Government of **Western Australia**
Department of **Water**

Securing Western Australia's water future

Warren-Donnelly

surface water allocation plan

Evaluation statement 2012–2016

This is the first evaluation statement for the Department of Water's 2012 Warren-Donnelly surface water allocation plan. It summarises how the department has implemented the plan since its release in 2012.

The allocation limits and licensing policy continue to provide a useful framework for managing the surface water resources of the Warren Donnelly catchments. Over the evaluation period, surface water flows have been sufficient to provide water for the current levels of irrigated agriculture and environmental and social values.

The development of the Planning and Allocation Tool (PAT model) and a trial in the Upper Lefroy catchment have supported variable take licensing in six catchments. Variable take (or two-tier) licensing is a new regulatory mechanism for access to additional water in higher-flow years. It enables self-supply water users to take water above the allocation limit when river flows are high. Because this water isn't available during drier years, its reliability of supply is lower than water licensed to the allocation limits set through the plan.

For water security to support longer term growth, the Water for Food: Southern Forests project is investigating options for a larger-scale, integrated irrigation scheme in the plan area. If feasible, a new water distribution scheme could provide irrigators with access to additional water and greater reliability of supply.

We will continue to work with stakeholders to find innovative ways to promote the efficient and sustainable use of water resources, including approaches to manage the future impacts of climate change on surface water resources.

Warren Donnelly area

Warren Donnelly plan area

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% of years has a reliability of 90%). For the Warren-Donnelly plan area this is calculated using 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.

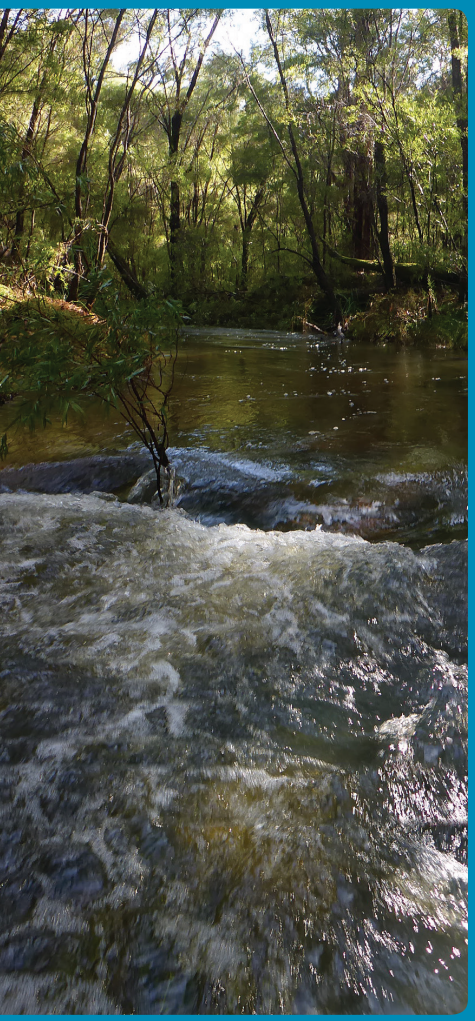
Variable take licensees can only take water once flows exceed a required flow rate which may not occur every winter. This supply is therefore less reliable across multiple years. We refer to this as two-tier licensing.

The Warren-Donnelly surface water area

The Warren-Donnelly plan area covers the catchments of the Warren and Donnelly rivers and their tributaries including the Tone and Perup rivers, and the Lefroy and Barlee brooks. The area is divided into 25 subareas for managing surface water.

In agricultural areas, the majority of surface water for commercial use is taken from on-stream dams and used for irrigating horticultural crops, viticulture and pasture for the dairy industry. With the success of branding under the Genuinely Southern Forests label, the area is increasingly recognised for its high-value horticultural produce.

Almost two thirds (4000 km^2) of the total plan area (6100 km^2) is covered by state forest, national park and conservation reserves. The rivers, particularly in these forested areas, support significant conservation and social values.



