Rising Waters, Shifting Risks: Flood induced channel change in the River Murray

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# ABSTRACT

The Barmah-Millewa reach is a section of the River Murray that flows through the Barmah-Millewa Forest. Here the River Murray leaves a narrow section of floodplain (a confined reach) and enters a large, low-angle, distributary alluvial fan, known as the Barmah Fan. The natural narrowing of the main river channel through the Barmah-Millewa reach has always presented a major constraint on the flow capacity of the river and the distributary nature of the channel system means there is a long-term risk of avulsion occurring. Previous investigations (Streamology, 2020; Grove, 2021) identified that the presence of excessive deposits of coarse sand in the river channel downstream of Yarrawonga Weir is most likely to be the major contributing factor to the on-going measurable loss of capacity through the reach. In conjunction with the loss of capacity due to bed aggradation, ongoing degradation and erosion of riverbanks has also been occurring due to regulated flow patterns and exacerbated by the excess sand, as well as other factors such as vessel wash and deterioration of riparian vegetation. Other impacts from the sand build-up include loss of geomorphic diversity and habitat across the reach.

Sediment transport through the reach is complicated by the distributary nature of the channel system, with previous analysis indicating that more sand can come into the reach from upstream than can be readily moved through it (Streamology, 2020 and 2021). The excessive volumes of sand now in the river means that the natural progressive infilling of the main channel and subsequent avulsion process is being accelerated.

The large flood event that occurred in the River Murray across October 2022, saw a step change reduction in the regulated flow capacity (i.e., the maximum flow rate for water delivery than minimizes flows onto the adjacent floodplain) from approximately 9,200 ML/day in 2021, to around 8,300 ML/day. In this paper we explore how bathymetric survey collected before and after the flood event can test previous assumptions around sediment transport processes and the effects of excessive sand volumes in the channel and what this means for long-term flow reduction and avulsion risks.

# REFERENCES

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