

Coulta

Eyre Peninsula Groundwater Dependent Ecosystems monitoring site

2019 Report Card

Summary

Type of site: Control site for Vanilla.

Status: **Green**, positive trend in the short term (2016 to 2019).



Red Gums:



Condition
Good



Trend
Getting better

Short term
(2016 to 2019)



Trend
More data required

Long term

Ground water levels:

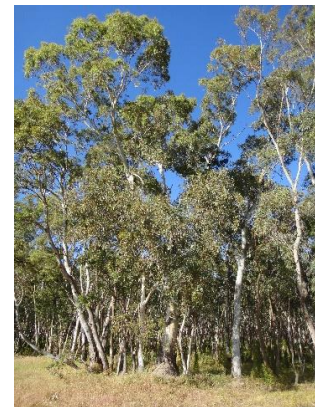


Trend
Stable

Short term
(2016 to 2019)

Climate: Above average maximum temperatures and declining annual rainfall and recharge events.

This Report Card should be read in conjunction with the Overview, which provides information about Groundwater Dependent Ecosystem (GDE) monitoring and summary information for all monitored GDE sites.

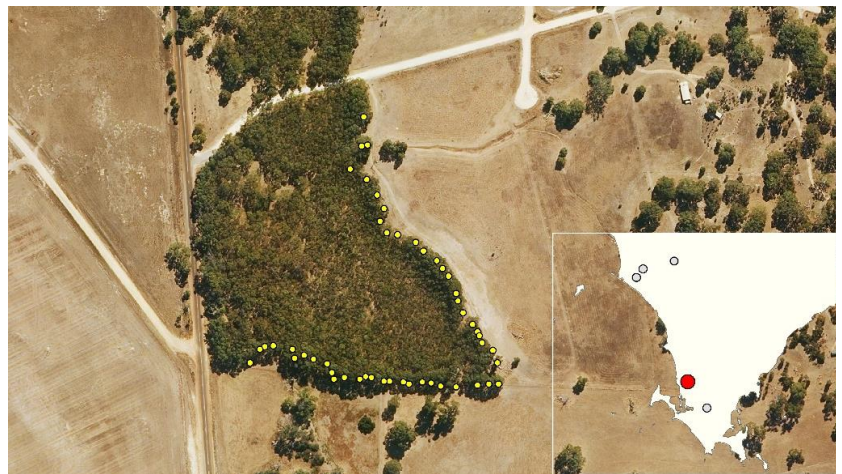


Adult Red Gums at Coulta assessed as in 'moderate' condition.

The **Coulta** Groundwater Dependent Ecosystems monitoring site is situated three kilometres south of Coulta, on the Flinders Highway. The site includes a remnant patch (approximately 17 ha) of Red Gum (*Eucalyptus camaldulensis*) Woodland. The understorey is dominated by native and introduced grasses.

Coulta is a control GDE Site, and is monitored to assess the impact of factors other than licensed extraction (e.g. climate) on GDE condition. It is located outside the zone of influence of any current or known historic licensed extraction.

While there is unlicensed extraction of water for stock and domestic purposes, this is assumed to be low compared to extraction for licensed consumptive purposes at other sites, and there is a low likelihood of it having any impact on the GDE.



Coulta site map. Note: yellow dots represent 50 surveyed trees.

Red Gum condition

Tree condition monitoring was undertaken in 2016 and repeated in 2018 and 2019. In 2016 the average Red Gum Condition Index (RCI) score was 0.47, increasing to 0.64 in 2019. While this shows a 17% improvement in Red Gum condition over this three year period, the dataset is too short to enable determination of any long term trends.

Groundwater and climate assessment

Improvement in Red Gum condition was observed from 2016 to 2019 despite possible increased stress due to climate variability.

Graphs on the right show climatic factors contributing to Red Gum stress:

- In the short term (2016 to 2019) total annual rainfall has decreased from 670.5 mm in 2016 to 385.4 mm in 2019. Despite this, water levels at both wells show a stable trend.
- Graph 2 shows in the long term, there is also a decline in total winter (May to September) rainfall (blue line). Daily rainfall events of more than 10 mm in winter (between May and Sept) are also in decline (orange line). These events are likely to be the main cause of recharge to underground water and are thought to be significant for long-term Red Gum health (Graph 2).

In addition, the average annual maximum air temperature at Port Lincoln has increased by 1.2 degrees Celsius between 1962 and 2019.

