

## Clear View Needed in Environmental Monitoring

Hugh Possingham sees many inefficiencies in the way we look after the natural assets that underpin much of Australia's economic wealth.

**W**ith the government now articulating the massive threats from climate change to Australia's environment and economy, scientists and managers need adequate support for measuring environmental change and disseminating that information fearlessly.

Australians invest tens of millions of dollars in monitoring the state of their environment from the national scale – in projects like the National Land and Water Audit – to the level of local groups. For instance, monitoring and evaluation are major components of the new regional delivery arrangements for the Natural Heritage Trust and the National Action Plan.

Some people think that monitoring attributes of the environment – like water quality and threatened populations of native fauna – is a waste of time. Others, often scientists, think we don't do enough. We urgently need to develop a clear view of the purpose of monitoring so we can allocate optimum resources to appropriate tasks.

There are several purposes for monitoring. An auditing role, like determining how many hectares of vegetation a catchment group has established, may seem dull but is necessary. Much of current government effort falls into this category.

Secondly, monitoring an aspect may lead to some serendipitous discovery. This prospect is an exciting incentive for scientists and may be profitable for society, but is hard to guarantee. Further, monitoring engages and informs the community about matters that affect them directly, like information about air quality.

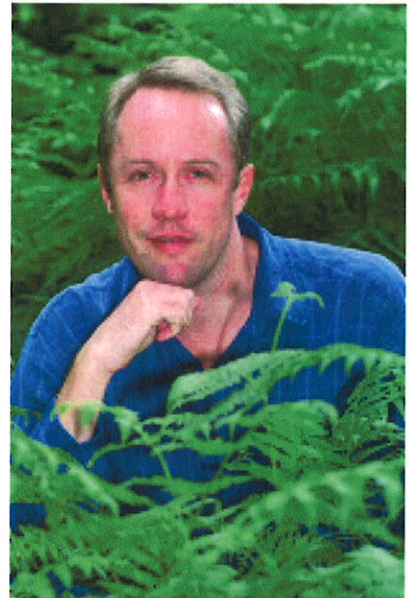
Assessment of the general state of

the environment can be very helpful in forming policy. Mapping the extent of remnant vegetation, for example, was crucial to formulating land clearing reforms in Queensland. Public pressure and interest determines how much we embark on this sort of monitoring, but its economic value is hard to measure.

In contrast, we do too little of two other kinds of monitoring that are essential for making better decisions. Good policy should be driven by gathering knowledge on the state of the environment. For instance, quotas on kangaroo harvesting rely on measurements of population size. Similarly, we should follow closely the numbers of species that we believe are in decline, like koalas, so that we can test our perceptions against facts and determine when and where actions are required to conserve such an iconic and profitable species.

When groups decide to monitor a particular attribute of the environment – like the size of a population of threatened species or pest – they should have an explicit idea about how they will react to changes in that attribute. All too often we have monitored species to local extinction, like some of our frogs, or have no plan of action when we observe significant and sustained increases in populations of pest species like the common myna. When we need to make decisions that depend on how big or small a population is we can use economic tools to determine how much money we need to spend to know the population size well enough to make sound decisions.

The best decisions for managing the environment are made when we have



Prof Possingham and his group apply mathematical and statistical tools to solving ecological problems. Photo: University of Queensland

complete information. For example, given two ways of eradicating foxes – aerial baiting or shooting – we can only determine which is more efficient if we know their relative cost and probability of success. We can only learn this by trialling them and measuring their performance.

All environmental management should incorporate learning through well-designed experiments but this is almost never achieved. The framework for success is called active adaptive management. It requires people with skills in economics and quantitative ecology. This would resolve much of the tension between management and research, and provides a logical focus for monitoring.

Australians will have a much more sustainable and prosperous future if we resource those responsible for the health of the country as well as we resource those responsible for our personal health.

Prof Hugh Possingham is a newly elected Fellow of the Australian Academy of Science and Director of The Ecology Centre at The University of Queensland. He chairs the federal government's Biological Diversity Advisory Committee. *conSCIENCE* is a column for Australians to express forthright views on national issues. Views expressed are those of the author.