

# BIOLOGICAL RESPONSE TO FLOWS DOWNSTREAM OF CORIN, BENDORA, COTTER AND GOOGONG DAMS

Spring 2020

Summary report to Icon Water



**Prepared for:** Icon Water

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## EXECUTIVE SUMMARY

### SPRING 2020 RESULTS AND CONCLUSIONS

- Discharge across the region in the six months prior to sampling was higher in spring 2020 than spring 2019, largely due to higher average rainfall during this period in 2020.
- Water quality parameters at below dam test sites were largely within guideline levels in spring 2020, with the exception of nitrogen oxides (NO<sub>x</sub>) in all the test sites and total nitrogen (TN) in test sites (CM1, QM2 and QM3) which were above guideline levels.
- Test site CM2 did not meet the environmental flow ecological objective of <20% cover of filamentous algae in riffle habitats. It is possible that low discharge resulted in lack of flow disturbance and an increase in filamentous algae growth prior to sampling.
- Only one of the test sites (QM2) was assessed as band A and met the environmental flow ecological objective of AUSRIVAS band A. Four of the test sites (CM1, CM2, CM2 and QM3) were assessed as AUSRIVAS band B in spring 2020 and did not meet the environmental flow ecological objective.

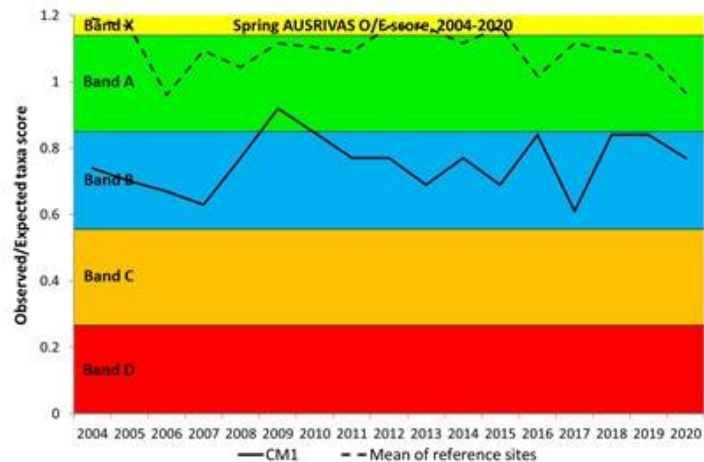
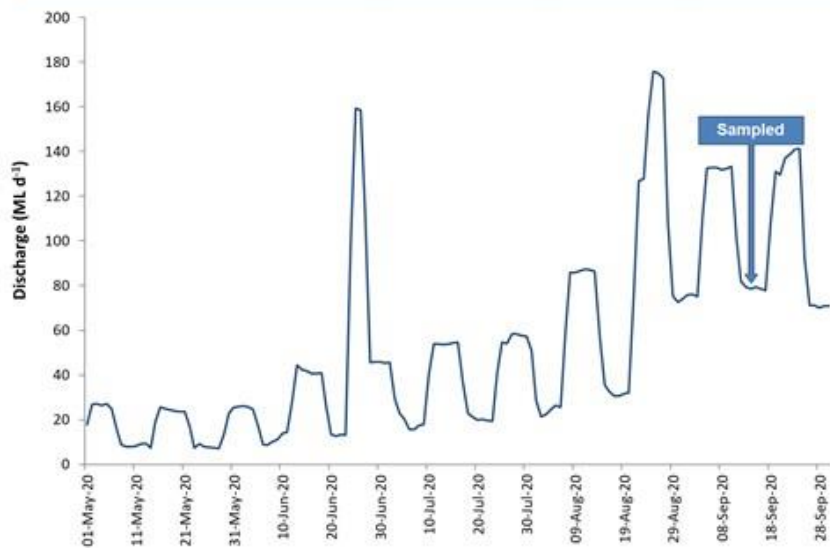
Filamentous algae cover and AUSRIVAS band scores for the test sites (green shading indicates environmental flow objective met, orange shading indicates environmental flow objective not met).

	Riffle filamentous algae cover (%)	AUSRIVAS band (O/E score)
Site	Spring 2020	Spring 2020
CM1 (Corin Dam)	<10	B
CM2 (Bendora Dam)	40	B
CM3 (Cotter Dam)	<10	B
QM2 (Googong Dam)	<10	A
QM3 (Googong Dam)	<10	B

# CM1 – Spring 2020

Downstream of Corin Dam

Environmental flow ecological objective	Autumn 2020	Spring 2020	Objective met?
AUSRIVAS band A	Band B	Band B	No
<20% filamentous algae cover in riffle habitat	<10%	<10%	Yes



