

Restoring landscapes with confidence – evaluating the science, the methods and their on-ground application

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Date: November 2008

Introduction

Landscape restoration is a relatively new science in Australia. It has generated a large volume of knowledge and is essential to underpin increasing levels of investment in managing the environment. This short paper draws on a recent project managed by Land & Water Australia that assessed the extent to which the research, tools and information that are currently available on landscape restoration are being used by regional natural resource management agencies and other organisations to achieve on-ground outcomes.

Methods

The project involved a 'State of knowledge' review; four regional workshops in Nagambie, Cowra, Albany and Emerald; four desktop studies in Tasmania, SA, NT and the ACT; questionnaires (to support the review and workshop/desktop components) and associated interviews. Because of the volume of information available, combined with limited time and financial resources available to the project, the literature review was presented as a discussion paper, rather than a comprehensive literature review. The focus of the project was on regional NRM groups, although other organisations with an interest and involvement in landscape restoration projects were included where possible. The full report from the project, a summary factsheet and the discussion paper on landscape restoration that forms the basis of this short paper are available at www.lwa.gov.au/nativevegetation (see 'Further reading' below for full citations).

What the project told us

The project found that the term landscape restoration is widely used to cover activities aimed at improving native vegetation and biodiversity outcomes at paddock to landscape scales. It is an umbrella concept under which a number of different philosophies and approaches are grouped. The term is used less in the more intact landscapes of northern and central Australia, compared to the south and east of the continent. From the start of the project the message was reinforced that landscape restoration not only relied on sound science, but that having committed people and the resources to implement restoration projects were also critical. This important combination would be more likely to lead to on-ground action supported by science with local credibility.

An assessment of the science of landscape restoration, undertaken as part of the project, found it is grouped around a number of 'themes', which vary geographically in Australia. Research to date has largely focused on terrestrial vertebrates, less on plants (apart from vegetation as habitat), and even less on soils, although these areas are starting to gain more attention. Early work on reserve design, especially island biogeography theory, has had a major influence on the way landscapes have been described and restoration projects designed. Many scientists working in the area of landscape restoration aim to identify principles that can be applied in a number of settings. Many of the people involved in the workshops felt that the number of principles already available could be overwhelming, making it difficult to identify which ones applied to their situation.

The project found that the context where landscape restoration research is undertaken and applied is critical (a point expanded on below), as is setting clear restoration goals. A number of trends and influences on landscape restoration science and its application were identified, ranging from 'pattern to process' to 'increased use of technology' were ascertained (Box 1). The growing number of 'biolink'

style projects (e.g. Gondwana Link, Habitat 141 and Birdsville to Bay), which until recently have had a limited scientific basis, was particularly evident. More than 15 of these resource-intensive projects are underway or planned in Australia, so it is important that their scientific underpinning is well founded. In addition to these themes, trends and influences, a number of new directions in landscape restoration science were identified by both researchers and on-ground practitioners. These included clarifying corridors and connectivity, identifying the spatial and temporal dynamics of key processes such as pollination, dispersal, fire regimes and nutrient cycling and the role of cryptic biota in restoration (fungi, rhizobia etc.). Social research was also identified as an important gap that needed to be filled. This will be revisited in the recommendations below.

Based on the responses to the questionnaires and interviews, feedback at the workshops and examination of policies and programs, the main restoration approaches/concepts used by regional groups included focal species, thresholds, improving vegetation condition, maintaining or enhancing structural and floristic diversity, using local provenance seed and establishing connectivity/corridors (in the intensive land-use zone). The choice and application of these approaches by policy and on-ground practitioners varied considerably – from intuitive to systematic. Once implemented their effectiveness often goes untested. While conservation planning and prioritisation science/tools are not usually included in the ambit of landscape restoration science, they were found to play an important role and are of keen interest to policy and on-ground practitioners.

Box 1: The trends and influences on landscape restoration science and its application identified in the project. See Williams (2008) for further details.

- From pattern to process
- From patch to continent
- From static to dynamic (space & time)
- Managing the matrix (ILZ)
- Ecosystem services
- Prioritising restoration activities (triage, value, cost, landscape zoning)
- Market-based instruments, offsets
- Whole property/farm business focus
- Geographic information systems and modelling
- Optimisation of resilience approaches
- Land sparing (intensification) of 'wildlife friendly' farming
- People as part of the landscape
- Climate change
- The 'carbon economy'

Despite the substantial body of knowledge gained over the last twenty years on landscape restoration, and the large range of tools and guidelines available, the project found that this has had little bearing on the on-ground management of landscapes. The diversity of information - scattered amongst websites, publications, guidelines and in 'people's heads' - means that it is difficult for people to work out which approach or technique best applies to them and the work they are doing. The context of landscape restoration is critical to credibility. This includes the location of the research, the place where it is applied, and its perceived relevance on-ground. The need for 'brokers' to tailor the science in a local or regional context was a clear and constant message.

Bringing the science alive in a real-life situation has a number of challenges, especially when people are time-poor, under pressure to deliver and working within very short timeframes. Some of the challenges identified included having 'real people' with available time and skills to provide the science when it is needed; the lack of opportunity to build enduring partnerships based on trust; and building and sustaining long-term monitoring – who monitors what, and who provides support beyond life of project? Valuing people and the knowledge they bring to landscape restoration was seen as essential for effective outcomes. Current programs and funding cycles do not adequately support relationships

in which researchers and practitioners can work collaboratively, using shared knowledge for landscape restoration.

Overcoming the challenges

The project demonstrated that there are solutions to these challenges! To address the clear need for more effective knowledge transfer, especially where people are so time-poor, a number of recommendations on how to move forward have been made. These include the development of an 'information hub' on landscape restoration, on-line seminars and lectures on key topics and the establishment of a national database of projects. Because many of the project participants identified the need for social research, the recommendation was initially to 'mine' the work done in programs such as LWA's Social & Institutional Research Program and The Cooperative Venture for Capacity Building to see what had already been done. The findings from this 'trawl' would be tailored to the needs of people working to conserve native vegetation and biodiversity. Importantly, crossing all these activities, landscape restoration theories and approaches need to be demonstrated in action, with the 'real life' challenges and opportunities they bring, clearly communicated.

Further reading (all available at www.lwa.gov.au/nativevegetation)

Land & Water Australia (2008) *Restoring landscapes with confidence—a summary of key findings and recommendations*. Land & Water Australia, Canberra.

Land & Water Australia (2008) '*The Bowral Checklist*' *A framework for ecological management of landscapes*. Land & Water Australia, Canberra.

Lovett, S., Lambert, J., Williams, J.E. & Price, P. (2008) *Restoring landscapes with confidence — an evaluation of the science, the methods and their on-ground application. Final Report*, Land & Water Australia, Canberra. www.lwa.gov.au/nativevegetation

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Acknowledgements: The project team would like to thank Land & Water Australia, Greening Australia and the North Central CMA (the sponsors of the project) for giving them the opportunity to add to our understanding of landscape restoration in Australia. Our special thanks goes to all of the people who attended the workshops, responded to the questionnaires and took part in the interviews. Your input was invaluable to the project.