Barlee Brook

Improving how we manage water

The department's main achievements between 2012 and 2016 were:

- Released *Securing water resources for the South West* to inform stakeholders on how we are managing in a changing climate in the South West.
- Improved our modelling capacity through the development of the Planning and Allocation Tool. This tool allows us to model surface water flows at a range of scales and quantify the reliability of supply for water users under different future climate scenarios.
- Introduced variable take licensing in six catchments across the plan area. This two-tiered approach to licensing optimises available water by enabling licensing of additional take only in high flow years.
- Initiated the $3.6 million Water for Food: Southern Forests project which is investigating the potential for an integrated irrigation scheme.
- Intensified our monitoring of surface water through using new technologies for measuring dam bathymetry and surface water flows.
- Met all of the resource objectives set in the plan for 2012–2016.

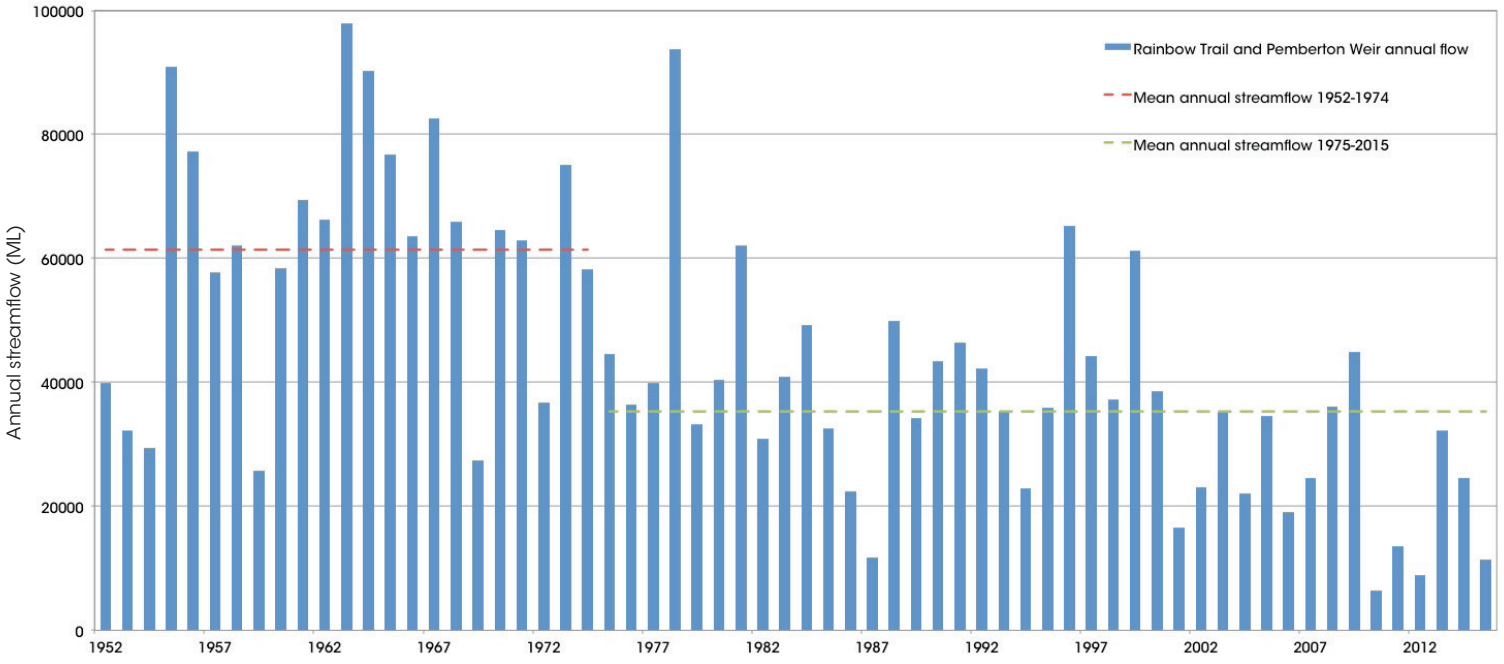
Objective	Department of Water actions and achievements 2012–2016
1. Flow regimes in irrigated subareas that supply licence entitlements in almost all years. This includes leaving sufficient water in rivers to reach downstream users and to meet minimal environmental needs in dry years.	• Assessed annual streamflows at the Channybearup site (Australian Water Resources Council (AWRC) reference 607002) for each year from 2012 to 2015. Flows in 2012 were lower than in 1987 (the historically low-flow year used to set allocation limits) however a surveys of dams in the target catchments indicated that most dams filled in that year. • Annual flows in 2013, 2014 and 2015 recorded at Channybearup were both higher than in 1987 and, surveys confirmed, were sufficient to provide licence entitlements for water users. • Reliability of supply modelling, using PAT, confirmed that the majority of irrigation dams in the Upper Lefroy (66 of 76 in 2014 and 68 of 76 dams in 2015) subarea continued to receive more than 90% of their entitlement. Other subareas will be assessed as model components are completed. • The development of environmental flows for Barlee Brook (see below) will be used as a reference for all subareas including agricultural areas.
2. Flow regimes in forested and conservation subareas that maintain existing environmental and social values. This includes retaining most or all of the water as environmental flow where land-use zoning is incompatible with irrigation.	• All existing environmental and social values were retained at the upper and lower Barlee Brook reference sites (AWRC reference 608019 and 608015) during the lower than average annual flows in 2012 and 2015 and above-average flows in 2013 and 2014. This was based on the assessment of annual streamflow. • Completed a hydraulic model for Barlee Brook which will be used to finalise environmental flows for the brook. This will provide a reference for future monitoring and assessment of environmental flows across the plan area, including forested and conservation subareas.
3. Sufficient flow retained for the existing public water supply reserves.	• Assessed streamflow at Record Brook using rainfall (Bureau of Meteorology reference 009908), modelling and comparison with nearby operating gauging stations. The modelled flow for the Record Brook catchment in 2015 exceeded the 500 ML public water reserve
4. Sufficient freshwater flows in the Warren River to complement the salinity recovery targets.	• Salinity was assessed at the Barker Road Crossing gauging site (AWRC reference 607220). The average daily salinity has been higher than the 500 mg/L TDS target since 2012.

