



## Investigating priority water resources

### *Gnangara groundwater system*

The Gnangara groundwater system is the major source of potable water for public water supply in the south-west of Western Australia. It also supports an extensive horticultural industry, urban parks and recreational areas, industrial activities and a range of unique ecological systems.

In the last 30 years, particularly the last decade, there has been less rain to recharge groundwater, which has had a direct impact on the groundwater stored in the system.

Groundwater-dependent ecosystems in Gnangara have adapted to a water regime of winter recharge that supports these ecosystems through typically hot, dry summers. However, declining groundwater levels across the mound, combined with the drying climate trend have resulted in a corresponding decline in the health of groundwater-dependent ecosystems.

This system is a priority water resource and the Department of Water is implementing a program of investigation that is part funded by the Australian Government's \$12.9 billion *Water for the Future* initiative.

### *Where are the projects occurring?*

The Gnangara groundwater system covers an area of approximately 2200 sq km, bounded by the Swan River to the south, Gingin Brook to the north and between the coast and the Darling fault.

### *What will the projects involve?*

The projects being conducted by the department in this region will improve our understanding of the following topics:

- Shallow groundwater systems investigations and assessment  
*Finding out how wetlands have relied on groundwater and responded to changes in climate over thousands of years will help us distinguish between the impacts of human activities and natural environmental changes.*
- Confined aquifer investigation and assessment  
*We will drill bores in the deeper aquifers to better understand how groundwater flows and the connection between deep and shallow layers.*
- Research into water allocation alternatives  
*Highly valued water resources are, and will become fully allocated in the coming years. We need to plan and make decisions about how we will allocate water as we approach sustainable limits. By analysing options for how water could be allocated in the future, we will be better positioned to implement the most appropriate model(s).*
- Investigation into unlicensed water use  
*There is a large amount of garden bore use from the Gnangara system. Measuring water use in a cross section of metropolitan gardens will help us to update the estimate of the amount of water used for today's average garden sizes and types.*

*This will help us estimate how much water we need to set aside for unlicensed use so that we allocate water for licensed use within the limits of the resource.*

- *Development of pathways for the management of over-allocated systems Some areas of the Gnamangara system are over-allocated which means that total volume of water able to be extracted by licence entitlement holders at a given time is not sustainable. This over-allocation has led to over-use which has impacted the groundwater resources. By considering various management options to reduce use, this will help us to recover over-allocated resources to sustainable levels.*
- *Develop environmental water provisions in the context of a drying climate We will develop a framework for assessing how much water ecosystems need in a drying climate. We will then use this framework to develop environmental water provisions.*

### ***Why are we doing the projects?***

These projects will provide more information about the Gnamangara groundwater areas and this will directly support improvements to future management of the resource. We will use this information to review and update the current water allocation plan and develop a new plan for Gnamangara by 2012. The next allocation plan will also be informed by the land and water use recommendations of the *Gnamangara Sustainability Strategy (GSS)*, and will align with the department's *Perth Peel Regional Water Plan*. It will also be consistent with the requirements of the National Water Initiative.