

Annual Waterways Report

Welcome Catchment

Water Assessment Branch

2009

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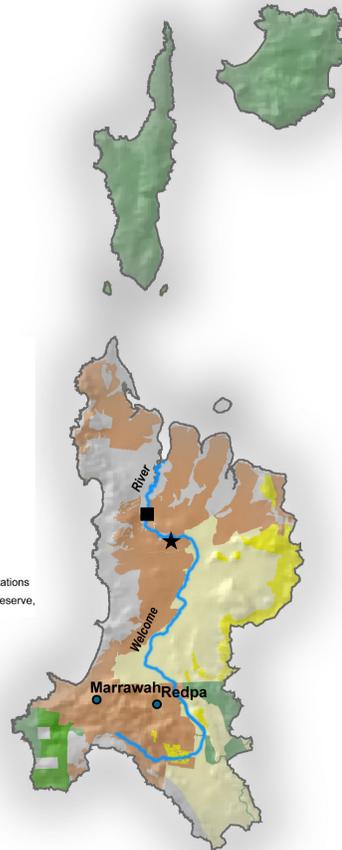
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Welcome Catchment

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1. About the catchment

The Welcome catchment lies on the northwestern extremity of Tasmania and encompasses the natural drainage of the Welcome River (approximately 38 km long) and the Marcus River, as well as a number of smaller coastal creeks. The entire 546 km² catchment is relatively low-lying, and originally the Welcome River flowed through extensive, low-lying swamp forests. These have largely been cleared and drained to facilitate the expansion of beef cattle and dairy farming, which along with forestry is the main land-use activity in the area. Some swamp forest remains within the Dismal Swamp Nature Reserve and Welcome Swamp.

Rainfall throughout the catchment is relatively high, and increases from north to south. Average annual rainfall at Marrawah is about 1,100 mm.

2. Streamflow & Water Allocation

Streamflow

There is one streamflow monitoring station maintained in the Welcome River catchment as part of the DPIW state-wide monitoring network. This station is:

- Welcome River (14223).

Streamflow in the Welcome River was lowest in autumn, and highest in winter to early spring. The minimum flow recorded during the year was 0.175 ML/day (Mar), and the maximum 511 ML/day (Jul).

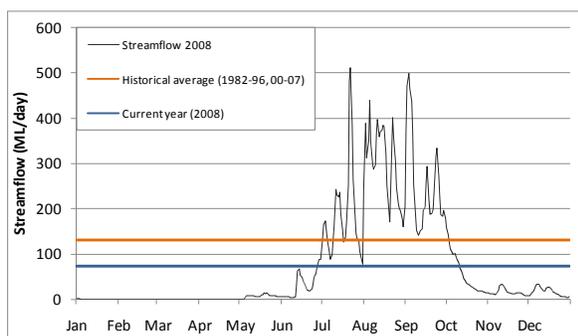


Fig: Time series of 2008 streamflow in the Welcome River (station 14223), plus a comparison of current year average flow with the historical.

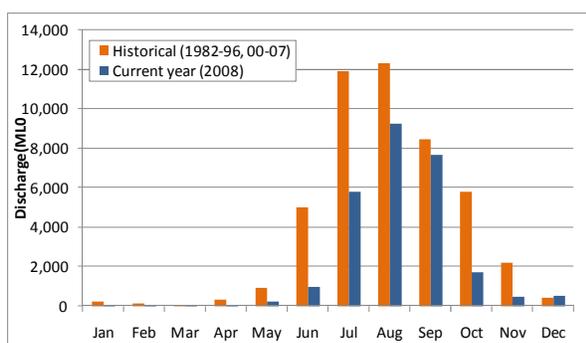


Fig: Comparison of total monthly discharge with the historical average for the Welcome River (station 14223).

Monthly discharges were below historical averages in all months except December, which exceeded the average by 81 ML. The months with the highest discharge were July, August and September.

Water Allocation

The Welcome River catchment had a total of 902 ML in licensed allocations for 2008. The following table shows the breakdown of the allocations.

	Total Allocation (ML)
Irrigation	897
Stock & Domestic	5
Water supply	-

Of the total licensed water allocation within this catchment, 772 ML is held within constructed storages and 130 ML is taken directly from rivers and streams.

