Annual Waterways Report

Clyde Catchment

Water Assessment Branch

2009

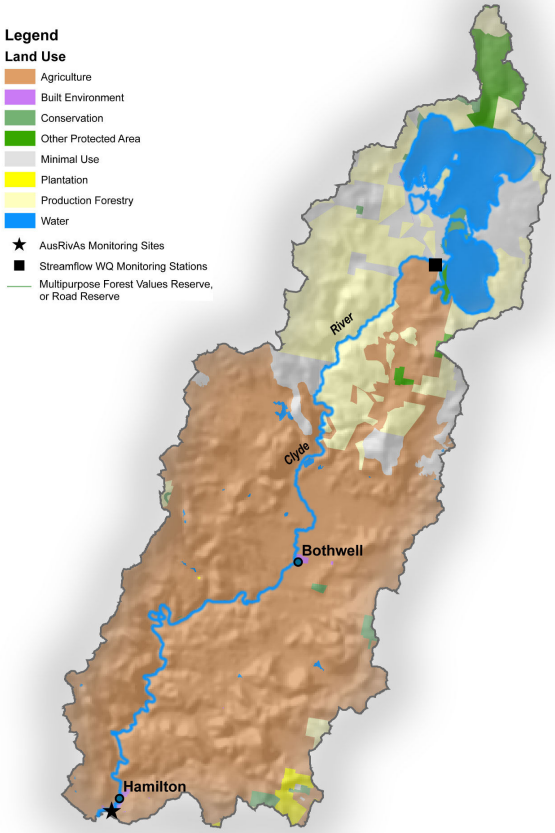
ISSN: 1835-8489

Department of Primary Industries and Water

Tasmania
Explore the possibilities

Clyde Catchment

Contents



1. About the catchment

The Clyde River catchment (catchment area 1,120 km^2) lies within the driest region in Tasmania, with much of the catchment receiving annual rainfall of less than 550 mm. The catchment contains two significant storages, Lake Sorell and Lake Crescent. Water level in both lakes is regulated and flow in the Clyde River is managed at the Lake Crescent outlet to supply water for irrigation and domestic purposes for the towns of Bothwell and Hamilton before joining the Derwent River system at Lake Meadowbank. Water in both the lakes and the Clyde River is managed by the River Clyde Trust, which was formed following an Act of Parliament initially passed in 1857.

Land use in the catchment is predominantly agriculture (cattle and sheep grazing, dairy farming and cropping) and timber is harvested primarily from private land. Both Lakes Sorell and Crescent were very popular trout fisheries in the past, however the introduction of European Carp has resulted in restricted access to both of these lakes and radical changes to water level management.

2. Streamflow and Water Allocation

Streamflow

There are two streamflow monitoring stations maintained in the Clyde River catchment as part of the DPIW state-wide monitoring network. These are:

- Clyde River downstream of Lake Crescent (4202); and
- Clyde River at Bothwell (54).

Streamflow during 2008 in the Clyde River below Lake Crescent was close to zero from July onwards. In the Clyde at Bothwell, flows peaked in November and December.

Below Lake Crescent, the minimum flow recorded during the year was 0.004 ML/day (Dec), and the maximum 14.2 ML/day (Jan). At Bothwell, the minimum flow was zero ML/day (one day, Mar), and the maximum was 43 ML/day (Nov).

Monthly discharge amounts were well below historical averages at both streamflow stations. Clyde River downstream of Lake Crescent experienced greatest discharge in January (307 ML) and the least in August (4 ML). The Clyde at Bothwell experienced greatest discharge in December (289 ML) and the least in August (62 ML).

Water Allocation

The Clyde catchment had a total of 19,469 ML in licensed allocations for 2008. The following table shows the breakdown of the allocations.

	Total Allocation (ML)
Irrigation	19,462
Stock	7
Other	5,000

Of the total licensed water allocation within this catchment, 18,640 ML is held within constructed storages and 829 ML is taken directly from rivers and streams.

Water Use Restrictions

Water restriction triggers have been developed for the Clyde River at Bothwell for each month of the year. Water use restriction levels have been set as part of the Clyde River Water Management Plan, available at:

www.dpiw.tas.gov.au/Water/Water Management/Water Management Plans

Due to low lake levels and the associated water management plan provisions, in 2008 there were no water releases from the Clyde River for the purpose of irrigation.

Fig: Clyde River downstream Lake Crescent.

