

CONNECTIONS FOR RESILIENCE: SHARING LAND MANAGEMENT KNOWLEDGE BETWEEN FARMERS AND POLITICIANS

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ABSTRACT: Sharing knowledge is essential if Australian politicians are to effectively support farmers to be more resilient and adapt to climate change. Transformational change takes time; it can be fostered by on-ground examples of best practice in land management and innovative new approaches such as landscape rehydration. Farmers and politicians need to connect, to view and understand these methods and approaches and share their learnings. However, we need to go from connections for resilience to actions in the form of outcomes-based policy and financial support to achieve change.

INTRODUCTION

This paper describes the work of the Mulloon Institute (TMI), its landmark project — the Mulloon Rehydration Initiative (MRI)— and explores the gap between the knowledge developed and held by Australian farmers and politicians and their officers responsible for developing policy. The paper also summarises some of the challenges faced in sharing knowledge between farmers and the political class, describes how better connections can be made to drive innovation in policy and practice, and suggests what actions can be taken to make connections for resilience of our landscapes and farming communities.

THE MULLOON INSTITUTE

The Mulloon Institute (TMI) is Australia's premier scientific organisation in landscape rehydration. Its work focuses on capturing and retaining water in the landscape, through identifying and restoring hydrological processes using physical interventions and regenerative land management approaches. As a not-for-profit organisation, TMI carries out landscape repair and rehydration of catchments, by sharing regenerative land management practices, monitoring the outcomes and educating farmers and land managers on these practices. TMI has its own commercial farm comprising 2500 ha that acts as a demonstrator, located on the southern tablelands of NSW near Bungendore, around 40 minutes east of Canberra.

The Mulloon Institute was founded by landholder Tony Coote AM in 2011. Tony passed away in 2018, but has left a lasting legacy that will continue to contribute to natural resource management in Australia in the long term. Tony bequeathed his two farms on the southern tablelands near Canberra to the Mulloon Institute so the practices and scientific investigation could be continued in perpetuity. Tony also funded the development of the MRI.

The Mulloon Institute is overseen by a Board chaired by Gary Nairn AO and supported by a panel of key advisors and a Science Advisory Council that oversees the MRI. TMI collaborates with a range of academic and civil institutions, and the Australian Government, along with other not-for-profits and commercial operators. Collaborators include the Australian National University; the University of Canberra; Landcare NSW; Landcare Australia; North Queensland Dry Tropics; the Department of Agriculture, Water and the Environment; the NSW Environmental Trust; Hydroterra; and CIBO Labs. Funding is drawn largely from philanthropy but also from a variety of grants focused on natural resource management and environmental repair. Two for-profit enterprises — Mulloon Creek Natural Farms, producing free-range, pasture-raised eggs and grazing beef cattle, and Mulloon Consulting — return profits to the Mulloon Institute.

THE MULLOON REHYDRATION INITIATIVE

The Mulloon Rehydration Initiative (MRI) is a catchment-scale project involving 20 landholders, and covering 23,000 hectares and 50 kilometres of creek. The project has been selected by the United Nations Sustainable Development Solutions Network as one of five globally that demonstrate how environmental repair can improve agricultural outcomes. The project responds to the historical degradation of Mulloon Creek, where nearly 200 years of European land use, including agriculture, forestry and mining, has caused widespread land degradation. Like pulling the plug out of a bathtub, the deep and chronic erosion of creeks and gullies has lowered the watertable, dried up wetlands and dramatically reduced the water holding capacity of the soils (Figure 1).



Figure 1: Before and after catchment views of Mulloon Creek.

The functional hydrological and ecological connection between Mulloon Creek and its floodplain has been lost. According to Johnson and Brierley (2006), prior to European settlement, lower Mulloon Creek was a discontinuous chain of ponds flowing through intact alluvial sediments. Base-flow water levels would have been close to the top of the bank and would have reflected the level of the underlying groundwater. Colonial land use practices removed vegetation and led to incision of the creek through the alluvial sediments.

The project involves controlling livestock access to the creek, installation of instream bed control structures (leaky weirs) built to raise the creek level an average of 500 mm, and planting and transplanting thousands of native riparian and aquatic plants. Rebuilding the creek's former structure and function will also support natural vegetation regeneration, and therefore habitat regeneration, within the system. Habitat regeneration to date has been successful and the pilot project area completed in 2006 has been assessed by scientists at Taronga Zoo as the most suitable in NSW for release of the Yellow Spotted Bell Frog *Litoria*

castanea, a critically endangered species in NSW confined to a single population near Yass (OEH 2019) and as a captive population maintained by Taronga Zoo.

The restoration of Mulloon Creek will include over 90 leaky weirs constructed in the bed of Mulloon Creek. These soft-engineered 'natural' eco-structures trigger landscape regeneration and become part of the stream system. They are designed to:

- raise the water level
- rehydrate the floodplain
- trap fine sediment
- rebuild aquatic and riparian habitat.

The construction essentially rebuilds wetlands in the system (Figure 2) that slow the water but also restore habitat for a range of species native to the area and endangered in Australia. The leaky weirs slow the water and encourage sediment to deposit, building the bed of the stream and making it easier for flows to overtop the creek banks and recharge local aquifers. Improved water retention on the floodplain improves soil health and increases soil carbon levels, encouraging vegetation to flourish and increasing



Figure 2: Mulloon Creek in 1975 and 2015.



