

# Making tracks for the future

How will today's economic and social choices shape Australia's environmental destiny? **Emilia Tagaza** outlines the quest for 2050 vision.

**E**xcessive farming, fishing and forest harvesting conventionally have shouldered the blame for environmental degradation. But a group of CSIRO scientists is studying the underlying culprit, the ones who drive these excesses: we, the people, our increasing numbers and our rapidly changing lifestyles.

Since the beginning of the 1990s, CSIRO has helped to resolve several environmental issues by improving our understanding of ecological processes. Scientists have helped to develop indicators that give an overview of how the Australian environment is faring (see 'Keeping tabs on environmental conduct', *Ecos* 89). These indicators are needed because economic wealth alone is not a good measure of national wellbeing. A rise in the country's GDP can come at the expense of 'quality of life' factors such as the environment, work enjoyment, leisure and community cohesion. And, because of the way GDP is calculated, apparent improvements can hide an underlying deterioration in the resource base on which we depend.

Predicting our environmental future, however, involves much more than ecological understanding. In fact, the challenge of ensuring Australia's future habitability is the focus of an unusual research project at CSIRO's Division of Wildlife and Ecology. The Population-Development-Environment Project aims to use our scientific understanding of physical ecosystems to develop

potential scenarios for long-term national policies. The ultimate goal is to help shape Australia's future.

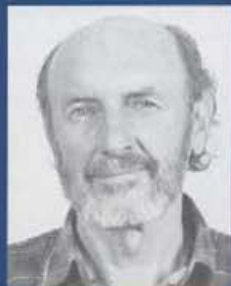
The project was first mooted two years ago when it became apparent that many factors with a decisive influence over future environmental quality fall outside the short-term focus of existing decision-making processes. Project leader, Barney Foran, says CSIRO's own research was also failing to take account of the big forces affecting environmental quality in the long term: population growth, lifestyle changes, technological changes and climate change.

'Scientists can say something meaningful about future environmental quality only by assuming how people will behave in the future,' Foran says. 'For example, the best information available to us suggests that if people maintain their current lifestyle, then environmental quality in the future might be poor. But lifestyles have changed dramatically in recent decades and will probably go on doing so. Thus we need to think about the implications of different lifestyle choices available to us, or likely to become available to us.'

The researchers acknowledge that the project is a difficult task. They have set themselves a 10-year time frame, but hope to be able to provide useful and interesting insights into improving Australia's environmental quality along the way. It is hoped that these insights will provide a link between national policy decisions and the environmental quality they will deliver.



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**Doug Cocks:** anticipating the environmental challenges and opportunities for Australia to 2050.



Some of those insights have emerged already. The project last year conducted five Environmental Futures workshops attended by specialists from a range of disciplines. Each workshop examined the environmental quality trends in four geographic zones of a particular sector. The four geographic zones were coasts, farms and forests, cities and the interior. The five sectors focused on were biodiversity, water, air, soils and natural amenity.

Foran says the Environmental Futures workshops were excellent scene-setters for the project. 'They provided the forward-looking insights that science alone cannot provide,' he says. 'We drew out the opinions of specialists on what the future would be like: opinions they are usually reluctant to give because they go beyond their immediate field of expertise. We won't hold them to these projections, but their collective "best guesses" provide plausible scenarios for the future.'

The experts found six rising quality trends, eight falling trends and six that didn't have a clear trend. Overall, they concluded that Australia wasn't doing too badly, but wasn't doing really well either.

**Biodiversity:** Australia's biodiversity stocks in cities, farms and coastal areas are down and are under continual pressure from land clearing and urban development. In contrast, stocks in the forest and interior zones, are more or less stable and responding well to balanced management.

**Water:** Domestic water quality in cities is being maintained by better technologies applied by corporatised water agencies. However, the quality of marine water bodies has declined due to intense coastal land use, acidity from cleared acid sulfate soils and untreated sewage. In agricultural zones, water use is up while water quality crises are frequent. In forestry zones, water quality is stable.

**Air:** Air quality in three zones – coast, cities and interior – is generally good and improving due to strong regulation and improved technologies. The experts were ambivalent about air quality in farms and forests because of chemical sprays, pollens odours and smoke from bushfires.

