

# Marne Saunders Catchment Report Card 2026



Reporting on data for 2023, 2024 and 2025

# Marne Saunders Catchment Report 2026

## Our mission

The idea for a report card stemmed from requests by the community for timely information in an easily readable format. Community members hope that this will help to ensure future developments in water related policy are more inclusive and enable everyone to work together towards sustainable management of the catchment.

The Murraylands and Riverland Landscape Board is proud to release this second Marne Saunders Report Card. This innovative way to report on catchment health in South

Australia, brings together government, citizen science and community contributions to measure how the Marne Saunders Catchment is tracking against a range of indicators.

The 2026 report card covers 3 years; a repeat of the 2023 year published in the 2024 Report Card including new and improved naming, criteria and data for indicators, as well as new reporting for the 2024 and 2025 years. Short-term trends over the 3 years and longer-term trends (where data are available) are also included.

## Message from Murraylands and Riverland Landscape Board Chair Frances Simes

*On behalf of the Murraylands and Riverland Landscape Board, I am pleased to release this more detailed 3-year Marne Saunders Report Card. The landscape board is aware of the hardships felt by everyone living and working in these areas during these recent dry years. We hope these report cards help improve everyone's understanding of the status of these important rivers by displaying as much relevant information as possible from a wide range of government and community sources.*

*Throughout the Marne Saunders water allocation plan review, and likely amendment processes, the landscape board will continue to work in collaboration with landholders, First Nations, industry, experts, government, and the wider community, as we search together for effective catchment management solutions.*



## Message from Marne Saunders Reference Group Chair Leon Deans

*This year's report card brings together 3 years of information, removing much of the 'noise' of single year assessments while providing deeper insight into what, why and how change is happening. This enables considered effective action to be taken based on knowledge rather than short-term ineffective reaction based on limited data.*

*People across the hills and plains rely on these aquifers, creeks and springs, and many have noticed changes for years. Now we begin to see the longer story of the catchment more clearly — how climate, low flows, groundwater, and water quality are shaping the places we care about. As we work through the water allocation plan review, it will give us a clearer, shared understanding of what needs to be done to support a healthier, more resilient Marne Saunders catchment into the future.*



## Mount Lofty Ranges to the River Murray

*The headwaters of the Marne River and Saunders Creek start on the crest of the Mount Lofty Ranges, flowing east while taking spectacular pathways through gorge country, spilling out onto the plains below and winding their way to join the mighty River Murray.*

*These rivers share a vital role in bringing water from the higher rainfall hills to the lower rainfall Murray plains, through the river channels and via groundwater recharge.*

*The lifeblood of many towns, the waters of the Marne Saunders catchment are of great social, economic, environmental and cultural value. This water supports irrigation, stock and domestic uses as well as a wide variety of habitats for native animals and plants, including majestic centuries-old river redgums.*



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The website provides links to important resources including the accompanying Marne Saunders Technical Report and an opportunity to provide feedback.

<https://flow.landscape.sa.gov.au/marne-saunders-catchment-community>



# First Nations water and cultural values in the Marne Saunders

The Murraylands and Riverland Landscape Board acknowledges the First Nations of the Murraylands and Riverland region and recognises their deep and ongoing connection to land, waters and sky. We pay our respects to Elders past and present, and acknowledge their cultural, spiritual and community leadership. We honour the knowledge they hold, and the responsibility they continue to carry for caring for Country.

First Nations groups across the Marne Saunders region — the Peramangk Aboriginal Corporation, the Mid Murray Aboriginal Corporation, the Mallee Aboriginal Corporation, and the Mannum Aboriginal Community Association Incorporated — have each shared strong, and often consistent messages about the role of water in their cultures, landscapes and community wellbeing. Healthy water means healthy Country, and healthy Country means cultural strength.

**Across all groups, several themes have emerged:**

## **Water as a living entity**

Water is not just a resource but a living, cultural presence that shapes identity and responsibility. Springs, soaks, pools and creeks carry story, memory and obligation. Even small or intermittent water places have cultural meanings that extend far beyond their physical size.

## **Protecting springs, soaks and refuge sites**

First Nations voices highlighted the cultural and ecological importance

of protecting the places that continue to hold water for longer periods. These sites are often fragile, vulnerable and irreplaceable.

## **Cultural continuity and climate pressures**

First Nations groups have observed how declining flows, shrinking pools and long dry periods affect not only ecology, but cultural practice. Reduced water availability makes it harder to visit, monitor and care for places that have been important for thousands of years.

## **Caring for Country**

All groups emphasised the need for ongoing involvement in land and water management. This includes cultural monitoring, supporting ranger programs, walking Country, identifying cultural indicators, and having a direct role in decision-making about water.

The report card is one tool that helps ensure these values, carried across generations, continue to be recognised and respected.

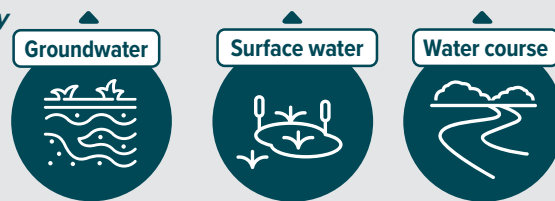
# What is affecting these rivers?

Change in the catchment is driven by a range of factors including climate, water interception and management.

## Water use in the Marne Saunders

The communities of the Marne Saunders rely on 3 main water sources: groundwater (from fractured rock aquifers in the hills and the sedimentary aquifer on the plains), surface water collected in dams and direct extraction from the watercourse.

*There is a high dependency on groundwater, while the use of water drawn straight from the rivers is very small due to short, unreliable flow periods.*



## Climate

The climate of the Marne Saunders catchment has changed over the past two decades.

Along with an overall decline in rainfall, seasonal patterns have shifted, with less rain falling in autumn and spring and the break of season often arriving later.

This change in seasonality means soils stay dry for longer and need more rainfall before they become saturated, reducing the chance of streamflow each year. Reduced autumn and spring rainfall also limits groundwater recharge, while hotter

temperatures increase evaporation from soils, dams and river pools.

Together, these changes mean less water remains available in the catchment.

## Rainfall-Runoff relationships

### Pre-Millennium Drought:

Annual rainfall typically produced predictable runoff and streamflow.

### Now:

The catchment produces less runoff from similar rainfall totals.

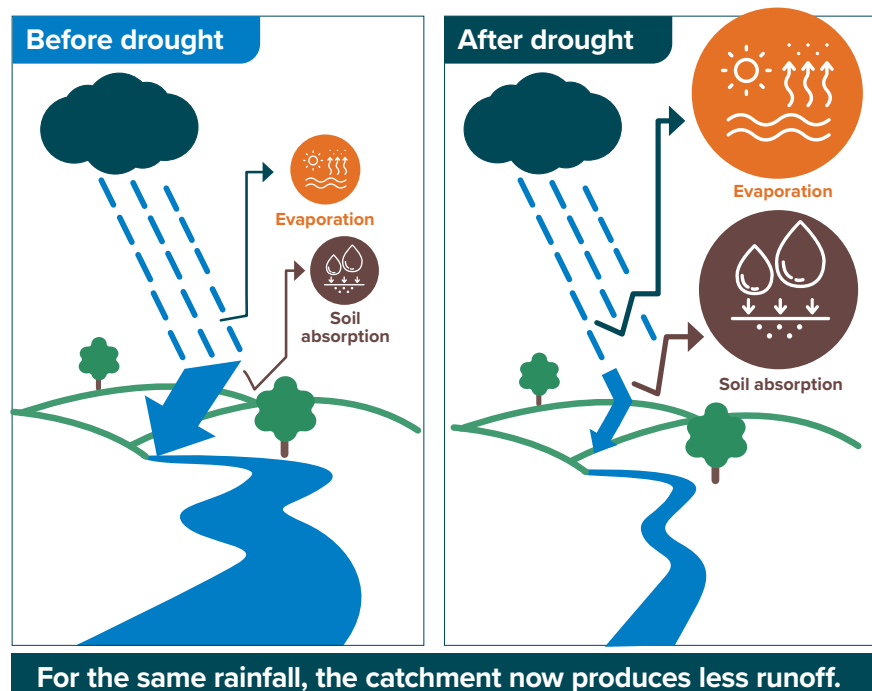
### Why?:

- Delayed break of season
- Hotter temperatures
- Less autumn and spring rainfall
- Soils remain drier for longer and absorb more water before runoff begins

### What this means:

Even when rainfall is slightly above average, **streamflows have not returned to historical levels.**

**For more information, visit the website**



## Historical changes in the water use

Construction of large dams in the hills zone of the catchment has affected the amount of water flowing through the river system and the length of flow season.

Communities reported a noticeable decline in the water resource in the 1980s and '90s which led to the prescription of surface water and groundwater in the Marne Saunders catchment in 2003.

