

Future landscapes – moving forward together

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The natural resource managers of NSW are facing immense challenges. We have one of the worst droughts on record, water scarcity, and on top of that, evidence that this may be the norm in the future.¹

Despite these challenges, we should remain optimistic about the future for rural NSW because Australian communities have enormous capacity to respond and adapt to change. It is groups like Landcare that provide the inspiration and energy to continue our resilience. However, we need to focus on what we want our future landscapes to look like, and then ensure that all of the efforts of government and the community are focussed on delivering that future. We need to visualise a future where:

- healthy, functioning landscapes continue to support our rural and urban communities
- landholders will be paid not only for the goods they produce but receive income for the services delivered to the broader community through their management of healthy landscapes
- the agriculture industry and its communities are seen by the wider community as the custodians and managers of the life support systems for society.

We need clear goals if we are to have any chance in reaching this vision. Without them, individual issues and challenges can seem overwhelming and we risk responding in the wrong way. The NSW Government has articulated goals for natural resource management (NRM) in 13 state-wide targets (Attachment 1). These targets are embedded in the State Plan which means that all of the NSW Government is accountable for delivering improvements to our natural resources.

This paper reflects on the past, discusses the present and explores the future. First, it will reflect on our natural history, the practices that have impacted on our natural capital and the birth of a movement that paved the way for where we are today. It will present the arrangements that are starting to be put in place in NSW to steer us in the right direction. Finally, the paper will present a vision for the future and challenge us all to focus our activities on common goals – the 13 state-wide targets - to achieve this vision.

Our natural history and impacts

Australia's geological history has created an ancient, flat continent that has accumulated enormous amounts of salt in our soils. Because our country is flat, we have sluggish groundwater systems and rivers, which have little energy and capacity to drain the country of the salt in its soils.

¹ See Williams, J. and Singh, A. (2007) *Climate change impacts on future water resource availability, presentation delivered at Namoi Climate Change Forums*, hosted by Namoi CMA and NSW Department of Primary Industries, available at http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/126593/jwilliams-asingh-nrc-namoi-climate-change-forums.pdf

Our agricultural landscapes function very differently to a lot of North American and European landscapes, where many of our farming ideas come from. For example, unlike European landscapes, the evolutionary traits of our native vegetation meant that the leakage rate of water and nutrient past the root zones to the landscape's internal drainage system was equal to the capacity of that landscape to lose water from it. In other words, what went in was balanced by what went out.

But, over the course of two hundred years we have changed the fundamental hydrological balance in the landscape. By clearing vegetation for our agricultural landscape, we have disturbed the natural balance of water, nutrient and energy flows in the landscape. Recreating this natural balance in future farming landscapes is the key to sustainability.

Where are we now in NSW?

There are several very important developments coming together to help us heal our landscapes, visualise our future landscapes and to coordinate our actions. We have:

- Landcare, that has paved the way to how we manage our natural resources now
- relatively new institutional arrangements and approaches to manage natural resources in NSW
- emerging market based instruments that allow us to better value and protect our natural resources and assets
- advances in science that allow us to visualise future landscapes and to better target our limited funding.

Landcare - heading us in the right direction

Landcare has lifted our understanding of the natural resource and environmental problems we are confronted with. It has acted as an agent of change in both our rural and urban communities and strengthened our determination to tackle NRM problems. Right now there are more than 1700 community Landcare groups in NSW working on the ground to help improve and maintain our natural resource and environment into the future.

Landcare still has important work to do, but it will need to do things differently in the future. NSW's regional model for NRM, with our CMAs now provides Landcare with the framework to focus and channel its work to deliver whole-of-catchment natural resource outcomes. Landcare will need to ensure its activities contribute to the relevant catchment targets, set out in Catchment Action Plans, and ultimately, NSW's state-wide targets.

NSW's regional model for natural resource management

In 2003, NSW embarked on a new way of managing its natural resources. This included the:

- creation of Catchment Management Authorities (CMAs), statutory bodies who are tasked to work with their communities to develop and implement desired natural resource outcomes in their catchments
- creation of the Natural Resources Commission (NRC), an independent body to provide the appropriate checks-and-balance on the way we manage our natural resources
- adoption of thirteen state-wide natural resource targets in NSW's State Plan, which provide a focus for all NRM, planning, and investment decisions

- adoption of the *Standard for the Quality Natural Resource Management* (the Standard) by the NSW Government to promote quality practice in the NRM sector, and encourage adaptive management to achieve the state-wide targets.²

The state-wide targets for natural resource management describe a vision for all of NSW. The NSW Government has committed to this vision in the State Plan following state wide consultation with the community. The Government has publicly signalled that NRM - like other mainstream areas of government - needs targets, quality standards, investment plans and strong monitoring, evaluation, reporting and independent auditing. The challenge for all of us is now in implementing this vision and securing sustainable landscapes and communities for generations to come. This will be no easy task.

The state-wide targets set goals that we can all help to achieve. Reaching the targets requires us to look after the health of our natural systems – the life support systems for society - so that they can continue to support thriving rural and urban communities. When we talk about healthy, functioning landscapes, we are talking about a vibrant agricultural sector that balances production with biological diversity. We mean healthy rivers that supply water for agricultural and urban use, as well as crucial environmental flows. We are talking about the ability to adapt to climate change while maintaining competitive primary production.

