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Landcare as a Tool in Sustainable Rural Conservation

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Abstract

Two hundred years of settler society in Australia have modified an ancient landscape resulting in soil erosion, loss of forest and woodland cover and transformed grasslands. Landcare, a voluntary community group movement, began in the late 1980s to fix problems rising from land degradation (<https://landcareaustralia.org.au/>). By changing public attitudes about land, water, vegetation and biodiversity management on farms over three decades, Landcare has produced acceptance of constraints on resource use and transferred information and techniques to farmers, building capacity and social cohesion in the face of economic and technological global changes. With some government funding, local community involvement in planning and undertaking repair and replanting works has had great benefits for improving rural landscapes with fenced off watercourses, revegetating riparian corridors and new techniques for using the land. Implementation of Landcare illustrates the recently approved ICOMOS World Rural Principles in operation.

Keywords

Landcare, Revegetation, Community involvement, World Rural Landscape Principles

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Landcare as a Tool in Sustainable Rural Conservation

I love a sunburnt country, A land of sweeping plains, Of ragged mountain ranges, Of droughts and flooding rains. I love her far horizons, I love her jewel-sea, Her beauty and her terror -The wide brown land for me!

My Country, Dorothea Mackellar 1905

Context

Aborigines have lived in Australia for 60,000 years caring for country. Europeans settled here only 228 years ago, bringing northern hemisphere perspectives, and wondered at the strangeness of this new land they set out to exploit. Fire, drought, flood and insect plagues almost overwhelmed them and their introduced crops and animals. However, over the last century there has been a gradual understanding of the deep ecological time embedded in this continent and of its violation by settler Australians. This led to establishment of reserves to protect timber, “beauty spots,” scenic coastlines and national parks.

Much of Australia is public land – arid zone rangelands leased to pastoralists, forests, national parks and conservation reserves. These large landscapes have been managed following American models. The wheat belt and mixed cropping zones are private freehold land subject only to local government planning schemes or State policies, such as retention of remnant native vegetation. Landscape conservation in Australia is usually understood as “landscape scale” and national parks are often used as a surrogate measure for this (Lennon 2017). In response to community pressure, local governments are introducing controls to protect productive landscapes close to cities and croplands threatened with coal mining.

The Challenge

While in ecological terms it is not long since the first livestock were introduced to Australia, their impact has been profound (Pearson and Lennon 2010). The introduction of hooved animals with different grazing patterns hardened the soil and changed the extent to which rain is absorbed

or runs off the land surface, often carrying soil into rivers which now run faster but also then silt up and slow down. The removal of perennial, deep rooted vegetation for annual crops causes groundwater to rise and dissolves salt crystallised in the soil, resulting in soil salinity. Fire regimes have changed radically. New predators, notably cats and foxes, caused and continue to cause mass extinctions of species (Rolls 1969). Rabbits and other rodents out-compete native herbivores, while European carp have transformed the major river systems of the south east. Questioning the sustainability of agriculture has led to a re-examination of the origins of these problems. Gammage (2012) has examined the interface between Aborigines and nature in the precolonial era; and Pascoe (2014) has assembled a persuasive case that Aborigines farmed their land, harvested cereals, lived in villages, and built complex aquaculture that supported agricultural lives previously thought to have arrived with Europeans in 1788.

Over 90 per cent of Australia's rural landscape is either grazed rangelands or conservation reserves. Rainfall, or the lack of it, is the most important single factor determining land use. The agricultural lands are in three zones: high rainfall along Australia's east coast, Tasmania and the south-west corner of Western Australia occupying about 6 per cent; the wheat belt, a transitional zone between the continent's moist coast and its arid interior occupying about 14 percent; and the pastoral zone, where agriculture is restricted to livestock raising on native grasses in most of the inland area comprising 72 percent. Farming viability depends on local environmental factors: slope, water availability, soil type and its moisture retention capabilities, tree cover requiring clearing, and physical access to markets and labour (Lennon, 2015). Major problems have resulted from clearing the land, overgrazing and strip mining, resulting in salting and gully erosion.

