

Wungong

Whispers



Volume 9 – September 2009

Groundwater update

With what seems like one of the best winters in years following thinning in some crucial areas of Wungong Catchment, what's been happening with streams and groundwater?

The short answer is that we are still analysing data, and it will take some more months of monitoring to really know what effect thinning has had.

In the meantime we have started to see some very interesting results in the Cobiac research catchment.

Cobiac is located along the upper reaches of the Wungong Brook, in the far south-eastern portion of the catchment. Treatment, including harvesting by FPC and follow-up thinning funded by Water Corporation, was undertaken during 2008, with some small areas finished early this year.

In the previous issue of Wungong Whispers we described the changes observed in Cobiac between the time when it was monitored as part of Alcoa's hydrological research programme (from 1992 to 1998) and since 2005 when we recommenced monitoring as part of the Trial.

To recap – from 1992 to 1998 Cobiac needed to receive around 240mm of rain before the stream at the gauging station started to flow. From 2005 to 2008, this had increased to 330mm of rain.



Groundwater overflowing from monitoring bore in Cobiac catchment.



Groundwater saturating the surface in Cobiac catchment.



Nearly 100mm more rainfall has been needed to start stream flow.

This year the stream started to flow after 256mm of rain, a great improvement on last year.

What about the groundwater levels?

Groundwater contribution to the stream stopped sometime between 1998 and 2005 – from 1992 to 1998 groundwater regularly intersected the surface in the swamp areas, boosting stream flows at the same time.

Over the 2005-2008 period groundwater has not been recorded intersecting the surface, in fact the average groundwater depth in the swamp areas over this time was about 2m below the surface.

However, this year things are different with three bores near the gauging station now recording positive groundwater levels, which means that Cobiac is starting to act more like it did over the 1990s.

The project is trying to find out if the increase in water is due to the amount of rain we've had?

Due to the pattern of the rainfall over this winter? or due to the treatment in the catchment?

We will send an update in the next issue of Whispers.

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Research of Forest Red-tailed Black Cockatoo



Male displaying to a female at a hollow in Marri tree (Research nest tree 042).



The male (L) is glossy black with a bright red panel in the tail. The female (R) has orange-yellow barring on the breast and undertail.

Western Australian (WA) Museum researchers are working in the Wungong Catchment with support of the Water Corporation to monitor and document the breeding, feeding and roosting sites for the Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo and Baudin's Cockatoo.

Over the past 10 years the WA Museum has been studying

the breeding biology of the Forest Red-tailed Black Cockatoo *C. b. naso* in the Wungong Catchment slowly gaining knowledge of their nesting areas, nest sites, breeding behaviour and timing of nesting attempts. Of particular interest is the social organisation and local movements, especially since 1995, of some birds out of the catchment and west onto the coastal plain (south of Perth) in summer to feed on White Cedar (Cape Lilac) fruits and Marri seeds.

The specific purpose of the research is to document the current distribution, status, habitat preferences, breeding season and diet for each species; monitor nests with details of nest trees, continue searches for new nests and collect data on clutch size, incubation period, fledging period, breeding behaviour and movements.

The Red-tailed Black cockatoo was named *Calyptorhynchus banksii naso* by John Gould in 1837; the name *naso* refers to the nose in reference to the large bill in comparison to other populations of Red-tailed Black Cockatoo. There are three subspecies, or different populations, of Red-tailed Black Cockatoo in Western Australia; *Calyptorhynchus banksii macrorhynchus* found in the Kimberley,

C. b. samueli found in the arid zone (Pilbara, Gascoyne and northern Wheatbelt), and *C. b. naso* restricted, or endemic, to the Jarrah, Marri and Karri forests in the south-west corner of the State. The subspecies *naso* is currently listed as Schedule 1 (Endangered) under the Western Australian Wildlife Conservation Act, and as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*.

