically deliver carbon and nutrients from the forest to adjacent waterways to support food webs	Support carbon cycles and nutrient cycles in the forest and wetlands and periodically deliver carbon and nutrients from the forest to adjacent waterways to support food webs

Although objectives have been set there are no measurable targets to determine whether success is being achieved or otherwise.

On April 20, 2023, NCCMA were asked the following questions:

1. What measurable targets have been set for the VEWH objectives?

2. What criteria are being used to assess performance?

3. What results have been achieved (to-date) on a yearly basis?

On June 12, 2023, another question was added (in recognition that results may vary from plans),

4. What actions were taken before the 2021-22 and 2022-23 waterings to achieve the above objectives?

Following on from the article in the Country News (May 2, 2023, - page 14) where it said:

"*Water for the environment is due to be delivered in Gunbower Forest this winter and spring to build on the breeding events that occurred in the forest and across the northern wetlands after the 2022 floods and rain*".

It was requested (May 17, 2023) could NCCMA please advise us of:

1. the Ecological Objectives that have been set for this watering,

2. the associated targets and

3. the watering regime

In the format as laid out in the:
Gunbower Forest: Environmental Water Management Plan 2011. MDBA Publication No. 221/11

No reply has been received.

It is clear that the only action being taken is:

"JUST ADD WATER"

with objectives being altered to suit outcomes rather than actions being taken to achieve stated objectives.

Environmental Water Flow Volumes (Frequency/Extent/Duration)

The frequency/extent/duration of the flooding, prior to river regulation, was determined by the height of water in the river whereas frequency/extent/duration is now determined by artificially raising the height of the creek (Hipwell Weir) and the regulator gates (throughout the forest) remaining closed to prevent water returning to the River.

This change in frequency/extent/duration is having a marked effect on the ecology of the forest.

Up-date: June 27, 2023

The following photo was taken of the Murray River at Shillinglaws Regulator (Sept 21, 2021) and shows a Murray River flow rate of 15,137 ML/d. As suggested from the attached table only ~100 ML/d would be entering the forest.

There are six locations were this would/could occur (principally from the Gunbower Creek).

However, it should be noted that the water, in the forest, would be low i.e., a similar height below the surface as per the above photograph. Shillinglaws regulator is also 1.5 metres below the Yarran Creek regulator and hence water would be exiting the forest at this time.

As the water rose, or fell, in the River so would the height of the water in the creek and forest.

Currently floodwaters in the forest are maintained at full height by the presence of closed regulator doors. This enables the water to be retained for many months.

To fully flood the area, the water in the river would need to be as shown in the photograph below:

To maintain this prior to river regulation the river would have had to maintain the above height, for the full period, or the level of water in the forest would have reduced.

Also, it would be necessary for rainfall to continuously occur in the catchment, as with no dams it only takes approximately 11 days for catchment water to reach Gunbower Forest. **No rain equals no water!**

Historical evidence points to the river being low:

1. Paddle-steamers could operate in 50cm of water, but they were only able to operate in the River for 6 to 7 months per year. The river was too low for 5 to 6 months of the year.

2. Even when the paddle-steamers were operating there was a permanent shelter at “Master’s Landing” (this house still exists). Goods were off-loaded at Masters Landing and taken to Gunbower by horse-drawn dray or wagon. This could not happen if the forest was flooded.

3. Grey’s Sawmill (1870 - 1919) was located on the bank of the Murray River. It was basically a township of a size sufficient to have a state school with an average of 19 students per year. This could not occur with a flooded forest.
As can be seen from the table below there are varying Murray River flow volumes (theoretical) that may result in inflows into Gunbower Forest.

There is no justification/consistency for these forecasts and there is certainly no evidence that the forest would be flooded at the extent/frequency/duration as is currently occurring.

Forest Flow Rates at various River Flow Rates				
Source	**Flow (ML/d)**	**Torrumbarry Flow (ML/d)**	**Action**	
MDBA - p.26	Commences	1,500	Inflow	
1,500 ML/d is an almost dry Murray River				
MDBA - p.31	Commences	>14,000	Inflow	
See attached photo.				
NCCMA from Baldwin - p.18	Commences	13-15,000	Inflow	
VEWH (29/08/2022)		18-20,000	Inflow	
"Water can begin to enter Gunbower Forest via natural flow paths …"				
CEWH - p.46	Commences	16,000	Inflow	
Inflow less than 100 ML/d (see CEWH - p.10)				
CEWH - p.10	100	20,000	Inflow	
Only 100 ML/d				
NCCMA from Baldwin - p.18	<200	25,000	Inflow	
CEWH - p.10	2,500	30,000	Drainage	
Shillinglaws channel is too small to handle 2,500 ML/d How does 2,500 ML/d drain into a full river?				

Reedy Lagoon
(Giant rush)

The following aerial photo (2009) shows the entire Reedy Lagoon site.

It should be noted that the majority of the site, especially the centre, is completely free of Giant rush.

Figure 8: Example of wetland type O (permanent freshwater lakes) – Reedy Lagoon (photo J. Mollison; 2009).

"*We monitor giant rush and we're not concerned it's threatening the health of Reedy Lagoon at this stage but will continue to monitor it*" (NCCMA March 8, 2023)

June 27, 2023

Environmental Water Delivery, Gunbower Forest, CEW (2012)

7. Risk assessment and mitigation strategies

7.5 Giant Rush invasion of wetlands

Giant rush (Juncus ingens) is a native emergent aquatic plant endemic to Gunbower Forest and the mid-Murray region. It has emerged as a threat to wetland health in Barmah-Millewa Forest
where it has been promoted by summer flooding that has increased following river flow regulation.

Giant rush has formed extensive, dense beds and excludes other native plant species.

Summer watering will be increased as part of the watering strategy for Gunbower Forest to meet breeding objectives for fish and waterbirds. It is possible these conditions will also favour giant rush establishment in permanent and semi-permanent wetlands.

There are few mitigation measures available for this risk. Watering in summer should be avoided except where clear ecological objectives are being met. Flooding in autumn should be avoided. Deep watering in winter and spring should be provided to reduce giant rush condition.

Gunbower Forest, Environ. Water Management Plan. MDBA (2012)

Table 4.6: Summary of risks and mitigating actions

Giant rush colonisation - Monitoring water regime and burning if required.

Showing Endangered River Swamp Wallaby Grass, with Invasive Giant Rush along edges This 2013 photo's location is centre right of the previous 2009 aerial photo.

The Living Murray Intervention Monitoring 2015-16 Activity Report mentions:

… "In 2014 environmental water was delivered to Gunbower Forest via the Hipwell Road infrastructure. Following the watering event there was a **noticeable** increase in the extent of giant rush at Reedy Lagoon".

The Living Murray Intervention Monitoring 2015-16 Activity Report (continued):

… "Prior to the commencement of environmental watering in 2015, giant rush extent at Reedy Lagoon was photographed using high resolution aerial imagery, … the flight collected approximately 1,200 images …"

One photo is attached to this Activity Report and no other Report was ever prepared.

