Editorial

In this issue we bring you up to date with the progress of on-ground works that include construction of grade banks, fencing and revegetation in the Buntine-Marchagee Catchment. The works are designed to manage water to optimise farm productivity, land conservation and biodiversity management and have been made possible through the allocation of significant funding from the National Landcare Program (NLP) and the Northern Agricultural Catchment Council (NACC).

We feature articles about climate change and how it is affecting people, agriculture and biodiversity and what strategies we can use to adapt. A notable element of the climate change issue is the variety of interpretations on the impact of climate change. This is apparent in the articles featured.

We hear about Nature Conservation Covenants – how you can help preserve your bushland for future generations – and profile Donna Rayner, Biodiversity Support Officer for the Northern Agricultural Catchment Council.

A poem by Andrew Barton ‘Banjo’ Paterson seems appropriate as we move into winter 2008:

The Weather Prophet

“Ow can it rain,” the old man said, with things the way they are? You’ve got to learn off ant and bee, and jackass and galah;
And no man never saw it rain, for fifty years at least, ‘Not when the blessed parakeets are flyin’ to the east!”
The weeks went by, the squatter wrote to tell his bank the news. “It’s still as dry as dust, he said, “I’m feeding all the ewes;
The overdraft would sink a ship, but put your mind at rest, It’s all right now, the parakeets are flyin’ to the west”.

We hope the parakeets fly in the right direction for all this year!

Fiona Falconer

Rainfall data comparisons January-December 2007

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On-ground dollars for farms in the Buntine-Marchagee Catchment

By Rowan Dawson

Two funding approvals mean that more than $500,000 will be dedicated to on-ground works in the Buntine-Marchagee Natural Diversity Recovery Catchment (BMNDRC) during the 2007–2008 and 2008–2009 financial years. These works are an extension of an Integrated Catchment Management (ICM) project that started in 2004 with a demonstration catchment (see Figure 1) funded by the National Landcare Program (NLP) and managed by the Department of Environment and Conservation (DEC).

We are living in a drying climate. At the same time, we are experiencing a shift away from reliable winter rainfall patterns towards more annual rainfall being received in high intensity, destructive summer thunderstorms. This change is clearly shown in Figure 2 (winter rainfall trend) and Figure 3 (summer rainfall trend). ICM works are designed to mitigate the erosion, inundation, waterlogging and sedimentation resulting from high intensity rainfall events. Under the current and expected climate regime, ICM works have never been more appropriate. The works entail construction of grade banks and waterways; revegetation; fencing; and upgrades to shire road water crossings. A small shallow relief drainage trial is also being implemented. New dams are also being constructed, and surface water control structures are being upgraded or modified to increase flows into existing dams. As well as contributing to drought-proofing properties, the dams constructed or upgraded through this project will increase the retention and utilisation of excess water; water that would otherwise continue downstream and contribute to inundation, waterlogging and erosion.

Funding for the works has come from Federal and State sources. Federal funding totalling $170,000 is being delivered via the NLP’s Community Support Component, and will be used to implement Sub Catchment ‘1’ of the Inering Hills Project Area (see Figure 1). The funding was applied for by the Coorow Land Conservation District Committee (LCDC), with assistance from DEC’s BMNDRC team. In addition, the BMNDRC team requested, and was granted, a further $335,000 from the Northern Agricultural Catchment Council (NACC) for implementation of ICM works in Sub-Catchment ‘2’ (see Figure 1). ICM, especially in the context of a changing climate, is a land management approach designed to optimise the benefits to farm productivity, land conservation and biodiversity management. With substantial funding support, and input from the BMNDRC team, farmers in the BMNDRC are implementing landscape-scale works to tackle landscape-scale issues.

Acting now on climate change

By Joanna Moore

Our dependence on the environment has taken its toll, with one of the most serious consequences being the threat of global climate change. We can take practical steps to create a sustainable economy, society and environment and so reduce the risk of suffering the extreme impacts of climate change predicted by scientists. What is the Government doing? The State Government’s $101 million climate change action package – Making Decisions for the Future: Climate Change – was launched in May 2007. It outlines actions taken by the State Government to reduce greenhouse gas emissions, the principal cause of climate change. These include cleaning up energy generation, working with industry to reduce emissions, reducing the need for cars and managing natural resources and vegetation to abate emissions. Examples of these actions are wind farms from Esperance to Kalbarri, the new southern rail line and the $64 million Strategic Tree Farming program.

The climate change action statement also describes major new initiatives such as the establishment of a cleaner energy target, a renewable energy target and a Low Emissions Energy Development Fund which will focus investment towards technologies such as geothermal, bioenergy and clean coal as well as wind, wave, tidal and solar power. The Solar Schools program will be expanded and a household audit and education program will be established. Funds and research will be provided to help industries, businesses and agencies plan for the effects of a changing climate. The action statement includes plans to develop a blueprint for agriculture and forestry adaptation to climate change.