Prescription means the water resource must be sustainably managed to provide security for all water users,

including the environment. Under the Landscape South Australia Act (2019), the landscape board has a duty to develop a water allocation plan to guide the granting of licences and allocation of the water for licensed purposes, while ensuring ongoing spiritual, cultural, environmental, social and economic needs of current and future generations are also met.

## Flows for the Future

Since 2017, the Flows for the Future Program has been working with landholders in the Marne Saunders catchment to deliver the low water flows that are critically important for fish and other aquatic biodiversity. Dams are fitted with bypass devices or other low flows infrastructure. So far this has resulted in 76 sites passing low flows at dams and

watercourse diversions, including the voluntary removal of 3 dams. This represents around two-thirds of the dams that were highlighted as having a significant influence on river flow. The remainder includes sites where devices could not be installed for technical reasons, or the landholder chose not to participate in the program.

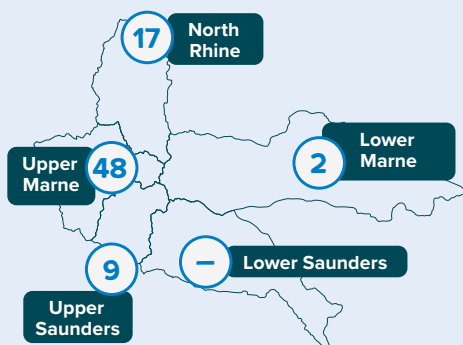
The program is ending in December 2026 with support available for committed landholders to maintain their devices into the future. Insights from the program will be invaluable in guiding future low flows projects and/or further development of low flows infrastructure into the future.

**For more information, visit the website.**

### Sites passing low flow

Numbers of sites passing low flows in the Marne-Saunders Catchment

Total = 76



Phil Lehman has been running a mixed farming business growing grapes and olives, and grazing sheep in the North Rhine sub-catchment for about 23 years. Over this time, the big change he has noticed is the reduced rainfall and runoff, affecting the dams as well as the waterways.

*"The river system looks basically healthy, certainly in terms of pollution or litter, but in recent years these systems are usually dry."*

*"I was aware that the water licence for irrigating the horticultural crops included a future requirement for installing low-flow bypasses on our licenced dams. But I also believed in the premise behind these installations that water remaining in the environment outside of the irrigation dams potentially can provide habitat for native animals and plants that also need the water." said Mr Lehman.*

He has installed low flow infrastructure and now dreams of a couple of wet years, strung together, to fill everything up.

## Water allocation plan under review

The changing climate over the longer term has resulted in far less water running into the rivers and recharging groundwater than it did when the current Marne Saunders water allocation plan (WAP) was written in 2010.

The WAP is currently being reviewed to ensure the plan works in today's much drier climate. New scientific investigations on rainfall, streamflow,

groundwater, aquatic ecology, and water use have been undertaken, along with economic and First Nations cultural assessments, to assist our understanding about what parts of the WAP are working, what is not, and what needs to change. The results tell us new water management actions are likely to be needed to ensure sustainability of the resource in years to come.

A summary of the new science has been shared with the Marne Saunders Community Reference Group and First Nations partners, and much of it forms the basis for this report card. The next step will be open community discussion on possible plan changes to create a fairer, more resilient and climate-ready system for everyone who depends on the Marne Saunders catchment.

# Indicators of catchment health

Indicators are vital for assessing river health as they show the current state of water quality, species populations, and overall environmental conditions. Measuring key indicators like flow regime, groundwater levels, and species diversity over time will improve knowledge about how the river system is functioning and identify areas that may require attention. This information is important for making the best decisions to protect and improve the health of the rivers.

Indicators chosen for this report card have established annual monitoring or survey programs and there quite a few of these undertaken in this catchment. Some parts of the catchment, such as the Lower Saunders, currently have fewer sites monitored, particularly for groundwater monitoring.

## Our current indicators:

### Surface Water Flow



**Flow** – Important water flow measures.

### Water Quality



**Refuge pools**  
– Water level and water quality.



**Temporary water**  
– Flowing sites and temporary pool water quality

### Groundwater



**Groundwater salinity**  
– Water quality



**Depth to groundwater**  
– Depth to water table

### Ecological



**Fish** – Modelled survival and diversity of fish populations in low flow season



**Waterbugs** – Modelled condition of the aquatic waterbug community

## Reading the scores

Scores for indicators of health are graded on scale ranging from **A** to **F**. **A** is the healthiest that an indicator can score whereas **F** is considered to be the worst case. Sites that are dry are also scored **F**.

The area is split into 5 sub-catchments – 3 in the hills and 2 on the plains. Each indicator is scored in each sub-catchment and then averaged for the overall scores.

Where there is insufficient data available to score an indicator of health, a **No Data** result takes the place of a score. Where an indicator category is not applicable for a sub-catchment, i.e. there are no refuge pools in a sub-catchment, **NA** is used in place of a score.

## Where does the data come from?

This report card collates and analyses data from the Department for Environment and Water (DEW), Nature Glenelg Trust, and Murraylands and Riverland Landscape Board's citizen science projects.

The scores represent the status of the rivers between December of the previous year (start of summer) and November (end of following spring) corresponding with the DEW 'flow year'. The irrigator water-use totals are tallied by DEW from July-June, so are behind by 6 months for each year.

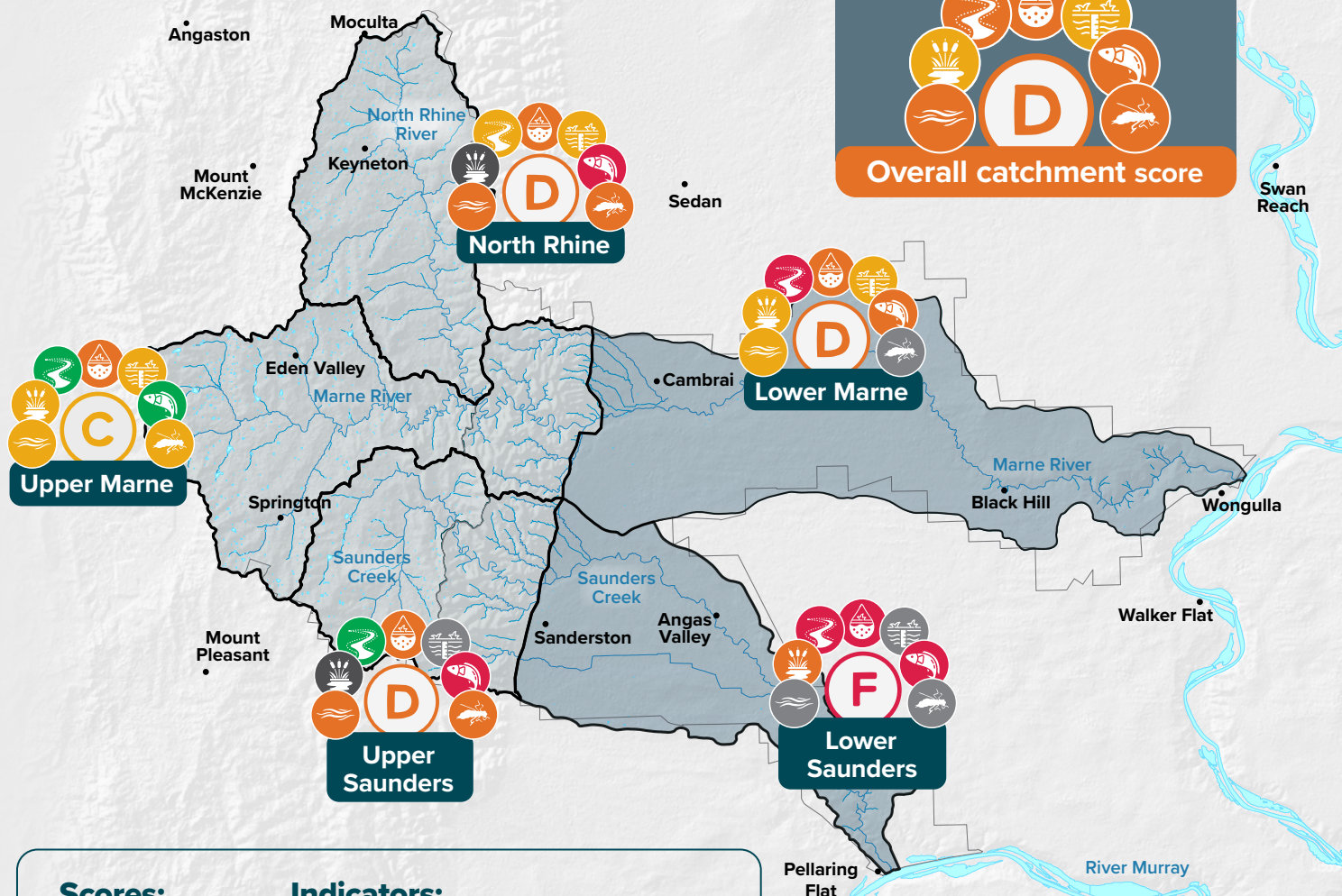
An analysis of the current economic status of the Marne and Saunders Prescribed Water Resources Area, undertaken by Aither Consulting, is included in this report card as a summary. Aither's report utilised data from the Australian Bureau of Statistics (ABS), the Department for Environment and Water, and water user surveys to estimate the value of the water resource in economic terms.