The maximum spread of farming population was in the late nineteenth century, and from the 1970s there has been increasing depopulation from pastoral and dryland farming areas. The 2016 national census showed that while 92 per cent of Australians live in an urban setting, only 8 per cent live in the farmlands, bush and deserts, and fewer farmers are operating bigger landholdings. The number of farm holdings decreased from 144,860 in 1997/8 to 85,681 in

2015/1; some reverted to shrub lands, some were used for grazing and some for nature conservation (ABS 2016-17). Concurrently, there has been a demographic reorganisation of Australia's rural landscape, with "the wheat belt tithing population to bigger towns," and farmland growth areas dominated by urban overspill and rural lifestyle areas (Salt 2018).

Landcare

The major impact on contemporary landscape conservation in Australia has arguably resulted from Landcare's revegetation programs aimed at environmental repair. Landcare began in Victoria in the late 1980s as a voluntary community group movement in response to land degradation from over-clearing (Youl 2006). Now there are over 5,400 Landcare, Coastcare and community groups and 11,000 Junior Landcare groups and schools. Their sense of stewardship, commitment and deep appreciation for the environment underpins Landcare (<https://landcareaustralia.org.au/>). Over the last three decades, Landcare has cultivated a transfer of knowledge to farmers and land managers of new techniques for sustainability and repair, the latter often involving community groups in on site work, building capacity and social cohesion. Connectivity for conservation of forests, woodlands and their native fauna and flora, for aquifer recharge and slowing soil erosion is a new focus.

The National Landcare Program, the Australian Government's primary commitment to natural resource management, includes support for Australia's 56 regional natural resource management bodies, World Heritage grants, the Indigenous Protected Areas program, and local environmental and sustainable agriculture projects through investing \$1 billion over four years from 2014–15. Conversely, State governments are responsible for funding management of national parks and conservation reserves on public land, and this funding has decreased dramatically over the last decade.

Landcare as a building block in the natural resource management system includes regional networks and organisations from the public, private and not-for profit sectors (National Landcare Advisory Committee 2016). Major achievements include conservation cropping practice change,

salinity management in the Murray-Darling Basin, increased groundcover through changing grazing regimes, and increasing biodiversity and habitat. Overall, successful outcomes were achieved where there was agreement about the type and potential severity of a shared problem (soil health and salinity, for example), and recognition of the benefits of working to address the problem (shared private and public projects, for example, landholders achieving on-property benefits and communities achieving higher water quality). Success typically involved engagement of a wide range of people and organisations over 20 to 30 years.

Nevertheless, there are still opportunities for improvement and innovation. Since, in most cases available funding is short-term and tied to specific projects, while the land and water challenges are long-term, a crucial requirement is to improve priority setting in a regional context. Providing longer-term base funding enables keeping skilled staff and making new partnerships. By not prescribing long-term outcomes, space is allowed for developing new approaches at local and regional scales and engaging a wider range of organisations – not just farmers, but Aboriginal organisations and rural residents as well. Adaptive management which allows for flexible change in approach as more is learnt about the environmental impacts of activities, needs to be enabled (Natural Resource Management roundtable 2016).

World Rural Landscape Principles

A suite of issues ranging from demographic change, sustainable resource management, maintenance of forested landscapes, climate change and bushfire protection requires adaptation and new design in landscape management. These issues are not just confined to Australia. ICOMOS, through its International Scientific Committee on Cultural Landscapes, has prepared World Rural Landscape Principles which were adopted at its general assembly in Delhi in 2017 (ICOMOS GA 2017 6-3-1). The principles seek to address loss and adverse changes to rural landscapes and their associated communities through the recognition, safeguarding, and promotion of their heritage values. Specific measures are to understand, protect, sustainably manage transformation, and communicate in order to transmit landscapes with heritage values into the future.

Landcare projects can demonstrate how some of these principles may be implemented. Some case studies follow for specific principles.

A. UNDERSTAND RURAL LANDSCAPES AND THEIR HERITAGE VALUES

A 3. Develop baseline knowledge of the physical and cultural characteristics of rural landscapes.