Red-tailed Black Cockatoos have strong sexual dimorphism (sexual differences) – see below. Juvenile and immature birds are similar to the female and adult plumage is acquired at four years of age. These birds live for about 50 years, begin breeding at four years of age, mate for life and tend to nest in the same hollow each breeding season (generally every 2 years). In the Wungong Catchment, as in many hills areas, the cockatoos you see are from an ageing population with little recruitment back into the flock. Despite these being large conspicuous birds, very little is known about their breeding biology.



First recorded in Bedfordale, Red-tailed Black Cockatoos have learnt to feed on the berries of the introduced Cape Lilac *Melia azedarach*.



Research on growth rates of nestlings. Note yellow band on right leg of chick (from research nest tree 020).

Wungong tour for Landgate International

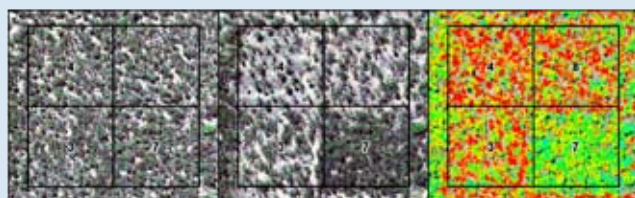
In May 2009 members of the Wungong Catchment Trial's Working Group (Michael Loh, Marg Wilke, Frank Batini and Michael Canci) hosted a tour for participants in the Landgate International Fellowship Program.

Landgate International provides training programs and consultancy to governments across the Asia Pacific and Indian Ocean regions to assist the establishment of sustainable land administration systems that will contribute to the social, economic

and environmental advancement of their country. During April-May 2009 Landgate International provided forest monitoring training to ten Fellows from Vietnam.

The tour participants were from various Vietnamese government agencies involved in Land Administration, Natural Resource Management and Remote Sensing, were shown forest management and monitoring activities being carried out within the Wungong Catchment. They visited several demonstration sites in the catchment where different thinning treatments have been applied to the forest that will improve forest health and increase runoff to the dam. Included was a visit to sites where detailed on-ground and remote sensing monitoring has been done to understand the response to the forest operation.

As shown is a series of images of the sites before and after the thinning showing an analysis of the forest recovery.



2005 Baseline data

2007 data

Changes between 2005 and 2007

Gleneagle Climate Station

by Department of Water

This Premier's Water Foundation Project aims to improve our understanding of the combined dynamics of vegetation structure and catchment water yield in response to climate change and forest management.

An essential component of this research project is the Gleneagle climate station which represents the characteristics of the air mass moving across the 31 Mile Brook Catchment where intensive meteorological water measurement studies are being carried out.

Co-incidentally the Water Corporation Wungong Trial has a requirement for Class A Pan evaporation data to improve the water balance calculations of the Wungong Reservoir for the assessment of the stream flow increases from forest treatment areas. To support the CSIRO project and to minimise the clearing of vegetation the Water Corporation agreed to co-locate the Class A Pan on the site of the climate station.

Department of Environment and Conservation completed the site clearing in mid April and the Gleneagle Climate station site number 509647 was commissioned by the Department of Water on 15-05-2009. Data is available for the site on the Department of Water website.

The site is located in a rehabilitated Bauxite mining area near to the catchment boundary between 31 mile Brook and Wungong Brook.

The Parameters monitored at the site are:-

- Pluviometer (Operation funded by Water Corporation Wungong Trial)
- Ambient Air Temperature
- Relative Humidity



Gleneagle Climate Station.

- Barometric Pressure
- Wind Direction
- Wind Speed
- Global Solar Radiation (Photosynthetically Active Radiation)
- Soil Temp @ 3cm
- Soil Temp @ 30cm
- Automatic Class A Evaporation Pan (Operation funded by Water Corporation Wungong Trial)

The site is polled once every day between 6am - 7am. More information can be found online: <http://kumina.water.wa.gov.au/waterinformation/telem/509647/509647.htm>

The Premier's Water Foundation Project 041 05 "Vegetation dynamics and water yield under changing climate and management" (PWF) led by CSIRO, is a collaboration between the Department of Water, the Department of Environment and Conservation, the Water Corporation, ALCOA, the University of WA and Murdoch University.