For more information on the data and analyses in this report card visit the [website](#).

# Reporting on data for

# 2023

Overall catchment score



## Scores:

- A** Very Good
- B** Good
- C** Fair
- D** Poor
- F** Very Poor
- No Data**
- NA** Not applicable

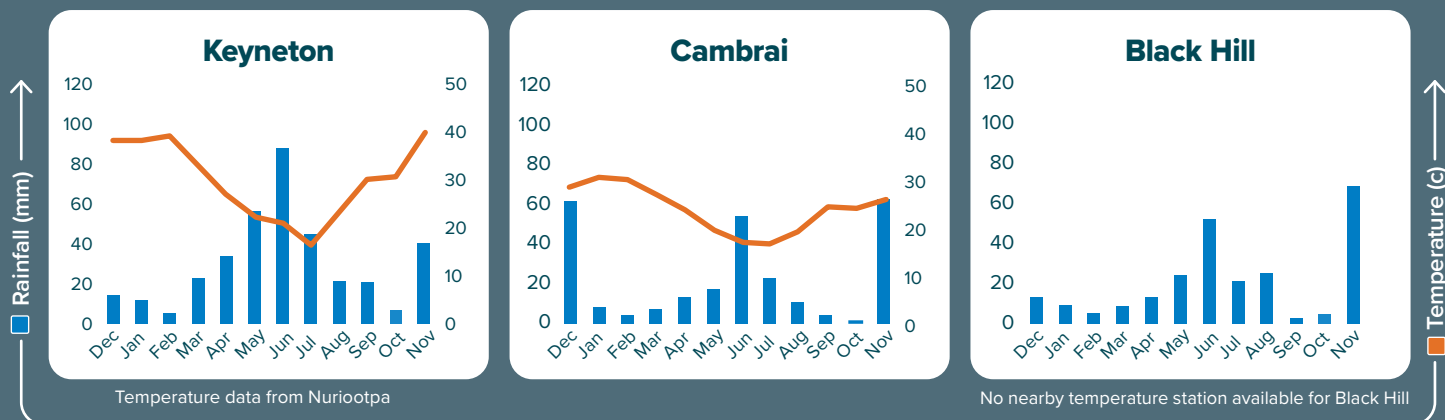
## Indicators:

- Flow**
- Refuge pools**
- Temporary water**
- Groundwater salinity**
- Depth to groundwater**
- Fish**
- Waterbugs**

Sub-catchment boundaries

Hills Plains

Marne Saunders Prescribed Water Resources Area (PWRA)

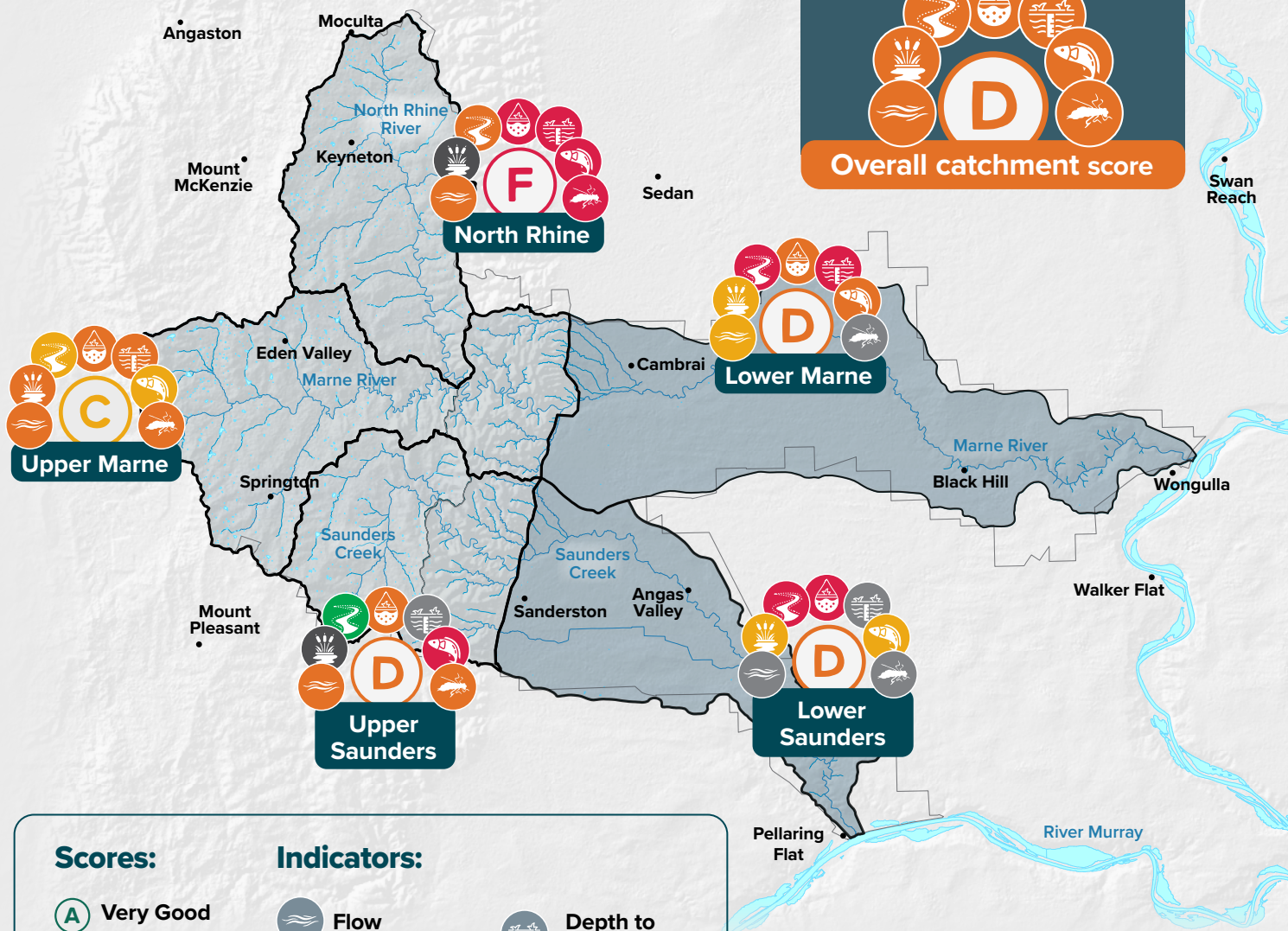


Monthly rainfall data from Bureau of Meteorology (BOM), average monthly maximum temperature data Landscape Weather Network.

# Reporting on data for

# 2024

Overall catchment score



## Scores:

- (A) Very Good**
- (B) Good**
- (C) Fair**
- (D) Poor**
- (F) Very Poor**
- (/) No Data**
- (NA) Not applicable**

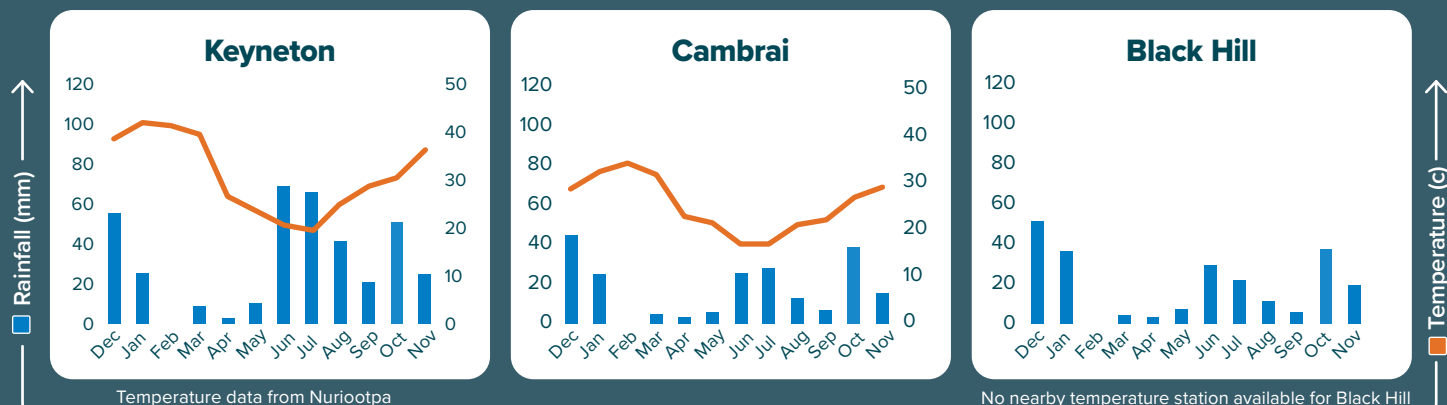
## Indicators:

