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## Natural Resource Management as a Form of Multi-level Governance: The Impact of Reform in Queensland and Tasmania

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### Introduction

Australia's multi-level system for the governance of natural resources has changed significantly in the last 40 years. In this context, we refer to multiple levels of governance across spatial scales (as per Cash et al. 2006). We also refer to the 'governance system' to describe the complex array of multiple players (from organisations to individuals) and the decision-making and influence they exert within and across different spatial levels from the site to the global level. While Parker and Braithwaite (2003) refer to governance as the 'intentional shaping of the flow of events so as to realise desired public good', we consider that the shaping is done in both the public and private sectors, and that both public and private outcomes might be achieved through our nation's governance system.

It is important to note that, as a definable part of the nation's wider governance system, no single individual or organisation is in charge of Australia's natural resource governance system. It is the interactions between many independent decision-makers and the decisions they make that determine the nation's natural resource outcomes. While we also

cannot forget the interactions between the nation's (social and economic) governance systems and our natural resource governance system, these are not the focus of this chapter. Equally, global-level governance also has significant implications for natural resource outcomes in Australia, though, again, we do not specifically consider the influence of governance at the global level in this chapter.

Natural resources comprise the wide range of biotic and abiotic features provided by nature and used by human society as ecosystem services. These services underpin our social and economic wellbeing as a species. Key natural resources include assets like water, air, soil, minerals, energy, plants and animals and the ecosystem processes that result from interactions between them. Humans value these resources in different, and sometimes competing, ways. These values range from specific utilitarian uses of economic import to a wide range of social, cultural and spiritual values. It should be stressed, however, that these resources also have intrinsic value and many would argue that society has additional, non-anthropocentric stewardship responsibilities for supporting their existence.

Poor natural resource health limits the human potential of Australian society, as natural resources underpin our economy. Consequently, to manage the sustainable use of these resources and to balance competing natural resource values, several reviews and changing governance arrangements have emerged at national, state, regional, local and property levels over the past three decades (e.g. Commonwealth of Australia 1999; Keogh et al. 2006; Australian Government 2011a). More explicit alignment of planning and delivery efforts within these arrangements and between these levels has also been emerging. In this context, this chapter does not repeat the backgrounding to multi-level governance (MLG) concepts outlined in the introductory chapter in this book, but explores and enriches them in a case example.

At the regional level, regional natural resource management (NRM) bodies play a particularly important, but not an exclusive or independent role, in integrating decision-making. There are 56 such bodies across the nation. They are constituted by a variety of methods (usually statutory or community-based) and their core roles include the development and monitoring of regional NRM plans and the collaborative development and implementation of major delivery programs. The emergence of regional NRM bodies over the last 20 years has sparked much more national, regional and local debate about how aspects of NRM governance in Australia work and how they could be continuously improved.

In 2010, the collective of regional NRM bodies (NRM Regions Australia) drew attention to the fact that no one body or institution monitors the health of the Australian NRM governance system as a whole, or takes responsibility for developing a clear vision and driving reforms that would improve its performance. Governance changes at different levels often occur without reference to a broader systemic context. Operating between large governments and small communities, regional NRM bodies are particularly affected by changes both above and below them in scalar terms.

In this chapter, we take as a starting point a recommended set of NRM governance principles that emerged from research undertaken by NRM Regions Australia (Ryan et al. 2010). We then relate the history of changes to the Australian system over the last 30 years or so, and assess the revealed trajectories in terms of these identified principles. The impact of those trajectories on regional NRM bodies is explored in two case regions – Queensland’s Wet Tropics and southern Tasmania – enabling us to explore systemic reforms that would enhance our multi-level NRM system.

While the ideas considered in this chapter have emerged from discussions amongst regional NRM bodies and other stakeholders in the NRM system, the views expressed are those of the authors alone. We hope that these thoughts may spark wider academic, government and community discussion about the future of Australia’s broader multi-level NRM governance system, as this system underpins the capacity of the nation to secure its longer-term economic and social sustainability.

