Variation to the Seasonal Watering Plan 2020-21

This variation was made to Section 5.4.1 Goulburn River of the Seasonal Watering Plan 2020-21 by the VEWH Commission on 30 October 2020.

5.4.1 Goulburn River

Amended text in Table 5.4.1 and Table 5.4.2 is shown in red

Table 5.4.1 Potential environmental watering actions and objectives for the Goulburn River

Potential environmental watering action	Functional watering objectives	Environmental objectives
Year-round low flow (500-830 ML/day in reach 4 and 540-940 ML/day in reach 5)	• Provide slow, shallow habitat required for the recruitment of larvae/ juvenile fish and habitat for adult small-bodied fish • Provide deep-water habitat for large-bodied fish • Submerge snags to provide habitat for fish and waterbugs and a substrate for biofilms to grow • Maintain habitat for aquatic vegetation and water the root zone of low- bank vegetation • Vary flow within a specified range to encourage planktonic production (for food), disrupt biofilms and maintain water quality	
Winter/spring fresh (one to two freshes of more than 6,600 ML for 14 days during July to October in reaches 4 and 5)	• Improve macroinvertebrate habitat by improving water quality and by increasing the wetted perimeter • Provide carbon (e.g. leaf litter) to the channel • Wet bench habitats to encourage plant germination • Remove terrestrial vegetation and trigger the recruitment of native bank vegetation	
Provide slower recession to unregulated flows or releases from Goulburn Weir (3,000 ML/day and below in summer/ autumn and from 6,000 ML/ day in winter/spring) in reaches 4 and 5	• Minimise the risk of bank erosion associated with rapid drying • Minimise the risk of hypoxic blackwater after natural events	
Year-round low flow (400 ML/day in reach 1)	• Wet and maintain riffles to provide habitat for biofilms and waterbugs • Scour fine sediment from the gravel bed and riffle substrate • Maintain the wetted perimeter of the channel and habitat for aquatic vegetation • Maintain existing beds of in-channel vegetation • Maintain habitat for small-bodied native fish	
Winter fresh (up to 15,000 ML/ day with more than 14 days above 6,600 ML/day in June/ July 2021, reaches 4 and 5)	• Improve macroinvertebrate habitat by improving water quality and by increasing the wetted perimeter • Provide carbon (e.g. leaf litter) to the channel • Wet bench habitats to encourage plant germination • Remove terrestrial vegetation and trigger the recruitment of native bank vegetation	

Potential environmental watering action	Functional watering objectives	Environmental objectives
Flows should not exceed 1,000 ML/day for five to six weeks after a spring fresh (in late spring/summer) in reaches 4 and 5	• Allow newly grown littoral emergent and semi-aquatic plants to become established and persist • Provide habitat for small-bodied fish and macroinvertebrates	
One spring/summer fresh (greater than 6,600 ML for one day between November and December in reaches 4 and 5) 	• Provide a cue for golden and silver perch to spawn	
Autumn fresh (one fresh up to 6,000 ML/day for two days between March and April in reaches 4 and 5)	• Encourage the germination of new seed on the lower banks and benches • Improve water quality by reducing turbidity and mixing stratified water • Flush fine sediment from hard substrates to allow new biofilm growth and to improve food and habitat for macroinvertebrates	
Flows should not exceed 1,000 ML/day (for more than 20 consecutive days, with a minimum of seven days between pulses in summer/ autumn in reaches 4 and 5)	• Maintain for more than one season a littoral fringe of emergent or semi- aquatic plants • Provide slow-flowing littoral habitat for small-bodied fish and macroinvertebrates	

Table 5.4.2 Potential environmental watering for the Goulburn River under a range of planning scenarios

Planning scenario	Drought	Dry	Below average	Average	Wet
Expected river conditions	• No natural flow • Blackwater could be an issue in the warmer months	• Natural flow is expected to provide some low flow for half a month from winter/mid-spring and is likely to provide small, short winter/ spring freshes • Blackwater could be an issue in the warmer months	• Natural flow is expected to provide some low flow for a few months from winter/mid-spring and is likely to provide small winter/spring freshes • Blackwater could be an issue in the warmer months	• Natural flow is expected to provide low flow for most of the year and is likely to provide the winter/spring freshes • Blackwater could be an issue in the warmer months	• Natural flow is expected to provide low flow and multiple overbank flow events in winter/ spring
	• Normal minimum passing flows at reach 5 of 400 ML/day during July to October and 350 ML/day during November to June				
Expected availability of water for the environment[1]	• 154,000 ML	• 265,000 ML	• 386,000 ML	• 461,000 ML	

Planning scenario	Drought	Dry	Below average	Average	Wet
Potential environmental watering – tier 1a (high priorities)[2]	• Year-round low flow • Recession flow management • Year-round low flow (reach 1)	• Year- round low flow • Winter/spring fresh (partial) • Recession flow management • Year-round low flow (reach 1)	• Year-round low flow • Winter/spring fresh • Recession flow management • Year-round low flow (reach 1) • Extend natural flow events	• Year-round low flow • Winter/spring fresh • Recession flow management • Year-round low flow (reach 1) • Winter fresh 2021 • Spring/summer fresh • Extend natural flow events	• Year-round low flow • Recession flow management • Year-round low flow (reach 1) • Winter fresh 2021 (partial) • Spring/summer fresh • Extend natural flow events
Potential environmental watering – tier 1b (high priorities with shortfall)	• Winter/spring fresh (partial)	• Winter/spring fresh • Winter fresh 2021 (full) • Spring/summer fresh	• Winter fresh 2021 (full) • Spring/summer fresh	• N/A	• N/A
Potential environmental watering – tier 2 (additional priorities)	• Winter/spring fresh	• N/A	• N/A	• Autumn fresh (partial)	• Autumn fresh (partial)
Possible volume of environmental water required to achieve objectives[3]	• 120,000 ML (tier 1) • 107,000 ML (tier 1b) • 28,000 ML (tier 2)	• 234,000 ML (tier 1) • 188,000 ML (tier 1b)	• 366,000 ML (tier 1) • 175,000 ML (tier 1b)	• 388,000 ML (tier 1) • 47,000 ML (tier 2)	• 316,000 ML (tier 1) • 47,000 ML (tier 2)
Priority carryover requirements	• 23,000 ML	• 23,000 ML	• 23,000 ML	• 0 ML	• 0 ML