

Topic 3: What special legal issues arise for the use of environmental water in times of “flood” (natural or artificial)?

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Introduction

The construction of Goulburn Weir near Nagambie in Victoria in 1891 marked the beginning of almost a century of construction of major assets to support irrigation in the Murray-Darling Basin.

By the time Dartmouth Dam was completed in 1979 Governments had built enough dams across the Basin to store more than one year’s average inflow.

In the southern Murray-Darling Basin, where 80% of the Basin’s irrigation occurs, the combination of dam construction and irrigation changed the rivers from winter-spring flowing to summer-autumn flowing and in the process eliminated most small flood events.

With Australia’s highly variable rainfall and with heavy irrigation use, it became quite common for winter-spring rain events to be almost fully captured in storages. Only the wettest 15% of years now result in significant overbank flow events in the mid to lower Murray, whereas prior to development such overbank flows would have occurred in almost 50% of years.

The impact on floodplain ecological communities has been dramatic with large areas of floodplain forests and woodlands dead or highly stressed.

The impact of such large scale irrigation combined with prolonged drought had other impacts during the decade 2001 to 2010. The beds of lakes and rivers which had been permanently inundated, often for thousands of years, turned acidic on drying and for two periods each of about three and a half years there was no flow to the sea resulting in the accumulation of millions of tonnes of salt in the Lower Lakes. Today, three years after the drought brake, the salinity in Lake Albert is still greater than 2,600 EC and may take another couple of years to reduce to the levels experienced prior to the drought.

A severe one year drought in 1967 had highlighted that “things weren’t right with our rivers”, with initial focus on salinity. Governments addressed that challenge through a salinity and drainage strategy which resulted in 20 years of hard effort to construct salt interception schemes and reform irrigation and drainage practice. Today we are meeting the salinity target adopted by Ministerial Council to guide investment in a range of actions to control salinity. Salinity is no longer the challenge it was because of our efforts to address it.

By 1995 Governments had agreed that continuing growth in water use was not sustainable and introduced a Cap on Diversions. Whilst Cap stopped growth, it is only through The Living Murray Initiative (which sought to return 500 GL of water to the environment, as a first step) and the Basin Plan, that water use will be reduced to a level that is sustainable. The Basin Plan aims to reduce consumption in the Basin by a further 2,750 GL.

The next challenge for Governments and communities is to resolve how to make the most effective use of all water that is available for the environment.

Meeting low flow targets is relatively simple as this only requires the additional delivery of small flow rates through the rivers all the way to sea.

Medium flow targets generally involve pulsing flows for periods from a week or so up to a few months at flow rates that remain “in-channel”. Through summer and early autumn channel capacity is often fully used to support irrigation. However, the natural cues for medium flow events are typically in the spring to support fish breeding and so these can also generally be met with careful planning.

Meeting high flow targets is where the biggest challenge lies.

Regulating releases from storages at rates that result in overbank flows from the storages all the way into South Australia, a journey of almost 2,000 km, is possible but raises concerns for the hundreds of landholders who occupy the floodplain.

The largest floodplain forests have been the beneficiaries of a major works program over the past decade to allow substantial parts of the forests to be watered even though flows remain “in-channel”. Works at Gunbower and Koondrook Forests will return almost 25,000 ha to a near natural watering regime out of a total area of these forests of about 50,000 ha.

Downstream of Euston works at Hattah Lakes, Lindsay Wallpolla Islands and Chowilla will return about 16,000 ha to a natural watering regime, compared with about 85,000 ha of flood

dependent floodplain vegetation in the reach from Euston to Wellington. Ultimately, it may be possible to return another 5,000 ha to a near natural watering regime using works in this reach.

The question for Australia is “What should happen to the other 60,000 ha or 75% of the floodplain?” Is it good enough to allow this large area of floodplain to simply die and become a wasteland?

Challenges of Using Environmental Water Effectively

If the only viable solution is to change the hydrological regime, then that creates a range of stakeholder challenges. Realistically, it is physically possible to “just add water” and the ecological impacts will be apparent quite quickly.

The challenge for governments and river operators comes through understanding how floodplain landholders have adapted to changing river hydrology which occurred progressively through the 20th century as a result of dam construction and use of stored water for irrigation.

By way of example, landholders in the reaches immediately downstream of large storages such as Hume, Eildon, Burrinjuck and Blowering Dams have seen the frequency, peak and duration of winter-spring floods diminish. Whilst not specifically designed to mitigate floods, these dams by their very presence and mode of operation have eliminated all but the very largest floods.

The result for downstream landholders is that their flood risk has changed and they have adapted by changing how they use their land. They have increased production by replacing native pastures with introduced species and on occasions (and only on some properties) have been known to plant winter cereal crops. These practices would have been unlikely a century ago as the risk of loss due to flooding would have been too high. Today the risk is tolerable.

Other landholders have protected large areas of floodplain with levees, to allow winter cereal crops to be grown on the highly fertile floodplain. Whilst the land protected by the levees should not be inundated by a changed flow regime, access to the land may well be, particularly where access is by low level crossings across floodplain creeks and flood-runners.

In the upper reaches of the major rivers landholders do not rely on overbank flows for the moisture required to drive production. Rainfall is generally more than 500 mm to 600 mm and is sufficient. Further downstream rainfall is often quite low (less than 400 mm) and landholders rely on overbank flows in spring to produce grass on “flood country” that can be grazed in summer. Nevertheless, even where the net impacts of overbank flows are positive landholders may still have concerns.

Overbank flows in the mid to lower Murray typically require simultaneous overbank flows in most if not all of the upper Murray, Kiewa, Ovens, Goulburn, Murrumbidgee and Darling Rivers.

To reinstate substantial inundation of mid and lower Murray floodplain will require releases from Hume Dam to achieve flow at Albury of up to 40,000 ML/d for durations up to about ten days to two weeks, at times in winter-spring when Hume Dam is filling at even higher rates (but not spilling) and there are also high flows in the other major tributaries. Such operation may be possible in 15 to 18 years every century and combined with the 15% of wettest years that still produce floods, notwithstanding regulation, should have a marked impact on floodplain health.

There is, however, a possibility that such translucent operation of a major storage, such as Hume Dam, could result in claims for compensation by downstream landholders.

Dam design and operating practice has generally aimed to ensure that downstream flooding is mitigated to the extent reasonably practicable having ensured that firstly the integrity of the dam is maintained and secondly the dam’s primary function of water conservation is maximised.

Translucent operation of a storage would not mitigate flooding to “the extent reasonably practicable”. It is possible that a dam operator directing such a translucent operation would no longer enjoy the general indemnity provided by the relevant government for which he or she works. In any case, governments will not be keen for their dams to be operated in ways that result in repeated claims for damages.

Available Options

A range of measures are available and have been used previously to address claims for damage arising from changes in how rivers are operated. These include:

- acquisition by relevant authorities of affected lands,
- acquisition of flood easements with benefits extended to all relevant authorities,
- construction of levees to protect private lands and assets, and
- provision of enhanced access facilities for affected landowners.

In addition, there is clearly benefit to be gained by undertaking a comprehensive investigation of all potential liability issues associated with operating rivers to deliver environmental objectives. In the first instance, it is necessary to understand existing powers and obligations. From there, it may be possible or necessary to strengthen the various Water Acts and the Murray-Darling Basin Agreement in combination with voluntary implementation of the range of land related measures set out above.