The Living Murray Intervention Monitoring 2015-16 Activity Report (continued):

"To improve our understanding about the risks associated with environmental water and the spread of giant rush. It is recommended

that the aerial photography mapping exercise be completed, following the same methodology after another watering event".

This initial mapping exercise was not completed, and no other mapping exercise has ever been undertaken.

By June 4, 2021, the Endangered River Swamp Wallaby Grass had been completely replaced by Invasive Giant Rush

NCCMA - Community Newsletter (Edition 3, 2013)

"Annual monitoring of vegetation has taken place since 2006 between March and April to collect information about tree, understorey and wetland vegetation health."

Gunbower Forest Vegetation Condition Monitoring 2021 (Fire, Flood & Flora)

“REEDY LAGOON:

“Reedy Lagoon has been repeatedly recorded with the highest richness and cover of Characteristic flora species and legislatively listed threatened species, compared to the other monitored wetlands over the monitoring period.

These results reinforce Reedy lagoon’s high conservation value and attests to the positive ecological response of this wetland to near annual inundation since 2014 - achieved largely through eWater delivery.”

Reedy Lagoon (Feb 2017)

Reedy Lagoon covered with endangered River Swamp Wallaby Grass

There is currently no vegetation in a site that six years ago was covered in Endangered River Swamp Wallaby Grass

Reedy Lagoon (April 19, 2023)

"*We monitor giant rush and we're not concerned it's threatening the health of Reedy Lagoon at this stage but will continue to monitor it*" (NCCMA March 8, 2023)

Someone should be concerned!

Gagged

Since 20 September 2021 we, the Central Murray Environmental Floodplain Group Inc. (CMEFG) have raised queries on approximately twenty topics with North Central Catchment Management Authority (NCCMA) and/or with the Victorian Environmental Water Holder (VEWH), about their watering plans, actions and consequences.

Our group has begun keeping a photographic record of this environmental watering and its impact and sought to question some of the public claims made by NCCMA and VEWH.

We have received an email (21 Oct 2022) from Brad Drust, Chief Executive Officer, NCCMA stating “While we are committed to responding to community queries, I advise that we can no longer service your requests as we have in the past (i.e. responding to your letters and emails)”.

A similar email was also received from Dr Sarina Loo, Co-Chief Executive, VEWH (24 Oct 2022).

Of the twenty topics we have raised queries about, nineteen of these have been based on publications and/or presentations initiated by the above authorities. We don’t introduce new topics, but only seek clarification or justification for statements made by NCCMA or VEWH.

Of the twenty topics, eight have received no response whatsoever.

Of the answers received the information is often incorrect and/or incomplete, yet we are expected to accept whatever answer is provided and our follow-up questions are generally ignored.

For example, in response to one of our follow-up questions about 7,000 ML/day entering Gunbower Forest we were told “Water can begin to enter Gunbower forest via natural flow paths when Murray flows are as low as 18,000 – 20,000 ML per day”. As the attached photo is 18,000 ML/day we are still waiting for a reply as to how 7,000 ML/day will go into the forest, when the river is this low.

It would appear we don’t receive answers to our follow-up questions as this would render inaccurate the initial claim made.

It is also claimed “that during the three years we estimate that North Central CMA has received, on average, a piece of correspondence from you every two weeks that have often included multiple questions and requests”. Of the twelve questions responded to this works out that **responses** to our queries are being made at the rate of less than one, per active member of the CMEFG, per year, and nine of these twelve have not had follow-up questions answered.

NCCMA/VEWH offered to have a staff member(s) meet with us every two months and this was gratefully accepted. But we’ve now been told that we need to submit our questions before the meeting and at this stage we see no evidence that this is anything but a ploy to avoid providing a written answer. It is certainly not the “effective and efficient” solution proposed by the VEWH as we could be waiting eight weeks for an answer.

We have written records of all our queries, the answers received, and our follow-up questions. We intend to widely communicate these in the immediate future to verify our comments above.

Our queries have all been reasonable and gagging us by not giving written responses from NCCMA and VEWH will only lead to a further lack of transparency in the practices occurring in our forest.

Oxford Dictionary

Definition of a forest: - a large area chiefly covered with trees and undergrowth.

Definition of a wetlands: - land consisting of marshes or swamps; saturated land.

?

What is the purpose of environmental flooding? The forest has obviously been flooded, so why would you have it continually sitting in water?

Ask your common home gardener if it’s a good idea to have all his plants sitting in water for 8 months a year?

Where are the earthworms and bardi grubs gone in the forest that had been flooded?

Gunbower Creek aquatic weed infestation.

Parrots Feather (*Myriophyllum aquaticum*) introduced aquatic weed

- • Parrot's Feather (*Myriophyllum aquaticum*) is a freshwater aquatic herb with feathery, blue-green leaves in rings on stems up to 2 m long, forming vigorously growing tangled mats.
- • It is widely naturalised in the coastal districts of southern and eastern Australia.
- • It is locally troublesome as a weed of ponds, dams, drainage ditches and waterways that impedes water flow, alters habitats, and disrupts recreation and other activities on waterways.
- • Seed is not produced in Australia and it spreads vegetatively by broken stem fragments.
- • Plants are capable of forming dense mats (especially in nutrient-enriched waters).

Hornwort (*Ceratophyllum demersum*) aquatic native to Australia

Above: Hornwort (Ceratophyllum demersum) removed from a pump inlet pipe on Gunbower Creek

- • Hornwort (*Ceratophyllum demersum*) is a free-floating, submerged, rootless, leafy, annual or perennial freshwater herb, reproducing vegetatively and by seed.
- • It occurs in sheltered sites in stagnant or slowly moving water in ponds, dams, streams and reservoirs.
- • Hornwort is native to Australia, occurring in all states except Tasmania.
- • In Australia, Hornwort rarely causes problems when it is in balance with the surrounding ecosystem and can be beneficial. However, when environmental change occurs, the plant becomes weedy and has a negative effect on stream flow, interferes with navigation, fishing and hydro-electric output.
- • Hornwort can be commonly mistaken for species of Milfoil (*Myriophyllum* spp.) and Fanwort (*Cabomba caroliniana*). This is because their submerged foliage looks very similar. The Milfoils and Fanwort have both emergent and submerged leaves, often of different shape, whereas Hornwort has only submerged leaves. The leaves and stems of Fanwort are covered with a thin gelatinous coating, unlike those of Hornwort. Also, the flowers of Fanwort and the Milfoils are emergent whereas the flowers of Hornwort remain fully submerged (Sainty & Jacobs 2003). https://profiles.ala.org.au/opus/weeds-australia/profile/Myriophyllum%20aquaticum
- • Hornwort is an aquatic plant, and as such, is extremely susceptible to any sudden changes in temperature. When temperatures drop below what the hornwort is used to, the plant can become stressed and even die. This is especially true during the winter season, when temperatures can dip well below freezing.
- • Hornwort is an aquatic plant, and as such, is extremely susceptible to any sudden changes in temperature. When temperatures drop below what the hornwort is used to, the plant can become stressed and even die. This is especially true during the winter season, when temperatures can dip well below freezing. https://shuncy.com/article/can-hornwort-survive-winter

Parrot's Feather (*Myriophyllum aquaticum*) and Hornwort (*Ceratophyllum demersum*) have reached invasive levels in Gunbower Creek. Ongoing monitoring and control measures need to be implemented to control invasive plants that are a threat to the environmental values of Gunbower Creek and the supply of irrigation, stock and domestic water for the community. Gunbower Creek supplies Gunbower, Leitchville and Cohuna water treatment plants and farms in the district that produce, beef, dairy products and grain to Victoria. Invasive weeds cause damage to irrigation pumps and interruptions during irrigation. Weeds not only threaten environmental values they are also a threat to these communities. Irrigators and many local people will affirm that when Gunbower Creek was allowed to draw down during winter, aquatic weeds were less dominant in the creek during irrigation season.

