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CSIRO'S PAST AND PRESENT RESEARCH IN WESTERN AUSTRALIA

by Richard Hobbs

CSIRO Wildlife & Ecology has been conducting research in WA for many years. Initially, research focussed on the biology and conservation of birds, with notable work on emus, cockatoos and noisy scrub birds. In the mid-eighties, work was directed at the problems facing remnant vegetation in the wheatbelt. The research centred on questions relating to the dynamics and management of flora and fauna in these extensively modified landscapes.

Early in the program, research focussed on the impacts of fire on vegetation and fauna populations, the impacts of weed invasion, and the movement of biota around the landscape. As the research developed, the focus broadened to include more than just the biota in the remnant vegetation but also the impacts that the processes in the surrounding agricultural landscape were having. It became clear that it is impossible to manage the remnant vegetation in isolation from the rest of the landscape, and hence an understanding of the broader landscape processes was essential. This involved co-operation and discussion with agricultural scientists, hydrologists and, most importantly, with farmers and other land managers.

This research was conducted primarily in the Kellerberrin area and we learned a great deal through being able to concentrate our efforts on a single area. The information gained in this way is being translated into management guidelines and planning options for catchment groups. However, we did not know how applicable what we had learned in Kellerberrin was to the rest of the wheatbelt.

Our current research thus involves studies in other areas which aim to compress the process we went through in Kellerberrin down to shorter-term investigations. These will provide local management options and also build up to a bigger picture of the regional variation in the wheatbelt and the range of management options available in each region.

The first of these studies was carried out in collaboration with CALM and local landholders in the Dongolocking area, and further studies are underway in collaboration with Greening Western Australia and ALCOA in South Tammin and Tin Dog Creek. We aim to conduct a series of case studies across the wheatbelt, and use these to develop and test a regional framework. The outcome of this research should be a more effective way of planning management and revegetation activities and of setting management priorities, together with guidelines for actually implementing the management required.

A further program of research was initiated in the late 1980s which focuses on the extinction and reintroduction of small mammals. Australia's mammal fauna has been severely depleted over the past century, with many mammal species going extinct, either completely, or from mainland Australia. An understanding of the processes leading to extinction is essential if these processes are to be reversed and mammals reintroduced. This research has focussed on mammal populations on offshore islands, and has also involved the experimental reintroduction of mammal species to a peninsula at Shark Bay.

Until 1997, our work in WA was carried out largely in isolation from the rest of the country. However, it was recognised that the work here had broader applicability in eastern Australia, and hence we became part of a larger program looking at the integration of conservation with production. At the same time, it was recognised that our Wildlife & Ecology lab needed to interact more closely with other parts of CSIRO and other agencies. To facilitate this, we decided to move from our location in the hills, in Helena Valley, to the main CSIRO site at Floreat Park. This move was completed in July 1998, and we are now established in our new building at Floreat.

The new national program of research has three main components, of which we are involved mostly in two – integrating conservation with production, and restoration ecology. The background and aims of these are discussed briefly below.

Options for integrating conservation with production

A major part of Australia is used for primary production – for example, cropping, forestry, pastoralism. These rural lands contain valuable and unique resources for production of food, fibre and other products; for maintenance of the quality of the environments that sustain us, and for future economic and lifestyle benefits that potentially come from understanding and utilising our natural biodiversity. However, there have been major changes to the functioning of ecosystems in rural

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lands over the last two centuries, resulting in substantial declines in biodiversity and in the productive capacity of the land.

Most Australians, including the owners and managers of rural lands, agree that maintenance or enhancement of the natural resources of those lands for the benefits of present and future generations should be a high priority. One way to achieve this is by managing the land to meet a range of goals, including both conservation and production. The challenge for CSIRO is to contribute to the scientific basis for managing rural lands for multiple objectives; to methods for integrating physical and biological understanding with social and political understanding to stabilise current rural production and conservation of biodiversity and, where feasible, reverse the presently observed declines.

We aim, together with landowners, rural communities, land management agencies, policy makers and other stakeholders, to develop theory, design principles and methods needed to integrate conservation of biodiversity with other land-use objectives and rural policies. The goal is to produce guidelines for incorporating conservation objectives into integrated land-use, and to participate in demonstrations of applying these guidelines.

Restoration ecology

Widespread losses of production and conservation values make large-scale ecosystem restoration increasingly urgent. Tackling this problem requires the development of methodologies for assessing the current status of landscapes and identifying appropriate management strategies. Identification and development of the elements of these strategies which lead to the maintenance or enhancement of production and conservation values are also required. A key element of restoration strategies will be the reintroduction of flora and fauna which were formerly present in the system and which either performed key system functions or are identified as having key conservation significance.

To date, little use has been made in agricultural areas of ecological expertise developed in the rangelands or mining sectors, and there is a clear opportunity to develop and extend this expertise in agricultural landscapes. There is also an opportunity to develop strategic responses which feed into current government funding programs and community demands for solutions.

The strategy for the next 5 years is to capitalise on work being completed in the rangelands and minesites and extend this into agricultural areas. In addition, work carried out in the WA wheatbelt will be continued and expanded into new areas in eastern Australia, in consultation with collaborators and stakeholders. An important component of the research strategy is the recognition of the importance of maintaining long-term research sites at which long-term system dynamics can be evaluated.

We would be happy to discuss these projects further, and welcome input regarding research directions. Indeed, our aim is to conduct research which provides useful results. We aim to conduct fundamental strategic research and to provide answers to pressing questions – ie. we want to provide answers for today's problems, but also ask questions which might prevent some of tomorrow's problems.

Richard Hobbs is Officer in Charge of CSIRO Wildlife and Ecology in WA. He can be contacted on (08) 9333 6442.