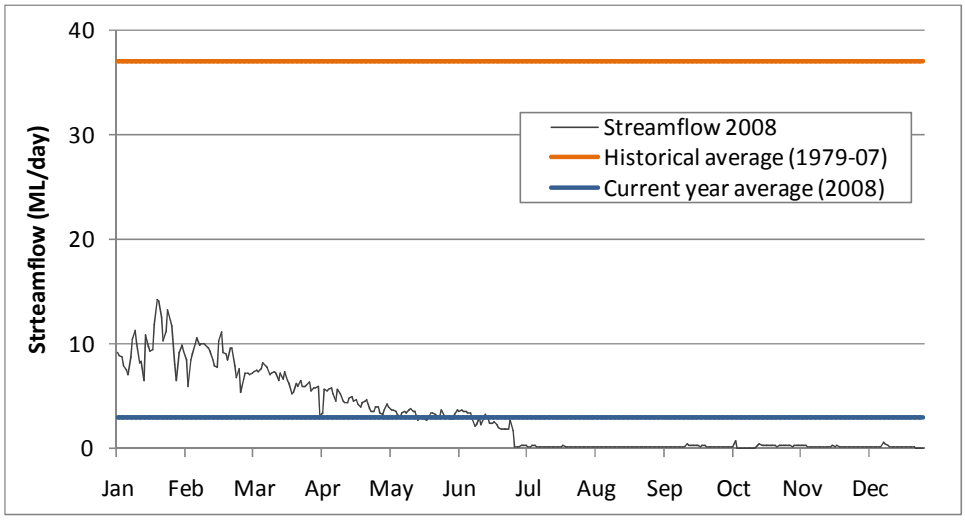


Fig: Time series of 2008 streamflow in the Clyde River downstream of Lake Crescent (station 4202), plus a comparison of current year average with the historical.

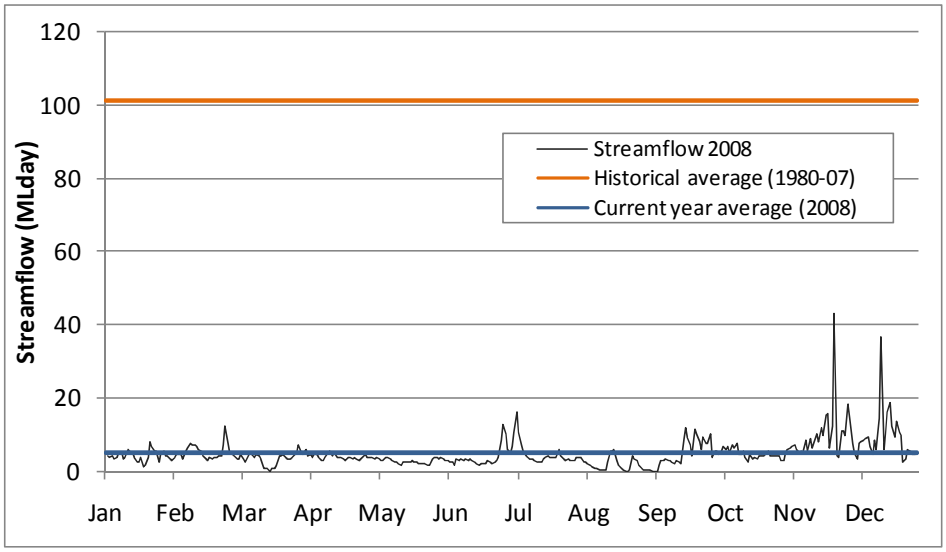


Fig: Time series of 2008 streamflow in the Clyde River at Bothwell (station 54), plus a comparison of current year average with the historical.

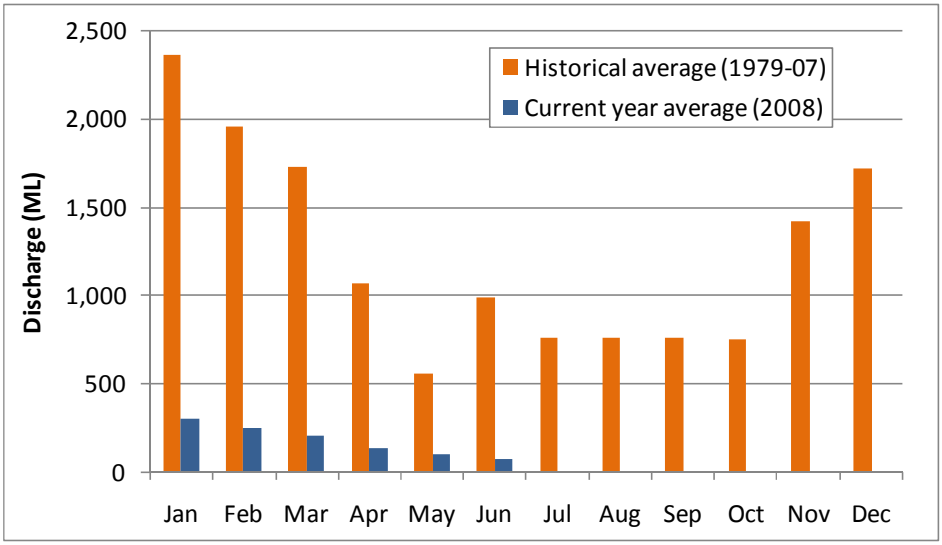


Fig: Comparison of total monthly discharge with historical average for the Clyde River below Lake Crescent (station 4202).