## Principles for a healthy multi-level NRM governance system

The principles that form the starting basis for our analysis were developed by taking a complex systems approach to the governance of natural resources in Australia. By drawing on an extensive literature from research and practice, Ryan et al. (2010) deduced 10 principles that could be used to assess the functional health of our multi-layered system and guide future system changes.

The basis for analysing NRM governance in Australia as a system came from the concepts and theory of complex systems behaviour and the observation that NRM governance has many characteristics of such

systems. Principally, these systems have many interconnected and multi-layered component parts and their behaviour as a whole is shaped largely by interactions between layers and components within layers. Cause and effect relationships are not linear, and outcomes cannot be confidently predicted from knowledge of the component parts. Simple interventions often do not work. In the context of NRM governance, the system as a whole includes both the social system (the source of governance) and the natural resource system (the target of governance). In such a systemic context, natural resource governance was considered to be inclusive of the many ways in which decisions that influence natural resources are made: from government policies, legislation and funded implementation programs, to community, industry, traditional owner and farmer actions.

An insight from taking an Australia-wide systems view of NRM governance was that the interconnections between components of the governance system (particularly at different levels) are sometimes weak. There are many organisations involved but they often make decisions independently, with relatively little regard for how the outcomes of that decision will interact in the decision space of others. Another consequence of framing NRM governance as a multi-level system reveals that no single organisation takes responsibility for the design/integrated working of all the components as a whole.

The principles for good health of the NRM governance system were found to be:

- **Continuity:** the need to maintain an enduring country-wide planning and delivery infrastructure based on local skills and social capital that is stable in the medium term, but supported to change and adapt in the longer term.
- **Subsidiarity:** the need to devolve decision-making to the lowest capable level for achieving the job required in order to better engage people, but also to preserve strong roles for governments in providing direction, standards, guidelines, incentives and sanctions.
- **Integration:** the need for alignment of different organisational goals up, down and across levels to ensure they account for interactions in ecosystem processes and trade-offs between ecosystem services.
- **Holism:** the need to place all activities within an holistic context (e.g. not undertaking water planning in isolation from biodiversity planning).

- **System-orientation:** the need to match governance mechanisms to the systemic complexity of the social–ecological system under consideration. Simpler mechanisms can be used where linkages between cause and effect are clear. More nuanced and adaptive mechanisms need to be applied in more complex situations. Additionally, the time scale for change in different contexts needs to be matched to social capacity to absorb change.
- **Relationship orientation:** the need for recognition that relationships between organisations and individuals are important in harnessing synergies across the system.
- **Resilience:** the need to manage for resilience of ecosystems and communities. This requires the use of knowledge of ecosystem dynamics to better target investments to the slow controlling variables that determine ecosystem structure and function.
- **Knowledge and innovation:** the need to equip the governance system with skills, capacity and knowledge and encourage innovation, including in the governance system itself.
- **Accountability:** the need to ensure accountability of key players at all levels in the system based on sound systems data, knowledge and effective reporting.
- **Adaptability:** the whole Australian NRM governance system needs regular review/adaptation.

Articulating these system principles provides us with some theoretical logic in the following section for exploring and analysing the health of Australia's NRM governance system from a regional perspective between 2010 and 2015. We then provide a case study analysis of how decisions at higher levels impact on NRM outcomes in regions. This enables us to consider potential national reforms to the current MLG system that might assist the Australian Government to continue to strengthen the system at national level, while being conscious of the multi-level nature of the system.

## Evolution of Australia's national NRM governance system

The foundations of MLG for integrated NRM have been steadily building across Australia over the last four decades. Before the 1970s, state/territory governments, local governments, industries and landholders took the majority of natural resource decisions with little attention to some of the key principles for systemic health such as integration, holism and systems orientation. In particular, the limited systemic focus resulted in undesired environmental impacts arising from poor NRM, producing key pressure points within Australian society.