- Flow**
- Refuge pools**
- Temporary water**
- Groundwater salinity**
- Depth to groundwater**
- Fish**
- Waterbugs**

Sub-catchment boundaries

Hills Plains

Marne Saunders Prescribed Water Resources Area (PWRA)

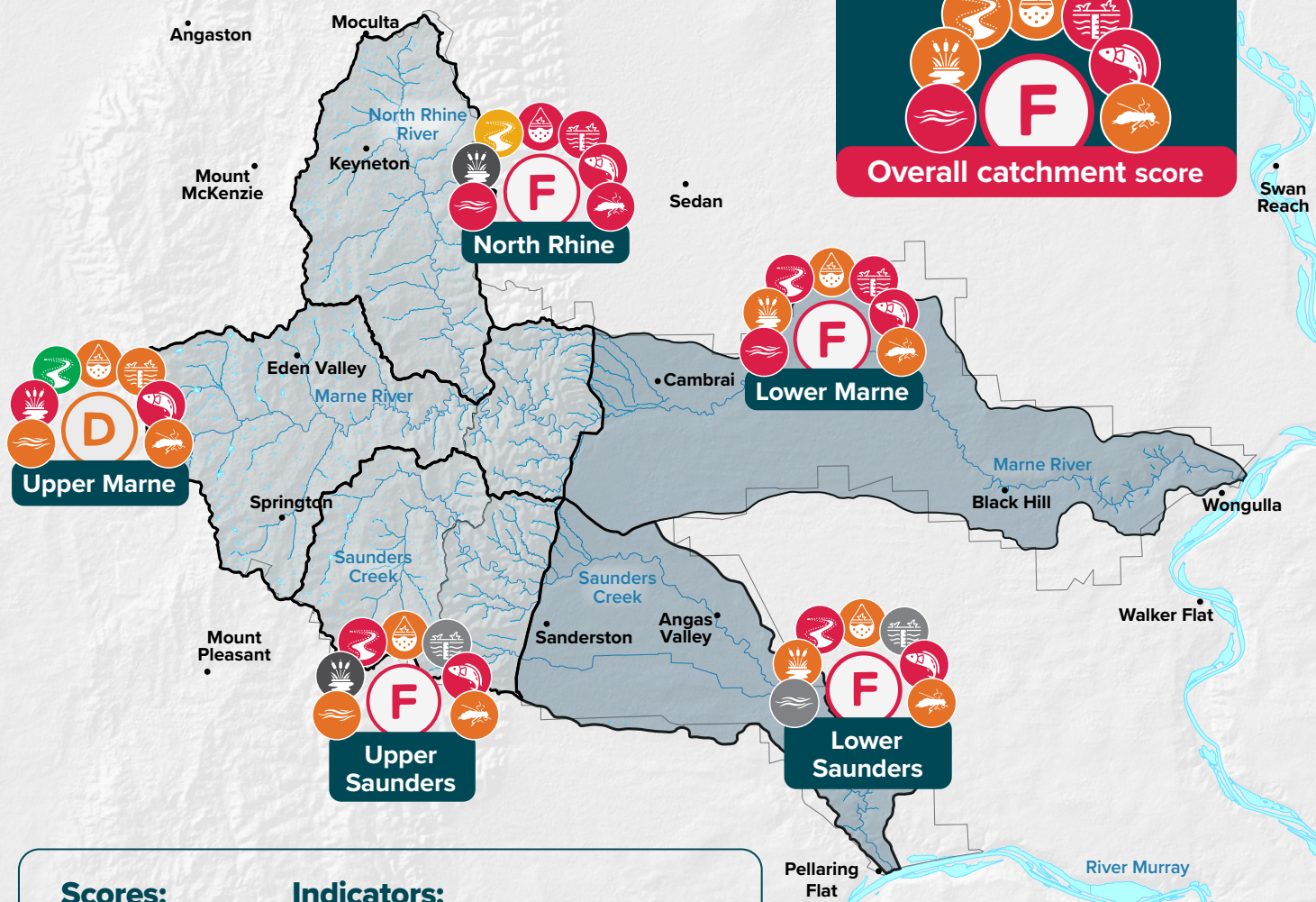


Monthly rainfall data from Bureau of Meteorology (BOM), average monthly maximum temperature data Landscape Weather Network.

# Reporting on data for

# 2025

Overall catchment score



## Scores:

- (A) Very Good**
- (B) Good**
- (C) Fair**
- (D) Poor**
- (F) Very Poor**
- (/) No Data**
- (NA) Not applicable**

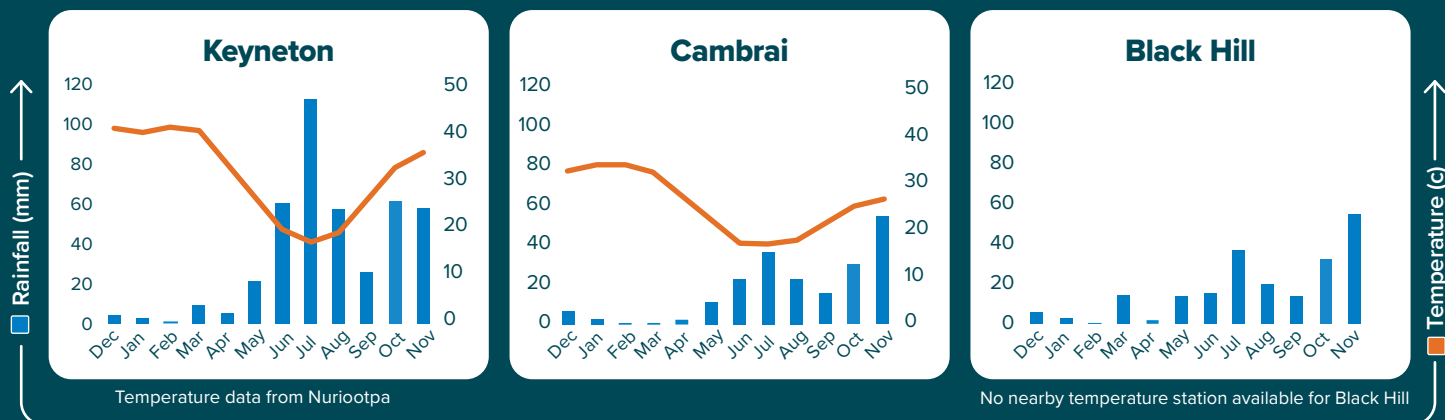
## Indicators:

- Flow**
- Refuge pools**
- Temporary water**
- Groundwater salinity**
- Depth to groundwater**
- Fish**
- Waterbugs**

Sub-catchment boundaries

Hills Plains

Marne Saunders Prescribed Water Resources Area (PWRA)



Monthly rainfall data from Bureau of Meteorology (BOM), average monthly maximum temperature data Landscape Weather Network.

| Indicators    | Measures                                                                                         | 2023 | 2024 | 2025 | Long-term Trend                                                                     |
|---------------|--------------------------------------------------------------------------------------------------|------|------|------|-------------------------------------------------------------------------------------|
| Surface water |  Flow           | C    | D    | F    |  |
| Water quality |  Refuge pools   | C    | D    | D    |  |
|               |  Temporary      | D    | D    | D    |  |
| Groundwater   |  Salinity       | D    | D    | D    |  |
|               |  Depth to Water | C    | D    | F    |  |
| Ecological    |  Fish           | D    | D    | F    |  |
|               |  Waterbugs      | D    | D    | D    |  |

| Rainfall (mm) and deviation from average (▼) |                                 |                                 |                                 |
|----------------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Locations                                    | December 2022-<br>November 2023 | December 2023-<br>November 2024 | December 2024-<br>November 2025 |
| Keyneton                                     | 383 (143mm ▼)                   | 370 (155mm ▼)                   | 416 (109mm ▼)                   |
| Cambrai                                      | 273 (21mm ▼)                    | 209 (84mm ▼)                    | 205 (88mm ▼)                    |
| Black Hill                                   | 247 (36mm ▼)                    | 227 (56mm ▼)                    | 213 (70mm ▼)                    |

# Water use and rainfall

## Rainfall shapes water use

Across the 3 years, rainfall has consistently been below average. 2024 was extremely dry, with the hills zone being well below average. 2025 has continued to be very dry.

