Government of **Western Australia**
Department of **Water and Environmental Regulation**

Whicher

area surface water allocation plan

Evaluation statement 2013–2016

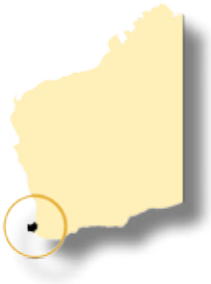
On 1 July 2017, the Department of Water and Environmental Regulation was established which amalgamated the Department of Environment Regulation, the Office of the Environmental Protection Authority and the former Department of Water.

This is the second evaluation statement for the *2009 Whicher area surface water allocation plan.* It summarises how we have implemented the plan and what adjustments were made to management since the previous (2013) statement.

A key advancement in this evaluation period was developing and using computer-based catchment models, called the Planning and Allocation Tool, to estimate streamflows and dam storage levels. The models were used to review allocation limits in the Gunyulgup, Cowaramup and Wilyabrup catchments, and to complete work identified as a priority in the 2013 statement.

To evaluate the performance of water resources in the plan area we analysed streamflow and assessed environmental flows at four key sites each year. This work was complemented by improving our monitoring program and assessing river health across six catchments in 2015–16.

Whicher plan area



Over the 2013–2016 evaluation period, streamflows were sufficient to provide water for existing users, and to support environmental and social values in the plan area. The plan continues to provide an effective framework for managing the diverse surface water resources of the Whicher area.

The Whicher surface water area

The Whicher plan covers three surface water management areas – Capel River, Busselton Coast and Lower Blackwood. These management areas are further divided into 52 surface water management subareas to help us allocate and manage water effectively at a local scale.

In agricultural areas the majority of surface water taken for commercial use comes from on-stream dams. The water is used for the irrigation of viticulture, horticultural crops and fodder for the dairy industry. Direct pumping from water courses is also common in some areas.

The rivers and streams in the plan area support significant ecological and social values. Intact catchment, river bank vegetation and permanent river pools are especially important as habitat for flora and fauna. The upper Margaret River and tributaries of the Blackwood River support particularly diverse aquatic fauna, including threatened fish species, as well as having rich social and cultural values.

Viticulture in the Chapman Brook Catchment

Improving how we manage water

The main achievements between 2013 and 2016 were:

- *Securing water resources for the South West* was released to inform stakeholders on how we are managing resources under a changing climate.
- *Selection of future climate projections for Western Australia* was released to show stakeholders how we are incorporating future climate into our water planning.
- The Planning and Allocation Tool (PAT) was developed in five high water demand catchments. This facilitated modelling surface water flows at a sub-catchment scale, quantifying the reliability of supply for individual water users, and running different projected future climate scenarios.
- Allocation limits in Gunyulgup, Cowaramup and Wilyabrup subareas were reviewed and updated. These catchments were previously classified as over allocated. The review confirmed that the current level of use is secure and sustainable under the projected drying climate to 2030. Allocation limits in these catchments are now equal to current authorised use.
- Dam storage and surface water flows were measured using new technologies to expand our understanding of water resources and support PAT model development.
- Monitoring and evaluating of environmental flows was improved by developing flow indices in representative catchments and expanding the monitoring program to include triennial river health assessments.
- All of the resource objectives set in the Whicher plan were met for 2013–2016.

The 2009 plan set allocation limits equal to historical use (total dam storage) or based on a calculated sustainable diversion limit, whichever was higher. Following the release of the plan we revised our estimates of historical use based on information collected through the licensing process, farm dam mapping and field visits. In several catchments our estimate of historical use was higher than the allocation limit and these catchments were identified as over allocated in the 2013 evaluation statement.

We committed in the 2013 statement to retain the allocation limits until we had finalised licensing historical use, and undertaken further investigations into the impact of the drying climate on the reliability of supply for water users and the environment. The PAT models have allowed us to complete this work in the Gunyulgup, Cowaramup and Wilyabrup catchments.