Consequently, from the 1970s on, when environmental issues (particularly water and air pollution) began to have a higher profile, the predominant state/territory government response to NRM problems was to introduce compliance-oriented regulation (Gunningham 2009). Over the same period, landholders (the people managing most of the nation's natural resources) began to come together at the local scale to embrace a new, or to articulate an existing, ethic of local stewardship (Lockie and Vanclay 1997). This became known as the nation's Landcare movement.

With respect to the relative balance between regulatory, market-based and voluntary efforts, most state/territory governments and the Australian Government have primarily used regulation to address key NRM problems such as soil degradation, excessive land clearing and the overallocation of water. While this has achieved many sound environmental outcomes, it has come at an economic and social cost to the rural and remote communities that manage these resources (Productivity Commission 2003). While achieving environmental outcomes, regulating tree clearing in previously undeveloped but productive areas, for example, can and does impact on future economic development opportunities for particular landholders and communities. In the long term, however, the future of extensive biodiversity, water management and landscape-scale biosequestration/greenhouse gas abatement activities in Australia will largely depend on the role of privately managed lands. Effective management of these lands, in turn, depends on landholders valuing and managing multiple ecosystem services in the landscape (Commonwealth of Australia 2009; Ostrom and Cox 2010).

Additionally, regulatory protection of the landscape alone does not generate the financial resources needed to manage and restore natural systems and their ecosystem services. State-based legislation to protect vegetation from clearing, for example, does little at the local scale to prevent biodiversity decline resulting from poor grazing practices, weed encroachment, altered fire regimes and feral animal pests (van de Koppel and Reitkerk 2000). In a sense, as a blunt tool, regulation itself has tended to become the baseline for management, providing little incentive for improved practices. Theoretically, using regulation in this way has been seen as a panacea: the application of a single solution to a multi-dimensional problem with potentially unsuccessful and socially divisive results (Ostrom and Cox 2010). This again highlights the importance of the systems and relationship-orientation principles.

Some sense of regional or catchment-scale coordination of emerging regulatory and/or voluntary activities began developing separately in individual states from the 1980s via the birth of diverse types of integrated catchment management groups. A key theme within these groups was the development and implementation of integrated catchment management plans, developed with strong community input and encompassing strategies and support for coordinated on-ground action. This formalised fledgling initiatives within different layers in the system (e.g. at national, state and local levels) and established the foundations for some limited continuity in the relationship between these layers. At this stage, governments across the nation increasingly applied some program-based funding to support integrated catchment management and grassroots landcare delivery.

The fragmented foundations of strong regulatory and weak grants-based approaches in the 1980s and 1990s, however, failed to stem public exposure of several latent natural resource crises, including the insidious creep of dryland salinity and its impacts on infrastructure and agricultural productivity (Australian Government 2001), the collapsing health of Australia's most productive river (MDBA 2010) and the increasing threat of poor water quality in the Great Barrier Reef lagoon (Australian Government and Queensland Government 2009). State-based regulatory approaches to several landscape-scale issues, such as tree clearing, also triggered vocal rural resistance and declining community trust in governments (e.g. see Productivity Commission 2003).

High-profile policy problems of this kind exposed the need for Australia to pay more attention to bigger-picture (holistic) strategic and integrative issues facing the sustainability of the nation's rural and remote landscapes. This led to a distinct shift in thinking about natural resource governance about 20 years ago (Commonwealth of Australia 1999). The combined result was that, from around the turn of this century, the then federal Coalition Government began to be more involved in NRM in agricultural and more remote Indigenous landscapes. The shift aimed to secure a move from a geopolitically (e.g. state by state) and sectorally (e.g. water versus biodiversity) fragmented approach towards a more systemic and integrated national framework, albeit one informed by emerging approaches to integrated catchment management in the states (Dale et al. 2008). This new approach aimed to improve aspects of the nation's natural resource governance system (McDonald and Weston 2004) by focusing on enhancing connectivity among decision-makers (i.e. the relationship principle) and improving the knowledge use, capacity-building and organisational health within organisations (at different levels) to strengthen planning, implementation, monitoring and evaluation (i.e. subsidiarity).

