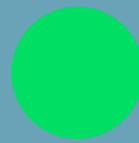


Coulta

Eyre Peninsula Groundwater Dependent Ecosystems monitoring site

2022 Report Card



Summary

Type of site: Control site for Wanilla.

Status: **Green**, improving trends in the short term (2016 to 2022). Stable condition (2021-2022) likely due to ongoing good winter rainfall, and increasing groundwater levels.

Red Gums:



Condition
Good

Annual change
(2021-2022)
Declining



Short term trend
(2016 to 2022)
Improving



Long term trend
More data required



Groundwater levels:

Annual change
(2021-2022)
Improving



Climate: Below average maximum summer temperatures and above average June and July rainfall, with good groundwater recharge events.

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



Adult Red Gum at Coulta assessed as in 'good' condition in Oct 2022.

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

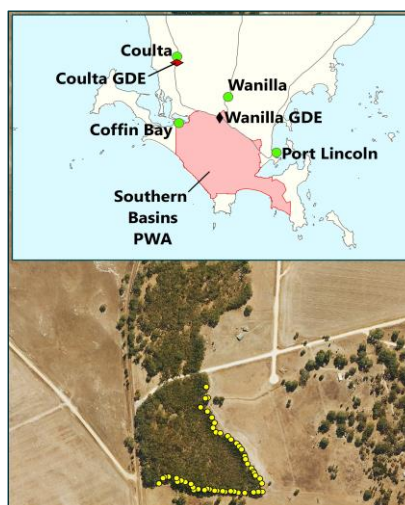
Coulta is a control GDE Site, and is monitored to assess the impact of factors other than licensed extraction (e.g. climate) on GDE condition. It is located outside the zone of influence of any current or known historic licensed extraction.

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.

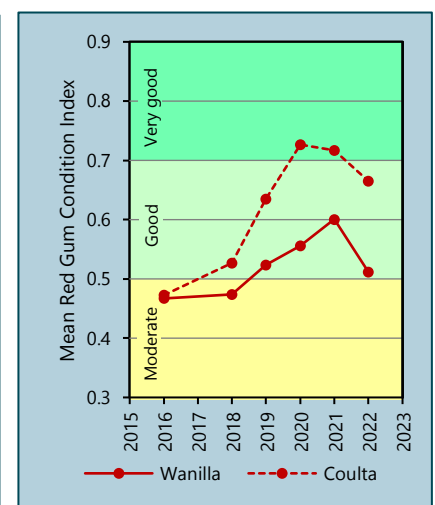
Red Gum condition

Tree condition monitoring is carried out in late October to early November. First completed in 2016, monitoring has been repeated annually since 2018.

In 2016, when the monitoring commenced, the Red Gum condition was moderate, with an average Red Gum Condition Index (RCI) score of 0.47. In 2020 the Red Gum condition was very good, with average RCI score of 0.73. This was a 25% improvement in Red Gum condition between 2016 and 2020. The condition has declined to good through 2022 (average RCI score of 0.67). The decline in the average RCI at Coulta during 2022 can be attributed to less vigour i.e. less flower and/or less tip growth. The dataset is too short to enable determination of any long term trends.



Coulta site map (yellow dots represent 50 surveyed trees)



Graph 1 Change in Red Gum Condition Index at Coulta (control site for Wanilla) and Wanilla from 2016 to 2022

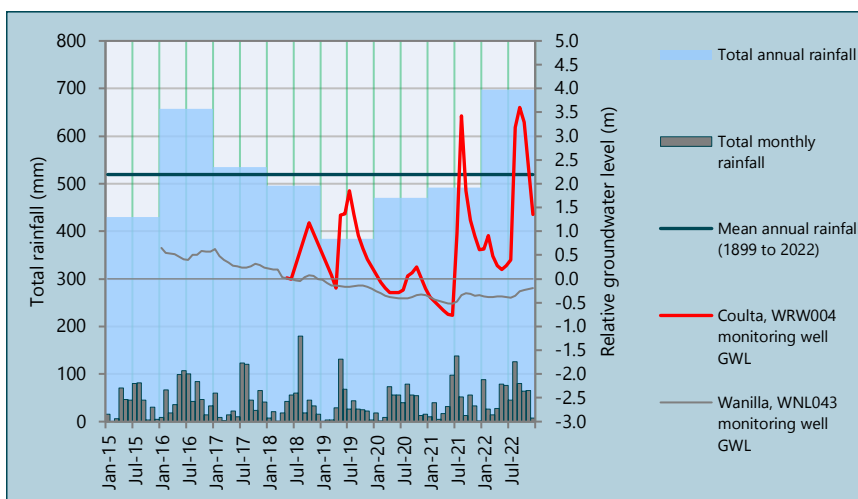
Groundwater and climate assessment

Red Gum condition declined slightly to good through 2022, with trees supported by increased groundwater levels, higher than average rainfall during August - September, and cooler than average maximum daily temperatures.