Status of water resources

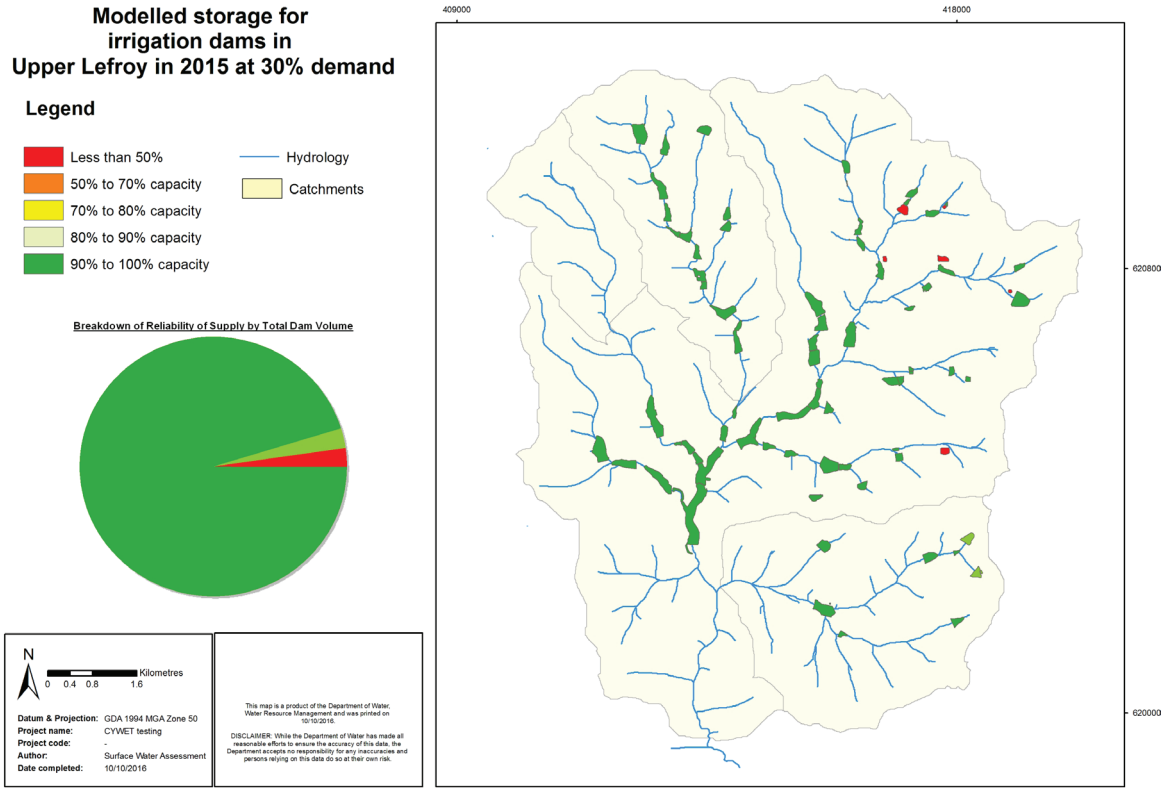
The drying climate in the South West Region means we have to manage our surface water resources carefully to maintain reliable water supplies for users and minimise the risk of impacts on river ecosystems. To monitor these risks, and help us to keep improving our understanding of surface water resources, we collect measurement data from over 30 sites across the plan area. These include long-term reference streamflows at eleven sites and nine rainfall gauge sites, and using new technologies to collect short-term (3—5 year) data from stream reaches at nine project sites and five dam sites. We have used this information to assess how the surface water resources were affected by water use and the changing climate.