**Soils:** Soil quality in all zones was judged to be down.

**Natural amenity:** This sector has improved considerably over the past decade because of Australians' willingness to manage natural areas. Cities and towns in agricultural areas have been spruced up, while heritage areas in the interior have been well managed, with many Aboriginal people again living in their own land. The only blight is the coastal zone because of poorly planned urban expansion.

Having laid this foundation, the project team has progressed into 'future-gazing' work, setting broad scenarios for the future. The scenario work is being led by Dr Doug Cocks, whose book *People Policy: Australia's Population Choices* (see story on page 15) describes a number of population scenarios.

The project is now set to anticipate the environmental challenges and opportunities for Australia to 2050, and to design ways of meeting those challenges and making the most of opportunities.

Cocks is developing three scenarios to contrast with a 'business as usual' plot which sees Australia running towards 2050 without major changes. These are the economic growth, conservative development and post materialism scenarios.

Economic growth includes increased production and consumption in Australia and takes on the concepts of correct pricing, free markets and technological optimism. Conservative development assumes that we continue to develop and exploit Australia's resources within a tight regime of environmental controls. Post materialism assumes that production and consumption will actually fall as social learning will have taught us to put family and friends before consumption.

At the same time, the team is conducting scenario-setting workshops with specific 'stakeholder' groups that are most affected by environmental degradation. The first workshop, organised by the Australian Rangeland Society, dealt with rangelands. Foran says the workshop attracted wide interest, with 300 participants helping to identify the threats and opportunities faced by Australia's rangelands.

'Following the success of that workshop, we now aim to develop a broad future-gazing capability in a wider range of

A 'scenario-setting' workshop helped to identify threats and opportunities facing Australia's rangelands.





industries and activities that have impacts on the environment,' Foran says.

### Taking stock

A crucial part of the project is to assess the environmental and resource inputs of each of the scenarios. To do this, the researchers are developing a number of models of the interactions between the Australian population, economy and environment. One of the models, the Australian Stocks and Flows Framework, will test the physical viability of the scenarios developed by Cocks. The framework uses information on the main material stocks and flows over the past 50 years and runs them through to the year 2050.

These material stocks and flows include all the physical things used and produced in the economy, and required to support the Australian lifestyle. So the framework keeps track of (among other things) people, land

areas, crops and livestock, mineral and energy, buildings and their contents, vehicles, infrastructure, and the state of our land, air and water resources. Many of these stocks are 'vintaged' (recorded by age) because age affects the performance of the stocks and how quickly we can change them. Young people need schools and colleges, old people need health care and nursing homes. Land which has been farmed for a long time is more likely to be degraded. The age of our industrial plant and vehicle fleet limits the rate of introduction of cleaner, greener technologies.

Essentially, the framework will show us whether, in the long term, we have the materials, energy and environmental resources to support the scenarios. In the short term, of course, financial considerations dominate national decision making; we have to service our mortgages

and the overseas debt. But behind the financial transactions there are real physical processes whose effects accumulate over long periods, and lead to serious environmental problems. Because these problems develop slowly, they seem less urgent and are given low priority. The Australian Stocks and Flows Framework will make it possible to foresee the consequences of our economic and social choices and, where there are problems, to chart a way around them.

To convey the message that there is a fundamental tension between economic growth and ecological sustainability, the project has been working on the concept of ecological footprint developed by the Canadian scientists Dr William Rees and Dr Mathis Wackernagel. This is a measure of the amount of land needed per person to supply food, forest products, water, built environments and waste assimilation capacity. A Griffith University study found that Sydney has an ecological footprint 35 times its actual size. The CSIRO researchers are working with students at the University of Canberra to describe and quantify the nature of Canberra's footprint. The scenarios will be used to project future footprints from major population centres in the future.

Another area of work is the impact of population on coastal environments, concentrating on the most heavily populated arc from Cairns to Adelaide. Initially the focus will be on marine and coastal pollution from activities on shore, from which projections will be made about the impacts of future population growth. Eventually, the whole of Australia will be studied in collaboration with Universities and relevant Government agencies.

The project will also further develop indicators to supplement GDP as a measurement of national progress and give a better picture of how Australians are faring. This will build on the state-of-the-environment indicators already developed and expand them into measures of other factors affecting our quality of life, such as social stresses, work and leisure satisfaction and technological progress. The objective is to be able to monitor developments in the economy with impact on quality of life.

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Liz Poot/Wildlife and Ecology