Environmental Water (E/water) Delivery

Gunbower Creek is also a conduit for irrigation water. Prior to the implementation of E/water, from the middle of May until the Middle of August Gunbower Creek was left to draw down. Wading water birds (Egrets, Heron, Spoonbill) fed along the submerged beaches. Early historical records show that Gunbower Creek would cease to flow after high water levels dropped in the Murray River as the Gunbower Creek bed is higher than the Murray River, reducing the creek to pools and billabongs. The point is, irrigation using Gunbower Creek was developed over decades. Since 2014 Gunbower Creek has been used to deliver E/water to Gunbower Creek and Gunbower Forest. Authorities are keeping the levels high all year round which is causing bank slumping, silt accumulation and River redgums and Box trees to fall into the water reducing flow and increasing weeds.

2021 Native Fish Report Card (NFRC) survey in the Gunbower Creek. Overall, the Gunbower Creek appears to be maintaining healthy populations of Golden Perch and particularly Murray Cod. The report also indicates that Golden Perch were stocked into Gunbower Creek for the first time in 2016. Twenty thousand **Golden Perch** were stocked in 2016; 40,500 in 2017; 200,000 in early 2018; and 70,000 in 2019; 70,000 in 2020, 70,000 in 2021 and 65,000 in April 2022.

Twenty thousand **Murray Cod** were stocked in 2016; 55,000 in 2017; 100,000 in early 2018 and 50,000 in late 2018; 115,690 in 2020 (of which 65,000 were in December) and 60,000 in January 2022. Murray Cod stocking started in 2001, with 20,000 stocked in most years until 2016. The exceptions to this are: 120,000 in 2012 and 80,000 in 2014. No Murray Cod were stocked in 2019. In the same report-Quote: "Due to the low abundances of Silver Perch collected during NFRC the key health indicators cannot be measured. However, low abundances of Silver Perch have been detected in all six years (Figure 8). The Silver Perch detected are predominantly adults with only adults collected in 2018 to 2021 (Figures 8, 9). Juveniles were detected in 2017 and 2022 only". https://www.ari.vic.gov.au/__data/assets/pdf_file/0019/552160/Native-Fish-Report-Card-2021-Gunbower-Creek.pdf

You have stated that providing water through winter supports the survival of young Murray Cod and other fish species within Gunbower Creek yet the above report cannot confirm this statement. Could it be that most of the fingerlings ended up in Gunbower Forest when they were swept through the Hipwell Regulator with the E/water?

Gunbower Landcare do not work along Gunbower Creek to undertake weed removal; however, Gunbower Landcare volunteers were leaders in taking action to lobby water authorities Goulburn Murray Water (G-MW) the NCCMA and DEECA to take action to control Pale-Yellow Water Lily (PYWL) in 2006. This initiated G-Mw to start spray trials in 2009 on PYWL. Actual treatment to control PYWL did not commence until 2012/13 when The NCCMA received funding for Enhancing Values of the Gunbower Wetland- Key Asset Protection Project.

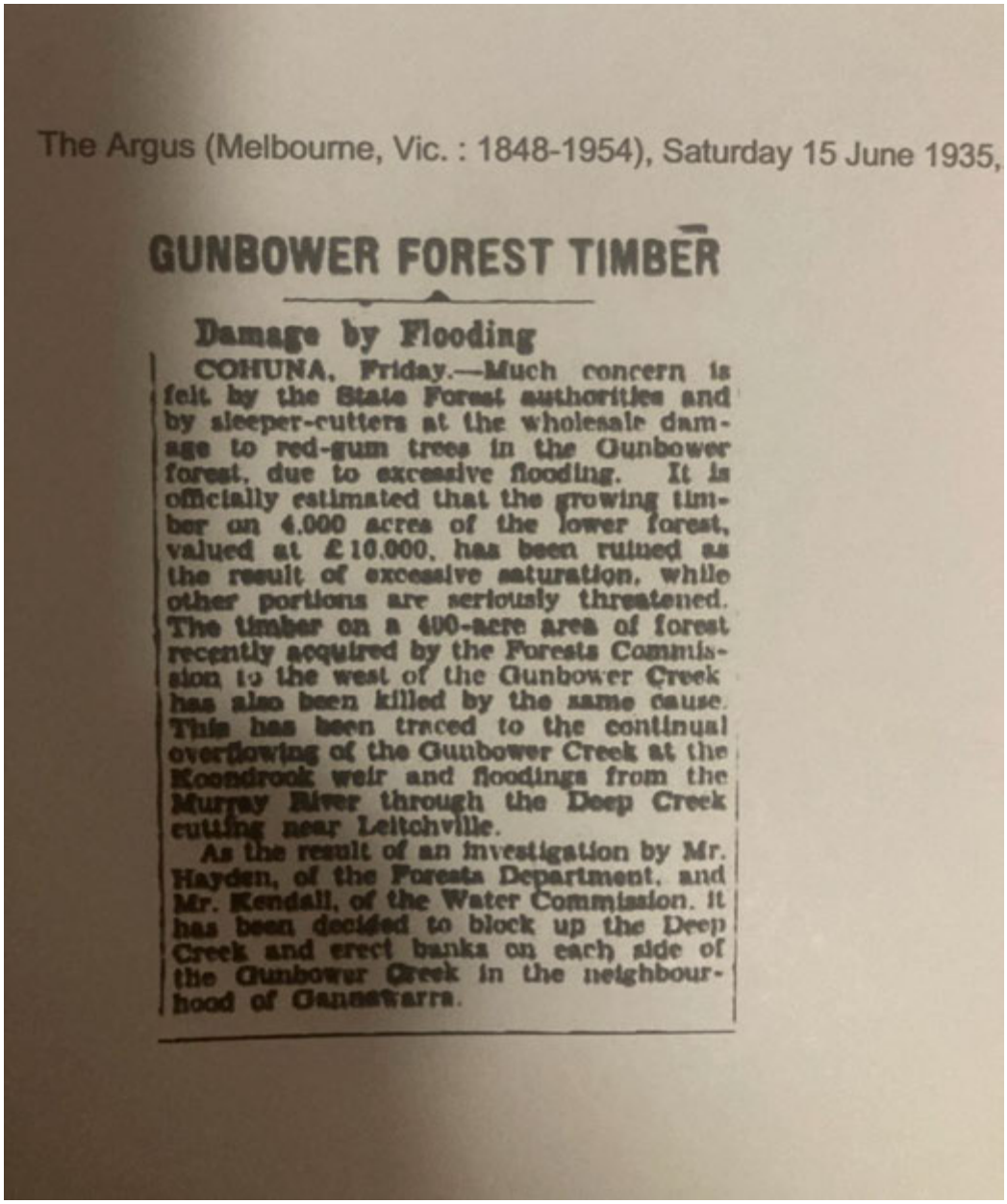
Conclusion:

- • NCCMA inform the community about the decision that has already been made rather than consult with the community during the process.
- • First hand knowledge from people with day to day experiencing this environment, their knowledge is disregarded as they cannot produce a document that has been peer reviewed by so called experts on certain matters.
- • Funding for Natural Resource management; Invasive weeds, plants and pests should be ongoing and local agencies set up with enough staff to do on ground works to reduce these issues.
- • Millions of Tax payer money is being spent on hundreds of consultants to produce reports that end up on the shelf and few if any recommendations are implemented.

Are Environmental Objectives being met by the NCCMA in relation to values of Gunbower Creek?

Tourism

With the constant flooding of the Gunbower Forest businesses from Gunbower, Leitchville, Cohuna, Koondrook and Barham have been vocal about their loss of trade. Long time Visitors have been critical and frustrated that every time they have had a major break the forest has been inundated and the tracks have been closed so they are now going elsewhere. Even new visitors have been caught out by NCCMA advertising the forest is open for business and when they have arrived found everything closed to camping. Not happy campers.



The Argus (Melbourne, Vic. : 1848-1954), Saturday 15 June 1935,

GUNBOWER FOREST TIMBER

Damage by Flooding

COHUNA, Friday.—Much concern is felt by the State Forest authorities and by sleeper-cutters at the wholesale damage to red-gum trees in the Gunbower forest, due to excessive flooding. It is officially estimated that the growing timber on 4,000 acres of the lower forest, valued at £10,000, has been ruined as the result of excessive saturation, while other portions are seriously threatened. The timber on a 400-acre area of forest recently acquired by the Forests Commission to the west of the Gunbower Creek has also been killed by the same cause. This has been traced to the continual overflowing of the Gunbower Creek at the Koondrook weir and floodings from the Murray River through the Deep Creek cutting near Leitchville.

As the result of an investigation by Mr. Hayden, of the Forests Department, and Mr. Kendall, of the Water Commission, it has been decided to block up the Deep Creek and erect banks on each side of the Gunbower Creek in the neighbourhood of Cannewarra.

Blue Strained Timber

Blue stain is the commencement of a rot and shows in the growth rings emanating from the heart of red gums that have had too much water too frequently or have been in areas that have not dried out as they would have under natural conditions.
If conditions remain the same the blue stain becomes a black rot destroying timber value and eventually killing the tree.
I have seen this happen in Barmah Forest due to constant rain rejection flows and also in Gunbower Island due to overwatering with environmental water. An area we were logging earlier this year had numerous trees dying from too much water.
I have spoken with Vic Forests and the NCCMA about this problem. What did NCCMA do? They put in another environmental flow in prior to the latest natural flood event which will make the situation worse and kill more mature red gums.
Regards
Paul Madden

Modernisation Project Loss of Biodiversity Prepared by Audrey Dickins CMEFG

2012- Modernisation/ Connections Project Northern Victoria

Modernisation/Connections Project Aims:

- build a sustainable future for productive agriculture.
- create water savings for environmental use across the Basin (i.e., Deliver 425GL of water savings)
- Increased efficiency of water resources delivering up to 425 GL (long term average) water savings to provide water for:
- The environment (up to 175 GL long term average)
- Irrigators (up to 175 GL long term average)
- Melbourne (up to 75 GL long term annual average)

Saving Water-Leakage, Seepage, Evaporation

Given the importance of ensuring continued food production and economic and social viability for a growing population, focus has been placed on improving infrastructure and on-farm practices to allow the same agricultural production for less water, with water savings transferred to other uses.

The concern is that water saved at the farm scale may not reduce water consumption at the basin scale, as a portion of water previously extracted would have remained unconsumed and returned to the basin to be reused elsewhere.

The suggestion is that for a given amount of water diversion from a river to an irrigation scheme, more efficient irrigation generally leads to less return flow to the river.

Return flow refers to water which has been diverted from rivers for irrigation but causes gains in rivers either due to surface drainage (surface return) or groundwater-surface water interaction (ground return). The suggestion is that for a given amount of water diversion from a river to an irrigation scheme, more efficient irrigation generally leads to less return flow to the river.

[Ref: Assessing the Impact of Irrigation Efficiency Projects on Return Flows in the South-Eastern Murray–Darling Basin, Australia. Water 2021, 13, 1366].
https://doi.org/10.3390/w13101366

The Connections Project was the largest irrigation infrastructure project the Victorian Government has ever undertaken. Through the modernization of irrigation infrastructure across the Goulburn-Murray Irrigation District (GMID), it delivered **429GL** of annual savings to the region. Below, figures presented by Goulburn-Murray Water (G-MW) in 2020.

- **1,725 Channel decommissioned (km)**
- **310 Channel remediation (km)**
- **7,709 Landowners modernised**

https://www.g-mwater.com.au/customer-services-resources/projects/connectionsproject

- Decommissioned channels were drained and filled in.
- Channel remediation included draining the water, excavating the silt, rebuilding the banks and lining with High Density Plastic (HDP).
- Irrigation Efficiency Projects (IEP); open farm irrigation channels were replaced with Heavy Duty Poly pipes and ‘risers’ (remote controlled outlets).

Government Grants for Upgrades
During this time Government Grants were offered such as the Northern Victorian Irrigation Renewal Project (NVIRP) for upgrades. Some individuals were quickly offered huge incentives to upgrade while others who had toiled for years building their businesses and systems up weren't. Families were told they couldn't get anything because their farm sat on a backbone channel, yet neighbours on and off the backbone channel received Grants into the millions. What a rort!