Objective	Department of Water actions and achievements for 2013—2016
1. Minimise impacts of new surface water developments on existing water users.	• Assessed new licences using state-wide and local licensing policies in the plan to prevent negative impacts on other users and streamflow. • Completed PAT models for Capel, Gunyulgup, Quinninup, Cowaramup, Wilyabrup, Boodjidup and Chapman catchments to assess reliability of supply for new and existing users. The models are used to support the licensing process in these areas.
2. Protect key ecological, cultural and social values so they are kept at an acceptable level of risk from the effects of surface water use.	• Annually assessed streamflow using stream gauging data to monitor trends. Streamflows are declining as a consequence of less rainfall. • Developed criteria to assess recorded flows against environmental flows in Cowaramup, Wilyabrup, Margaret and Chapman catchments where environmental flow studies were completed. This confirmed that environmental flows for these catchments were met over the evaluation period. • Implemented river health monitoring in six catchments (Capel, Carbanup, Wilyabrup, Margaret River, Boodjidup and Chapman) to confirm values are being maintained. The results of this monitoring verified the environmental values set for each of these catchments. • Launched the Regional Estuaries initiative to improve the health of six WA estuaries, including the Vasse-Wonnerup system and the Hardy Inlet. • Launched the four-year Revitalising Geographe Waterways program to implement the key actions of the Vasse Geographe strategy.
3. Manage commercial use in proclaimed areas through licensing.	• Implemented licensing in proclaimed areas, where water is available. There was gradual growth in licensed use since 2013. • Implemented a compliance strategy to encourage licensing of the remaining 10 per cent of existing unlicensed users.
4. Provide regular statements against the management objectives outlined in this plan and update the community on the ongoing work to review this plan.	• Annually evaluated how the resources were performing under the management set out in the plan. The results of this work are published every three years – this is the second statement since the plan was released in 2009. • Maintained our regular contact with stakeholders through water user and natural resource management groups.
5. Implement effective water management through measurement, monitoring, auditing, compliance and reporting to provide transparency and accountability of water use.	• Continued to improve and refine our monitoring and evaluation framework to include annual review of streamflow, modelling of reliability of supply to water users and assessment of environmental flows. • Refined and improved our management of the water resources by completing plan actions and as identified in the previous evaluation statement. This included review of allocation limits in over-allocated catchments. • Launched the statewide Water Online (https://online.water.wa.gov.au) and water register (www.water.wa.gov.au/maps-and-data/maps/water-register) websites to provide contemporary web-based water licensing and water availability reporting systems.

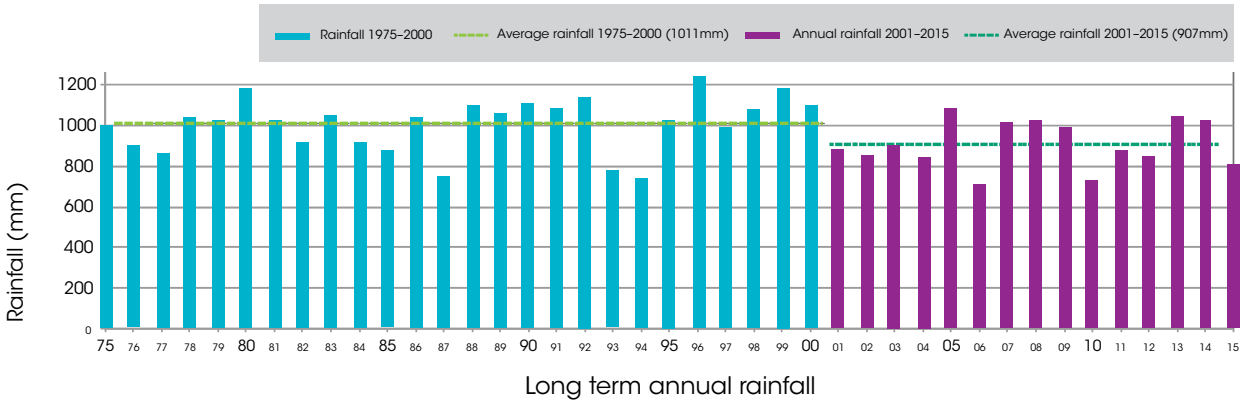
Status of water resources

Similar to other areas in the state's south west, streamflow in the Whicher plan area was impacted by the drying climate. We have continued to monitor rainfall and streamflow to track trends in water availability. We currently operate 22 permanent flow gauging stations and nine rainfall gauges in the plan area and an additional 24 project-based sites.