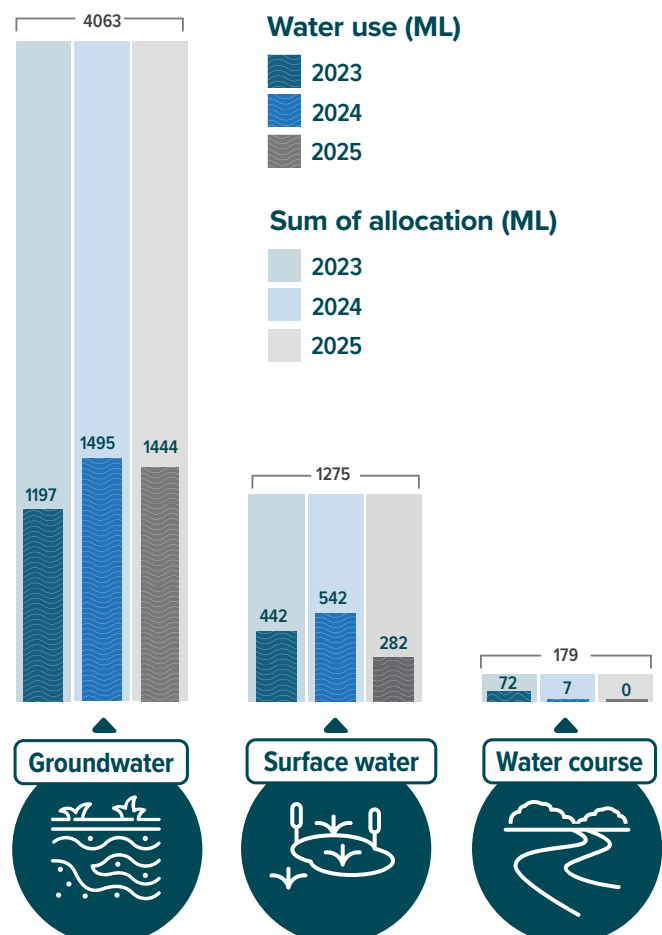
## Groundwater is the most heavily used resource

Sedimentary groundwater on the plains makes up the largest share of licensed use each year, typically around **60% of all water taken**, with surface water and fractured-rock groundwater in the hills contributing smaller amounts. These patterns were consistent over the 3 reporting years.

## People adjust the source of their water use, where they can, to match local conditions

In wetter years, more surface water stored in dams is used for irrigation. This drops sharply in years with low rainfall because dams capture less runoff, meaning less water is available. In drier years, groundwater becomes an important safety net and its use increases — especially the sedimentary aquifers on the plains.

The **actual water use is well below the total volume allocated** each year, across all water sources.



# What the scores tell us

## From bad to worse

Seasonal river systems like the Marne Saunders flow after rainfall which naturally varies greatly across the catchment and over time. This makes painting an annual picture of overall health of the catchment complex.

The catchment scored an overall grade of D for 2023, D for 2024, and F for 2025.

These low scores are due to a range of climate related factors:

- Warmer, drier conditions intensifying evaporation, reducing water flow in rivers and lowering groundwater levels.
- Shorter flow seasons mean fewer opportunities for fish and waterbugs to disperse and breed.
- Long periods of no water flow cause fragmentation — species become trapped in isolated pools.
- Drying of refuge pools reduces the ability of populations to survive from one year to the next.
- Even in wetter years, ecological recovery is constrained by the cumulative effects of previous dry years.



## Surface water



The surface water flow indicator combines measures for the number of days the river is flowing; the number of high flow days when the river flows strongly; and the date that the river begins to flow after the dry summer period. Indicator data is collected from flow monitoring stations at 6 locations. Each year is scored relative to the historical data available for that site, from lowest on record, to average, to highest on record, with others in between.

Seasons with reduced flow result in less time for species to reproduce and migrate and more time spent in high-stress, low water quality environments.

The overall catchment score for this indicator has decline from C in 2023 to D in 2024 and F in 2025.

- Upper Marne declined from a C in both 2023 and 2024 to a D in 2025 due to less days of river flow, less low-flow days and a longer break before rains returned.
- Upper Saunders remained at a score of D for all 3 years.
- North Rhine declined from D in 2023 and 2024, to F in 2025.
- Lower Marne fell from C in 2023 and 2024, to F in 2025.

**Long-term trends:** The flow regime across the catchment has shown steady declines since monitoring began in the 1970s.

## Water quality



### Refuge pools

The river pools are the refuges of our creeks — the places that hold water the longest and support fish, waterbugs, frogs and cultural values during the driest months.

The score for the health of these pools is based on several water quality measures: how acidic or alkaline the water is (pH), the dissolved oxygen (DO) available for aquatic life, and salinity. The water level at the time of measurements is also assessed. The health, breeding and survival of the animals and plants that rely on these pools is impacted when certain thresholds are reached.

The overall grade for this indicator has declined from C in 2023 to D in 2024 and 2025. In many sub-catchments, pools persisted but became shallower, leading to warming, less dissolved oxygen in the water and increasing salinity. These pressures are reflected in the declining water quality score for some sub-catchments.



- Upper Marne shows the steepest 3 year decline moving from C to D to F.
- North Rhine and Upper Saunders did not have any monitored pools that retained water all year and could not be scored for this indicator.
- Lower Marne pools are mainly fed by groundwater and fluctuate less dramatically. They still showed a downward trend, moving from C grade in 2023 to D in 2025.
- Lower Saunders showed a small improvement in 2024 when late-season rainfall briefly supported improved water quality, however, in 2025 scores dropped as pools shrank again.

**Long-term trends:** Decline in the health of refuge pools has been a longer term trend. Many pools have become shallower, more saline, and more likely to dry completely. Lack of refuge pool availability is one of the strongest predictors of ecological decline in the catchment.



### Temporary water

This indicator scores the condition of river sites with flowing water and/or temporary (ephemeral) pools. These sites only hold water after rain or runoff but they are vital for wildlife, providing short-term habitat for frogs, insects and small aquatic species. This indicator includes measures of salinity and pH (acidity) and sub-catchments receive an F(dry) if none of the monitoring sites have water that year.

Ephemeral pools are naturally short-lived, but when they dry too quickly or fail to fill at all, then whole ecological cycles are impacted. Many species rely on these brief wet phases to breed or disperse. Lower scores therefore signal fewer seasonal “windows” for wildlife.

Across the catchment, scores remained at D for all years, indicating a landscape experiencing fewer opportunities for temporary water to accumulate. The upper sub-catchments in the hills where rainfall tends to be higher achieved better scores, but when combined with the dry lower areas, this resulted in a low overall score.

- Upper Marne, fell from a B to a C grade in 2024, and returned to B again in 2025. In this area, many ephemeral pools filled less often in 2024, limiting the seasonal habitat available.
- Upper Saunders maintained a B score until 2025 when all sites were dry and it fell to F.
- North Rhine scores fell from a C in 2023 to a D in 2024 with fewer filling events and shorter periods of standing water. It returned to a C grade in 2025 due to some reasonable winter rainfall.
- Lower Marne and Lower Saunders sites were dry at all monitoring sites in all 3 years and scored F.

**Long-term trend:** Ephemeral water condition shows increasing variability and a gradual decline over time, indicating ephemeral water sites are becoming less reliable, drying earlier and failing to persist long enough to support full ecological cycles.

## Groundwater



### Groundwater salinity

High groundwater salinity can hinder reproduction and survival of native species as well as reduce its suitability for farming, stock and domestic use.

Across all 3 years of data, most monitoring sites stayed in the D to F range and the overall score remained a D. Salinity levels were often high, unsuitable for some sensitive crops and likely to affect farm productivity – especially in the lower catchment.

- Upper Marne, and Upper Saunders both continue to have more stable and slightly better quality water and score a D grade in all years.
- North Rhine groundwater quality dropped from D in 2023 to F in 2024 and 2025.
- Lower Marne has scored a consistently poor D, with salinity remaining well above desirable levels.
- Lower Saunders sits in the saltiest part of the plains aquifer.



In 2023 and 2024, conditions were extremely poor scoring an F. In 2025 conditions improved slightly, scoring a D grade.

**Long-term trends:** The aquifers are relatively salty and not suitable for all uses. Most monitoring wells show little long-term change.



### Depth to water

Depth to water is measured by DEW from a series of observation wells in October/ November each year. All monitored bores are within the Marne River catchment with none in the Saunders. Groundwater provides bore water for animals and people, is accessed by deep-rooted plants like river red gums, and comes to the surface as springs or seeps that maintain many refuge pool habitats.