\* Denotes values outside guideline levels



Temp. (°C)	EC (µs cm <sup>-1</sup> )	pH	D.O. (mg l <sup>-1</sup> )	Turbidity (NTU)	Alkalinity (mg L <sup>-1</sup> )	NH <sub>4</sub> <sup>+</sup> (mg L <sup>-1</sup> )	NO <sub>x</sub> (mg L <sup>-1</sup> )	TN (mg L <sup>-1</sup> )	TP (mg L <sup>-1</sup> )
7.43	1	7.29	11.32	0.0	18	0.008	0.185	0.31	0.011

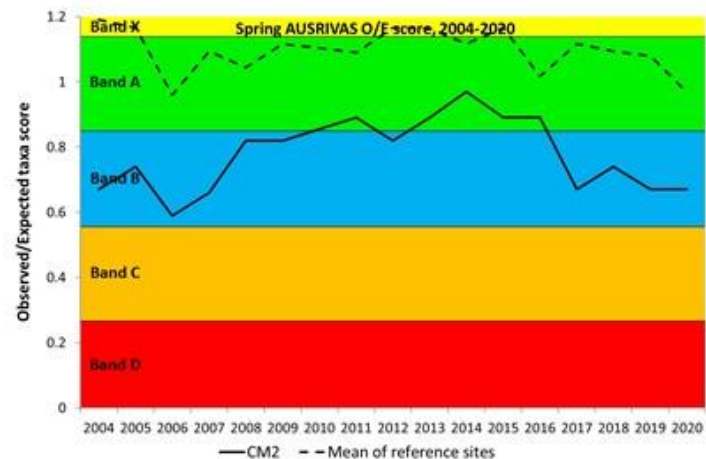
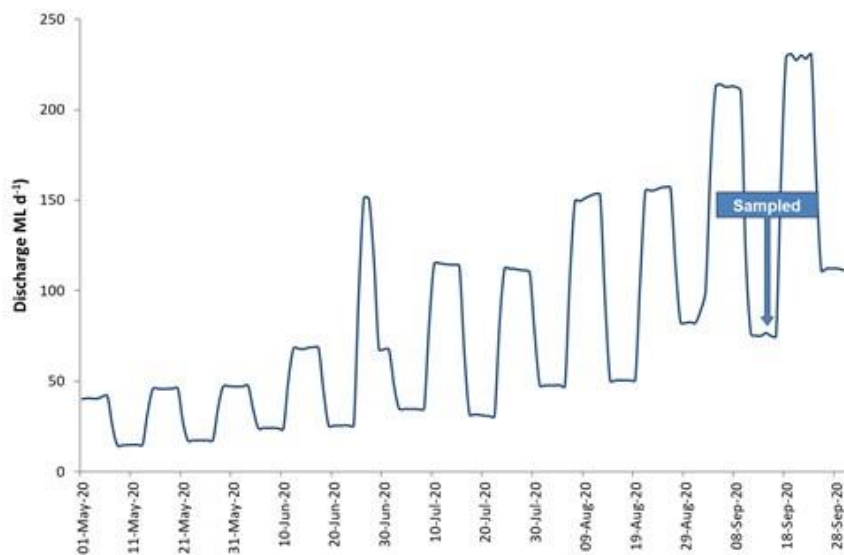




# CM2 – Spring 2020

## Downstream of Bendora Dam

Environmental flow ecological objective	Autumn 2020	Spring 2020	Objective met?
AUSRIVAS band A	Band B	Band B	No
<20% filamentous algae cover in riffle habitat	<10%	40%	No



\* Denotes values outside guideline levels



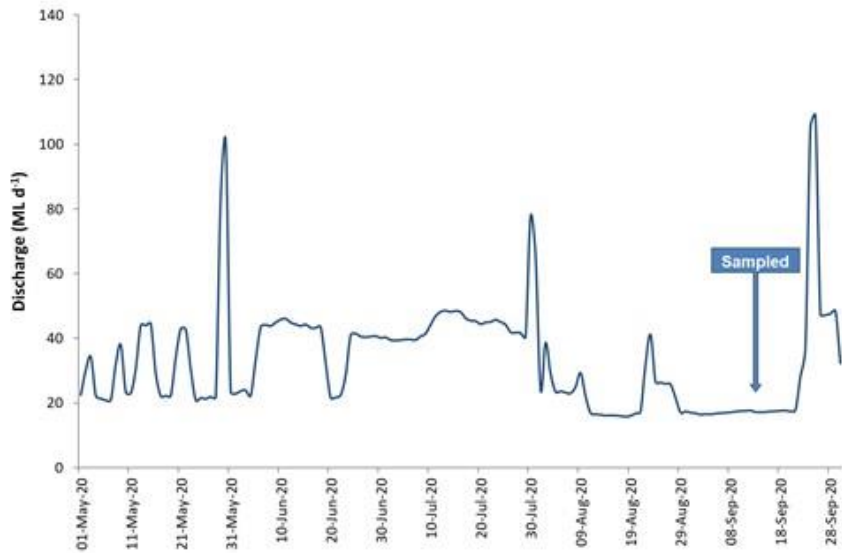
Temp. (°C)	EC (µs cm <sup>-1</sup> )	pH	D.O. (mg l <sup>-1</sup> )	Turbidity (NTU)	Alkalinity (mg L <sup>-1</sup> )	NH <sub>4</sub> <sup>+</sup> (mg L <sup>-1</sup> )	NO <sub>x</sub> (mg L <sup>-1</sup> )	TN (mg L <sup>-1</sup> )	TP (mg L <sup>-1</sup> )
8.06	0	7.27	11.5	0.3	13	0.004	0.141	0.22	0.005