Environmental Effects-
Terrestrial and Aquatic fauna Torrumbarry Irrigation Area (TIA)
Water is conveyed from the Murray River from Torrumbarry Weir Pool through the Torrumbarry Headworks and National Channel into Gunbower Creek.
The following native species are found in Gunbower Creek. Three fresh water Turtle species: Murray River Turtle *(Emydura macquarii)*, Eastern Long-neck Turtle *(Chelodina longicollis)*, endangered Broad-shelled Turtle *Chelodina (Macrochelodina) Expansa*. Rakali (*Hydromys chrysogaster)* or Native Water Rat*).* Common Yabbies *(Cherax destructor).* Platypus *(Ornithorhynchus anatinus).* Native Fish species: Murray Cod *(Maccullochella peelii),* Silver Perch *(Bidyanus bidyanus)*, Golden Perch (Macquaria ambigua) Native Eel-tailed Catfish *(Tandanus tandanus).*
During the advent of irrigation in the 1890s a network of irrigation channels was excavated by men working with teams of horse-drawn scoops. Gradually the above species began to habit the connected irrigation channels from Gunbower Creek and adapted to the changed conditions.
Channel decommissioning, channel remediation and lining with High Density Plastic (HDP), pipelines and on farm efficiency infrastructure is having an immediate impact on terrestrial and aquatic species in the TIA.
Example: Winter works Channel Remediation 2017 Torrumbarry Irrigation Area-Channel 2/4/1

Above: Areal view, TIA Channel 2/4/1 > 3km (red line) showing vegetation on both sides of the channel. This channel was constructed to pump water using steam driven pumps from the Murray River into Gunbower Creek. The cannel was dug out by men using teams of horse-drawn scoops in 1900c.

Above: Channel 2/4/1 before remediation looking in a westerly direction.

Above: Channel 2/4/1 -cut made by excavator to drain water from the channel for works to begin.
This channel conveys irrigation, stock & domestic water through a flume which crosses Gunbower Creek. There was no attempt to relocate Turtles before the channel was drained leaving many turtles stranded in the mud and silt.

Freshwater Turtles

Above: Stranded endangered Broad-shelled Turtles *Chelodina (Macrochelodina) Expansa* in the silt at the bottom of the channel 2/4/1 dated 24 May 2017.

Above: Remediated channel lined with HDP. Fresh water Turtles cannot exit plastic lined channels.

There are many instances where Kangaroo and Wallaby and other wildlife have drowned in these channels since they were remediated and lined with plastic.

Environmental Impact: Vegetation removal
Vegetation shown on the aerial map on page 118 and the photo of Channel 2/4/1 at the top of page 119 clearly shows a dense covering of trees in the vicinity of this channel. The channel was excavated in 1900c the majority of mature trees removed in the photo below, predominantly Blackbox (>120years old) would have regenerated from seed soon after the original channel was excavated. Blackbox are habitat for Ring-tail *(Possum Pseudocheirus peregrinus)*, Brush-tailed Possum *(Trichosurus vulpecula*) Lace monitor (Varanus varius) Tree Skink *(Egernia Striolata)*, Yellow-footed Antechinus (Antechinus flavipes) and migratory birds from Northern Australia which include the Sacred King Fisher (*Todiramphus sanctus)*, and many local bird species including the Azure Kingfisher (Ceyx azureus).

Above: channel 2/4/1 after it was drained showing vegetation before it was cleared looking east dated 21/05/2017.

Above: Vegetation cleared at the same location as the previous photo dated 2/07/2017

Above: A fraction of the timber that was removed along Channel 2/4/1.

Above: Channel 2/4/1 from the top-Clay lined, HDP lined, crushed rock and Rock wall finish. Works completed between May and August 2017.

Conclusions:

429 Annual water savings-Infrastructure efficiency upgrades have reduced Environmental Values
Channel 2/4/1 is a fraction of the **310 kilometers of channels remediated** to deliver 425GL of water savings. Countless Trees removed; riparian vegetation destroyed; loss of habitat for terrestrial and aquatic fauna species at all sites.

Channel lining with HDP prevents seepage reduces groundwater-surface water interaction and also impacts vegetation in close proximity to HPD lined channels.

Channel lining with HDP is a hazard that can trap and drown native wildlife. Adult turtles and turtle hatchlings can enter irrigation channels via Gunbower Creek. Turtles cannot exit HDP lined channels. Dead turtles have been found in plastic lined channels when they have been drained of water.

HDP Lined channels with rock faced banks are a danger for Kangaroo and Wallaby attempting to drink from the channel as the rock is unstable if stepped on.

1,725Km decommissioned channels, loss of permanent habitat for Fish, Turtles, Yabbies and other aquatic species.

On farm efficiency upgrades replacing farm channels is a great loss of biodiversity. Open farm channels are habitat for frogs and waterbirds to feed.

429GL Annual water savings- Evaporation
On farm efficiency upgrades replacing small open channels with pipes prevents seepage, reduces groundwater-surface water interaction.
Again, using Channel 2/4/1 as an example; compare photos before remediation works and when completed. The surface water area remains the same. Therefore, surface water evaporation would be the same- under any seasonal conditions.
Which poses the question: **Is surface water evaporation calculated as water savings for 310 km of channel remediation works?**
From observations in the TIA, remediated channels are **kept permanently full.** Therefore, calculating evaporation in this instance cannot be claimed as water savings. Evaporation is part of Earths water cycle and so water evaporated from the surface of an open channel into the atmosphere could fall as rain or snow in another environment. It is not a loss or a saving.

429GL Annual water savings -Leakage, Seepage to Groundwater
Groundwater is the water present beneath Earth's surface in rock and soil pore spaces and in the fractures of rock formations. About 30 percent of all readily available freshwater in the world is groundwater. Groundwater is a source of recharge for lakes, rivers, and wetlands. Eventually, after years of underground movement, the groundwater comes to a **discharge** area where it enters a lake or stream and becomes surface water. There, the water will once again be evaporated and begin the cycle again. Water has been transported through the water cycle for millions of years and will continue this cycle forever. In the water cycle, water is constantly on the move. Ref: www.un-igrac.org.
Leakage and seepage recharges groundwater and has benefitted the TIA environment since the advent of Irrigation in the TIA since the 1900s.
Plastic lined channels cannot recharge groundwater from seepage or leakage.

The Problem, The Lower Lakes

We believe The Murray Darling Basin Plan fails to address the real problem, which is the two lakes at the end of the Murray; Lake Alexandrina and Lake Albert, Adelaide's recreational playground and water supply.
Lake Alexandrina (64,950 hectares) and Lake Albert (16,800 hectares) together represent the largest freshwater reservoir in South Australia. Lake Albert is situated to the south-east of Lake Alexandrina, to which it is connected by a narrow channel near Point Malcolm. Lake Alexandrina and Lake Albert are shallow, with mean depths of 2.8 m and 1.7 m respectively, holding 1924 GL in storage. Using (Shepherd 1971) evaporation equation the seasonal evaporation for the surface area of the 81,750 hectares is a staggering 865.2 GL a year, just under a third the capacity of the Hume Dam.
This also equals a third of the total evaporation losses for the entire Murray Darling system. It has to be stopped.
This third was believed to equal the entire 100% seasonal allocation for the Goulburn Murray Irrigation District and Southern Riverina Irrigation District. This has to be addressed.

During the drought in 2010, if flexible management operations had been in place for the Lower Lakes, it is estimated that the ability to conserve 1180 GL in evaporation losses from the Lower Lakes (2003/04) plus an additional 280GL that went over the Barrages into the sea (2003/04), would have delivered 100% water security for South Australia, plus given an estimated increase in water supplies of 25% - 30% for Victoria and New South Wales Murray Irrigation regions. The financial implications of this savings are almost immeasurable.