Revisiting the woodchip research catchments

*These research catchments were established in the mid 1970's, to investigate the effects of different silvicultural techniques on stream flow and water quality (turbidity and salinity). The results were previously reported in a study by Borg in 1987, but the data collection was discontinued for many years.**

In an effort to bridge this gap, in May 2009, five of these catchments were revisited, boreholes were located, depth to watertable measured and the forest condition described. This



included three catchments in Sutton block East of Manjimup that are predominantly karri forest and two catchments West of Manjimup, at Lewin, that are predominantly jarrah forest.

The Sutton catchments were named as April road South (as an uncut control), April road North (clear-felled and regenerated in 1983 to karri, leaving a 200 metre stream buffer) and March road (clear-felled and regenerated in 1983 to karri with no stream buffer). The old-growth karri in April road South is some 65-70 m in height, with basal areas between 35 and 50 square metres per hectare and tree diameters from 1 to 1.75 m. The regenerated karri forest is between 20 and 25 m high, with basal areas of 20-35 m²/ha and diameters between 20 and 34 cms. Site quality is variable as some of the sites regenerated to karri formerly carried a mixed jarrah- karri forest.

The Lewin catchments comprised a control (Lewin North) and a heavy selection cut in Lewin South, during 1982, to an average of 7m²/ha basal area retention, equivalent to an overstorey crown cover of eleven percent. A small strip alongside the creek was clear-felled and regenerated to karri forest. Previously some areas in both catchments were logged in the 1960-1970 decade.

– continued over to page 4

Biodiversity group workshop

On August 28 the Biodiversity Group met in order to go over the recommendations of the "Review of the Research Program" undertaken by CSIRO. In particular the discussions focused on the Key Performance Indicators for their work.

Over 20 experts from different organisations such as the WA Museum, DEC, CSIRO, UWA and Water Corporation attended the session.



L-R: Keith Barrett, Graeme Hughes, Amanda Reed, Ron Johnstone, Richard Boykett.

Revisiting the woodchip research catchments – from page 3

These areas were burnt in 1981-82 (North) and 1983-84 (South). Both catchments were also prescribed burnt in 2008-09.

In 2009, a number of plots were measured, with the following results:

The control catchment is a mixed forest of jarrah-marri averaging about 40-45 m in height and with an average basal area of 35m²/ha (range 24-48). It has a range of size classes, from larger trees to regeneration that followed the commercial cut in the 1960's.

The karri regeneration ranges from 18-25 m in height with basal areas between 22 and 24 m²/ha. The jarrah regeneration is lower, 12-15 m in height with basal areas averaging 15 m²/ha (range 10-18) and diameters around 15 cms. The overstorey retained in 1982 averaged 40 cms in diameter and 7 m²/ha (range 6-10) giving a total basal area now on the site of about 22m²/ha. We will report on the water tables at a later date.

* Borg H, Stoneman GL, Ward CG (1987). Stream and ground water response to logging and subsequent regeneration in the southern forest of Western Australia: results from four catchments. 16, 113 p.

Farewell to Marg Wilke

After two years of working in the Communications Coordinator role for the Wungong Thinning Trial we farewell Marg Wilke who retired in June. We wish Marg all the best in this new exciting stage of her life.



New team member

Paola Diaz has joined the Wungong team to work in Communications and Research support. She has been with Water Corporation for three years and brings with her a background in Environmental Sciences and her Public Relations experience.



Calendar update

- | | |
|--------------------|---------------------------------|
| August 28 | Biodiversity Group Workshop |
| October 20 | Technical Reference Group Forum |
| October 27 | Water and Land Group Workshop |
| November 16 | Research Forum |

WIN MOVIE TICKETS



Provide your feedback on this publication and you can be in the draw to win two movie tickets. See contact information below:

Contact details

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March 2009