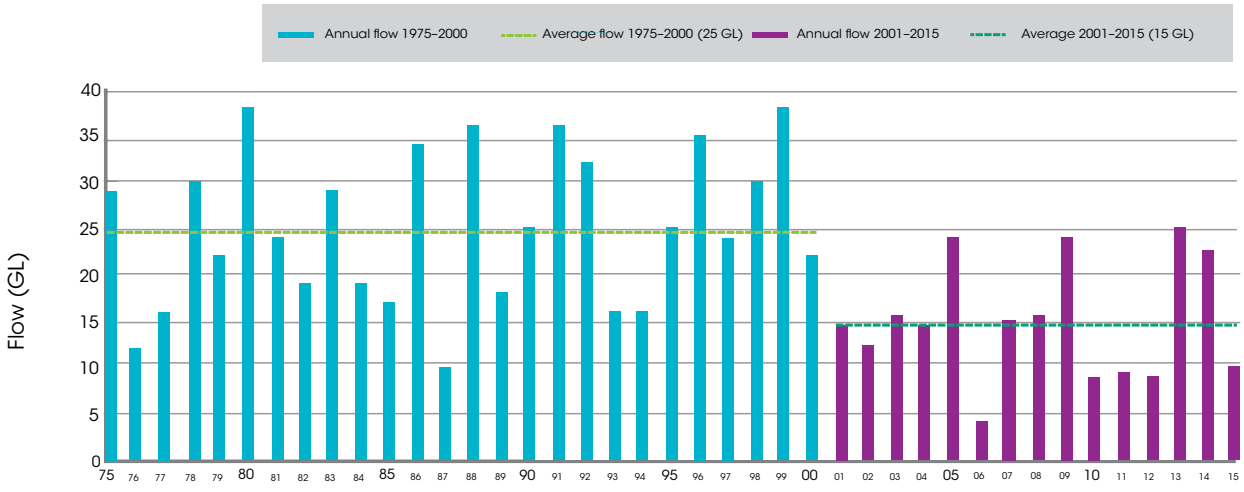
As part of the 2016 evaluation we reviewed the hydrology of eight catchments (Capel and Margaret rivers and Carbanup, Cowaramup, Wilyabrup, St John, Blackwood and Chapman brooks) using data from 12 streamflow gauges to quantify trends in rainfall and surface water since 1975.

Between 2001 and 2015 most sites experienced a 9–10 per cent reduction in rainfall compared to 1975–2000. This declining rainfall has caused reductions in streamflow, ranging from 23 per cent at Capel Railway Bridge (AWRC 610010) on Capel River, to 52 per cent at Willmott's Farm (AWRC 610001) and Whicher Range (AWRC 610008) stations on Margaret River.

Climate-induced, reduced rainfall appears to be the main cause of reduced streamflow, with significant reductions at sites with no influence from dams or abstraction upstream of gauging stations and minimal clearing of catchments upstream (state forest and/or national park). Groundwater inflow has maintained summer flow at some sites, such as Capel River and also sustains summer flow or refuge pools in other systems including parts of the Blackwood and Margaret rivers.



Long term annual rainfall



Long term annual streamflow

Results from monitoring and modelling undertaken show that the majority of dams in agricultural catchments continue to fill each year. More than 90 per cent of dams in Wilyabrup, Cowaramup and Gunyulgup catchments were filling in 90 per cent of years between 1975 and 2015. These results indicate that the current allocation limits continue to provide a high level of reliability of supply for water users even though there are declining trends in streamflow.