Figure 3: Log weir on the NQ Dry Tropics' demonstration hub in North Queensland.

the productivity of farming land. Water is released slowly over time, building resilience to drought and to bushfire.

Results from the monitoring of the MRI have so far been encouraging:

- 60% increase in stock-carrying capacity on the floodplain (J. Guilfoyle, Mulloon Creek Natural Farms, pers. comm. 2012)
- reduced variability in groundcover production (that is groundcover extremes fluctuations from lows to highs) have been moderated, specifically there is consistently more groundcover maintained (CIBO Labs 2020)
- overall average increase in groundcover since the millennium drought (CIBO Labs 2020)
- increased biodiversity and habitat for endangered species (TMI 2020a)
- sustained baseflow in Mulloon Creek (TMI 2020b).

KNOWLEDGE SHARING BETWEEN FARMERS AND POLITICIANS

The MRI is an exceptional on-ground example of landscape rehydration and restoration at the catchment scale. This project is seen as a model that can be scaled up and applied in suitable catchments across Australia and where appropriate internationally. This project is also an excellent way to reach all the members of civil society and begin to build an understanding of what can be done to repair landscapes, recognising that sometimes policy and regulatory frameworks can create obstacles to be overcome rather than opportunities to be realised.

Much of our environmental regulation in Australia is focused on mitigating the impacts of development which are key drivers of economic development. Landscape rehydration, in contrast, can have some short-term environmental impacts during construction but is focused on environmental repair and restoration. An outcomes-based approach for regulators would enable a more nuanced

assessment of these works, a process TMI is pursuing with the Mulloon Law Committee, a group of dedicated lawyers providing their time to advocate for and design appropriate regulatory reform.

Agricultural land systems are complex, with many interactions of social and environmental domains across time and space. These make it difficult for policy to grapple with in an environment where many decisions, including political decisions, are based on immediate problems, rather than holistic decision-making. This is particularly challenging for politicians, who need simple clear messages that win hearts and minds (and votes and budget allocations).

CHALLENGES AND OPPORTUNITIES FOR KNOWLEDGE SHARING

Demonstration of practice is key to sharing knowledge and building understanding. However, it is necessary to go further and advocate directly to politicians, policy makers and regulators if Australian farmers are to be truly supported, and changes delivered that will address issues such as developing resilience to drought, flood and bushfire, and mitigating climate change. The following key points have been recognised by TMI.

- A broken water cycle, a result of eroded creeks and dried out floodplains, leaves farmers with less productive land.
- The MRI has shown a relatively simple solution to a complex problem that achieves increased agricultural production, environmental co-benefits and is inherently a social process (twenty landholders agreeing to creek interventions and learning and practising improved land management).
- Demonstrations of on-ground work and practice change must also be promoted to politicians and policy makers.

- Sharing knowledge that leads to transformational change takes time. Works at the pilot site at Mulloon Creek were started back in 2006, yet fifteen years on TMI is really only just gaining a profile in Canberra and across Australia. TMI was established in 2011 but it was only in 2018 that TMI received a \$3.5 million dollar grant from the Australian Government. Philanthropy supported the Mulloon Institute for all those years and continues to do so.
- Connections for resilience can come from unlikely sources. TMI was approached in 2019 by Matt Edgerton-Warburton to initiate the Mulloon Law Committee (MLC) after he visited Mulloon. TMI and the MLC have since briefed NSW government ministers who are progressing reforms to legislation to ensure there is a consistent approach to landscape rehydration in regulated parts of the system across New South Wales. An MLC chapter has also been established in Queensland (Figure 3).
- Drought, fire, flood and the COVID pandemic have heightened community and political awareness of the problems faced by farmers and the need for more than short-term, bandaid solutions.
- Relentless advocacy work has begun to get results, with visits to Mulloon from senior federal politicians, high-level bureaucrats and the Governor General in recent years.

BETTER CONNECTIONS: DRIVING INNOVATION IN POLICY AND PRACTICE AND FOR RESILIENCE

Our Australian landscape has all the answers we need. Examples assist politicians and policy makers to understand this potential and help farmers to deliver these solutions through profitable and responsible land management.

Philanthropy has made the MRI possible, and has provided an opportunity to showcase an innovative approach that can have major national benefits. Advocacy work has been very important and, as always, it is in the timing. The need for land management approaches that assist the sequestration of carbon from the atmosphere are set to grow in demand as the carbon market develops. Some of the key elements in driving innovation in agriculture that can drive adaptation to climate change include:

- outcomes-based policy (that can adapt to rapid technological change)
- responding to real world and complex problems with a holistic approach
- the sharing of knowledge through demonstration of on-ground projects
- skills-based learning for landholders.

A CALL TO ACTION

The Mulloon Rehydration Initiative is an on-ground example of landscape-scale repair and restoration, which can be scaled up and rolled out across Australia to the benefit of the nation. To date the political class has applauded this initiative and recognised its benefits. However, action is required to achieve the positive outcomes for the environment, farmers and rural communities.

Political support is required in the form of effective outcomes-based policy linked to funding mechanisms that see farmers reap the benefit rather than bear the costs.

There is also a role for corporate Australia when considering their Environmental, Social, and Corporate Governance (ESG) obligations.

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