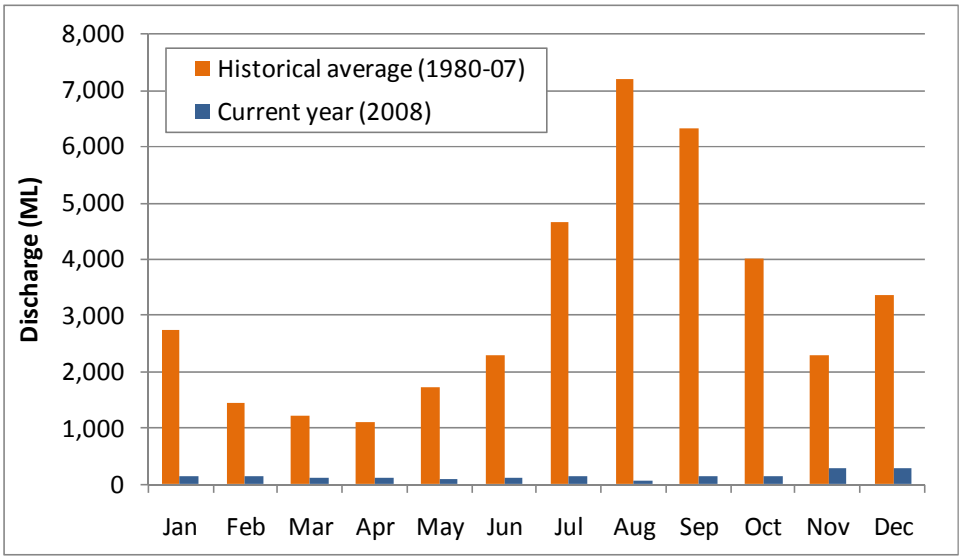


Fig: Comparison of total monthly discharge with historical average for the Clyde River at Bothwell (station 54).

3. Water Quality

Water quality monitoring under the DPIW Statewide baseline monitoring network consists of monthly sampling at a single location within the catchment:

- Clyde River downstream Lake Crescent (station 4202).

Sampling consists of spot measurements of selected water quality parameters on-site (water temperature, turbidity, conductivity, pH and dissolved oxygen). Bottled samples of water are also collected for analyses of nutrients (collected monthly) and pesticides (collected quarterly) at the Analytical Services Tasmania laboratory.

DPIW has developed site-specific trigger values for this site. The site-specific trigger values are based on monthly monitoring data collected between 2003 and 2006, and enable an assessment of *potential change* at a site since that time. The site-specific trigger values provide a target for the maintenance of existing ambient water quality, recognising that existing water quality at a site may already be influenced by varying degrees of impact. These trigger values indicate an expected range during daytime, base-flow conditions and should not be applied to high-flow periods.

A report containing further information about the DPIW site-specific trigger values is available through the DPIW website.

The table below provides summary statistics for monthly monitoring during 2008, as well as the relevant site-specific trigger values. Where the 2008 annual median exceeds a trigger value, this has been shaded to flag a potential change in water quality related to this parameter.

Links

1. Water Information System of Tasmania **www.water.dpiw.tas.gov.au/wist/**
2. Pesticide monitoring in Tasmania **www.dpiw.tas.gov.au/pesticidemonitoring**
3. DPIW surface water quality monitoring **www.dpiw.tas.gov.au/waterquality**
4. National water quality guidelines **www.environment.gov.au/water/quality/nwqms/**

Clyde River downstream Lake Crescent	**Minimum**	**Median**	**Maximum**	**No. samples**	**Site-specific trigger value**	
					lower	**upper**
Temperature (° C)	3.1	10.4	23.0	12	6	16
Turbidity (NTU)	36.1	150	353	12		175
Electrical Conductivity (µS/cm)	205	245	280	12	117	135
Field pH	6.85	7.58	7.96	11	6.5	7.4
Dissolved Oxygen (mg/L)	8.2	10.8	12.1	12	8.3	11.0
Dissolved Oxygen (percent saturation)	95.0	105.4	135.0	12	86	106
Total Nitrogen (mg/L)	1.700	2.950	5.300	12		3.500
Total Phosphorus (mg/L)	0.032	0.135	0.270	12		0.175
Dissolved Reactive Phosphorus-P (mg/L)	<0.002	0.003	0.004	12		0.005
Nitrate-N (mg/L)	0.005	0.067	0.531	12		0.566
Nitrite-N (mg/L)	<0.002	<0.002	0.006	12		0.003
Ammonia-N (mg/L)	0.019	0.076	0.175	12		0.115

Note that some samples were taken during periods of very low or no flow

4. River Health

The Australian River Assessment System (AUSRIVAS) is a standardised national system for assessment of river condition that uses benthic macroinvertebrates.