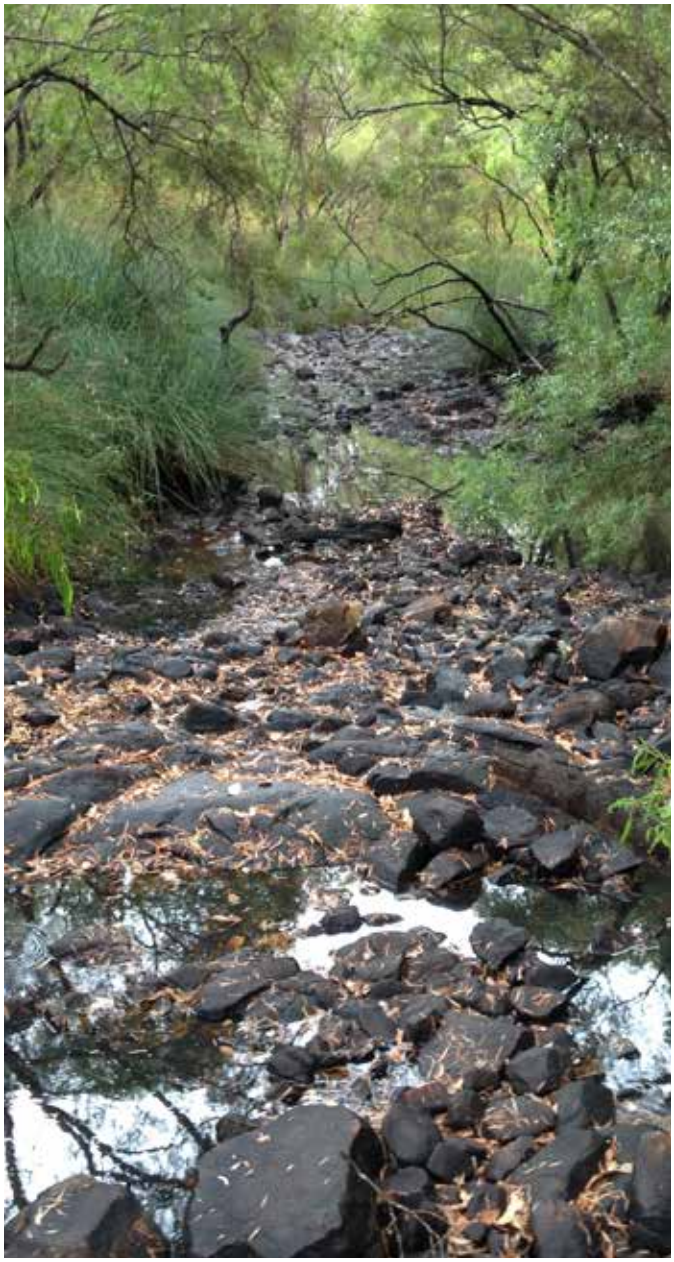
Since 2013 we have developed a framework for assessing environmental flows in representative catchments including Margaret River, and Wilyabrup, Cowaramup and Chapman brooks. The framework uses statistics (prediction intervals) to check whether measured flows are meeting environmental flows. Although streamflow is showing a declining trend the environmental flows in these four systems were met in each year since 2012. This confirms that the allocation limits set for these catchments are sustainable.

In summer 2015–2016 we completed river health monitoring across 16 sites in Capel, Carbanup, Wilyabrup, Margaret River, Boodjidup and Chapman catchments. This work was completed using the South West Index of River Condition to check if the environmental flows are maintaining environmental values. We aim to repeat these surveys every three years to check that environmental values of our surface water systems are being maintained.

The results highlighted the importance of areas with permanent river pools as refuges for aquatic plants and animals. These habitats will become more important as the climate continues to dry. The surveys recorded nine native freshwater fish species, including the threatened pouched lamprey, western mud minnow and Balston's pygmy perch. Four species of freshwater crayfish were also recorded, including the threatened hairy marron from the Margaret River.