Rainfall across the South West is now about 16% lower than the long-term average. This trend is set to continue, with more than 90% of global climate models projecting less rainfall in this part of the state over the coming decades. Reduced rainfall and higher temperatures mean less flow in creeks and rivers.

Manjimup and Pemberton have recorded rainfall declines (since 1975 conmpared to the long-term average) of 15% and 10% respectively. These declines in rainfall resulted in decreased streamflow. For example, since 1975 the Rainbow Trail gauging station (AWRC reference 607013) has recorded a mean annual flow of 35.3 GL/yr, compared to a long-term average (incorporating correlated data to 1952) of 61.4 GL/yr. Data from other streamflow gauges in the plan area show similar trends.



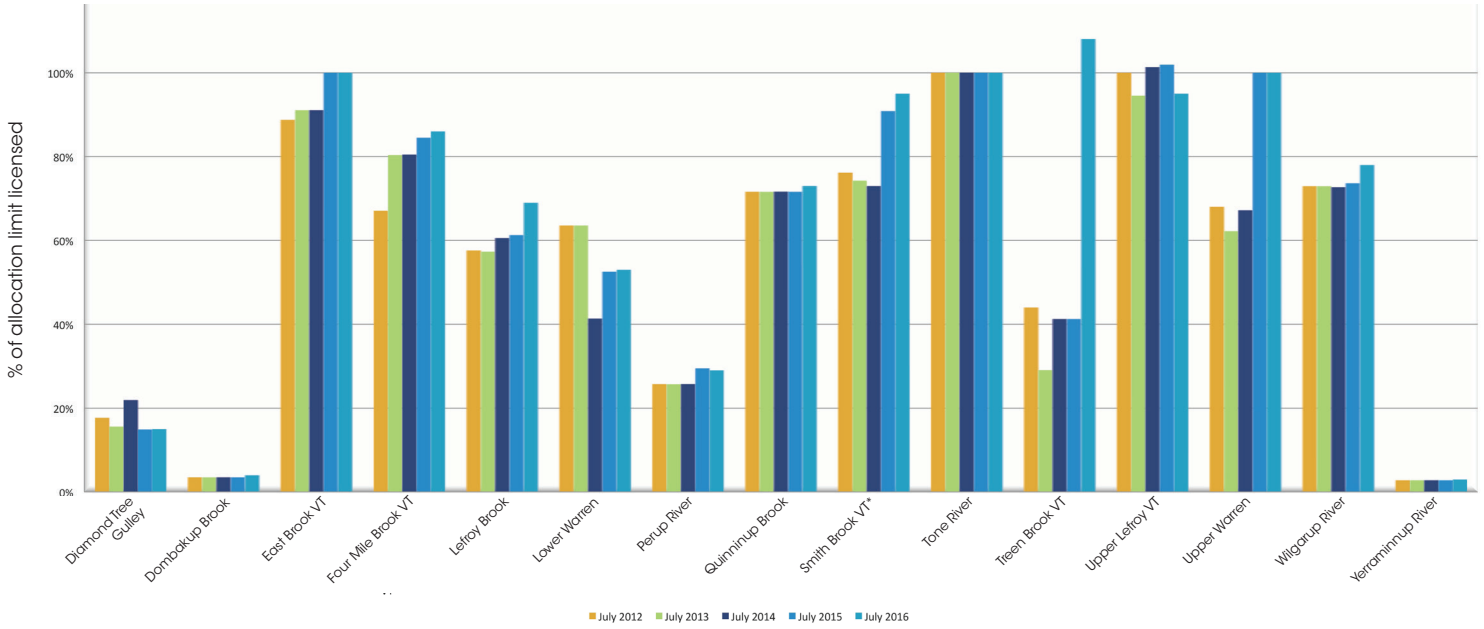
Annual streamflow at the Rainbow Trail (and Pemberton Weir) streamflow gauge (Lefroy Brook Catchment)