By the early 2000s, the new thinking was formalised through bilateral arrangements between state/territory and Australian governments regarding the delivery of the Natural Heritage Trust and National Action Plan for Salinity and Water Quality. These formally negotiated federal–state government arrangements spearheaded important reforms in the delivery of community-based NRM through strategic investment at a regional scale where regional NRM bodies (i.e. groups that could demonstrably represent viewpoints from across their communities) would develop regional NRM plans. The planning process required securing regional consensus on aspirational and resource condition targets across a wide range of natural assets and community sectors (including agricultural, conservation and Indigenous).

NRM bodies were largely governed by boards with broad combinations of skills that reflected the viewpoints of these different regional sectors. Regional investment strategies developed by the community focused on motivating and engaging landholders to avoid further damage, repair past mistakes and to continuously improve their management practices. Programs and projects were delivered by a variety of complementary partner organisations, such as landcare groups, industry bodies, non-government organisations, traditional owners, state/territory governments, local

councils or consultants (often via complex and durable partnerships). Landholders and managers often elected to become part of the NRM process through voluntary extension or incentive programs. Collaborative local projects were encouraged and resources provided to implement priority actions.

Regions, in the context of these new arrangements, generally referred to a sub-provincial geopolitical scale considered appropriate to the effective landscape-scale management of natural resources. Some 56 such regions were defined, mostly based on definable agro-ecological regions that formed a sensible management scale in biophysical, social and administrative terms. There was also often some synergy with biogeographic boundaries (Commonwealth of Australia 2004). Others were based on significant catchments (e.g. the Fitzroy Basin) or sub-catchments (e.g. the Condamine region) or even political-administrative units (e.g. the Northern Territory or the Australian Capital Territory).

Under these community-based arrangements, regional NRM bodies were designated by state, territory and federal governments on the basis of their emerging capacity to deliver effective natural resource programs and to engage the majority of the regional community's interests in the development and implementation of regional NRM plans. Regional NRM plans were jointly accredited by state, territory and federal governments and comprised scientifically informed, but regionally negotiated, targets and priorities. These targets comprised time-bound 'resource condition targets' (e.g. halt and reverse the decline of water quality into the Barrier Reef Lagoon by 2020) and associated 'management action targets' (e.g. rehabilitate 25 kilometres of a region's riparian zone by 2015). These plans reflected nationally consistent priorities (e.g. water-quality improvement) and common approaches to target-setting, but focused their attention on addressing regional priorities. Once accredited by federal and state/territory government agencies, plans formed the basis for investment in identified strategic actions from governments, local government, the community and private sectors.

Essentially, NRM carried out at the regional scale and using NRM planning processes that sought consensus and alignment of effort aimed to contribute to sustainable regional and rural development by integrating environmental policies through on-ground implementation (Williams et al. 2005). The regional NRM bodies, with varying degrees of capacity, developed the deep reach into the catchment, local government, landcare

and landholder-based delivery systems required to achieve complex project management and on-the-ground outcomes. There remained also the potential for regions to be able to report on progress on the achievement of targets in a nationally consistent way. Integration with wider regional economic and social development and land-use planning processes was also encouraged.

In the early years, the transition to the new structures and processes posed difficulties in some regions (Farrelly 2005). Implementation of this new national framework had varying strengths and weaknesses across different regions (Lane et al. 2009). Generally, however, it resulted in a shift towards more devolved regional approaches that achieved more integrated NRM (i.e. the application of the subsidiarity principle). With respect to the other governance systems principles articulated earlier, broad themes in systemic improvements that arose from this new approach have included:

- strengthening the scientific basis for decision-making at regional scale, including the integration of the social, economic and environmental sciences (knowledge and innovation)
- experimentation with the establishment of a clear bilateral framework between federal and state/territory governments to mobilise this national approach and to share investment (relationship orientation)
- an increasing level of cross-sectoral collaboration in determining strategic purpose and the alignment and mobilisation of the efforts of multiple parties (relationship orientation)
- progress towards clearer national targets with respect to securing the health of natural resources and a strong focus on monitoring longer-term condition and trend in the health of natural resources, reflecting an outcomes-based approach to investment (accountability)
- increasing the adaptive and longer-term capacity for decision-making of all sectors with a role to play in planning and delivering NRM outcomes (adaptability)
- continuous improvement through joint accreditation of the target-based regional NRM plans and joint designation (an authority to act) of NRM bodies to guide the management of national and state/territory investment at regional scale (adaptability and accountability).