Springs, seeps and river bank vegetation in the hills and the plains are vulnerable as water tables fall and the risk of drying out increases. Falling water tables can lead to bore pumps needing to be lowered or eventually becoming ineffective.

The overall score declined from a C in 2023, to D in 2024 and finally F in 2025. Many bores registered their lowest depth to water on record in 2024, and were unfortunately even lower again in 2025.

- The Upper Marne fell from a C in 2023, to D in 2024 and 2025.
- The North Rhine scored a C in 2023 but F in both 2024 and 2025.
- Lower Marne also declined from C to an F over the 3 years.

**Long-term trends:** Groundwater levels have been declining consistently in the fractured rock hills zone and the plains zone

sedimentary aquifers since 1996. Recovery after wetter years (like in 2016 and 2021-23) was brief and did not reverse the downward trend. Groundwater use in both aquifers is lower now than in the 1990s and early 2000s, yet levels continue to fall. This suggests climate influences are having a much stronger effect than water use. Currently, Black Hill Springs remains the only consistent groundwater discharge point to the surface.

Understanding these trends is essential for sustainable allocations, protecting ecosystems and planning for future water security.

# Ecological



## Fish

Fish grades are scored using the AquaSave condition model. These are site specific assessments of the diversity of the native fish community (including the presence of invasive species) plus fish breeding and survival rates in April each year.

The overall scores declined across the catchment and reached F by 2025, indicating reduced habitat quality and fewer suitable conditions with unsustained improvement.

- Upper Marne showed the greatest change, falling from a B in 2023 when populations of native obscure galaxias rapidly

bred in response to increased rainfall, to C in 2024, and then an F in 2025.

- North Rhine recorded an F grade in all years as pools were dry and not able to support any fish.
- Lower Marne remained at a D in 2023–2024 before dropping to an F in 2025.
- Lower Saunders briefly improved from an F in 2023 to a C in 2024 with slightly improved conditions and an increase in the number of native carp gudgeon, but declined to an F in 2025.

**Long-term trends:** Native fish remain low in species diversity and abundance, with many sites dominated by hardy species only. Sensitive species such as river blackfish remain absent from most sites and are now considered functionally extinct in the catchment. Recovery windows are now rare and many years do not provide enough flow to reconnect habitats and allow fish to recolonise pools.



## Waterbugs

The waterbug indicator score is based on the number of different species and their abundance in spring each year, coupled with environmental indicators that promote stable waterbug populations.

The overall score for each year remained at D, although it was very close to reaching an F in 2024. Many sites were dry in the latter years and not able to support waterbug populations, while others provided habitat only suitable for those able to

survive in harsh conditions. Scores across the sub-catchments show an overall decline from 2023 to 2025.

- Upper Marne declined from C 2023, to D in 2024 and 2025.
- Upper Saunders also declined although not enough to change the score from a D in all years.
- North Rhine fell from D in 2023 to F in 2024 and 2025.
- Monitoring sites in the Lower Marne and Lower Saunders

were introduced in 2025 and both scored D.

**Long-term trends:** The long-term decline in river flow has resulted in continued scarcity or absence of more sensitive waterbugs like stoneflies and some mayflies that rely on flowing water habitats. This indicates chronically stressed conditions. This may have detrimental effects for other animals that rely on them for food.



Obscure galaxias fish (*Galaxias oliros*) with waterbugs on left.

©Nature Glenelg Trust

# Economics report

Water plays a critical social and economic resilience role, supporting businesses, livelihoods and settlements across the catchment.

The Aither report (2025) calculated that water directly supports about \$5 million per year of regional domestic product from the Marne Saunders region. Importantly, these results use typical water use from 2010 to 2023 and combine it with current prices and costs (from 2022–2025). This means

## Total economic significance

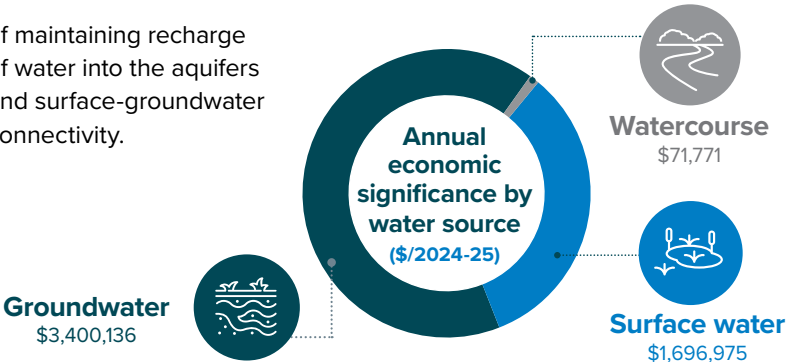


the figures show what water is worth under today's market conditions, using an average level of water use. They do not show how water use or the value of water has changed over time. The numbers could go up or down in future depending on rainfall, water availability, commodity prices and farming costs.

Regional modelling shows agriculture is the dominant industry in both the hills and the plains. Although the hills and plains differ in how water is used, they both contribute similar total economic value. The hills generate slightly higher value per megalitre on average, while the plains use more water overall, largely for lower-value annual crops.

Across both zones, groundwater accounts for the largest share, contributing around two-thirds of the region's direct economic value from water. On a per unit basis, groundwater is often used for higher-value purposes (e.g. turf on the plains, and winegrapes in the hills). The economic value of groundwater reinforces the importance

of maintaining recharge of water into the aquifers and surface-groundwater connectivity.



Stock and domestic use accounts for a moderate proportion of total water use (estimated in 2019 at approximately 20%) but generates a substantial share of economic value. As water used for stock and domestic is not metered (nor requires a licence), this economic value was calculated by estimating the cost of getting water from an alternative source (if there is one) and demonstrates the essential nature of water for households and livestock. This is particularly important in the hills, where rural living and stock watering are more prominent.

Aither's report highlights that the economic value of water to the region is not solely driven by irrigation, as stock and domestic water delivers high value per unit and underpins community viability. Industrial and recreational uses are small in volume, but also contribute to economic diversity, liveability and resilience.

As the economic values reported for water primarily reflect direct, on-site use (e.g. irrigation, stock and domestic supply, and industrial processing), these figures do

not capture the wider flow-on benefits that water enables across the regional economy, such as supporting suppliers, transport, storage, processing and marketing.

This broader economic activity indirectly associated with water use across the hills and plains is reported by Aither as contributing **approximately \$91 million dollars per annum** (gross revenue) to gross state product and generating over 200 jobs in the region.

[Visit the website for the full report](#)

Annual economic significance split by end use (\$/2024-25)



# Reflections

## Joe Keynes North Rhine

We are graziers on the North Rhine section of the Marne River system.

During the 1850s, the property was opened up for grazing sheep and cattle and stock waters were provided from creeks and spring fed pools.

The 1950s brought about some significant development with paddocks subdivided and dams constructed to ensure adequate water supply. When full, the dams provide water security for 2 years for the livestock.

The 1982 drought was severe and all the dams had dried up. We had to cart water from SA Water to keep the livestock watered. The extreme rainfall event, after the February 1983 Ash Wednesday bushfires, filled all the dams over a few hours. This was the first season that all dams were empty and was, thankfully, a relatively short time before they were filled completely.

In the early 2000's the Keyneton area was connected to a low flow reticulated water scheme provided by SA Water from the Blanchetown- Stockwell pipeline. We connected to the system to provide water security, in light of the 1982 experience and concern about reducing rainfall over the years.

Our property is now reliant on the River Murray to underpin our stock water needs and remain an economically viable farm. The dams are still used but are no longer a reliable source of water.

The springs and creek flows are much reduced and are having a marked effect on our environment.

The 2010 WAP set rules for the sustainable use of our water resource with a balance of the needs of the community, industry and the environment. The alarming decline of the resource over the years could not have been anticipated but is a tragedy.



## Leon Deans High Eden vineyard

Our High Eden vineyard, at the top end of the Marne Saunders catchment, has seen no run-off into dams over the last 3 years. The lack of rainfall was so severe that dams had little to no effect on river flows, as there was no runoff to hold back.

This has meant the cost of running a viable enterprise has increased, including the purchase of SA River Murray water for vineyard irrigation at \$3,000/ML.



# Michael Schwertfeger

## Black Hill

Our farm at Black Hill was purchased in the mid 1960's. The icing on the cake was the Marne River which according to local farmers had only stopped flowing once previously in history. The Black Hill springs were always reliable.