PAT modelled storage levels for 2015 in the Upper Lefroy Catchment
(Off-stream storage dams are presented with lower reliability because of how PAT models them)

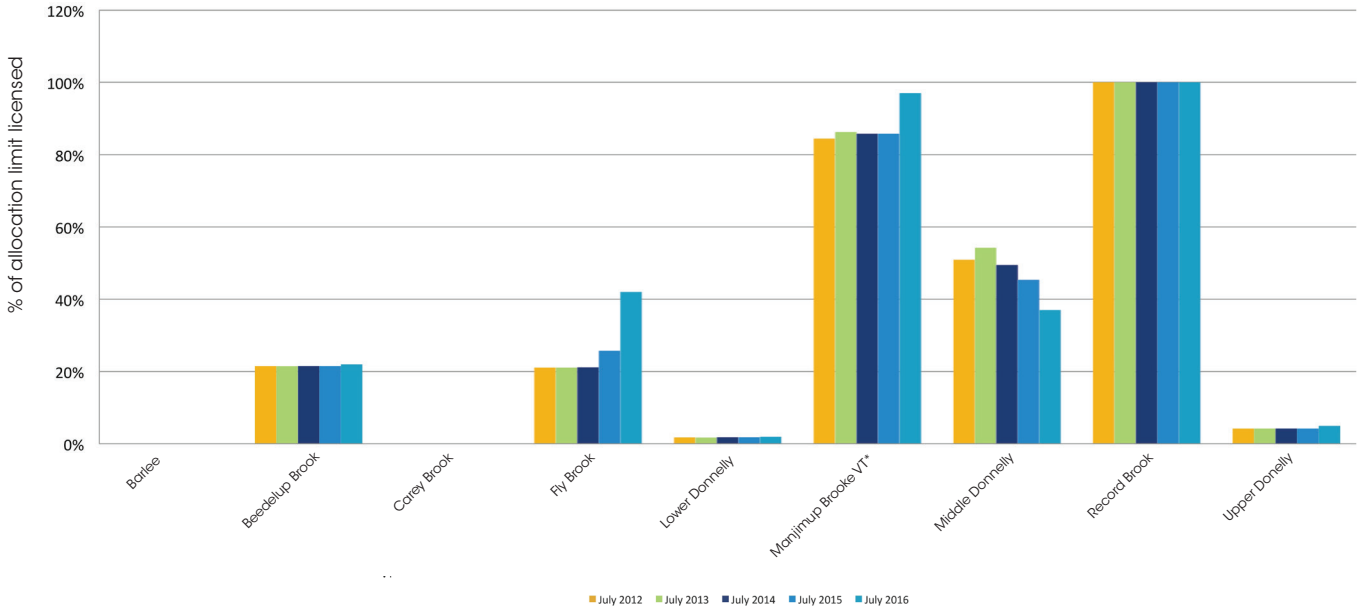
Status of water use

Nine of the 25 catchments in the Warren-Donnelly plan area are now fully, or close to fully, allocated. There is limited water available for licensing in two additional catchments (Wilgarup River and Lefroy Brook).



Water availability in the Warren Catchment

(*Variable take catchments with current high-reliability licence applications bring use up to the allocation limits).



Water availability in the Donnelly Catchment

(*Variable take catchments with current high-reliability licence applications bring use up to allocation limits).

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

Variable take licensing

Variable take licensing has been developed to optimise water available for use in fully allocated agricultural catchments by allowing additional take of high flows in wet years. The water provided for a variable take licence comes with a lower reliability of supply as water can only be taken during periods of high winter flows. By restricting this additional take to high flows we maintain high reliability of supply for existing users and minimise additional risks to the environment.

Variable take licensing has been made available in the following catchments:

- Manjimup Brook
- Upper Lefroy
- Four Mile/Big Brook
- East Brook
- Smith Brook
- Treen Brook.