Water Use Restrictions

Water restriction triggers have been developed for the Welcome River catchment. These triggers are given in the table below, together with how long the restriction was applied during 2008.

River	ML/d	%	Restriction	In effect 2008
Welcome River at weir	1.8	100	Ban on direct takes	80 days (Jan-Mar)

3. Water Quality

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

- Welcome River at Woolnorth (station 14223).

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 interpretation of 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/

Welcome River at Woolnorth	Minimum	Median	Maximum	No. samples	Site-specific trigger value	
					lower	upper
Temperature (° C)	7.4	12.3	16.6	11	10	17
Turbidity (NTU)	1.7	6.0	10.8	11		13
Electrical Conductivity (µS/cm)	535	1272	3700	11	561	1717
Field pH	6.63	7.67	7.91	10	7.1	7.9
Dissolved Oxygen (mg/L)	3.3	9.7	11.2	11	6.6	8.8
Dissolved Oxygen (percent saturation)	30.6	84.0	98.8	11	68	81
Total Nitrogen (mg/L)	0.420	0.790	2.000	11		1.718
Total Phosphorus (mg/L)	0.038	0.132	0.371	11		0.158
Dissolved Reactive Phosphorus-P (mg/L)	0.010	0.061	0.303	11		0.062
Nitrate-N (mg/L)	<0.002	0.088	0.458	11		0.177
Nitrite-N (mg/L)	<0.002	0.002	0.018	11		0.015
Ammonia-N (mg/L)	<0.002	0.015	0.072	11		0.048

Note the monitoring location was not accessible on the site visit in November 2008.

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 site in the Welcome River catchment.



Fig: Welcome River at Redmarsh Road.

Welcome River at Redmarsh Road

This site is located in the lower reaches of the Welcome River, approximately 3 kilometres upstream of the streamflow monitoring station (#14223). The site lies within an agricultural area however the riparian zone is dominated by native species and extends some 20 to 30 metres from the river on both sides. The river at this point is around 10 metres wide and consists of deep pools and shallow runs over silt and gravel substrate. At this site the river is heavily infested with Cumbungi (*Typha* sp.), which is likely to reduce flow rates and further promote the deposition of fine sediments.

Combined season AUSRIVAS assessments of the riffle habitat have not been possible as there has been no riffle habitat present on the majority of sampling occasions. Single season assessments of the riffle habitat for spring 2003 and spring 2007 classified this site as severely impaired (Band C).

Combined season AUSRIVAS assessments of the edgewater habitat have classified this site as significantly impaired (Band B). No assessment was possible for the spr04/au05 season as this site had environmental characteristics that are under-represented in the reference dataset. This site was therefore deemed to be "outside the experience of the model" (OE).

Name	Season	O/E Taxa Riffle	Band	O/E Taxa Edgewater	Band
Welcome River at Redmarsh Road	Spr03/ Au04		NS	0.65	B
	Spr04/ Au05		NS		OE
	Spr05/ Au06		NS	0.59	B
	Spr06/ Au07		NS		NS
	Spr07/ Au08		NS		NS
	Au08/ Spr08		NS		NS

(OE = Outside the experience of the model)

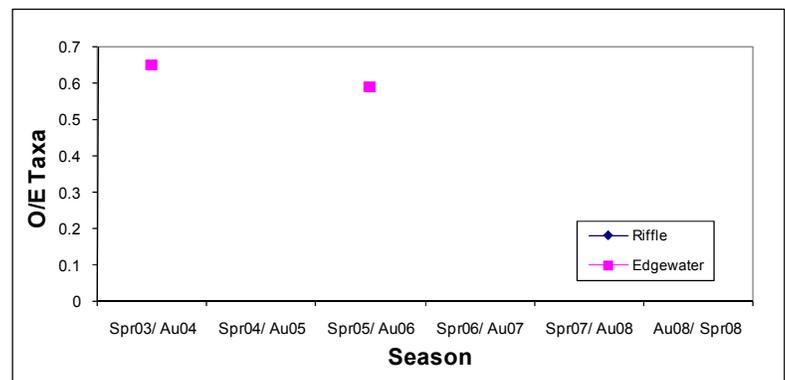


Fig: Combined season AUSRIVAS O/E Taxa scores for the Welcome River at Redmarsh Road.