Can you imagine on a hot summers' day having lunch under a willow tree with large crystal clear pools while picking succulent water cress to eat with your lunch. Even the water was good to drink or maybe a swim to refresh. We could always rely on floods to replenish the aquifer. *"All gone now due to over allocation of the water resource and drought".*

Our farming enterprise consisted of merino sheep and the Marne was their only source of water. During the drought years, they survived by eating the reeds which was like having a never ending hay stack thanks to the wide water course on our property. The sheep also grazed over the rest of the farm but still had to go to the Marne for the water, until we had a bore and windmill set up in 1990 to help reduce the reliance on the Marne. We also diversified to breed cattle. Sadly, water reliability changed in the late 90's when little to no floods occurred and by the early 2000's the water stopped flowing. We had to have a bore drilled and equipped with a solar pump to provide water when holding cattle to feed in yards. We used to be able to get water from the Marne using the windmill to pump from the deep channel.

We still run a herd of cattle that rely solely on bore water to drink. Due to not having spring water from the Marne anymore, the dynamics for running stock have changed with the demands on infrastructure very high.

Our water troughs have become very convenient for kangaroos and emus to access, adding pressure to fencing, feed, and for topping up water levels for our stock to drink.

The windmill and bore central on our property has had to be upgraded, having a new head, poly column and rods with also casing sleeve. This bore is 67 metres deep. The water table has dropped but quality is the same, about 4,000 ppm.

The solar bore on the banks of the Marne was originally bored to 17 metres deep in 2002. It was good at first with plentiful supply from the bore. Water quality was 4,000 ppm. In recent years it has slowed to a trickle. We found it had silted up, and in July 2024, a permit was allowed to clean the bore and drill it deeper to 24 metres including new casing etc by a contractor. We were unable to go deeper because the rock was too hard for the boring rig.

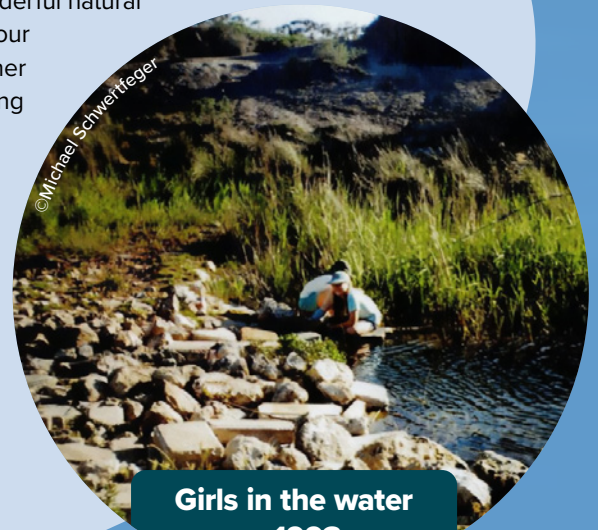
Thankfully we had a good flow and water tested at 2,200 ppm.

The required maintenance on the above bores is ongoing, I am always mindful that the aquifer is not sucked dry further upstream which would have detrimental effects on us.

This overall dictates the level to our farming practice particularly in recent years as we have been forced to scale back on our farming activities.

In summary, everywhere along the Marne is dying, the pristine nature the Marne Valley was known for has gone and I fear it is irreversible. I wish people unfamiliar to the unique area could have seen the wonderful natural environment our family and other locals, including previous generations, experienced.

The photo provided shows how the Marne used to be on our property.



**Girls in the water  
– 1993**

# Biodiversity

## River red gums

The majestic river red gums of the Marne and Saunders districts are a key indicator of the health of these river systems.

They play critical support roles for local biodiversity: providing hollows for birds and bats, their fallen branches provide homes for reptiles and small mammals, and they host a variety of insects and spiders which are eaten by other animals.

To survive, they need to tap into the groundwater in the aquifers and/or receive floodwaters. They can drop some of their leaves to reduce their water needs in the short term but if water is unavailable to them over many years, they will not survive.

Local John Endersby has been attempting to estimate the age of the massive river red gums at Meldanda, Cambrai.

As stated by Mr Endersby, *“it is very difficult to calculate the age of river red gums, they grow very rapidly for perhaps the first one hundred years and at around that stage their growth starts to become arrested. The centre*

*starts to rot out and frequently, at the same time, this dead centre wood also gets burnt out. This means if a tree is cut down, there are no growth rings in the centre of the trunk to count to calculate the tree’s age.*

*Hence a simple measurement of the circumference in centimetres and counting that as their age cannot work for very old trees. Instead,*

*I have calculated their radius at 1.5metres above the ground and assumed that their growth rings (if they were there) are one mm apart!”*

John has used this method to estimate the ages of river red gums on the Meldanda property at Cambrai, with many of the largest equating to well over 1000 years old!



## Birds

Mr Endersby has also been monitoring birds at Meldanda and 37 other locations in the Cambrai/ Sedan District. Between May 2019 and March 2022, he recorded 59 different species at Meldanda. All were native apart from the blackbird and house sparrow.

Another 92 species have been recorded by him in the district, but not seen on his Meldanda surveys.

Those sighted on more than 10 occasions included Adelaide rosella, galah, little raven, white-backed magpie, white-winged chough, white-plumed honeyeater, singing honeyeater, red wattlebird, striated



Rainbow bee-eater,  
*Merops ornatus*



Striated pardalote,  
*Pardalotus striatus*



Pied butcherbird,  
*Cracticus torquatus*

pardalote, and the kookaburra. Rarer birds included the sacred kingfisher, only seen when the river was flowing in October and November 2022.

The Mount Lofty Ranges has some of the highest bird extinction rates and concentrations of threatened bird species in Australia.

The upper Marne Saunders catchment falls within the area targeted by the Rebirding the Ranges program- Taking nature positive action to restore bird populations and habitat across the Mount Lofty Ranges.

**Find out more about  
Re-bird the Ranges**





Inland forest bat, *Vespadelus baverstocki*

# Mighty microbats of the dark sky

Microbats are night flying mammals that can play a crucial role in the ecosystem by controlling pest insect populations. Despite their size, often no bigger than a human thumb, they contribute significantly to maintaining ecological balance. To sustain their populations, they require adequate food resources,

minimal 'light pollution' at night, roosting habitat in tree hollows and underbark, and clean water to drink.

Local landholders undertook microbat call surveys over the summers of 2017-2018 and 2018-2019, and again in 2024-25 using Anabat detectors. Each species has a specific ultrasonic call, so it is possible to determine

which bats are active in the area through the recordings. So far 10 different species have been identified.

This project is continuing over the 2025-26 summer to improve our knowledge of the health of the microbat populations of the Marne Saunders catchment.

# Murray-Darling carpet pythons

Keep an eye out for these beauties. The non-venomous Murray-Darling carpet python was once widespread through much of south-east Australia. However, their distribution has declined as result of habitat loss or fragmentation, illegal poaching, persecution and predation from foxes.

This python was seen near Black Hill in spring 2025. There have been other recent sightings near the Marne River and this area is of particular interest for collecting data on movement and critical habitat features in this landscape!

Please share any sightings on the iSPYthon app as soon as you can.

Find out how  
to get involved



Murray-Darling carpet python, *Morelia spilota*

© Robert Gill

# The next generation

## Cambrai Primary School students' vision

Making more non-polluting things like possum/bat boxes around to help.

More nature and trees, just a lot of greenery if possible or making spaces specifically for the plants. Also helping plants spread to make more oxygen and shade for hot days. There's a house near our school that has lots of plants and greenery so if we could aim for that.

More community clubs around different topics such as sports, fishing etc. If we do open up some small clubs and communities make sure it has good accessibility for a lot of people so no one is left out!

Thanks - Love from Sara



I would like the water to flow across the Morne River for the frogs to get cool, fresh water.





© Aimee Linke

## Keyneton Primary School – nature and community connections

The past and the future collided when Keyneton Primary School students joined Mid Murray Landcare SA and property owner David Keynes for a recent tree planting day.

The students, who were joined by parents and siblings, made community connections and learnt hands-on the importance and techniques of restoring the local North Rhine River.

Mr Keynes, a past Keyneton Primary student, was able to share stories of his school days.

Alice Howard, the classroom teacher at Keyneton Primary, said, “The

students all worked hard, shared resources, communicated positively and kept going until everything had been planted and watered.

*“They learned about the different species being planted, why they were selected and how to treat them to give them the best chance of survival.”*

The children found out about the future planting plans of Mr Keynes and why it was so important to take care of and revegetate the reserves and vegetation corridors around Keyneton.

Learning about the history of farming, the clearing of land around our area and the effects this has had on the wildlife was also part of the day.

*“A highlight was digging up a banjo frog in one of the first holes we dug. The students were able to move it to a safe spot and we talked about what other wildlife might be found in the area”,* said Ms Howard.

The students had a great day and Keyneton Primary looks forward to being involved again in the future.

## Citizen Science – get involved at any age!

### Waterwatch – community water monitoring

Citizen scientists in schools and community groups, along with landholders and other interested individuals, have been assessing the health of these waterways for more than 20 years. New volunteers welcome.