Solution

Please read the "Better Way" on the next page.

“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-ofbank 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 its 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, Callop (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 Tailem 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 ph1.5. 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 devises to fit into the existing slots in a few of the bays in the Goolwa and possible 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 gigalitres/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 4500gigalitres/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 4,500|GL/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. Mob: 0412 450 924

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

We sincerely thank Ken for his inputs into our Submission. This document “A Better Way” for the Murray Darling Basin! is under Copyright and has been given to us to include in our Submission.

Future demands Barrages must remain in place!

The completion of the Federal Senate Select Committee on the Murray-Darling Basin Plan, Refreshing the Plan document ('wrap' paper) of March 2016 includes 31 Senate Committee recommendations. In its Executive Summary, the Senate Committee considers the implementation of the Plan requires greater effort to minimise its negative impacts.
For example, in its Recommendation 14, (3.284) the committee recommend the government undertake cost-benefit analyses of the following options for adapting the management of the Lower Lakes and Coorong and their social economic and environmental impacts throughout the basin, under these dot points:

- Removing the barrages;
-
- Removing some of the barrages;
- modifying some of the barrages (such as Tauwitcherie and Mundoo);
- allowing the ingress of salt water into the Lower Lakes during periods of low flow;
- and investigating the construction of an additional lock at a location above Lake Alexandrina, such as near Wellington, SA either in concert with the above options or as a single change.

In further recommendations: (3.285), the Committee says, "Should such an analysis indicate that one or more of these leads to more positive social economic and environmental outcomes than the current basin plan, the committee recommends the Plan be amended accordingly."

The five dot points above are representative of some of the proposals put forward by various Senate Inquiry witnesses, through inquiry presentations, written submissions and other supporting documents gathered during the course of nine separate senate inquiries across the Murray Darling Basin.

By seriously investigating the first two dot-point subjects, we find extensive downsides and many likely impacts on adjacent towns by removing the barrages!
These towns include **Goolwa, Meningie, Milang and Clayton.**

During the Miliennlum drought and to assist lakeside industries, freshwater feeder pipes were introduced down both sides of the Lower Lakes from the Murray River; near Tailem Bend. Currently, some lakeside irrigation continues with the use of Lower Lakes water; depending on type of use and levels of salinity at the time.

The established lakes edge environment and infrastructure adjacent to these towns would suffer major losses when the water subsides following any removal of the barrages. The barrage barriers ordinarily maintain lakes and channel water at an approximate Australian Height Datum of AHD 0.75 above sea level

since they were completed in 1940. By controlling water levels located upstream of the barrages to Lock One; the lakes and channel surface water levels would ordinarily be maintained at a satisfactory level to create reasonable surface water alignment with extensive, purposely built infrastructure including marinas, landings, jetties, pumps and various thoroughfares throughout the surrounding edges of the lakes and channels bordering the 840 sq km Lower Lakes system.

Removing the barrages would drastically affect both private and commercial property amenity and vessel passage from these towns. Most vessel movements located on the upside (lakes and channel side) should the barrages were removed, would be either completely neutralised or extremely limited when wanting to reach and access the Coorong. Creating a natural [barrage-free) estuary on the edge of these towns today, would not be acceptable to the residents and industry alike, and to countless thousands of tourism visitors who frequent each of the locations for respite, and recreation including numerous water activities.

Wind seiche occurs regularly in this region where water surface levels can vary up to a half metre or more during extremely windy conditions. During these periods in post-barrage times, it's not unusual to find the barrages closed to assist in limiting the impact. However, during tidal ebb and flow without the barrages, ocean water would quickly penetrate into the Lower Lakes system, and at the turn of the tides, it would just as quickly flow back out, through the Murray Mouth. Wind seiche would on occasions either add to or lower tidal ebb and flow levels.

Without the barrages, in a natural tidal system, the ebb and flow of the tides in this region would conceivably last all day or all night, or part thereof which would repeatedly remove the amenity or useful water lapping features of the surrounding region where receding tides would expose putrid, acid bearing muds and leave vessels stranded for many hours until the next tidal period. Conceivably, this situation may extend upstream for 274km to Lock One at Blanchetown unless a proposed Lock Zero is built below Tailem Bend prior to dismantling the barrages, Without the barrages and Lock Zero, the affects would also be noticeable upstream in lower Murray River regional river towns including those associated with managing the water intake pipes for Adelaide's reservoir's, located at Swan Reach, Mannum and Murray Bridge, below Lock One at Blanchetown.

Given we suffered during the disastrous Millennium drought, isn't it time to seriously think about the basin holistically, about forecasts of less rainfall into the storages resulting in less for taking from basin rivers, with the dire need to protect Australia's food security, and why many have a false expectation that we have an endless river water supply that will naturally flow 2500km downriver to fill every expectation when it comes to fresh river water only for the Lower Lakes and to clear the Murray Mouth!

With low rainfall over the catchments and reduced water levels in the whole of basin storages (Ref attached MDBA data, Whole of Basin Storage figures saved by the author Oct 2012-2016), revealing reduced rainfall and river flows. While already

witnessing visible signs of sea-level rise!).

The barrages most certainly should be retained and improved.

They'll become increasingly important in limiting the impacts from future severe weather conditions and sea level rise. Those that advocate the removal of the barrages have obviously not studied the current and future implications of their proposal. Conversely, many deem this 'remove the barrages' proposal lacking in substance from underestimating the Lower Lakes region and the wider basin area including the far-away mountain storages. Of paramount importance to reaching any conclusions are the subjects of future climatic conditions, likely reduced rain runoff in the catchments, less water for food production and the environment and reduced future levels of downstream water availability from the mountain storages, some 2,500 km upstream, The distance alone between the mountain storages and the Murray estuary place extensive hurdles with river water supplies over long distances with major losses estimated up to 60% volume levels from evaporation and seepage loss alone is possible, (ref: former MDBC).

In a barrage removal scenario without Lock Zero, towns in the lower Murray River reaches up to Lock One at Blanchetown would also face dire consequences of continuous ebb and flow tidal existence, whereby receding ocean water; would create an unsightly scene of exposed mud and debris notwithstanding inconvenience to river towns as well as the four towns fronting the Lower Lakes.
River bank slumping as occurred in the lower Murray River during the drought would occur again and further destroy property close to the river edge. The loss -of amenity and inconvenience to various boating organisations, including the historically famous **Goolwa Regatta Yacht Club** and the **Goolwa Aquatic Club,** its sailing craft, powerboats, canoe and kayak activities would be enormous. All would be drastically if not completely compromised in a tidal only Lower Lakes estuarine system.

For lakes towns, all have planned and developed substantial surrounding infrastructure designed to take advantage of the beauty of the attached waterways that bring property value, safety, delightful attractiveness and community usefulness throughout the whole lakes district.

