

Overbank run-off !

It's A River Killer!

Natural flooding from rain events across the Murray Darling Basin is extremely rare and unavoidable. Practicing controlled overbank flooding will always pick up on destructive sediments that will reach and destroy our rivers. No amount of environmental diligence or empathy with overbank flooding will save the quality of our river water, nor the expected property damage.

Soil-laden sediment is often very fine, loose stuff found in floodplain sand, clay or soil so why did the Murray Darling Basin Authority not consider the words watershed-spill and what that may contain, from day one?

Sedimentation begins as a dry and often-unhealthy particulate matter from erosion and plant decomposition on watershed floodplain landscapes, until its disturbed and carried by water run-off towards our basin rivers!

A watershed may be a tilted or raised strip of arable land that separates water flowing into rivers, anabranches or storages. It may be a section of land that could further drain to an even larger watershed and so on, to where it eventually flows over riverbanks into river channels, often causing notch erosion to the top edges of riverbanks.

The sedimentation of rivers in the basin streams and water storages, and even in the Coorong located at the delta end of the Murray Darling Basin in South Australia, represent a major invasive river pollutant that's not only damaging the quality of our river water throughout, but also the various biota reliant upon aquatic vegetation which is also being destroyed in river beds.

Sediments do destroy aquatic habitats and the organisms within.

So, where do our Basin Rivers and backwaters in the Murray Darling Basin sit with water quality and in-river environmental degradation?

For a clear insight, we look to Federation University Australia's **Water Research Network's** Professor Peter Gell, **Professor of Environmental Management**, for details following his extensive fieldwork across the basin including South Australia's Coorong. In an Extended Abstract "**Prospects For Ecological Recovery In Wetlands Limited By Muddy Murray Flows**" by Professor Gell, we find how "*Australia has embarked on a*

significant, and expensive, environmental flows program to restore the ecology of the Murray Darling Basin.”

Professor Gell said how *“restoration programs have been underpinned by the focus on river flows that cause system degradation.”*

So, how widespread and damaging are these problems?

“The condition of the aquatic ecosystems of the Murray Darling Basin has been recognised as widely degraded and a key Ramsar site has been declared to be in crisis. This poor state has largely been a consequence of the high level of regulation and diversion of surface waters, in particular for the development of a highly productive irrigated industry, although declining water quality is also evident,” he said.

It's then clear; our basin water quality is in question as are many of the river habitats throughout!

Professor Gell's Extended Abstract gets down to business with what we often contemplate when staring into a river; wondering what conditions may prevail in the bottom of the river?

“The long term records also attest to the rapid infilling of shallow wetlands and their likely territorialisation in the absence of future scouring flows. They also reveal regime shift changes driven by changes to the light environment from chronic high water turbidity,” he said.

“Further, sediment source studies reveal water to be the principal vector for the continued supply of fine sediments in wetlands questioning the anticipated wetland recovery from watering. Investment in the mitigation of sediment flux is essential if the community is to reap the full benefits of the allocation of contested water volumes to the environment,” Professor Gell said.

Today, it's about the quality of freshwater across basin rivers including freshwater reaching the upper Coorong in South Australia!

In July 2017, details were released concerning the quality of water throughout all basin rivers and the Coorong. From these extensive field research investigations across most basin rivers, scientists discovered finely granulated sedimentation loading suspended in upper levels of water columns. Suspended sediments impede or blocks sunlight penetration through the upper water column so that it doesn't reach river substrates across most basin systems. This sedimentation condition is to the detriment of an array of aquatic biota below including important aquatic vegetation, fish, molluscs and crustacean, as well as the necessary quality of fresh water within the basin river systems. It affects water quality for many, including growers, basin communities aquatic life.

This places future water procurement expectations concerning the health of our water resources across the basin, under an additional but necessary spotlight!

It also brings back into focus what is considered a right by the MDBA to create a wider 'greenbelt' beyond the natural river channels by processes involving overbank flooding. Practising this to actively water vegetation that's ordinarily, and naturally watered by rainfall precipitation. At any time and any level, this practice is damaging and costly!

Once again though, scientific history has been discarded! ***"In summary, the current operating system for the Lower Lakes and Murray Mouth is not sustainable with continued significant environmental degradation expected,"*** the former Murray Darling Basin Commission advised back in the year 2000.

Meanwhile, Palaeoecologist, Professor Peter Gell from Ballarat Federation University, in a recent interview with ***The Land*** newspaper told of *"Serious turbidity from increased sedimentation particulate in mid-river wetlands and even in the Coorong is now scientifically tested and acknowledged. The decline came to the attention of scientists from core sampling that exposed 7000 years of fine, settling materials such as sediment on to the submerged landfall. These findings are the results of several decades of core sampling and other investigative work,"* according to Professor Peter Gell.

"In the Coorong the sediments are coarse shelly marl prior to the establishment of the barrages, after which fine, organic muds accumulate. Above, many wetlands accumulate sediments only after regulation and, before then, were likely dry enough for the sediments to blow away. So, their natural wetting regime is irregular. Now, they are tied to a stable, wet system and continuous sediment accumulation is the new normal. Scarcily, this is occurring at 2-5cm/yr and so these depressions are filling up quickly with mud, and are so turbid, there is not enough sunlight reaching the bottom for plants to grow actively. Frequent watering of these sites with turbid water is unlikely to stimulate plant growth and is contributing to net sediment accumulation," he said.

According to Prof Gell, we should explore the options for Lake Alexandrina, In readiness for the next big drought. He questions whether we're to aerially release mulch, while calling for river flows when there are none, or to allow the sea in and protect freshwater habitats such as the Currency Creek and Finniss River deltas with low barrage barriers.

With a wide focus on water quality, all plants and other organisms rely on photosynthesis to synthesize nutrients from water. Sedimentation affected wetlands include those that may already have questionable **Ramsar** connections, including those of the Lower Lakes and Coorong region. Widespread particulate in the upper water column could badly disrupt or destroy water quality across the food bowl, throughout all of the Murray Darling Basin river systems.

Ken Jury
Senior Investigative Journalist
Marine & Aquatic Ecology
Goolwa SA 5214
06/04/18