CMAs in NSW have been leading the way in using the Standard to improve the way they do business. Widespread use of the Standard by all natural resource managers will mean that our NRM efforts will be based on best available knowledge and continually improved in response to new knowledge and experience. It will also mean that tax payers' money is spent on the right things at the right time. It will promote innovation and sustainable development through encouraging appropriate trade-offs between environmental, economic and social outcomes.

Under the new arrangements, CMAs must develop, and implement their Catchment Action Plans so they comply with the standard and promote the state-wide targets. To provide confidence and promote improvement, the NRC independently audits CMAs against the standard and state-wide targets.

These new arrangements provide a stronger foundation for NRM than we have had in the past, and send a signal to all natural resource managers that NRM delivery is now core business of government.

Market based instruments – putting value to our assets

Other innovations, such as market based instruments also provide an indication that government and industry are becoming more serious about the way we manage our natural assets. Market based instruments are emerging to ensure ecosystem services and environmental assets are better valued. As these systems become more established, they will also provide an opportunity for landholders to receive alternative income. For example:

- NSW's *Greenhouse Gas Reduction Scheme*,³ that aims to reduce greenhouse gas emissions by using mechanism such as such as vegetation to offset carbon emissions
- brokering services such as Landcare's *CarbonSMART* ⁴ and Greening Australia's *Breathe Easy*,⁵ that provides a mechanisms for landholders to create and transfer carbon rights from one party to another

² The Natural Resources Commission (2005), *Standard for Quality Natural Resource Management*. Available at www.nrc.nsw.gov.au.

³ More information can be found at <http://www.greenhousegas.nsw.gov.au/>

⁴ More information can be found at <http://www.carbonsmart.com.au/>

- NSW's *BioBanking* scheme,⁶ that allows landholders to generate and sell 'biodiversity credits' to developers to enhance and protect biodiversity values on their land while offsetting impacts from developments
- NSW's *Environmental Services Scheme*,⁷ that identified and valued environmental services on farms with the goal to create a market for trading these environmental services.

However, we must strive to ensure that these new initiatives are delivered so that they lead to long term outcomes, rather than being implemented for their own sake. They should all be channelling effort towards reaching the state-wide targets.

Using science in a landscape approach

To support these arrangements, we require the best available information to ensure our communities' vision and values are appropriately accounted for, and so we can target our limited resources.

We need a better way to support CMAs to work with regional communities and other organisations to improve or maintain the health and the environmental and economic productivity of landscapes in their regions and across NSW. In July 2007 the NRC recommended to the NSW Government that it adopt a landscape approach to NRM.⁸ Fundamentally, it challenges NSW to make decisions that ensure that biophysical processes – for example, water and nutrient cycles – continue to function properly. Without this, we will find it very difficult, if not impossible, to continue to support the environmental, economic and social values of our communities.

To achieve a landscape approach to NRM we need to be thinking and planning at bigger scales because these biophysical processes tend to operate at scales larger than the paddock fence. Scientists and researchers have been coming up with ever more innovative ways to help us understand these processes over larger scales, as well as to incorporate the community's social and economic values.

For example:

- *Lower Murray Landscape Futures* – this project analysed the impact of existing regional NRM plans across the Lower Murray region, exploring future options under various scenarios. The result was a 'landscape future' map representing the spatial distribution of potential NRM actions in the landscape under the various scenarios.⁹
- *Land-use change in the Douglas Shire, QLD* – using computer simulation, this research developed future visions for the Douglas Shire for the year 2025 in partnership with the local community. The aim was to identify the best land-use mix that would protect the Great

⁵ More information can be found at <http://www.breatheeasy.com.au/html/> (this scheme also explicitly addresses biodiversity outcomes)

⁶ More information can be found at <http://www.environment.nsw.gov.au/threatspec/biobankscheme.htm>

⁷ More information can be found at http://www.forest.nsw.gov.au/env_services/ess/default.asp

⁸ Natural Resources Commission (2007) *A landscape approach to vegetation management – Final Report, June 2007*, available at <http://www.nrc.nsw.gov.au/submodule.aspx?id=97>

⁹ Walker G. *et al.* (2005) *Lower Murray Landscape Futures Phase One Report*. Final Year 1 Technical Report prepared for the Centre for NRM, the Victorian NAP Office and CSIRO Water for a Healthy Country. More information can be found at <http://www.landscapefutures.com.au/>

Barrier Reef while also supporting support local industries and the well being of the community.¹⁰

- *Spatial prioritisation of NRM investment in the West Hume area, NSW* – this research aimed to identify locations where land use change would give multiple environmental benefits as well as production benefits. The result was a map, spatially ranking the best place to target investment to achieve multiple benefits.¹¹

These tools should help natural resource managers better plan and allocate resources for the outcomes we all want to achieve.

