



UNIVERSITY OF
CANBERRA



INSTITUTE FOR
APPLIED ECOLOGY

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

Spring 2019

Summary report to Icon Water



Prepared for: Icon Water

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EXECUTIVE SUMMARY

SPRING 2019 RESULTS AND CONCLUSIONS

- Discharge across the region in the six months prior to sampling was far less in spring 2019 than spring 2018, largely due to below average rainfall during this period in 2019.
- Water quality parameters at below dam test sites and reference sites were largely within guideline levels in spring 2019, with the exception of nitrogen oxides (NO_x) and pH which were above guideline levels at the below Corin Dam site (CM1) and total nitrogen (TN) which was above guidelines at both the below Googong Dam sites. .
- Test site CM1 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.
- Two of the test sites (CM3 and QM2) were assessed as band A and met the environmental flow ecological objective of AUSRIVAS band A. Three of the test sites (CM1, CM2 and QM3) were assessed as AUSRIVAS band B in spring 2019 and did not meet the environmental flow ecological objective.

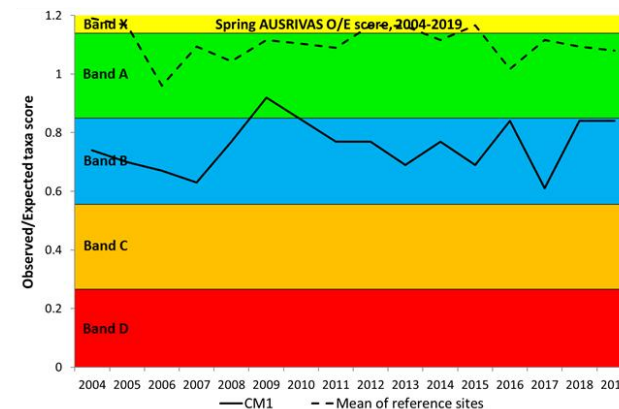
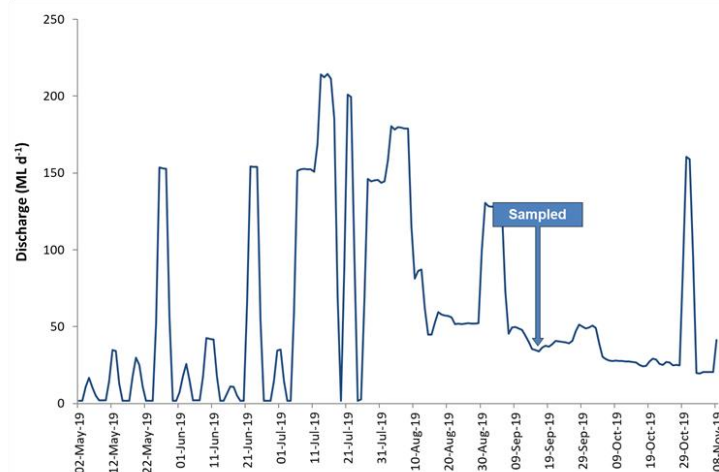
Filamentous algae cover and AUSRIVAS band scores for the test sites (green shading indicates environmental flow objective met, orange shading indicates environmental flow objective not met).

	Riffle filamentous algae cover (%)	AUSRIVAS band (O/E score)
Site	Spring 2019	Spring 2019
CM1 (Corin Dam)	> 20	B
CM2 (Bendora Dam)	< 20	B
CM3 (Cotter Dam)	< 20	A
QM2 (Googong Dam)	< 20	A
QM3 (Googong Dam)	< 20	B

CM1 – Spring 2019

Downstream of Corin Dam

Environmental flow ecological objective	Autumn 2019	Spring 2019	Objective met?
AUSRIVAS band A	Band B	Band B	No
<20% filamentous algae cover in riffle habitat	<10%	>20%	No