### Waterbug Bioblitz

#### Waterbug Bioblitz – a big day for small bugs

A Waterbug Bioblitz is a one-day event in the October school holidays where the community and Murraylands and Riverland Landscape Board staff join forces with experts to collect important information about the waterbugs and water quality of these rivers.



Citizen science is a great way to harness community knowledge, skills and passion to help answer questions about the region.

**Microbats in the Marne Saunders** – Survey for bats in your backyard

**Frogwatch SA** – Record frog calls through the FrogSpotter app

**TurtleSAT** – Seen a turtle crossing the road, nesting near rivers or swimming in your dam?

**BirdData** – Bird watchers please share your bird sightings

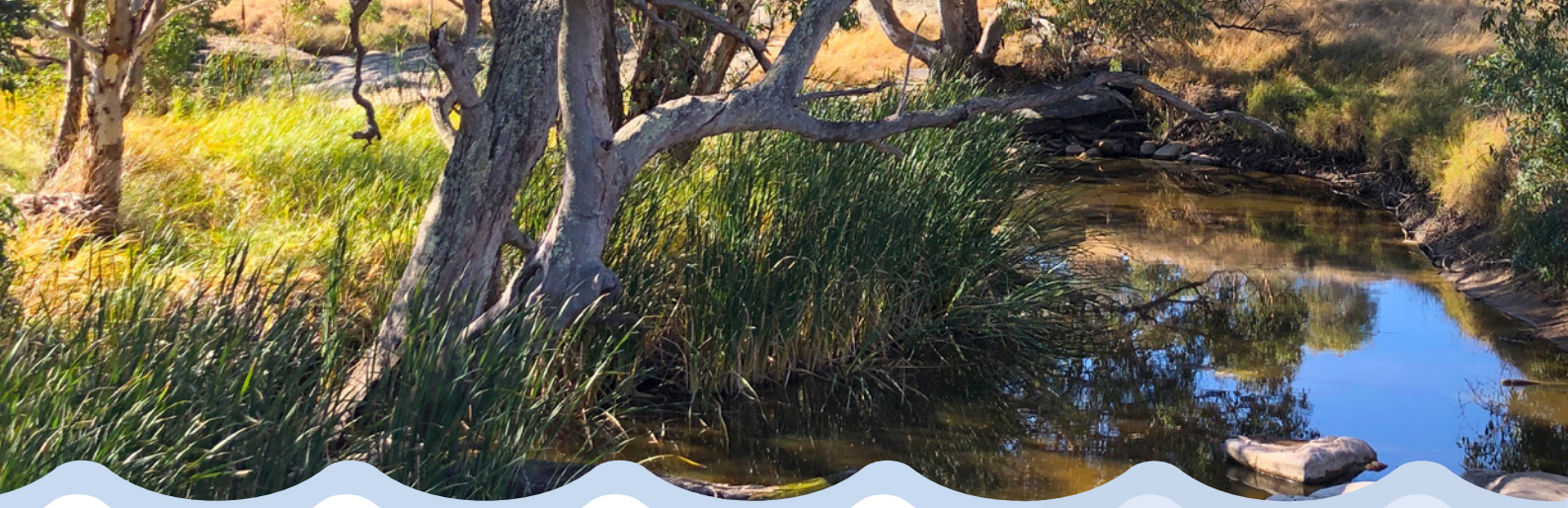


©Carolyn Van Der Moer

Eastern longneck turtle, *Chelodina longicollis*

**iSPYthon** – Have you spied a Murray-Darling carpet python?

**iNaturalist** – Every nature observation counts



# Making a Difference

The health of the Marne Saunders is showing long-term structural decline but there are many things that can be done to improve the health of the catchment.

This reinforces the importance of:

- Protecting and restoring refuge pools
- Supporting actions along rivers and surrounding land to promote flows that reconnect habitats
- Restoring First Nations connection to Country and knowledge sharing
- Long-term monitoring through government and citizen science programs to understand ecosystem change and resilience.

Aimee Linke from Mid Murray Landcare SA has compiled a list of actions that can be undertaken on properties to improve the health of the catchment

- Protect remaining native vegetation, especially big old red gums
- Attend weed control workshops and undertake weed control along creeklines
- Revegetate your property, particularly creek lines, create biodiverse corridors of native vegetation and slow water run-off
- Encourage living roots in the soil all year
- Minimise soil disturbance

- Reduce fertiliser use for crops and switch to natural options like manure, composts and bio fertilisers (and no fertiliser use at all for native grasslands)
- Fence off creek lines to prevent erosion and fouling by stock
- Reduce grazing in dry times, manage grazing to allow paddocks to rest
- Undertake erosion control on creeks
- Install low flow bypasses or reduce the capacity of your dam
- Turn your dam into habitat for wildlife by planting native plants in and around the dam, and install a turtle and waterbird nesting island (if the dam is large enough)
- Install bird and bat boxes to replace the loss of tree hollows

There are a range of grants available through the Murraylands and Riverland Landscape Board, local councils and others that may be able to assist with the costs of undertaking these activities.

**For advice and some assistance with applying for grants** please reach out to [admin@midmurraylandcare.com](mailto:admin@midmurraylandcare.com) or [mrenquiries@sa.gov.au](mailto:mrenquiries@sa.gov.au).

*Mid Murray Landcare SA is a community-based organisation that works collaboratively with the local community, environmental groups, Murraylands and Riverland Landscape Board and the Mid Murray Council to benefit the environment and wider community. <https://www.midmurraylandcaresa.org.au/>*

## Before You Start:

Some of the activities listed could inadvertently have negative impacts on watercourses, floodplains and groundwater if not done in the right way.

To prevent this, landholders are responsible for ensuring approvals are in place before works start, especially if you plan to:

- Construct, enlarge or remove a dam or structure that collects or diverts water
- Build structures, or obstruct, or deposit solid materials in a watercourse, lake or floodplain
- Excavate material from a watercourse, lake or floodplain
- Destroy vegetation in a watercourse, lake or floodplain
- Establish commercial forestry
- Drain or discharge water or brine into a watercourse or lake
- Drill, deepen and backfill wells, bores and groundwater access trenches
- Use effluent or imported water for commercial activities
- Drain or discharge water into a well

Getting the right approvals upfront can save you time, stress, and money. If you're unsure which approvals are needed—or whether any are required—just ask. Visit the landscape board's water affecting activity webpage or contact the water planning and assessment officer on 8532 9100 or at [mrlandscape.water@sa.gov.au](mailto:mrlandscape.water@sa.gov.au)



*Our communities along the plains rely on the Marne and Saunders systems every day — for stock and domestic use, for local businesses, for amenity, and for the health of the landscapes we live and work in. Over recent years, people across our district have seen the creeks run dry more often, permanent pools shrink, and salinity become a growing concern for both farming and the environment.*

*This report card is an important tool because it brings all of that information together in one clear picture. It helps us understand how climate, groundwater and surface water are changing, and what that means for the landholders, irrigators, towns and cultural places across the plains. Having this information means we can plan ahead, support good decision-making, and work with our communities on long-term solutions.*

*I encourage everyone in the Mid Murray region to engage with this report card. The knowledge it provides will help us protect our water resources, strengthen the resilience of our businesses and families, and make sure the Marne and Saunders continue to support our way of life into the future.*

**Mayor Simone Bailey, Mid Murray Council**

*The headwaters of the Marne and Saunders start in our hills country — where rainfall, healthy creeks and groundwater recharge are essential for the entire catchment. Over time, we've seen the impact of drier seasons, shorter flow periods and reduced runoff in many parts of the upper catchment. These changes affect not just local landholders, but everyone downstream who relies on the water that begins here.*

*That's why this report card matters. It gives our communities clear, easy-to-understand information about the condition of our streams, pools, springs and aquifers. It shows how the hills are changing, what this means for biodiversity and farming, and how our choices on the land influence the health of the whole system.*

*For the people of the Barossa hills, this report card is a chance to stay informed, contribute to the conversation, and help shape the future of water management in our region. By understanding what's happening in our headwaters, we can better protect our farms, our environments and the shared water that connects us all.*

**Benn Kromwyk – Senior Manager  
Infrastructure & Environmental  
Operations, The Barossa Council**

## Acknowledgements

We would like to acknowledge the Traditional Owners for looking after this country for thousands of years, and the local community efforts that have contributed to improving the catchment including those who have voluntarily installed low-flow bypasses.

This report card was made possible with the expertise and data collected by the Murraylands and Riverland Landscape Board, Department for Environment and Water, Nature Glenelg Trust, citizen science volunteers, First Nations groups, and the community. We thank the Marne Saunders Reference Group members for their input during its development.

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