Applying and assessing variable take licenses

In considering a variable take licence application we will use our standard licence assessment process to determine whether the proposal is acceptable in terms of potential impacts to other water users and the environment.

Lefroy Brook

We have developed the following policy to augment policy 1.3 in the Warren-Donnelly plan and to help guide licence assessment:

Variable take licensing will be made available in subareas subject to the following criteria:

- the water resource is fully allocated (all high reliability water is licensed)
- modelling using the Planning and Allocation Tool (PAT model) is undertaken to identify if the level of risk (to existing licence holders and environmental values) of applying variable take licensing is acceptable
- there is suitably located infrastructure (e.g. gauging stations) available to monitor streamflow and support the management of taking low reliability water.

The assessment of licences for variable take will follow the standard surface water licence assessment process with additional consideration of:

- Intent – The proposed take must be consistent with the intent of variable take; that is, only capture of high winter flows is allowed, not sustained additional take that would impact on a broader range of flows.
- Provision of information – Applicants may be required to survey existing dam volumes, provide surface water flow information, and/or carry out modelling to support their licence application.
- Reliability – The reliability of supply for all variable take licence applications will be calculated and the licensee made aware of the predicted reliability of supply. Consideration of the reliability of supply should be made by licensees as part of their business decisions. Applicants will be required to formally acknowledge the modelled reliability before being issued with a licence.
- Environment – Assessment of flow regimes will be made to minimise potential risks to the environment and maintain environmental values.
- Licence conditions – Licences may be subject to additional monitoring conditions reflecting the higher level of risk and management required for variable take.

When assessing proposals we will use the PAT model to calculate the reliability of supply for potential new variable take licences and any changes to the reliability for existing users or flows to the environment.

We will set a minimum target of 50% reliability for new proposals as a guide because of the potential risks to environmental values, the likelihood of compliance, and the management requirements of proposals below this level of reliability. The risk associated with the lower reliability of supply of variable take will be borne by the licensee.

We also use flows recorded during the low flow year of 1987 as a reference to compare potential impacts against, with the aim of maintaining a flow regime similar to 1987 as a minimum. We used the flows recorded in 1987 as a benchmark of minimum flows that provided secure water supply (for high reliability licences) and acceptable risk to the environment when setting the allocation limits in the plan.

We have currently capped water available for variable take licences in Treen Brook at 1 GL because of the objectives to maintain environmental and social values and salinity risks in this catchment. We will review this cap through our future evaluation processes.

Licensees who are granted access to variable take will be issued with an additional surface water licence (under section 5C and 26D of the *Rights in Water and Irrigation Act 1914*) from a variable take surface water resource. These licences will have additional conditions which identify them as a 'variable take licence'.

Manjimup Brook

Potential licensees should be aware that variable take licences are likely to require advanced measurement and infrastructure to allow for release and/or bypassing of flows when capture is not allowed. These requirements are necessary to help manage risks to the reliability of supply to existing users and to environmental values.

Further work on variable take

The expansion of variable take licensing into additional catchments may occur as allocation limits are reached and modelling to support licence assessment is developed. The department will consider professional hydrological modelling (subject to departmental peer review) to support licence assessments in catchments not yet covered by the PAT model.

We will continue to evaluate and adapt our licensing policy and assessment approach for applying variable take as new information becomes available or to refine how we apply variable take in different catchments.

Ongoing work in the catchment

The plan continues to provide an effective and useful framework for the management of surface water resources in Warren and Donnelly river catchments.

The Warren–Donnelly Water Resources Advisory Committee is an important stakeholder advisory group. To provide greater transparency, and to make sure the group represents a suitable cross-section of stakeholders, we will set guidelines for membership and review the role of the committee. This will be done in consultation with the current committee.

Incorporating future climate scenarios into PAT modelling will help us to refine allocation limits and investigate setting limits at a finer (subcatchment) scale in the future.

The Water for Food: Southern Forests project is investigating opportunities for alternative storage and distribution of water supply for irrigation use into the future. Our next phase of work will focus on consolidating variable take licensing and examining the potential for an integrated irrigation scheme.

Further information

For licensing information, please contact our South West region in Bunbury, phone 08 9726 4111.

You can also view the latest water allocation and availability information through our water register via our website www.water.wa.gov.au.

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