Panel consideration of draft operating rules developed by Woodwater

The panel that undertook the environmental risk and opportunities assessment of flow scenarios in the lower Goulburn River was asked to provide comments on the expected environmental outcomes for the lower Goulburn River of proposed operating rules developed by Woodwater.

Woodwater drew heavily on the panel's assessment when developing proposed operating rules for the lower Goulburn River.

1.1 Proposed rules

The proposed rules were developed by Woodwater. They enable environmental managers to

provide environmental freshes at any time but from 1 November to 30 April IVT deliveries have priority.

Base flow

The proposed rules included the following variable base flows:

- June to September - average monthly flow of 1,300 ML/d
- October to May - average monthly flow of 1,100 ML/d

The 1,100 ML/day base flow was selected as it provides for additional IVT and is lower than the 1,300 ML/day (40 GL/month interim 2020/21 rule) at which ecological risk had increased from low to medium.

To avoid notching of the riverbank the rules require the river operator to provide variability in flow to avoid notching. This could be achieved through weekly or fortnightly changes in flow, as well as fluctuations of at least plus or minus 0.1 m over one to two days.

Flow pulses

The proposed rules included pulse flows of up to 6000 ML/day[1] to increase the volume of water transferred to the Murray River (see section 7.1 for a discussion on pulse flow rates). The shape of the pulses was designed to have a rapid rising leg but a more gradual recession. Rates of rise were less than 0.8 m per day. The proposed target rates of fall were:

- 0.4 m per day when flows are greater than 3,000 ML/day
- 0.25 m per day when flows are less than 3,000 ML/day

A similar pattern of rates of rise and fall was proposed for pulses with lower peak flows.

The proposed duration of the pulses was to have flows of greater than the 1,100 ML/day operating range for 14 days or less.

It was proposed that the river operator could determine the timing of pulses in each water year subject to the following rules:

[1] Flows are currently limited to 3,000 ML/day. Work with lower Goulburn water users would be required to deliver higher flows over the summer and autumn period before such a rule could be implemented.

1. The first pulse (following the environmental Spring Fresh) may not occur until average flows are equal to or less than 1,100 ML/d for 6-8 weeks (i.e. at the end of the Spring fresh) (Note that this rule assumes that environmental freshes rarely extend into November)
2. A second pulse may commence when average flows have been equal to or less than 1,100 ML/d for at least 28 days
3. Subsequent pulses may commence when average flows have been equal to or less than 1,100 ML/d for at least 35 days.

Flows caused by rain rejection events lasting less than 5 days were excluded when calculating the average flows.

1.2 Panel comments

Specific comments from the panel included:

- Flow rates between January and March are required to fall back to 1100 ML/day after the delivery of individual pulses. This will ensure the littoral zone is not inundated beyond its tolerance limits during the growing season and to provide sufficient duration of slack water habitat over the warmer months for small bodied fish to breed. However, doing so in September to December is too restrictive given base flows in spring are naturally higher than those in the warmer summer and autumn months.
- The rule should be set so that there is a six to eight week period of base flow less than 1,100 ML/day after the spring fresh to provide appropriate low flow conditions for germination and establishment of littoral vegetation, which is critical to protect banks from erosion and support slack water habitat.
- It is difficult to predict outcomes of operational rules as proposed without knowing the resulting flow hydrograph, i.e. winter/spring base flow levels and the size and timing of spring freshes.

The panel were clear that the proposed operating rules provided an inferior outcome to Scenarios 1 and 2 from the environment risk and opportunities assessment report, but a superior outcome to other scenarios.

Noting that there was significant uncertainty, the panel advised that the proposed rules would avoid the kind of damage to the river caused in 2017-18 and 2018-19 from sustained high flows to deliver IVT. The risks of erosion would be substantially reduced, and it is probable that the river would slowly heal, given adequate sediment inputs from tributaries and continuation of current environmental flow management.

The current geomorphic complexity would be retained. Linear bands of flood tolerant species along the littoral zone are likely to be more prevalent but would be limited to a narrow band in the upper littoral zone. Vegetation along the lower elevations of the banks above the littoral zone would be maintained or increased. The current habitat and flow-regulated conditions for small-bodied and large-bodied species for low-flow months would be maintained.

All comments from the panel on the proposed operating rules assume that delivery of water for the environment occurs (and will occur in the future) and follows the principles of adaptive management to maximise ecological outcomes.