The river health monitoring also identified two key factors that threaten aquatic values – introduced and invasive species such as eastern Gambusia or mosquitofish; and deteriorating water quality during summer, particularly low dissolved oxygen.

Water quality issues can be exacerbated by declining flows. While the drying climate is the overriding influence on flows in the Whicher area, we need to continue to carefully manage water use to minimise risks to aquatic ecosystems. Where possible we will support other agencies in managing aquatic systems, such as the Department of Primary Industry and Regional Development which lead the management of introduced fish species.



Boodjidup Brook

The department's Selection *of future climate projections for Western Australia* presents a set of standard future climate scenarios for the state which will support a consistent approach to future water planning. The scenarios were developed using consolidated outputs from 12 global circulation models and provide three possible future scenarios – wet, median and dry – that capture the range and uncertainty in the models.

Status of water resources

There is water available for licensing in 38 of the 52 subareas in the Whicher plan area. The update of the allocation limits for the Gunyulgup, Cowaramup, and Wilyabrup subareas means these areas are now fully allocated. They were previously classified as over-allocated. The Capel West, Quinninup Brook and Upper Margaret subareas remain over-allocated.

Gunyulgup, Cowaramup and Wilyabrup subareas

Allocation limits for the Gunyulgup, Cowaramup and Wilyabrup subareas were reviewed.

The PAT model was used to predict the reliability of supply to existing dams under future climate scenarios to 2030 for each catchment area. The modelling showed that reliability of current use was maintained under future climate scenarios, including the projected future 'dry' scenario.

The same prediction interval methodology was used to evaluate annual flows for each subarea. The results showed that environmental flows would be maintained under current level of use and the projected future 'dry' scenario. Based on these outcomes we concluded that the current levels of use is sustainable now and into the future under a projected drying climate. Consequently the allocation limits were increased to meet the revised levels of use.

Upper Margaret, Capel West and Quinninup Brook subareas

The Upper Margaret, Capel West and Quinninup Brook subareas remain over-allocated.

A process for reviewing the allocation limits for these subareas is underway. To review the allocation limits for Quinninup Brook we modelled the catchment using streamflow data estimated from a neighbouring catchment. The results of the modelling were inconclusive.

Since completing the modelling we installed a streamflow gauge on Quinninup Brook to improve the accuracy of the modelled results. The allocation limits will be reassessed when we have a minimum of two years of streamflow and monitoring data. Establishing dam water level monitoring sites (with the cooperation of landholders) will provide valuable information for refining our modelling and reassessing allocation limits in the future.

Up-to-date information on water availability can be found on our water register via our website www.dwer.wa.gov.au.

Ongoing work in the catchment

The plan continues to provide an effective and useful framework for the management of surface water resources in the Whicher area. Allocation limit reviews in the Capel West, Quinninup Brook and Upper Margaret catchments will be progressed in 2017 and 2018.

We will continue to implement and improve our monitoring and evaluation framework to regularly check if the reliability of supply to water users is maintained and if streamflow is meeting the needs of the environment.

The recent changes to allocation limits have helped us to refine how we use PAT to assess dam reliability and risk to environmental values across catchments. We will use this approach in the future to investigate whether allocation limits can be refined further and set at a finer scale (sub-catchment) to improve water resource management. The impact of future climate on surface water flows and the environmental values will be an important part of this process and will help to determine if more water can be made available either through changes to allocation limits or the implementation of variable take licensing.

Margaret River

Reliability of supply

In surface water catchments with distributed dams we calculate the reliability of supply as the percentage of years streamflow is sufficient to meet a licence holder's annual water entitlement in full (for example a dam that is filled by streamflow in 90 per cent of years has a reliability of 90 per cent). For the Whicher plan area this is calculated using streamflow and rainfall data from 1975 to the current year.

Licences issued under the allocation limit are generally highly reliable (because allocation limits were set to achieve this), although position in the catchment can affect this for individual dams.

Further information

For licensing information, please contact our South West Region in Busselton, phone 08 9781 0111. You can also view the latest water allocation and availability information through our water register via our website www.dwer.wa.gov.au.

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