The Office of Climate Change, within the Department of Environment and Conservation (DEC), is driving the implementation of these, and many other, initiatives. What can we do? One aspect of the climate change action package is a public awareness campaign called Act Now for the Future. The campaign aims to make it easier for individuals, families and communities to do their bit to combat climate change and protect our environment. A website – www.actnow.wa.gov.au – and print and television advertisements have been used to raise awareness about climate change and to spread information about the programs, incentives and standards that are being implemented to look after the environmental and economic future of WA. Finding out more To find out more about the terms global climate change and the greenhouse effect, their impact on WA and what is being done to minimise the impacts, visit the climate change page of DEC’s website. You can also find information about the science behind climate change on the Act Now website – see the frequently asked questions section.

Figure 1 Location map of BMNDRC ICM project area showing demonstration site and sub catchment boundaries.
Climate change and biodiversity

By Dr Ray Wills

The role of the science community is to establish what (and if) relationships exist between specific events. Scientific research has established that during the Earth’s 4.5 billion-year history, the climate has changed on a wide range of time scales, due to natural causes and without human intervention.

While the Earth’s climate is dynamic and climate change is normal and continuous, the enhanced greenhouse effect is not, and is not well established. Science in its purist form is, of course, only ever tentatively correct. While the sceptics may be right to argue that just because all the experts agree does not make the conclusion right. It does suggest, however, that the conclusion is extremely unlikely to be wrong. Without exception, all qualified scientific bodies in the world accept that global warming is caused by man-made greenhouse gas emissions.

Forecasts from the Intergovernmental Panel on Climate Change (IPCC) in 2007 suggest global temperatures are likely to rise in the range of 1.8°C to 4.0°C this century. Each degree of warming in Australian latitudes is sufficient to move climate belts about 150 kilometres south, and a regional change of temperature of that order is likely to significantly impact on the majority of species.

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Crop yields are likely to decrease as our climate becomes warmer and drier. Existing climate risk strategies and new technologies, crop management practices and weather forecasting will help us adapt to climate change. white summary of various species, the temperature tolerance range for 41 per cent of Australian eucalypt species (including many used in wheat-growing areas) is less than 2°C in mean annual temperature. Fauna studies have suggested that all of the frog and mammal species studied would be restricted to small areas or would disappear with 0.5°C global warming above present annual averages. Researchers Beanmont and Hughes, in 2002, reported on an assessment of 77 Australian butterfly species and predicted 88 per cent of species in south-western Australia: technical report

Climate changes abruptly, climatic bands are likely to move climate belts about 150 kilometres south, and a regional change of temperature of that order is likely to significantly impact on the majority of species. The impacts of climate change on farming systems – the impact of climate change and the nature of the individual business. We already possess some of the know-how for adapting to climate change. A combination of current tactics and new technologies and management practices for managing seasonal risk will become increasingly important under a drier climate. Variety selection, flexible fertiliser strategies, better utilisation of soil moisture and readily scalable cropping programs will be critical to maximise productivity in favourable seasons. Climate change is a contentious issue, and there is a general decrease of temperature of that order is likely to significantly impact on the majority of species.

What is a covenant?

A Nature Conservation Covenant is a mutual pledge by the landholder and the covenanting body to support the management of the nominated bushland by entering into a partnership with State government and Commonwealth conservation goals. They are voluntary agreements between the government and the covenanting body that are legally binding and, once registered on the title of the land, will bind any future landholders thereby ensuring increased protection of the bushland into the future. Each covenant is individually designed to include a set of conservation goals that suit the unique nature of each parcel of bushland and cater to the owner’s wishes and needs. Importantly, both ownership and control of the bushland remains with the landholder, but the covenant agency has a long-term interest in the conservation of the land. The covenant agency will support the landholder in the event that the values of the land are threatened and provide advice on a wide range of issues to assist the landholder in their conservation efforts. Voluntary covenants are provided at no cost to the owner. In some cases, funding may be available either through the covenant agency or through other conservation organisations to assist landholders with the conservation of the land. Where funding is provided either through conservation programs the covenant agencies will endeavour to inform covenanting bodies of their available funding and assist them with their application.

In addition, taxation concessions may be available to landholders with DEC or National Trust of Australia covenants. These include the State land tax concession, as well as Federal government capital gains tax concessions. For information on the application of these tax concessions please consult your tax agent or in the case of the income or capital gains tax concessions, the Australian Tax Office. The increasing use of conservation covenants in Western Australia marks a shift in conservation thinking. Conservation has moved from being seen as the sole responsibility of government through formal conservation reserves, to an acknowledgment of the ability and desire of landholders to make a valuable contribution to conservation through their lands. Together, a network of private and government lands can be created for conservation to achieve an integrated approach to the protection of our natural heritage across the landscape.
By Dr Lynda Chambers

In 2007 the Intergovernmental Panel on Climate Change’s (IPCC) Fourth Assessment Report was released and it became very clear that climate change is affecting natural systems (Figure 1), with the majority of evidence coming from the northern hemisphere. In Australia, observed climate-related changes include reductions in snow cover, species range changes (poleward and uphill), changes in the genetics of the fruit fly and shifts in flowering, migration and breeding dates (reviewed in Chambers 2006).

