Wungong Whispers

Volume 2 – November 2006
ISSN 1834-3406

Thinning may improve aquatic biodiversity

Baseline studies undertaken by the University of Western Australia (UWA) have found that aquatic fauna in the Wungong catchment are likely to benefit from increased stream flows as a result of catchment thinning.

The studies, undertaken by the Aquatic Research Laboratory in the School of Animal Biology in 2005 used historical data (1984-1987) and conducted fauna surveys to record and compare the abundance and diversity of aquatic invertebrate and fish species in streams in the Wungong catchment.

Survey sites included streams at Vardi Road and Waterfall Gully (refer to page 3 for a map of these areas).

UWA Adjunct Senior Lecturer, Dr Andrew Storey said that the study had provided extremely good data for detecting changes, and when compared with data collected in the mid 1980s, would allow detection of any future changes in biodiversity as a result of catchment thinning.

"The purpose of the study was to undertake a baseline assessment of aquatic fauna in stream sites so we can monitor if there are any changes in aquatic biodiversity once thinning commences in these areas," Dr Storey said.

The study found that aquatic fauna at the survey sites were considered typical of flowing stream communities in relatively undisturbed upland jarrah forest catchments.

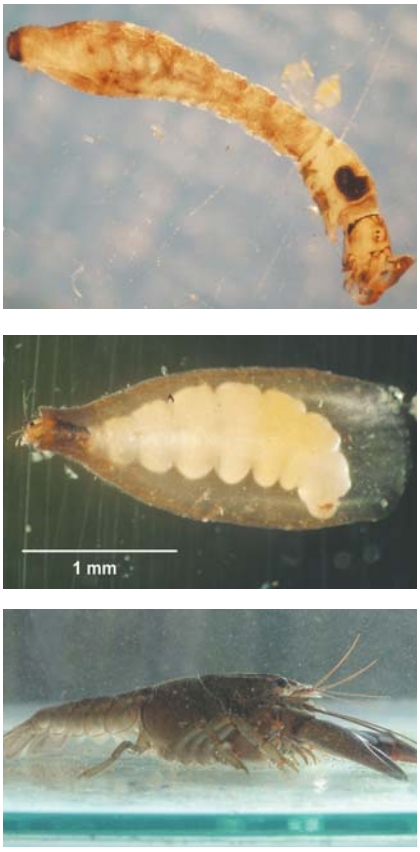
Fauna identified at the survey sites included 74 different types of aquatic species including stoneflies, caddis-flies and dragonflies, freshwater crayfish (gilgies) and freshwater fish such as the western minnow.

Based on the recent surveys, historical data and records of stream flows, it is predicted that aquatic biodiversity may increase if run off to streams is greater.

Previous research has demonstrated that seasonal streams in the jarrah forest tend to be less bio-diverse, but support species that have mechanisms to avoid dehydration (such as drought resistant eggs, shells that seal, animals that burrow into sediments and species that survive as airborne adults in riparian zones during summer).

Monitoring of several streams in the Wungong catchment over periods of more than 30 years has shown that these streams are shifting from permanently flowing to seasonal streams, partly as a result of the drying climate, therefore reducing the diversity of aquatic animals to those able to withstand drying.

By thinning the forest in these areas to increase water flows, it is likely that some streams will return from seasonal to perennial streams, meaning a greater range of aquatic species will be able to survive.



Pictures of a Black fly larva, Caddis fly larva and a gilgie identified as part of the research project. Photos courtesy of the Aquatic Research Laboratory at UWA.

INSIDE

Wungong Project wins Environment Award

Australian Water Association WA Branch President, Jeff Camkin presents Water Corporation Principal Planning Engineer, Graham Hughes, with the award.

The Wungong Catchment Environment and Water Management Project was the recipient of the prestigious Australian Water Association (WA) Water Environment Merit award, presented at the WA Water Awards on Friday 13 October.

The award is announced every two years and recognises environmentally significant projects encouraging innovation, constant environmental improvement and sustainable management of Australia's water resources.

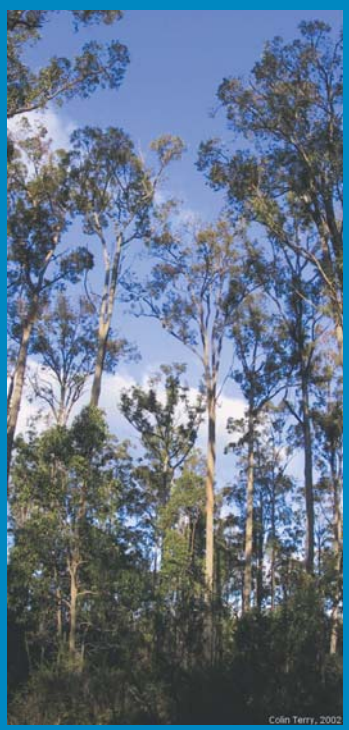
Water Corporation Principal Planning Engineer, Graeme Hughes was on hand to accept the Award.

"It is great to be recognised for our achievements so far," he said.