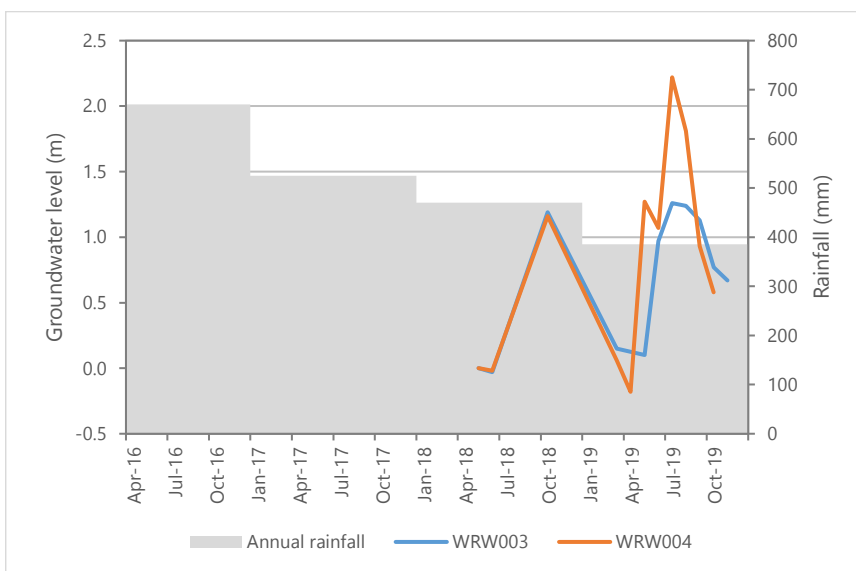
In combination, this decreasing rainfall and increasing temperatures reduce water availability for Red Gums. Less water is immediately available from rainfall, there is more evaporation, and there is a reduction in groundwater recharge. Groundwater levels can therefore decline, and this is thought to be significant for long term Red Gum health.

Monitoring into the future

Tree condition monitoring will continue on a yearly basis. As time goes on more data will allow for the identification of any trends in the GDE condition.

New monitoring infrastructure was installed at Coultas in 2019 to improve the site specific accuracy of data collection. Additions include:

- two monitoring wells,
- a water level data-logger at one well, and
- a rain gauge to measure rainfall intensity and amount.

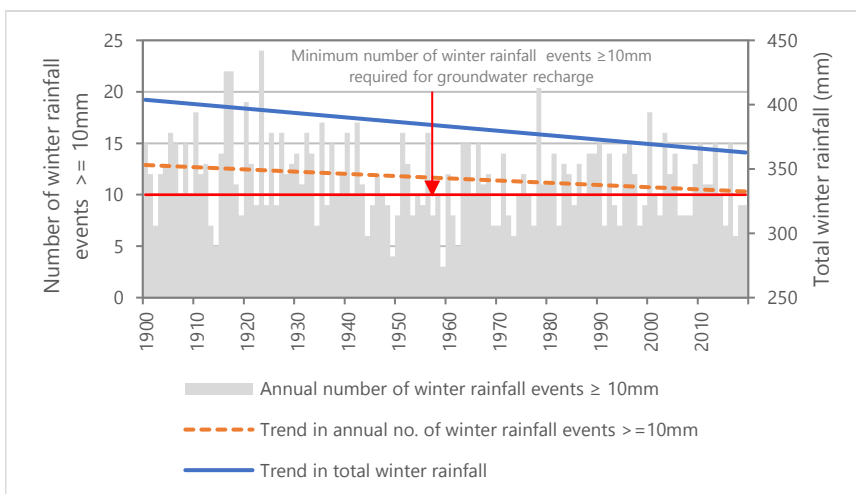


Graph 1 Total annual rainfall^{^^} and change in groundwater levels^{**} at two wells, from 2018 to 2019.

Notes:

^{^^}Rainfall data for 2016 to 2018 is regional data obtained from the Bureau of Meteorology station, Port Lincoln, Big Swamp (number 18017). Rainfall data for 2019 onward is site specific data obtained from the rainfall gauge installed at the Coultas GDE site.

^{**}For each well, the groundwater levels shown are relative to the groundwater level at the start of the monitoring period, which is shown as zero.



Graph 2 Long term trends in *total winter rainfall* (May to September) and *annual number of winter rainfall events ≥ 10 mm** from 1900 – 2019 (Port Lincoln, Big Swamp (18017) and Coultas rain gauges).

Note:

* Increases in groundwater levels are generally only observed when there are at least 10 winter rainfall events of 10 mm or more. Thus, if the grey bars drop below the red line for any year, there will be no groundwater recharge in that year. The orange line shows the trend in the grey bars. If this drops below the red line it indicates that there will be no groundwater recharge in more than 50% of years.

For more information

Access the full report on assessment of Red Gum condition in 2018 [here](#): Muller K. L., N.J. Souter and Australian Water Technology (2019). *Eyre Peninsula Groundwater Dependent Ecosystem Data Analysis: Red Gum tree condition data (five sites)*. A report for Natural Resources Eyre Peninsula, Department for Environment and Water, Port Lincoln, South Australia.

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