The four towns in the region are also holiday destinations for multiple thousands and for full-time residents who have chosen these idyllic places to live and enjoy the benefits of what this unique setting naturally offers with its waterways and natures other attractions.

Yes? options exist including a very progressive proposal as discussed 'in brief' below!

A Better Way-for the Murray Darling Basin, is a 15-page paper first released in early 2012 and further updated by the author, Investigative Journalist in Marine & Aquatic Ecology, Ken Jury of Goolwa in South Australia.
Contact details on final page.

A Better Way -for the MDB was written following extensive investigations across the whole Murray Darling Basin, with a view to providing a suitable basin-wide solution to Australia's largest food growing crisis, while enduring reduced freshwater availability throughout!

"A Better Way" for the Murray Darling Basin!

The full paper version is supplementary to the documentary *Muddied Waters - A Clear Solution* that screened in December 2012. Copies of this paper available by emailing to the author! Details page 6.

The full version describes how:
• 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 only a portion of the freshwater volumes currently used for the Lower Lakes etc. with provision to hand 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 and because:
• The MDB and the Lower Lakes are within a highly variable system.
The Lakes will remain a reversible system – fresh generally during natural flooding and estuarine at other times. Climate Change with sea level rise is already upon us. It will make all of this inevitable by (circa) 2050. This will affect the 7.6km barrages and all of the island embankments between when sea level rise will bring about a possibility of extending barrage and embankment heights.

Briefly: A Solution for the Murray Darling Basin!

All it will take is one more river Lock; we'll call it Lock Zero given the current first lock is located some 275km upstream of the Murray Mouth at Blanchetown in South Australia. With minor barrage adjustments and the removal (or part removal) of an unwanted island adjacent to the mouth, that grew from being a sandbar, the basin and our food security can then be saved. Mundoo Channel connected to Lake Alexandrina has the shortest and most direct flow towards the Murray Mouth which will greatly assist with clearing the river mouth.

Lock Zero should be built to regulate minimal freshwater flow to (40%-1800GL/per yr) into Lake Alexandrina to mix with ocean water, forming and maintaining an estuarine environment, and for the first time, 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 will create a saving of 2700GL of freshwater to grow our food!

This will rid the lower river section below Blanchetown of acid mobilization, so bad at times that even the authorities openly admit defeat with treatment of mobilised acid-laden water, notwithstanding a possible threat to the intake pipes that feed potable water back to Adelaide hills reservoir storages.

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

Using lakes stored estuarine water, the system could be flushed at will through the barrages while replenishment for the lakes would be activated with free ocean water on the next incoming tide, followed by mixing with a small portion of freshwater stored behind Lock Zero to be naturally mixed by wind seiche!

In flushing the lakes; by allowing lake levels to recede by up to a maximum of 20cm only by opening selective barrage gates, estuarine water from the 840 sq km surface of the lakes will provide flushing volumes of scouring water for the river mouth at a rate in the order of 150GL used in one single out going tidal session to successfully scour and clear the mouth.

To enable selective flushing, an upgrading of the logs in the Goolwa Barrage is recommended given the lifting of the current single barrage concrete logs stacked on top of each other is both cumbersome and time consuming as they're handled individually - one by one as commonly seen at this barrage today.

The alternative in each of the Goolwa barrage compartment bays is for single, thick walled poly tanks to fit the overall slot in each bay, to operate by using nearby water through a single pump to each tank as the hydraulic in one 'single lift and fall motion' to enable necessary increased flow pressure with outflows to assist in clearing the mouth and keeping it clear. Equally, to provide opportunity to direct outflows of estuarine water towards the mouth with a view to a portion of this water flowing through to the southern section of the northern lagoon of the Coorong.

The removal of a sandy, highly vegetated knoll that badly restricts outgoing water passage through the Mundoo Channel, located directly opposite the Murray Mouth.
Bird Island as it's known faces the river mouth, is located downstream of the Mundoo Barrage in the Mundoo delta on the edge of the Coorong. Its removal is necessary as it 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. These changes are necessary for allowing the Lower Lakes system to require much less freshwater.

Simplistic perhaps, but logically there's a view to reduce the freshwater maintenance volume for the Lower Lakes to 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.

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. A handful of streams actually 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 flood water would be adjusted by way of the now rejuvenated barrages and through Lock Zero to suit the situation. An upgraded Lower Lakes system as proposed would still be a reversible system. During low river flows it should be estuarine while river flood times may enable the river to completely fill the confines of the Lower Lakes as was generally the case. In all circumstances the freshwater or estuarine water biota throughout will adjust both ways as it most certainly always does in an estuarine environment!

Estuarine water:
Importantly, estuarine water can be made up of varying degrees of fresh and ocean water as is naturally the case in most estuarine deltas worldwide. Contrary to claims (and alleged state Govt. tests and claims in the Lower Lakes), estuarine water occurs at varying levels in deltas of most estuaries worldwide. These are often healthy ecosystems that provide immeasurable benefits to communities and governments alike.

Returning the Lower Lakes to estuarine would once again create a highly productive and useful environment. **However, the barrages are necessary in this case!**

Estuaries 'the world over' are known for their productiveness!
Such the case with viable fisheries known to exist in the Lower Lakes in pre-barrage times! 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 fishery and fisheries nursery and breeding ground, for the return of large, productive fishery. In turn, tourism throughout would surge ahead and so would development!

Ken Jury of Goolwa in SA – Senior Investigative Journalist (Marine & Aquatic Ecology),
May 2016.

We sincerely thank Ken for his inputs into our Submission. This document "Future demands Barrages must remain in place!", is under Copyright and has been given to us to include in our Submission.

Summary

The 2007 Water Act was unfortunately driven by political deception and opportunism with the need to retain power. Environmental water was seen as the golden ticket to retain parliamentary power when popularity was waning. The tool for the deception and the way around the Australian Constitution was quickly thought up on a whim and was justified by a Ramsar Convention. It was perfect when most of the electorates and population were in major cities, whose people were heavily hypnotised to the so-called atrocities happening to the Environment and the need for immediate change. Most city people had very little knowledge and understanding of land and its water environment and seem to have a dim view of farmers and agriculture. This was the perfect storm to introduce the 2007 Water Act and followed later in 2012 with the Murray Darling Basin Plan.

As Richard Beasley SC recently explained, the Murray Darling Basin Plan was worked out by taking Environmental Water out of the Consumptive Pool under an International Treaty on the best available science. Water being so complex allowed political manipulation getting away with not using the best available science. Climate change wasn't included in the Plan.

This was a good point; no climate change and adaptation have never been included and as you can see from our Submission this needs to be built in. There was never any form of flexibility for any change built into this slapped up Plan.
They didn't consider technical advancement.
They didn't consider a farm as part of the environment.
They didn't consider if a farmer didn't look after his farm environment, he wouldn't make a living from it or be able to pass it on to the next generation.
There was no strategy developed on implementation!
Water was shifted to highest value use with little regard given to the production of staple foods!
There was no planning scheme for farming!
Permanent plantings have become a problem.
There has been no accountability or transparency. No peer review by an independent panel!
Indigenous people were not considered or consulted and certainly no regard given for indigenous cultural flows!