"This project is an excellent example of how the Water Corporation has been able to partner with government agencies, universities and leading researchers to find innovative ways to sustainably manage our water supplies".

As winner of the State award, the project gains automatic entry into the national round of Australian Water Association awards to be announced at the Ozwater Conference in March 2007.

New project to study ecosystem response to thinning in Wungong Catchment



The Australian Research Council has agreed to fund a project between Murdoch University and the Water Corporation which will assess ecological responses to forest thinning in the Wungong catchment.

Vegetation dynamics, nutrient cycling processes and restoration pathways will be studied in relation to levels of disturbance of thinning and prescribed burning to achieve sustainable catchment ecosystems, water yield and water quality.

The 4-year project entitled "Balancing Water Quality and Ecosystem Health with Water Yield — Ecosystem Response to Thinning in Wungong Catchment" will cost $1.1 million, including in-kind contributions from research partners.

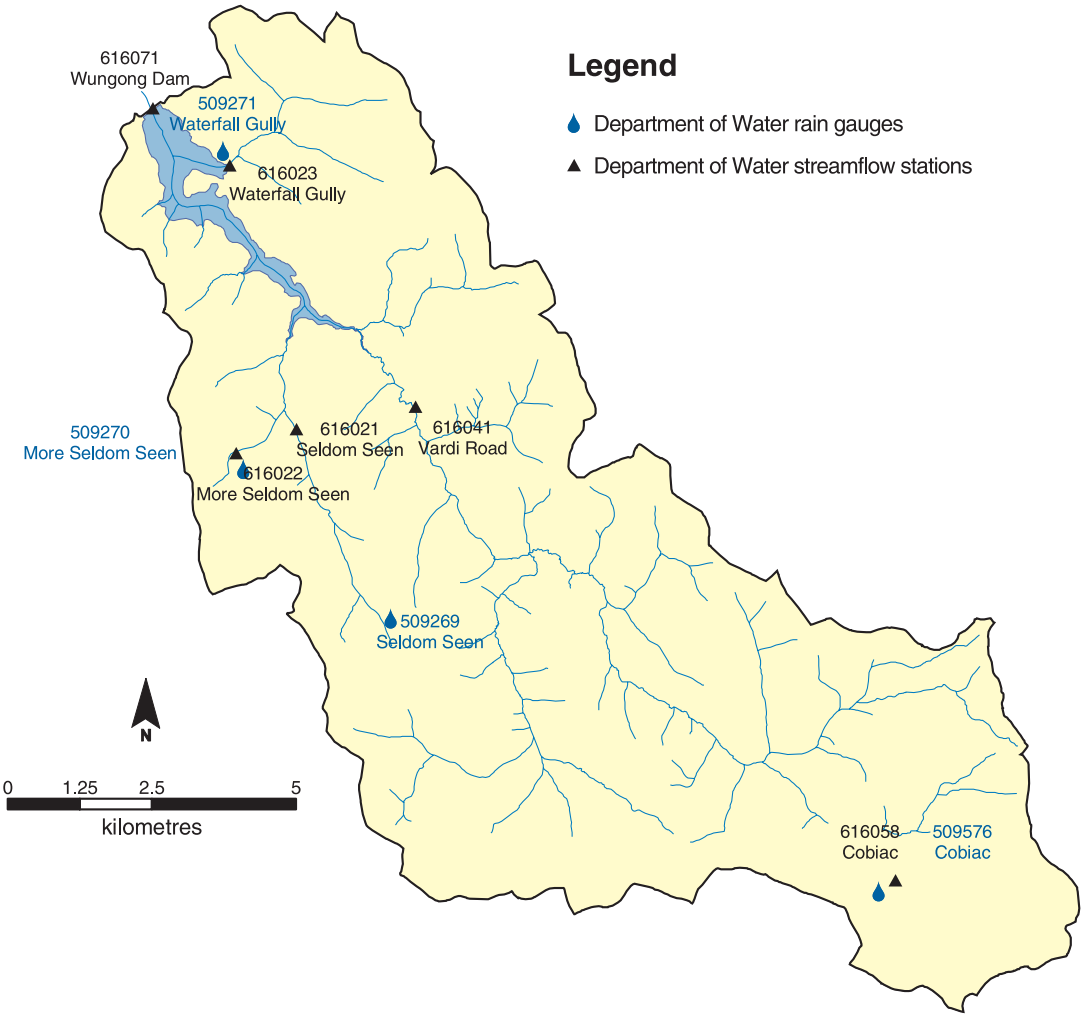
It will be led by Associate Professor Richard Bell, and Professors Arthur McComb and Richard Hobbs of Murdoch University's School of Environmental Science.

Dr Bishnu Devkota will manage the project for the Water Corporation with input from consultant Frank Batini.

Senior Research Fellow Dr Song Qiu will look at processes underlying biological responses and whether there are any associated risks to water quality. A PhD student will be recruited to investigate vegetation responses and forest health associated with thinning. Additional honours and postgraduate students will also be involved throughout the project.

The study sites will be selected in consultation with Department of Environment and Conservation. Shortlisting of sites commenced in early February 2006 and will include monitoring sites, transects, plot experiments, and 'historical' sites.