* Denotes values outside guideline levels



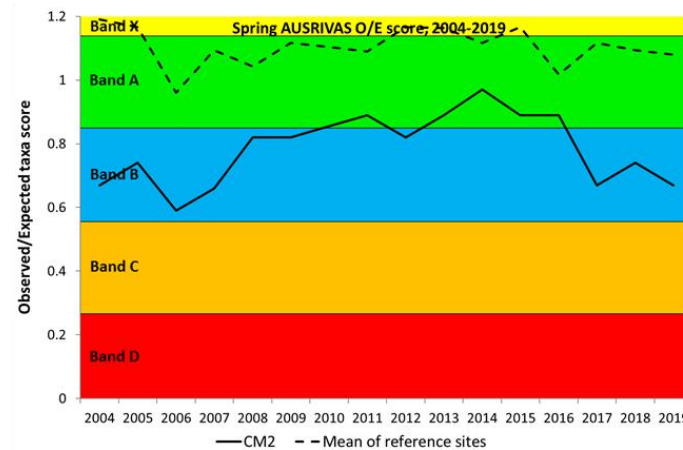
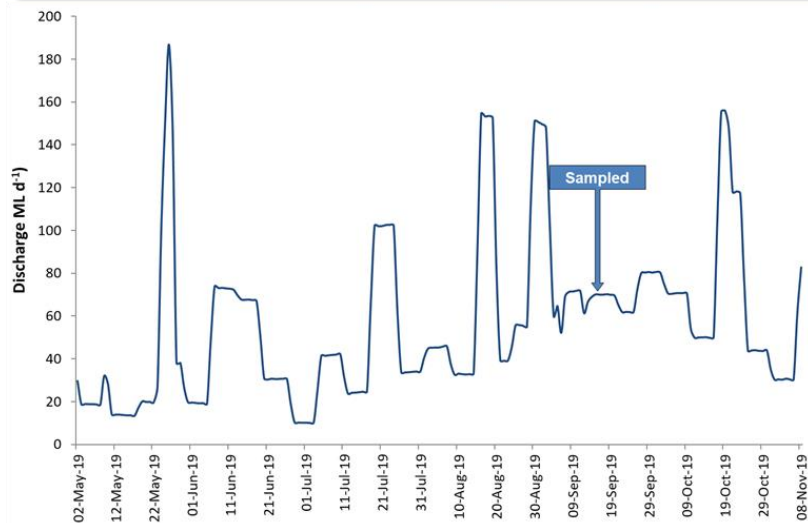
Temp. (°C)	EC (µs cm⁻¹)	pH	D.O. (mg l⁻¹)	Turbidity (NTU)	Alkalinity (mg l⁻¹)	NH ₄ ⁺ (mg L ⁻¹)	NOx (mg L ⁻¹)	TN (mg L ⁻¹)	TP (mg L ⁻¹)
10.61	20	6.36*	10.23	3.7	4	0.008	0.032*	0.14	0.009



CM2 – Spring 2019

Downstream of Bendora Dam

Environmental flow ecological objective	Autumn 2019	Spring 2019	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