Case Study: Cross Property Planning Project, Murrumbidgee region, NSW

Enlisting 74 landowners to implement more sustainable land practices was challenging because the project needed to work across fence lines to preserve and link scattered native vegetation and the properties varied in size, land condition, and management. The Project partnered with 25 organisations to deliver over 60 workshops and field days on landholder properties (attended by 1,100 landholders). These events demonstrated techniques such as pasture cropping, low-cost erosion control, low-input pasture management, paddock subdivision and weed containment via native species. Plans were drawn up based on each property's needs, with incentive funding provided to put them into practice (<https://www.nationallandcareconference.org.au/project/murrumbidgee-landcare-inc/>).

A 6. Recognise the local population as knowledge holders, who in many cases help to shape and maintain the landscape and should be involved in the building of collective knowledge.

Case Study: Namaliwiri billabong, Roper River, Northern Territory

The Ngandi, an indigenous Australian people of the Northern Territory, traditionally swam among the water lilies in billabongs, collecting bush food and bush medicine and having ceremonies nearby. Over the last 70 years, the landscape deteriorated from the impacts of cane toads, rubbish, pests, weeds, and tree felling. In 2002, Cherry Daniel established a women's ranger group to help restore the land. Today, the Yugul Mangi rangers, consisting of 20 men and women from several different Aboriginal groups, care for a combined 20,000 square kilometres of their lands around Ngukurr (Salleh 2016). Greening Australia funded fencing off billabongs to stop feral pigs, horses and buffaloes from trampling the surrounding ground, muddying the

waters and eating prized water lilies. Together with Macquarie University scientist Dr Emilie Ens, the rangers studied fenced billabong areas, comparing them to unfenced areas. Two of the billabongs in the fencing study are part of a songline on Cherry's country and of deep cultural significance (Ems et al. 2016). The study showed that four years of fencing saw an increase in lily cover at Namaliwiri billabong from 10 to 60 per cent. Good water lily cover is a measure of success from both a western scientific and Indigenous perspective.

B. PROTECT RURAL LANDSCAPES AND THEIR HERITAGE VALUES

B 3. Define strategies and actions of dynamic conservation, repair, innovation, adaptive transformation, maintenance, and long-term management

Case study: Restoring a degraded creek banks on a small holding, northern NSW

A small grant of \$14,000 for materials and tube stock, with planting by volunteer labour, was used to restore the degraded or missing riparian vegetation following overgrazing and clearing



along Bottle Creek, a tributary of the Clarence River. The restoration process involved obtaining Landcare funding to fence out grazing stock; collecting and germinating native plant seed, planting tube stock into ground sprayed to eradicate grass and controlling grass as the plants grew. The result was mature trees in three years, reintroducing river side native vegetation which has increased habitat for birds.

Figure 1. Exclusion fencing to keep cattle out of streamside. *Photograph by Jane L. Lennon © 2012.*



Figure 2. Landowner planting seedlings beside Bottle Creek.
Photograph by Jane L. Lennon.



Figure 3. Result 5 years later: mature vegetation able to withstand stream freshes.
Photograph by Jane L. Lennon.

B 6. Define monitoring strategies to review the effectivity of implemented policies and reassess short, medium and long- term goals, related to the monitoring results.

Case Study: Crooked Waterhole, Giru, Queensland

The policy is to protect coastal wetlands between farmland and the Great Barrier Reef World Heritage Area to restore water quality and filter fine sediment and nutrients from flood waters before they are washed out onto the Reef. Crooked Waterhole, at Giru about 35km south of Townsville, contains one of these valuable wetland habitats, but years of neglect and overgrazing had left the Waterhole infested with weeds making it unsuitable for most native species of fish. Lack of open water also made the wetland unsuitable for migratory birds once found there. Greening Australia through Reef Aid began working with the new owners in 2016 to restore the waterhole. Due to the extremely dense vegetation over the channels, a helicopter could not be used to spray the weeds, it was too thick to use a boat, and too dangerous for people to spray by hand. Instead, three kilometres of channels were successfully cleared using an amphibious excavator. This innovative approach meant minimal environmental disturbance and reduced the amount of herbicide needed. A few months later, water quality had significantly improved and native birds and fish, including barramundi, had returned. Adjacent landholders expanded the project increasing the benefit to the landscape and reef. Vegetation on the site is now being monitored by Greening Australia to create a model for wetland restoration which can be applied to other sites, while fish monitoring is being conducted in partnership with James Cook University and bird populations surveyed by Birdlife Australia (<https://www.greeningaustralia.org.au/projects/restoring-reef-kidneys-at-crooked-waterhole/>).