This lack of understanding and Government ignorance is now affecting Australian Farmers ability to produce food and fibre for the population. This is now proving to be a short-sighted vision that is destroying our iconic Australian River environment and our nation's future food security.

Community stress levels are ramping up with all major Rivers in our Shire now at flood levels especially as there are a number of breached levels and roads that haven't been fixed after last year's flood event. The constant Environmental watering of the Gunbower Forest is heightening this angst. This should be stopped, and the levees and roads fixed. A proper rotational environmental watering plan needs to be developed and adopted.

The Plan has led to the storage of excessive amounts of Environmental water and carryover, in our Dams which has been the major cause of last year's 1in 100-year flood. Simply there was no airspace for seasonal inflows. Our Shire of 3735 sq kms and its population were all affected in some form. Mass destruction of farm infrastructure, houses, loss of urban and rural water supplies and mass livestock deaths. The loss of production enormous. Mental Health, domestic violence and suicides are all real issues. The Dams are now already too full, threatening a repeat of last year's flood events and our future existence.

The relaxation of constraints and additional water buybacks will have a severe impact on the remaining delicate river communities and their environments future.

Under present conditions, serious future consideration needs to be given to piping Lake Argyle water to South Australia to reduce their total reliance on Murray Darling Basin water?

"A Better Way", has been well researched and thought out. It is a very good common-sense approach.

The individuals who were employed in the predecessors of the MDBA processed a deep understanding of water dynamics, being intimately familiar with how water flows, the importance of storage, and the necessity for water sharing.

Today, the people in the MDBA, NCCMA, VEWH, CEWH, etc are bureaucrats who do not understand water at all. They are project driven by personal income with the need to finalise outcomes regardless of the impact, so as to retain their jobs through to the next funding cycle. They don't understand the community needs.

We are the ones that live here and yet we must endure the decisions that adversely impact our environment and future.

ENVIRONMENTAL WATER MUST BE MEASURED NOT MODELLED!!!!
Every drop of water a farmer uses is measured. How can you run a successful business without? The true reality is the Environmental water has gone out the river mouth time and time again over the years. It has always been modelled and never measured. How can anyone run a transparent, accountable and successful business like this?

They have taken 1450GL out of a region which was the third most productive in Victoria in the year 2000. They have tried to shift water off 86% of the catchments privately owned farmland back to under 10% National Parks destroying the feeding and breeding grounds for 1000s of birds, animals, reptiles, aquatic life, and insects.

It is so ridiculous that Government is now for the third year in a row flooding the iconic Gunbower Forest, 8 months after a 1 in a 100-year flood. It's called just add water and walk away. The mid storey the under storey in areas has all gone and the ground has become toxic. It's become a breeding ground for European Carp and a producer of toxic blackwater.

The Murray Darling Basin Plan is a living nightmare destroying communities and our environment.

Have we been consulted yes, many times. You come you listen, but you don't **hear**! Our views and data are ignored. Nothing changes, it just gets worse.

I am yet to see a program aimed at helping the communities to adjust to the Basin Plan.

With so much visual damage already done to our region over the last decade, we want to see a completely independently funded diversely sourced committee charged with the responsibility of a cost benefit analysis of the plan outlining **the environmental benefit versus damage of environment to our Region.** We would also like to see a cost benefit analysis done on the social and economic benefits the Murray Darling Basin Plan has brought to our region.
We need honesty and transparency and some bureaucrats that will champion solutional change.
What we want is recognition:

That people are a part of the Basin and the environment, and their well-being is as important.

Recognition that environmental outcomes occur on farms and private property as well as National Parks.

Recognition that no amount of water forced down our system will ever keep the Murray River mouth open for an extended period because the Great Southern Ocean won't allow it.

The loss of water and an extra 450GL has and will lead to a massive loss of production affecting Australian economy's ability to make a profit. It has also led to an increase price of food and fibre items on the supermarket shelf.
Water buybacks only create a divisive dysfunctional system.

We are losing our Rural Scientists (farmers) and their knowledge and experience at an alarming rate.

A mindset change by Government needs to happen, that we the communities living this nightmare have the solutions and to be acknowledged and not insulted. We want a Plan built on honesty and transparency not modelling but hard measured evidence, that focuses on quality outcomes for all.

Wouldn't it be fantastic for Government to change their present mindset and work **with** Communities to build a vibrant flourishing Basin. Collaborating with its inspired passionate people to build a new and exciting sustainable successful future using open, transparent, and accountable outcomes for all to enjoy.

From this Submission you can now understand some of the many flaws of this Plan which hasn't changed. The flow on effects of the 2007 Water Act and the 2012 Murray Darling Basin Plan have been devastating to the environment and its river communities social and economic needs which will never recover from this hypocritical debacle.
It will linger in Australians history for generations as the time when Government and bureaucrats destroyed our Nation. This is why we are making Submission.

Throughout this Submission we have demonstrated the tools for positive change.

Will government final hear and make change?

"As we foreshadowed, with our call to action to the Federal Water Minister on the 5th of August 2022 last year, these man-made catastrophic disasters could be avoided with sensible planning and good management!"

Geoff Kendell
Chairman
Central Murray Floodplains Group Inc

Can you hear their cries!

Can you hear the rivers cry for help
They're sick and dying and so are their people
I live close to the Murray all my life close enough to hear her heartbeat
I've visited the Darling Baaka many times
Now I watch in distraught seeing their destruction

I hear the Murray's cries
Once an iconic River now turned into a government run Water canal
Trees and vegetation drowning, banks eroding metres at a time
Delicate ecosystems developed over millions of years
Now being destroyed right before my eyes

I hear the farmer's cry as he plants his seeds
I watched parched ground spring to life as farmers irrigate nurtured land
Bountiful food produced by long hours of toil
For our nation to enjoy
Now a land uncontrolled by vermin and noxious weeds

Can you hear the cries of the Darling Baaka
The beautiful River where dreamtime stories unfold
Now being crushed into oblivion by greed and corruption
The crystal-clear water that tasted so nice
Now a horrid toxic grey green slug unfit for even mice

I can hear the cries of its people
We can no longer feed our mob
Who lived on fresh fish and kangaroo
As our River she dies many of our people do too
Lucky to make it past the age of forty-two

The Government comes many times to consult
They listen to our stories
But they don't hear us; nothing changes
Their mismanaged Murray Darling River Plan
Sucking the lifeblood from this land

As a farmer I sit quietly by livelihood gone I hear their cries
My dog bounds to me tail wagging in anticipation of work
I turned to him and say “It’s all gone mate it’s been taken away”.
He lays his head in my lap in despair faithful to both our ends
As we ponder once what had been. Do you hear our cries?

Author Geoff Kendell Australia 14/2/2021

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Lake Charm Primary School
Murrabit Group School
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