

# Is environmental research a waste of time?

By Hugh P. Possingham

Over the past decade, we have noticed that the public service, government, environmental non-governmental organizations and the wider community have started to question the value of environmental research. In this editorial I will provide some of my favourite answers to the question of whether environmental research is a waste of time, answers that are eclectic and not comprehensive. I hope that readers of this promising new journal, which sits at the research/management interface, will discuss this issue further. The anti-environmental research argument goes a bit like this: we know that the major threats to Australia's biodiversity are vegetation clearance, feral predators, weeds, excessive herbivory etc.; we also know the solutions to these threats, so why not just get out there and do it? To a certain extent this argument has been one component of the Natural Heritage Trust (NHT) philosophy. Researchers are accused of wasting money on esoteric issues and not focusing on solving the big problems. I have some sympathy with this position: what is intriguing intellectually is not always important from a management perspective. However, in some cases the argument has gone so far that it is now detrimental to ecological restoration and protection goals. One of the consequences of the backlash against environmental research has been a reduction of research by government agencies: 'We are not allowed to do research any more, or if we do, we call it something else'. Another consequence is enhancing the myth that all research is pure research, boffins sitting in laboratories or in front of computers with no connection to the real world. This myth is popular with the media and fits well with their love of making a prejudiced caricature of any profession. Most of us know that the pure/applied research divide is fairly arbitrary, most major technological advances are founded in so-called pure research. Now to a few answers to the main question: is environmental research a waste of time?

## So-called 'pure' research in ecology is invariably useful to managers

Basic community and population ecology existed as 'pure' research before they were applied to conservation issues. The theories, models, empirical evidence and ideas of pure ecology now guide conservation management actions. For example, where would

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threatened species management be without an underpinning of theory about the population dynamics of small populations? Discovery-driven pure research can be unexpectedly profitable in guiding environmental management.

## We don't know all the answers

The naive belief that we know how to most efficiently mitigate threats to biodiversity is not true. For many threatened taxa we do not know the current major threats and even if we do, we are not sure which strategies will be most effective and efficient. Ignorance and uncertainty should not be taken as an excuse for inaction. Indeed, cries by some researchers to not act on environmental problems until they have all the information and have done another 10 years research may well have fuelled the backlash against environmental research. Research and management should go hand in hand.

## Research and management must proceed in concert

No business would ever imagine making a decision without monitoring the impact of that decision. Consider the following analogy: imagine changing customer service protocols in a retail outlet without first carrying out customer surveys to check for demand and then monitoring the performance of the new protocol using sales figures and further customer surveys. No business would be so naive, yet this is how we carry out much of our environmental management. Carrying out customer surveys and assessing business profits before and after a change in policy might be called 'performance monitoring' by business, but it is just another name for research. Indeed, if you have multiple retail outlets, the wise business would implement changes in only half and monitor both, creating a replicated experiment with controls.

Research is performance monitoring and the recent push in the NHT is to do more performance monitoring, more research. A well-trained research scientist will be able to enhance the efficiency of performance monitoring if they are skilled at experimental design.

## Environmental management nirvana: Active adaptive management

The active adaptive management paradigm is that all management is an experiment (Parma *et al.* 1998). The philosophy includes the

need to act now with best information, the need to include experimental design theory in management and the need to monitor impacts on management can be altered accordingly. This requires some premanagement data, replication and control sites where possible. How many environmental management activities do this well? Who has been monitoring landscape-scale revegetation projects? Where are the control monitoring sites in our on-ground management programmes?

In the most sophisticated form of active adaptive management we would construct alternative verbal or mathematical models of how we expect a system to respond to management and test those models with the monitoring data to develop new models that enable more efficient management (Hilborn & Mangel 1997; Lonsdale *et al.* 1998; Possingham 1998). While this can seem complicated, it is, in fact, human nature. Consider wheat farmers using a new herbicide. They know the yields before the application (they have premanagement data). In the first year they might typically try the new herbicide in only some of the paddocks (impact and control) and from the agricultural advisers they will have some expectation of which weeds may be more or less affected (they have a model). Partial success of the herbicide would be followed by increased use, whereas failure or minimal yield increases would be followed by more trials and revision of their mental model of how the herbicide works.

It is human nature to do research, testing and refining our model of how a system works. Everyone does it. Environmental scientists have some methods and tools about how we can do it most efficiently. I hope that our new journal will provide some well-worked examples to underpin my point.

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