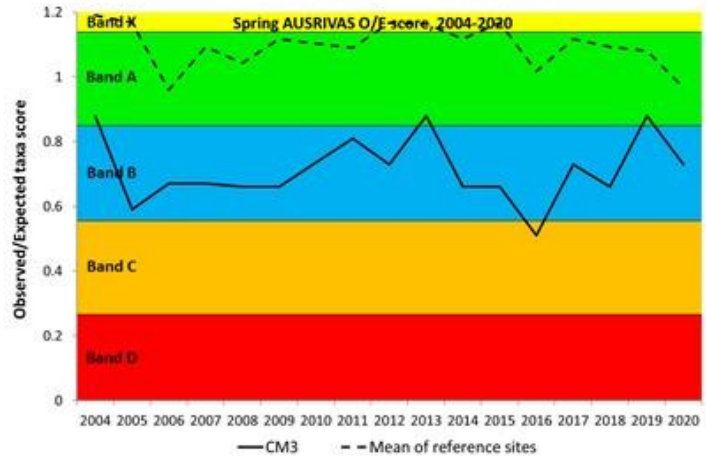
# CM3 – Spring 2020

## Downstream of Cotter Dam

Environmental flow ecological objective	Autumn 2020	Spring 2020	Objective met?
AUSRIVAS band A	Band A	Band B	No
<20% filamentous algae cover in riffle habitat	<10%	<10%	Yes



\* Denotes values outside guideline levels



Temp. (°C)	EC (µs cm⁻¹)	pH	D.O. (mg l⁻¹)	Turbidity (NTU)	Alkalinity (mg L⁻¹)	NH₄⁺ (mg L⁻¹)	NOx (mg L⁻¹)	TN (mg L⁻¹)	TP (mg L⁻¹)
11.88	14	6.94	10.84	4.1	19	0.025	0.037	0.17	0.007