B 7. Consider that effective policy implementation is dependent on an informed and engaged public, on their support for required strategies and involvement on actions...

Case Study: Superb Parrot Group

The Superb Parrot Project commenced in 1993 after research by the Department of Conservation and Natural Resource identified the need for the protection and revegetation of box woodland adjoining the Barmah Forest in northern Victoria. The forest is the last known nesting site of the endangered Superb Parrot. Clearing and development have severely depleted box woodlands,

their foraging habitat. The group is comprised of local landholders and several dedicated community members who have systematically planted and direct seeded 420 ha of their own land. Superb Parrots were recorded foraging again in project plantations in 1997 (<https://www.landcarevic.org.au/groups/goulburnbroken/spp/>).

C. SUSTAINABLY MANAGE RURAL LANDSCAPES AND THEIR HERITAGE VALUES

C 1. Consider bio-cultural rights within food and natural resource production. Implement planned management approaches that acknowledge the dynamic, living nature of landscapes and respect human and non-human species living within them.

Case Study: Spinifex Lands

The Anangu Pila Nguru (Spinifex People) are using a combination of traditional and contemporary land management practices to reduce threats and keep the people, culture and land healthy. The land area is diverse, with the Nullarbor Plain to the south, spinifex and sandhill country to the north and a variety of land forms incorporating salt lakes, rocky outcrops, hills, valleys and open plains with a wide range of desert marsupials, birds, plants and insects. A Healthy Country Plan, developed by local rangers and the community, provides direction and technical support. A standard Land Access and Mineral Exploration Agreement was developed to protect areas of cultural significance (<https://rangelandswa.com.au/spinifex-people-plan-for-healthy-country-and-culture/>). The Spinifex Land Management Program is based in Tjuntjuntjara, the second most remote community in Australia. Every ranger patrol is a logistical feat requiring careful planning to ensure proper cultural and ecological outcomes and participant safety, for example, the effort involved in transporting almost the entire community back to country for a visit at Ilkurlka. The Healthy Country Plan covering 95,000 square kilometres has key projects including reducing the threats of buffel grass, camels, altered fire regimes, and introduced predators. They aim for total eradication of buffel grass from their lands within 10 years. Buffel grass (*Cenchrus ciliaris*) is widely recognised as the single greatest invasive species threat to biodiversity across the entire Australian arid zone as it is a “transformer species” that alters natural environments. It out-competes native plants, increases fire intensity, degrades

native wildlife habitat and can outcompete bush tucker food plants for Indigenous people. Whereas traditional Aboriginal patch-burning encouraged regrowth of native grass species, the intense heat produced by burning buffel grass destroys native plants both above and below ground. Aboriginal women are reluctant to undertake traditional gathering practices because thick buffel grass decreases visibility of snakes (<https://landcareaustralia.org.au/project/buffel-grass-management-alinytjara-wilurara-region/>).

C 3. Consider the connections between cultural, natural, economic, and social aspects across large and small landscapes, in the development of sustainable management strategies for rural landscapes as heritage resource.

Case Study: Reviving hedge laying, Tasmania

The original hedge fences planted by convicts around farming land in the early colony fell into disrepair 60 or 70 years ago. The Dumaresq family, sixth generation farmers, have employed one of Australia's few traditional hedge layers to trim them again, lay them over in the traditional way and bring them back into traditional working order over ten years. Twenty-first century hedge laying involves a mix of traditional and modern skills using the ancient cutting tool, the billhook, and the modern chainsaw, which allow the hedge layers to accomplish restoration more quickly than their forebears could. Today, only 3,000 kilometres of historic hawthorn hedges remain. Encouraging people to have their hedges laid instead of pulling them out leads to restoration of a beautiful thick hedge that adds value to a property. Hedges are an important aesthetic component of the Tasmanian landscape and yet are not protected by legislation, so appealing to owners to look after them is necessary (Breen, 2017).