The key role of regional NRM bodies that emerged from these new national governance mechanisms included an increase in coordinated and collaborative action between sectors to resolve local and regional natural resource problems. This played out through enhanced:

- facilitation of local conflict resolution between the agricultural sector and other key sectors such as conservation, urban, mining, tourism, local government and Indigenous interests
- collective planning to review and jointly understand the available natural resource science and the development of jointly agreed targets for improving resource condition and trend
- development of collaborative projects aimed at securing agreed targets
- collective monitoring of resource condition and trend over time.

By and large, the increase in decentralisation of decision-making closer to the local and regional community increased Australia's adaptive capacity to manage natural resources by matching the scale of governance required with the scale of ecological and social processes that need to be mobilised (see Folke et al. 2010). Not all sectors experienced an even distribution of devolved power or appropriate resources, however – for example, the Indigenous sector or the central Australian region. To achieve such an outcome would require a longer-term, target-focused, landscape-scale effort across the nation (e.g. consider the continuity principle). The general national move towards a more nuanced and multi-layered approach, however, in comparison to the blunt and fragmented regulatory resource-use regimes of the past, was a significant governance advance. An integrated NRM framework of this kind, because it was to be focused over long time frames, could be seen to be more resilient in the face of change and shocks compared to remotely managed and fragmented programs (e.g. Folke et al. 2010).

Despite these advances, however, in 2007 a newly elected federal Labor Government, through its new Caring for Our Country program, retreated from a policy-oriented bilateral approach with state and territory governments. It also moved away from fostering the progressive development and continuous improvement of regional NRM plans and longer-term investment based on regional approaches that were continuously refined through outcomes-focused monitoring, evaluation and review. While it did adopt more devolved approaches in Indigenous domains and in some priority regions (e.g. within Great Barrier Reef

catchments), and refocused the geographic distribution of resources, it generally moved towards setting short-term national targets via an annual Caring for Our Country Business Plan and running linked competitive grant funding programs to support cross-regional, regional and local initiatives that could deliver on the national priorities. These changes in direction, in part, resulted from Australian Government responses to:

- pressure from various national interests in the conservation sector to alter the approach
- the high transaction costs associated with policy-oriented bilateral negotiations with state and territory governments
- the findings of the Australian National Audit Office that reporting from the key programs was ‘insufficient to make an informed judgment as to the progress of the programs towards either outcomes or intermediate outcomes’ (ANAO 2008).

Across the nation, many regional NRM bodies concurred with the findings of ANAO (2008) and, indeed, had long been contending that more outcomes-focused (both nationally coordinated and regionally informed) monitoring systems were required. This chapter’s case studies, however, suggest that those changes in the nation’s governance system have had significant implications for the effectiveness of NRM governance at the regional scale and that systemic, MLG principles were not applied in the policy redesign phase.

Cumulatively across the decades, however, progressive Australia-wide reforms in our natural resource governance system have coincidentally established a good foundation for guiding tradable markets in ecosystem services and emerging markets in terrestrial carbon biosequestration for greenhouse gas abatement (van Oosterzee et al. 2010). Consequently, new developments in reform in the nation’s multi-level NRM governance system in 2010 included the then federal Labor Government reviewing the role of regional NRM plans and recognising them as a plank within its recently announced Clean Energy Future initiative. The initiative included a wide range of activities that support not only the reduction of emissions and new renewable technologies, but also the harnessing of old and new ways of thinking about securing landscape resilience and managing/storing carbon in our landscapes. In particular, the initiative allocated \$1.7 billion to facilitate land-sector abatement, including \$44 million to revitalise the nation’s regional NRM plans, with the view that they support landscape-scale adaptation and guide the emergence of

the nation's land sector-based carbon market.<sup>1</sup> The then government also made it clear that reinvigorated NRM planning necessarily would need to sit within a wider national framework for both regional development and NRM management.