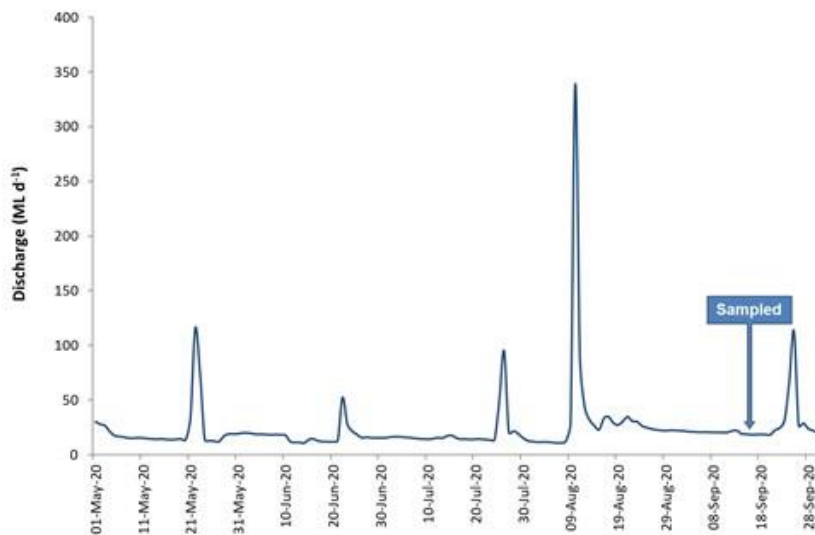




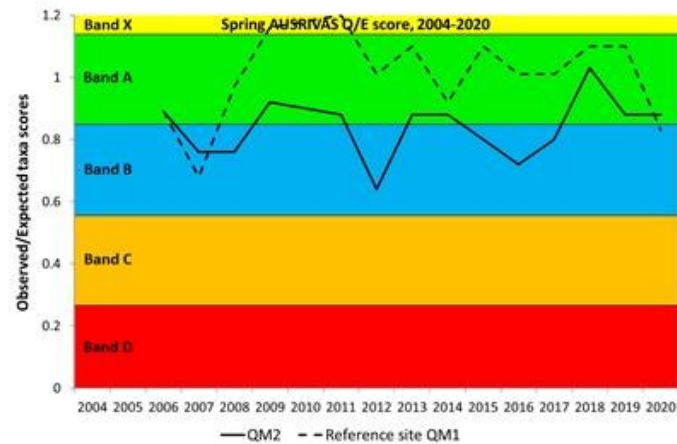
# QM2 – Spring 2020

## Downstream of Googong Dam

Environmental flow ecological objective	Autumn 2020	Spring 2020	Objective met?
AUSRIVAS band A	Band C	Band A	Yes
<20% filamentous algae cover in riffle habitat	<10%	<10%	Yes



\* Denotes values outside guideline levels



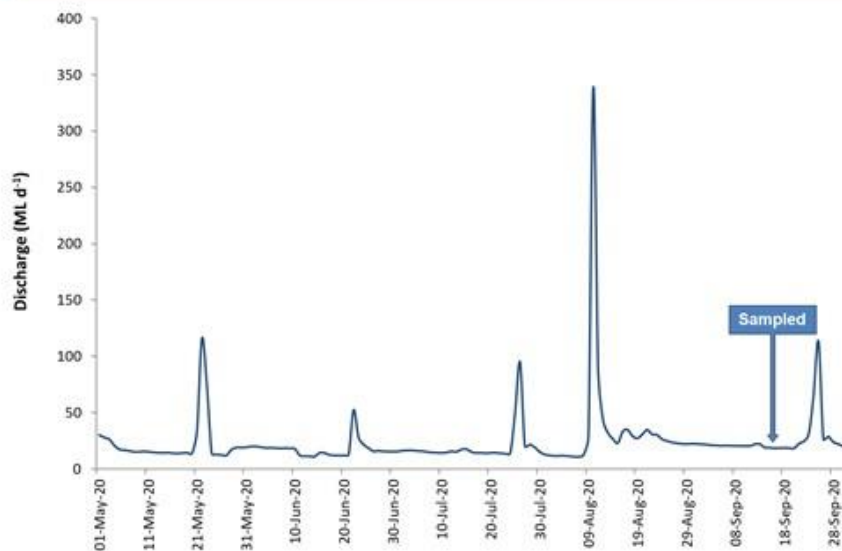
Temp. (°C)	EC (µs cm⁻¹)	pH	D.O. (mg l⁻¹)	Turbidity (NTU)	Alkalinity (mg l⁻¹)	NH₄⁺ (mg l⁻¹)	NOx (mg l⁻¹)	TN (mg l⁻¹)	TP (mg l⁻¹)
11.56	76	8.00	11.49	2.6	72	0.032	0.154	0.63	0.013



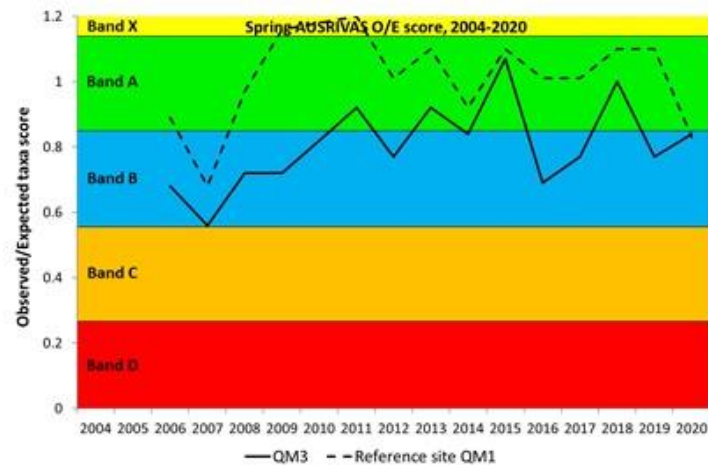
# QM3 – Spring 2020

## 2km Downstream of Googong Dam

Environmental flow ecological objective	Autumn 2020	Spring 2020	Objective met?
AUSRIVAS band A	Band B	Band B	No
<20% filamentous algae cover in riffle habitat	<20%	<10%	Yes



\* Denotes values outside guideline levels



Temp. (°C)	EC (µs cm <sup>-2</sup> )	pH	D.O. (mg l <sup>-1</sup> )	Turbidity (NTU)	Alkalinity (mg L <sup>-1</sup> )	NH <sub>4</sub> <sup>+</sup> (mg L <sup>-1</sup> )	NO <sub>x</sub> (mg L <sup>-1</sup> )	TN (mg L <sup>-1</sup> )	TP (mg L <sup>-1</sup> )
14.01	120	7.89	10.62	5.0	100	0.012	0.079	0.63	0.013