Farms of the future

As discussed earlier, our farm practices have not been designed, at the outset to operate in harmony with our unique Australian landscapes. Part of the solution is redesigning landscape and farms so they are compatible with water and nutrients flows that have evolved with our landscape. Key elements in redesigning landscapes include:

- using vegetation, namely annuals, herbaceous perennials, woody perennials
- incorporating new management practices (inputs, operations etc), for example:
 - temporal and spatial organisation of vegetation within management units (paddocks) and catchments using: phase farming, opportunity cropping, companion cropping, precision, agriculture etc
 - temporal and spatial organisation at broader scales incorporating agroforestry, and mosaic farming.¹²

Translated to a farm scale, a sustainable mix of land uses might consist of:

- 30 % of a farm permanently covered in native vegetation, including trees, shrubs and grasses
- 20 % of a farm covered in deep-rooted, shrubs and grasses, planted primarily for recharge control and income from grazing and farm forestry
- 30 % intensively used for annual crops
- 20 % intensively used for mixed grazing and cropping.¹³

By redesigning our farms, farmers can look for opportunities to be paid not only for the goods they produce but also receive income for the services delivered to the broader community through their management of healthy landscapes

¹⁰ Bohnet, I and Smith, D, M. (2007) Planning future landscapes in the Wet Tropics of Australia: A social-ecological framework. *Landscape and Urban Planning* 80, 137-152.

¹¹ Hill, P., Cresswell, H. and Hubbard, L. (*of NRM investment in the West Hume area (Murray CMA region)*), Technical Report, CSIRO Water for a Healthy 2006) *Spatial prioritisation* Country National Research Flagship, Canberra.

¹² Williams, J. (2005) Sustainable Agriculture in Australia - some ways forward, presented at the Farrer Oration, 2005. Available at http://www.wentworthgroup.org/docs/Farrer_Oration_JWilliams.pdf

¹³ Williams, J. and Saunders, D.A (2005) Land Use and Natural Ecosystems in Search for Sustainability (eds. Goldie, J., Douglas, B. and Furnass, B.) CSIRO Publishing, Melbourne, 2005.

Future farm incomes

Market mechanisms will continue to develop that will allow us to appropriately value our natural resources and assets which are the foundations on which our economy rest. Farmers in the future may have a diverse sources of income paid for either by private or public stakeholders. For example, a farmer, while continuing to produce much needed food and fibre may:

- generate biodiversity credits for sale under NSW's *BioBanking*,
- lease land to a company for wind turbines,
- generate CO2 offset credits under Landcare's *Carbonsmart*, and
- grow environmentally accredited timber to meet growing consumer demand for green products.

Bringing it all together

The key elements are in place in NSW that will allow us to re-design future landscapes giving us healthy functioning landscapes and viable producers into the future. State-wide targets are critical to connect the actions of individuals and groups so that the whole catchment works as a one - as a catchment must. We need Landcare and CMAs working innovatively together, using the best available science and market mechanisms to help us achieve our state-wide targets.

Overall, this approach recognises that a more systematic, business-like manner is needed to manage and look after our natural resources and assets. Investment in natural resource management must become mainstream business for government and the whole community. In the past we have run natural resource and environment management in an ad-hoc manner, with short term funding horizons. We don't do that with health, education or defence.

We all need to work together and focus on our goals. NSW's state-wide targets, catchment targets and the Standard provides an integrated, inclusive and adaptive way to coordinate all our efforts and to ensure those efforts are based on quality decision making that we can all have confidence in.

But in the end, it will be our rural farmers, working everyday on the land who will be the critical agents in healing and protecting our natural resources and assets. Farms of the future will be about managing the landscape, its rivers, wetlands and estuaries in ways that produce ecosystems services for all society and help us achieve state-wide improvements in critical natural assets.

State-wide targets for natural resource management

Biodiversity	
Macro-environmental	<ol style="list-style-type: none"> 1. By 2015 there is an increase in native vegetation extent and an improvement in native vegetation condition 2. By 2015 there is an increase in the number of sustainable populations of a range of native fauna species
Specific priorities	<ol style="list-style-type: none"> 3. By 2015 there is an increase in the recovery of threatened species, populations and ecological communities 4. By 2015 there is a reduction in the impact of invasive species
Water	
Macro-environmental	<ol style="list-style-type: none"> 5. By 2015 there is an improvement in the condition of riverine ecosystems 6. By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses 7. By 2015 there is no decline in the condition of marine waters and ecosystems
Specific priorities	<ol style="list-style-type: none"> 8. By 2015 there is an improvement in the condition of important wetlands, and the extent of those wetlands is maintained 9. By 2015 there is an improvement in the condition of estuaries and coastal lake ecosystems
Land	
Macro-environmental	<ol style="list-style-type: none"> 10. By 2015 there is an improvement in soil condition
Specific priorities	<ol style="list-style-type: none"> 11. By 2015 there is an increase in the area of land that is managed within its capability
Community	
Macro-environmental	<ol style="list-style-type: none"> 12. Natural resource decisions contribute to improving or maintaining economic sustainability and social well-being
Specific priorities	<ol style="list-style-type: none"> 13. There is an increase in the capacity of natural resource managers to contribute to regionally relevant natural resource management