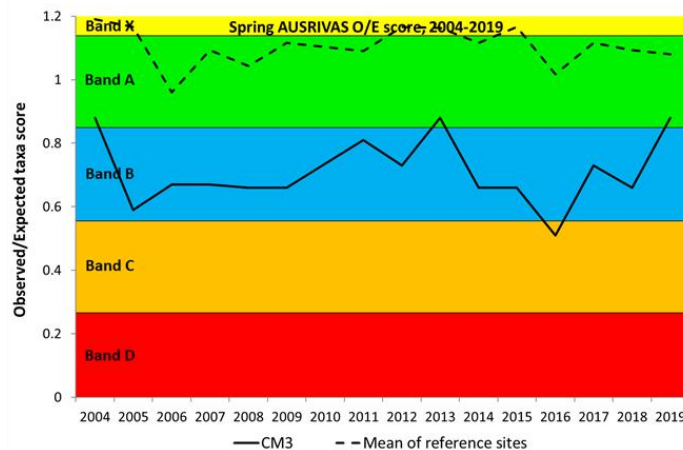
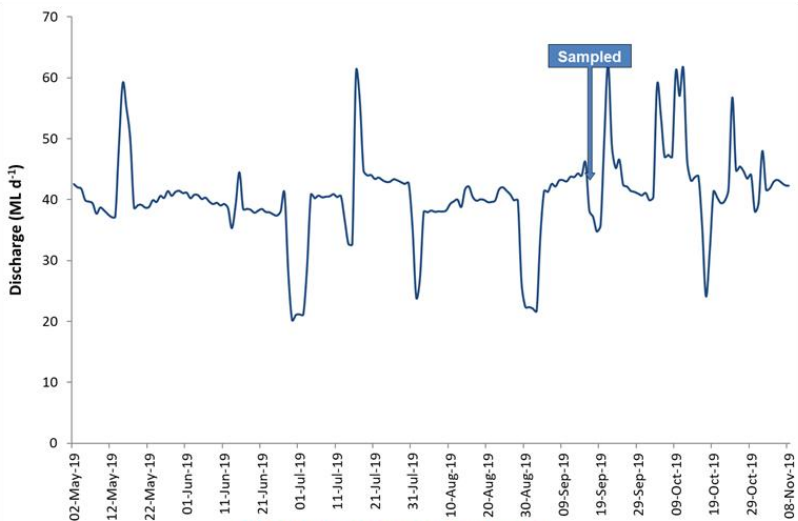
Temp. (°C)	EC (µs cm ⁻¹)	pH	D.O. (mg l ⁻¹)	Turbidity (NTU)	Alkalinity (mg L ⁻¹)	NH ₄ ⁺ (mg L ⁻¹)	NOx (mg L ⁻¹)	TN (mg L ⁻¹)	TP (mg L ⁻¹)
9.87	19	6.92	9.08	0.1	10	0.005	0.014	0.12	0.008



CM3 – Spring 2019

Downstream of Cotter Dam

Environmental flow ecological objective	Autumn 2019	Spring 2019	Objective met?
AUSRIVAS band A	Band C	Band A	Yes
<20% filamentous algae cover in riffle habitat	<10%	<10%	Yes



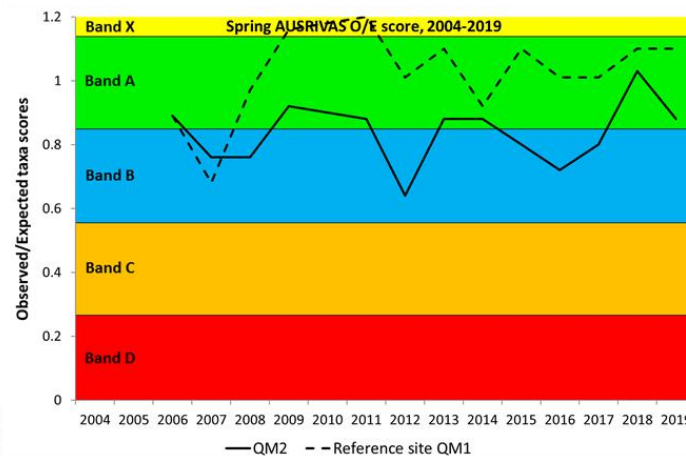
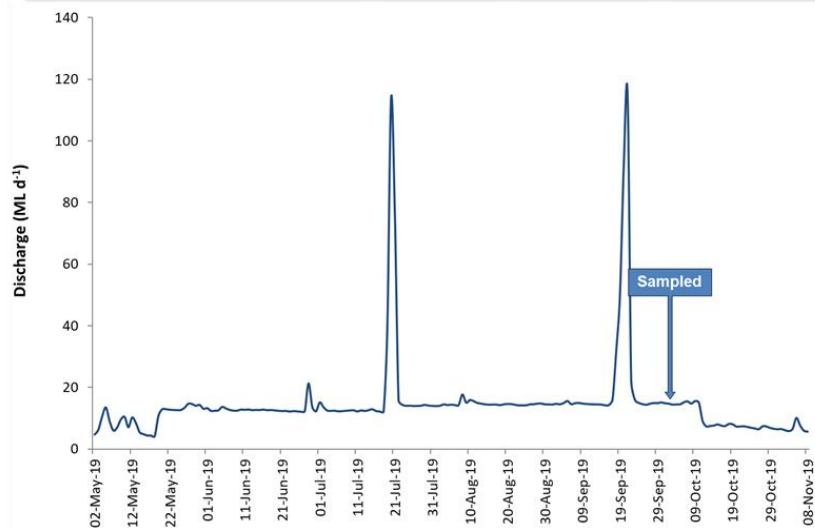
Temp. (°C)	EC (µs cm ⁻¹)	pH	D.O. (mg l ⁻¹)	Turbidity (NTU)	Alkalinity (mg L ⁻¹)	NH ₄ ⁺ (mg L ⁻¹)	NOx (mg L ⁻¹)	TN (mg L ⁻¹)	TP (mg L ⁻¹)
12.71	34	7.77	9.61	3.8	17	0.003	0.014	0.15	0.008