The boxes below show the total number of data series with significant changes (top row) and the percentage of those consistent with warming (bottom row) for (i) continental regions — North America (NAM), Latin America (LA), Europe (EUR), Africa (AFR), Asia (AS), Australia and New Zealand (ANZ), and Polar Regions (PR) — and (ii) global scale — Terrestrial (TER), Marine and Freshwater (MFW), and Global (GLO). The numbers of studies from the seven regional boxes do not add up to the global (GLO) totals because numbers from regions except PR do not include the numbers related to Marine and Freshwater (MFW) systems. (Figure 1 from IPCC 2007).

The Australian studies cover only a small number of species and are fairly localised, lacking detailed information on regional and national scales (particularly in western and central Australia and the tropical north), and highlighting a paucity of knowledge of climate impacts on invertebrates, amphibians, reptiles, mammals and agricultural systems.

More recently, changes in the timing of bird migration have been seen in south-western (Figure 2a) and south-eastern Australia. In WA, changes in waterbird migration timing were more closely related to rainfall changes in the region than to temperature changes. (Figure 2b).

Australia contains a high proportion of endemic species, which have already adapted to a highly variable climate system, and we need to exercise caution before applying Northern Hemisphere climate impact results to our species. Doing this has led to heightened interest in climate change impact studies in Australia and the development of a national ecological database. This national approach will enable significantly improved natural resource management decisions, enable better coordination of research efforts, aid policy development, and increase public awareness of climate change and its impacts in Australia.

The database documents datasets that may be useful for climate change impact work, particularly in the area of biodiversity, and can be accessed from www.bom.gov.au/nemd. If you keep regular records of native or agricultural plant or animal species on your property please consider listing your records in this database or contact Lynda Chambers directly.

Our knowledge of what historical flora and fauna data has been collected within Australia is limited. With the establishment of a national ecological database a systematic and coordinated approach to the analysis of natural system data is possible and will help ensure that the findings are fed back into local, national and international programs, such as IPCC.

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**Figure 1** Locations at which systematic long-term studies meet stringent criteria documenting recent temperature-related regional climate change impacts on physical and biological systems.

**Figure 2a** Departure dates of Great Egret near Manjimup.

**Figure 2b** Over time, the number of rain days has decreased and departure dates have become later.
Have you seen the tree-stem trapdoor spider?

By Renee Hartley

The tree-stem trapdoor spider (Aganippe castellum) is a small native spider that occurs across the central, eastern and northern wheatbelt up to the Morawa area. The species is ranked as endangered and its survival is threatened by habitat clearing and degradation, inappropriate fire regimes and trampling by stock.

The spider grows to about 12 millimetres long and builds a distinctive burrow against the stem of a tree or shrub such as broom bush and sheoak. The burrow consists of a silk-lined tube that extends above the ground with a fan of twigs leading up to the trapdoor. Passing prey, such as ants, follow the twigs to the trapdoor opening from which the spider springs to nab its meal.

Community members can help this species by keeping an eye out for the distinctive arrangements of twigs, which may lead to a burrow against the stems of trees and shrubs and reporting any possible occurrences to Renee Hartley at the Department of Environment and Conservation (DEC) in Jurien Bay.

Photos
1. Male tree-stem trapdoor spider
2. Female tree-stem trapdoor spider
3. Open burrow
4. Closed burrow

Profile

Donna Rayner
Biodiversity Support Officer (Northern Agricultural Catchment Council)

Donna brings her extensive knowledge and experience of Natural Resource Management to her position as Biodiversity Support Officer for the Northern Agricultural Catchment Council (NACC). Before taking up this position she worked with the community in the Gladstone area of Queensland on a range of projects such as revegetation; water use and quality; the value of remnant vegetation as a source of predators for horticultural pests; and the use of the black soldier fly larvae to break down domestic waste. Due to her special interest in birds, Donna was employed to undertake biodiversity surveys which increased her interest in plants and other animals.

Her role with the NACC is to work with the community and local Natural Resource Management Officers to help projects deliver on-ground benefits to biodiversity. Donna also produces the newsletter Bushnotes with a ‘regional biodiversity’ focus.

When asked what she likes about her job, Donna said she enjoys the opportunity to work with lots of interesting people.

“I really enjoy the opportunity for exchanging ideas and learning from each other about the bush,” she said.

Web sites

Act Now website
Information about the Act Now for the Future campaign can be found at www.actnow.wa.gov.au. This website was launched on 5 June 2007, World Environment Day.

To view the State Government’s climate change action package go to www.premier.wa.gov.au/docs/features/2007006ClimateChangeWEB.pdf.


The Agricultural Alliance on Climate Change was formed to provide a focus on the challenges and solutions for securing our rural future in the face of a changing climate. To view a copy of the Agricultural Alliance on Climate Change Rural Australia Providing Climate Change Solutions report, go to www.climateinstitute.org.au.