Did you know?



■ **Locations of rain and streamflow stations in the Wungong Catchment**

Recent monitoring is starting to show how consistently low rainfall and our driest winter on record may be impacting on streamflows in the Wungong catchment.

We need little reminding that 2006 has been an exceptionally dry year in South West Western Australia. The Bureau of Meteorology has reported that the total rainfall for January to October 2006 for Perth was 445 mm on 87 days making it the driest such period since the commencement of record in 1876.

The rainfall, streamflow and stream water quality monitoring, enhanced for the Wungong Project, is providing valuable hydrologic information. Although these data will be analysed in greater detail at the completion of the water year there are early observations of the impact of this very dry year.

The eastern Cobiac sub-catchment of the Wungong River required an accumulated 350 mm of rain before there was any streamflow, the same as in 2005 but 100 mm more than for each of the years between 1992 and 1997.

The River did not commence flowing until mid August, two months later than all but one of the seven years of record. It flowed for only 47 days, less than half the flow period of previous record. Runoff was only 5.7 mm out of the 530 mm of rainfall for the April to September period.

Streamflow measured at the main Wungong gauging station at Vardi Road and at the Seldom Seen and More Seldom Seen research catchment gauging stations was just 3.6%, 3.8% and 2.3% of catchment rainfall, respectively, for April to September 2006. However the control catchment, Waterfall Gully, maintained a respectable 10.4% runoff.

The preceding nine years (1997 to 2005) has been an extended period of low flows from forested catchment streams. Comparing April to September flows, Waterfall Gully streamflow in 2006 was half of the average for this preceding nine years, while the Vardi Road, Seldom Seen and More Seldom Seen streamflows were less than a quarter of the same period flows for 1997 to 2005.

The hydrologic records for 2006 will provide a valuable pre-treatment comparison for a very dry year.

Meet the Team!

Water Corporation Catchment Rangers Backrow L-R - Peter Chalmers, Kevin Lillee, Mal Reeves, George van der Meulen Frontrow L-R - Mick Ryan, Jason Tan, John Liddington

Surface Water Operations

Quality drinking water begins at the source. The Water Corporation's Surface Water Operations section is responsible for protection of source waters in Perth's surface water and groundwater sources. They play an integral role in the Wungong project, monitoring water quality and regulating access to the catchment.

The Wungong catchment area is one of 15 surface water catchment areas ranging from Mundaring in the north and as far as South Dandalup the south.

The catchment areas are not only a source of water, but also provide areas for flora and fauna conservation, as well as timber and mineral production, and are popularly visited for recreation purposes.

Surface water sources supply roughly 40% of Perth's annual drinking water supplies and currently require very low levels of treatment with only chlorine disinfection treatment and fluoride addition. Maintaining high quality water from these sources is imperative to ensure that more costly levels of treatment are not required and high quality drinking water can continue to be supplied to our customers.

For effective management of these drinking water sources the Surface Water Operations section implement Catchment Management Strategies.

These recognise the various risks to water quality in each catchment and have a range of prioritised management actions to manage these risks.

Senior Catchment Ranger Peter Chalmers supervises the day to day operations of seven Catchment Rangers who undertake much of the crucial field work associated with these strategies and actions. Various professional staff based at the Kelmscott Depot provide valuable support to the catchment rangers.

Typical daily activities include:

- sampling of the streams and reservoirs;
- feral pig control;
- public education;
- monitoring mining and timber harvesting operations;
- inspecting recreational sites and events; and
- apprehending those who have contravened the relevant bylaws, for example by fishing or marroning in the reservoirs.

For the protection of the water quality and the health of catchment area bylaws are in place to restrict the activities that may be undertaken in the catchment areas. This includes an internal Reservoir Protection Zone from which only authorised personnel are permitted to access.

Under delegation from the Department of Water the Surface Water Operations catchment rangers enforce these bylaws during regular patrols, both day and night.

Project Implementation Update

Most of the first of five treatment areas has now been interpreted for dieback by Department of Environment and Conservation (DEC) staff and tree marking is complete within the first section of treatment area one. About 280 hectares has been marked and notched, with some follow-up work required.

A total of 2000 hectares underwent a prescribed burn in spring 2005 and 2006. Despite heavy fuels up to 18 years old, DEC staff carried out two very successful operations.

Most of the monitoring and research programs have commenced and some useful baseline data have been collected. Some of these programs and preliminary results will also be featured in future editions of Wungong Whispers and the Water Corporation is currently investigating ways to make research findings available on the web site.

A public forum, presenting information on the range of research and monitoring projects being undertaken in the catchment will be held in the first quarter of 2007.

Contact Details

This newsletter is produced by the Water Corporation and is also available electronically at **www.watercorporation.com.au/wungong**. To subscribe or unsubscribe to this newsletter, please contact Louisa Kinnear, Communications Officer on **9420 3139** or email **louisa.kinnear@watercorporation.com.au**. For technical enquiries, please contact Bishnu Devkota on **9420 2042** or email **bishnu.devkota@watercorporation.com.au**.

WATER CORPORATION

November 2006