QM2 – Spring 2019

Downstream of Googong Dam

Environmental flow ecological objective	Autumn 2019	Spring 2019	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)	NH ₄ ⁺ (mg L ⁻¹)	NOx (mg L ⁻¹)	TN (mg L ⁻¹)	TP (mg L ⁻¹)
14.09	90	7.84	11.03	1.9	42	0.004	0.008	0.32*	0.007

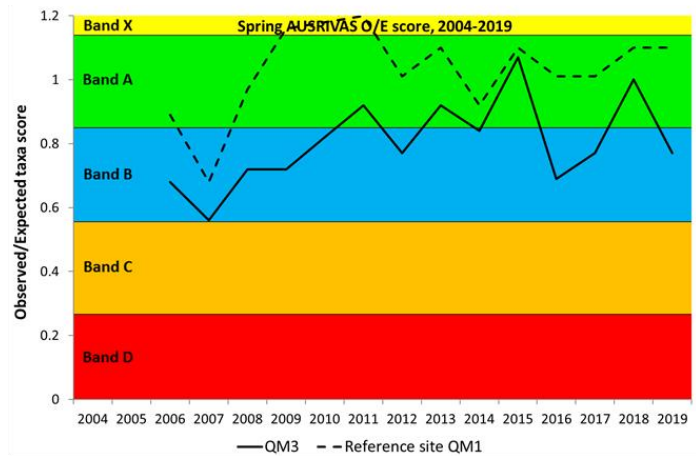
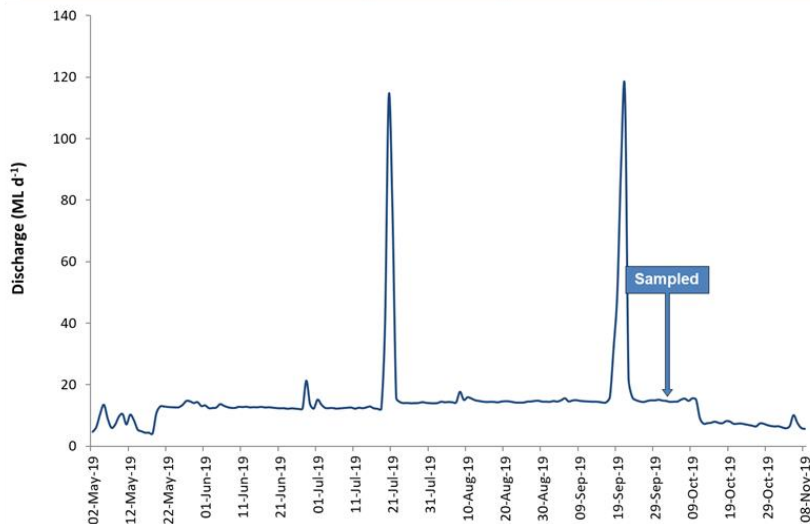


QM3 – Spring 2019

2km Downstream of Googong Dam



Environmental flow ecological objective	Autumn 2019	Spring 2019	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 ⁻¹)	pH	D.O. (mg l ⁻¹)	Turbidity (NTU)	Alkalinity (mg L ⁻¹)	NH ₄ ⁺ (mg L ⁻¹)	NOx (mg L ⁻¹)	TN (mg L ⁻¹)	TP (mg L ⁻¹)
16.43	119	7.75	10.39	2.5	50	0.004	0.002	0.33*	0.008



