

# The Murray Darling Basin Plan

## *Floodplain Inundation Regime based on Modelling not Evidence MDBA Modelling is not Peer Reviewed Quantitative Based Evidence*

### What is hydrological modelling?

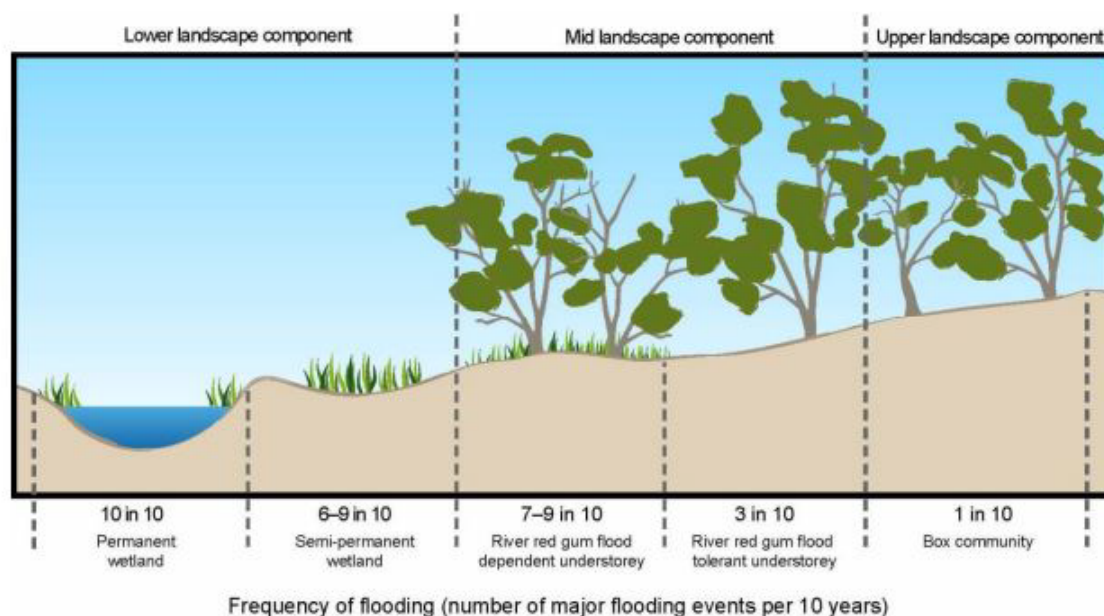
It is a simplification of a real-world system that aids in understanding, predicting and managing water resources. It should only be considered robust if 'peer reviewed' and preferably published in a scientific journal.

### What is quantitative research/data collection?

It is the systematic empirical investigation of real-world using data that is collected by a researcher from first-hand sources, using methods like experiments that are repeatable. It should only be considered robust if 'peer reviewed' and preferably published in a scientific journal.

### What is peer review?

It is one of the gold standards of science. It's a process where scientists ("peers") who are experts in the same field evaluate the quality of other scientists' research, ideas and models. Research cannot be considered robust unless peer review has occurred, and preferably published in a scientific journal.



After the 2007 Water Act was legislated the Murray Darling Basin Authority (MDBA) was formed and given the task of developing the Murray Darling Basin Plan (MDBP). With what is generally considered to be inadequate stakeholder engagement, the MDBA devised a plan to restore the health of wetlands and rivers in the Murray Darling Basin (Basin). The MDBP is based on the results of the 'Benchmark Model', an inundation model which assumes if you inundate an area of floodplain for a set period of time, you will restore the health of that system (MDBA 2012a). Figure 1 is the theory behind the Benchmark Modelling, however this is based on assumptions rather than Peer Reviewed Quantitative Based Evidence. It shows inundation in a supposedly natural system without modification and assumes health will be restored even in its heavily modified state. The model did not allow for heavily modified systems, regulated rivers / creeks, introduced species eg carp and a massive reduction in natural wetland vegetation and native species.

Figure 1. Flooding requirements of selected vegetation communities for Murray Darling Based lowland forests (Source: based on Ecological Associates 2006a).

## **Expert Panel declares Inundation Model as the basis for MDBP is inadequate.**

An Independent Panel of experts commissioned by the NSW and Victorian Governments (Blackmore 2017) reviewed the Benchmark Model's key assumptions and concluded:

- It is a flawed assumption to believe that simply inundating an area to a certain height and for a certain length of time will return the health of a system
- Criticized the modelling for only being developed in preliminary draft form, which was never agreed, finalised and published under peer review
- Stated there is little evidence to support the link between the default limits prescribed in the Plan and ecological impacts

The Panel recommended that 'effective decision making in relation to the Sustainable Diversion Limits Adjustment Mechanism (SDLAM) should be reviewed and improved to allow a package of supply measures to be assessed, and an associated supply contribution to be determined and agreed'.

To put this simply – review, modify, adapt and improve the SDLAM process to align with assessment and evidence based monitoring. None of this has been done to date.

## **Peer Reviewed Quantitative Based Evidence v's Modelled Flows**

MDBA Modelling – Gunbower Wetlands, Murray River, Victoria

MDBA 2012b - Flooding of the Gunbower wetlands is initiated at 15,200 ML/d (MDBA 2012a). The modelling conducted suggests that in approx. 9 years out of 10 flows would have exceeded 20,000 ML/d and inundated the majority of wetlands in Gunbower. Based on these modelled assumptions, watering regimes to match 9 in 10 years have been devised

Quantitative Based Evidence

A report from Gell et al (2018)

Paleo-ecology methods found that

- Pre River Regulation (weirs, locks, dams, pumps) many Gunbower Wetlands were intermittent/seasonal, and regularly dried out
- no net sediment accumulation (due to frequency and length of dry periods)
- any sediment build up was lost due to dry phases
- After River Regulation (post 1922),
- Increased wet periods, resulting in more lagoonal conditions allowing incoming sediments to settle.
- Wetlands are filling up with sediment at an unnatural rate of 3-5mm a year
- Decreased dry periods resulting in sediment build up
- Increased frequency and duration of inundation of wetlands may have increased nutrient load producing excessive algae

In a journal paper (Gell et al 2019) in a study of 62 MDB wetlands the authors concluded that less regular inundation, rather than more, is a viable option in restoring the ecological function of these floodplain wetlands and in slowing sediment infill in the Murray Darling Wetlands.

## **Way Forward to meeting the triple-bottom line approach of the MDBP**

- Stop further acquisition of water, including through the SDLAM projects and the 450 GL of Upwater.
- Invest the remaining funds set aside for water acquisition in evidence-based multiple measures approach, including engineering, management and ecological solutions devised through a partnership led base.
- Conduct an independent international peer review of the floodplain inundation modelling, as proposed in the panel in Blackmore et al (2017) - The establishment of a stable, agreed, clear and accessible benchmark as the basis upon which to assess a range of supply measures is critical.