As detailed below, graphs on the right show climatic factors contributing to groundwater recovery, and associated stable Red Gum condition:

- Rainfall was 179 mm above the long term¹ mean annual rainfall (519 mm), total annual rainfall increased from 491 mm in 2021 to 698 mm in 2022 (Graph 2).
- Groundwater levels at Coultla fluctuate seasonally. Through the early summer months of 2022 levels in monitoring well WRW004 fell. This decline was, however, followed by rapid recharge of groundwater in July to September, caused by the higher than average rainfall during these months. Groundwater levels increased by nearly 4 m during this period (Graph 2).
- Even though groundwater levels again started declining after this recharge occurred, levels have recovered such that in late October 2022, the peak groundwater level was the highest observed in WRW004 in since May 2018 (Graph 2).
- Temperatures were cooler than usual, with the annual average of daily maximum temperature 0.4°C below the long term¹ mean (Graph 3). These cooler temperatures could result in improved groundwater recharge, with less evaporation occurring after rainfall events. The impact of cooler temperatures on Red Gum condition is possibly mixed. Cooler temperatures can contribute to improved Red Gum condition, with the trees being impacted less by heat stress. Cooler temperatures could, however, also result in less vigour in the trees and might be the cause of the decline in Red Gum RCI during 2022. Similar decline in RCI with cooler temperatures was also seen at Bramfield, Bellevue and Polda.

Coultla is located outside the zone of influence of licensed extraction from the Uley Wanilla groundwater lens. The increase in groundwater

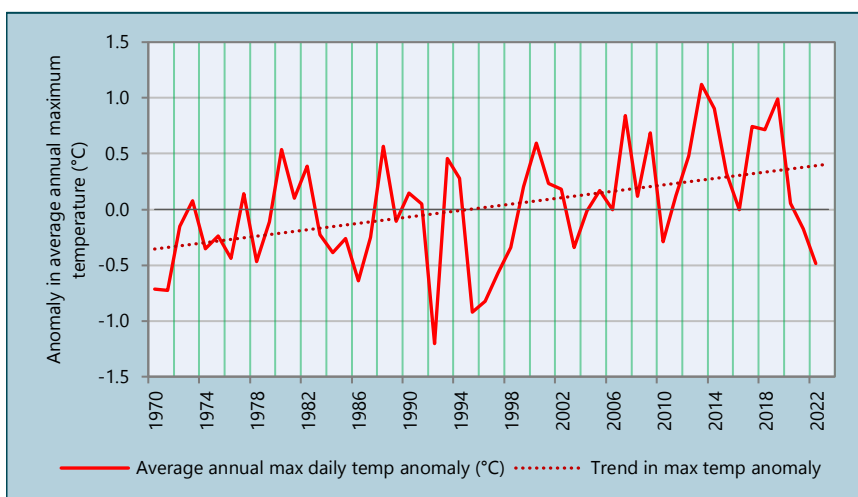


Graph 2 Total annual and total monthly rainfall^{^^}, and change in groundwater level^{**} at monitoring wells at Coultla, WRW004 ([5929-0737](#)), and Wanilla (extraction site for which Coultla is the control site), WNL043 ([6028-1605](#)).

Notes:

^{^^}Rainfall data for 2016 to 2018 is patched [SILO](#) data for the Bureau of Meteorology station, Coultla (number 18019). Rainfall data for 2019 to 2022 is site specific data obtained from a rainfall gauge installed at the Coultla GDE site.

^{**} For all monitoring wells the groundwater levels shown are relative to the groundwater levels in that well at June 2018, which are shown as zero.



Graph 3 Anomaly in annual average of daily maximum temperature[^] from 1970 to 2022

Note:

[^] This is the difference between the annual average of the daily maximum temperature for any one year and the long term¹ mean of the annual average of the daily maximum temperature. Maximum daily temperature is measured at the Bureau of Meteorology station, Coultla (number 18019).

levels observed at Coultla during 2021-22 therefore indicates that, in the absence of licensed extraction, during 2020-21, an increase in groundwater levels should have been observed in most other wells on the Uley Wanilla groundwater lens. Red Gum condition at other Red Gum GDE sites should have at worst only declined slightly, during 2021-22.

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 long term trends in the GDE condition.

¹All long term averages are for the period 1 Jan 1899 to 31 Dec 2022.

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 (DEW), Port Lincoln, South Australia.

Access the 2022 *Overview and Red Gum GDE Condition Summary* and other specific site (Wanilla, Bramfield, Bellevue, and Polda) report cards [here](#).

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