The AUSRIVAS models predict the aquatic macroinvertebrate fauna that would be expected to occur at a site in the absence of environmental stress such as pollution, habitat degradation or flow regulation. A comparison of the macroinvertebrates expected to occur at the test site with those actually collected (O/E ratio) provides a site specific measure of the biological impairment of the test site. Further details about AUSRIVAS can be found at:

www.ausrivas.canberra.edu.au/ausrivas.

AUSRIVAS assessments are carried out at only one location in the Clyde River catchment.

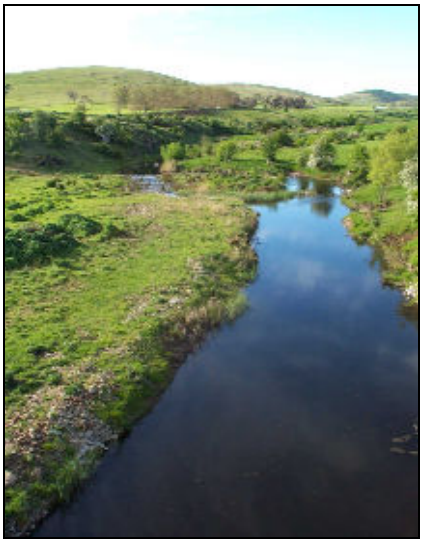


Fig: Clyde River below Hamilton.

Clyde River below Hamilton

This site is located downstream of the town of Hamilton and approximately 4 kilometres above the confluence of the Clyde and Derwent rivers. The surrounding land is used primarily for agricultural activities. Most of the riparian vegetation on both sides of the river has been cleared for grazing and the small amount remaining is dominated by non-native species such as willows, blackberries and hawthorn.

Within the stream habitat consists of deep pools and slow flowing runs over pebble / gravel substrate. Stock access and effluent discharge from Hamilton's sewerage treatment plant appear to have impacted on water quality and the condition of the instream habitat. A fine layer of silt and filamentous algae covers more than 70% of the substrate.

Combined season AUSRIVAS assessments for the riffle habitat have shown the site to be significantly disturbed (Band B) to severely disturbed (Band C) whilst for the edgewater habitat condition has consistently been equivalent to reference (Band A).

Name	Season	O/E Taxa Riffle	Band	O/E Taxa Edgewater	Band
Clyde River below	Au98/ Spr98	0.77	B	0.85	A
Hamilton	Au99/ Spr99	0.6	C	0.94	A
	Spr03/ Au04	0.55	C	0.9	A
	Spr04/ Au05	0.6	C	1.07	A
	Spr05/ Au06	0.65	B	0.99	A
	Spr06/ Au07	0.8	B	1.07	A
	Spr07/ Au08	0.65	B		NS
	Au08/ Spr08	0.65	B		NS

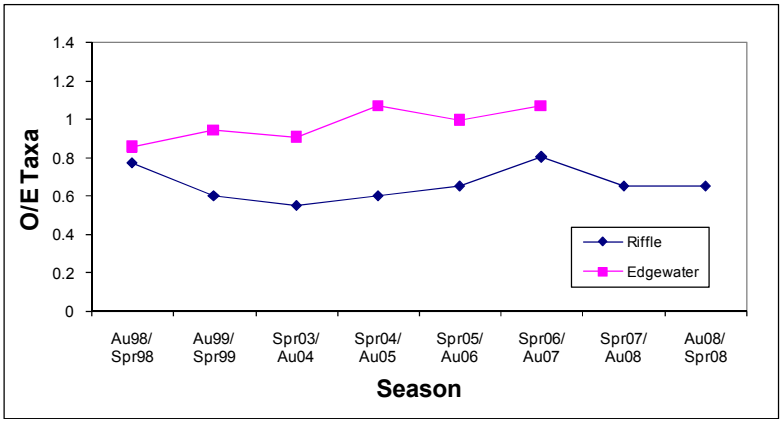


Fig: Combined season AUSRIVAS O/E Taxa scores for the Clyde River below Hamilton