C 6. Support the equitable governance of rural landscapes, including and encouraging the active engagement of local populations, stakeholders, and rural and urban inhabitants, in both the knowledge of, and responsibilities for, the management and monitoring of rural landscapes heritage. Because many rural landscapes are a mosaic of private, corporate, and government ownership, collaborative working relationships are necessary.

Case Study: Gondwana Link, WA

To achieve a band of healthy, reconnected bush across south-western Australia, one of the world's 25 biodiversity hotspots, Gondwana Link aims to create 1,000 km of continuous habitat from the dry woodlands of the interior to the tall wet forests of the far south-west corner. Two-thirds of the vegetation have been cleared, but 900 kms of the original habitat is relatively intact, making it the key restoration focus for the gaps of cleared land. Now entering its 16th year, Gondwana Link is an inspiring example of a cohesive effort by a broad spectrum of local, regional, national and international groups, private landholders and Indigenous communities. This is landscape repair at a mega-scale (<http://www.gondwanalink.org/>).

To restore habitat and heal country in the Gondwana Link, Greening Australia is working with Nowanup Rangers on a unique eco-cultural project. Under the shadow of the Stirling Ranges National Park mountains, tree planting is incorporating traditional designs of Noongar culture. This eco-cultural restoration approach recognises the age-old connection between the Indigenous community, plants and animals, and the landscape, reconnecting habitat so wildlife can move between the region's national parks across the wheat lands and sheep farms and help ensure the survival of endangered species such as the Carnaby's Black Cockatoo (<https://www.greeningaustralia.org.au/projects/gondwana-link/>).

D. COMMUNICATE AND TRANSMIT THE HERITAGE AND VALUES OF RURAL LANDSCAPES

D 1. Communicate awareness of the heritage values of rural landscapes through collaborative participatory actions, such as shared learning, education, capacity building, heritage interpretation and research activities...that involve civil society, private organizations, public authorities, and amongst both urban and rural inhabitants.

Case Study: Bellarine Rail Trail

The Bellarine Rail Trail in Victoria contains patches of remnant vegetation with rare flora species, but that diversity is under threat from weed invasion. With over 5,000 kms of rail corridors across Victoria, VicTrack maximizes their on-ground conservation activity by

sponsoring Landcare's Grassroots Program, which protects and restores native grasslands in and around the railway corridors. A partnership between Bellarine Catchment Network, VicTrack and Landcare is removing weeds allowing the natural regeneration of native species. Community and school engagement has been a key to the success of this project, replanting degraded areas with native species including seedlings from the endangered vegetation community 'Coastal Moonah Woodland' (<https://landcareaustralia.org.au/news/bellarine-rail-trail-corridor-biodiversity/>).

D 3. Support shared learning, training, and research using diverse tools, approaches and cultural practices... involving stakeholders, such as local communities, heritage specialists, professionals of various disciplines, schools and universities, and the media.

Landcare has been an enthusiastic promoter of field days to demonstrate practical application of research, as shown in many of the above case studies. Tree planting techniques are taught on site on many community days involving people of all ages and backgrounds. Australian national television has a highly rated weekly program called *Landline*. Each State has a weekly rural newspaper covering weather conditions, events, sales, and applied research into animal husbandry, cropping, soil protection, and other new techniques and applications. There is no shortage of academic and popular information, but the challenge is changing habits and mindsets about the compatibility of farming and conservation in a rapidly changing world of climate variability, fuel sources, market prospects, new crops and a social license to farm.

Conclusion

Australia has had painful lessons to learn about caring for country. These have implications for other countries:

- Be careful in increasing productivity
- Repair streams and watercourses
- Replant degraded lands

- Listen to the land and learn from traditional users.

Connectivity, entanglement of layered evidence in the biocultural landscape of varying scales and multiple tenures of public and private, in the midst of increasing uncertainty and unpredictability – are all key issues to be considered in a new approach. There is really no alternative but to accept modified landscapes of entanglement which are often rich with cultural associations.

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