Since the election of the federal Coalition Government in late 2013, there are early signs of a shift back towards more devolved approaches to NRM. Hence, the balance of this paper focuses its analytical attention and reform-based conclusions on the governance system as it operated up to that time. This means that our analysis may offer some considered guidance with regard to an emerging new phase of reform in the national governance system.

## Regional roles in the Australian NRM governance system: Perspectives from Queensland's Wet Tropics and southern Tasmania

To explore how these systemic health principles might or might not have been working in late 2013 from a regional perspective within Australia's multi-level NRM governance system, we used two cases: one from Queensland's Wet Tropics and one from Tasmania's southern region. These case study lessons have drawn largely from the experience and observations of two of the authors. In the Wet Tropics case, Allan Dale has previously operated both as the state government co-chair of the Commonwealth/state government joint NRM steering committee (2001–05) and as CEO of Terrain NRM, the regional NRM body for the Wet Tropics (2005–10). With respect to the Tasmanian case study, Kathleen Broderick has previously operated as the CEO of NRM South since 2009. Additionally, through the interaction of all three authors with the National Chairs Working Group and the national group of CEOs of regional NRM bodies, we believe our findings are largely in accord with those of other regions across the nation.

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1 See for example: [www.climatechange.gov.au/reducing-carbon/carbon-farming-initiative/carbon-farming-initiative-handbook/clean-energy-future](http://www.climatechange.gov.au/reducing-carbon/carbon-farming-initiative/carbon-farming-initiative-handbook/clean-energy-future) [Accessed: 24/12/2014].

## Queensland's Wet Tropics region

This region, of about 2 million hectares, comprises conservation, tropical agriculture, urban, tourism, rural residential development and Indigenous land uses (see Dale et al. 2008). Traditional owners (including some 18 different tribal groups) have a mix of historical, cultural and legal interests in all lands in the region. The most productive land is privately owned, while the more rugged parts are mainly leasehold, state forest or national park. Most of the forest in these areas is contained and protected within the Wet Tropics World Heritage Area. Agriculture is the main productive land use with nearly 130,000 hectares under sugar cane, about 25,000 hectares under horticulture, 20,000 hectares under dairy and 700,000 hectares under extensive pastoralism. Improved pastures for grazing account for about 65,000 hectares. In the coastal areas, the main crops are sugar cane and bananas. Extensive grazing is the main land use in the drier, western parts of the region. Forestry has declined in recent times, although rainforest vegetation covers about 95,000 hectares of freehold land. The main land-use trends include ongoing sugar farming and horticultural activities (e.g. bananas and tropical fruits), livestock intensification, private forestry, aquaculture and urban and peri-urban expansion. The balance between the region's primary crops fluctuates over time depending on commodity prices (McDonald and Weston 2004).

The region incorporates most of Queensland's Wet Tropics World Heritage Area (around 1.2 million hectares) and all catchments in the Wet Tropics also flow into the lagoon of the Great Barrier Reef, another world heritage asset of international significance. Consequently, tourism, based on the integrity of the region's world heritage assets and rural landscape, ensures an active regional debate about the need for integrated management of multiple ecosystem services. Losses of agricultural sediments, nutrients and pesticides, apart from diminishing productivity, reduce the resilience of reef ecosystems, while clearing for agricultural expansion competes with the protection of terrestrial world heritage values and the viability of economically important and iconic species, such as the cassowary.

In the last two decades, there has been a particular Queensland Government focus on regulating land management practices to reduce nutrient, sediment and chemical run-off into the reef. Vegetation management has also been heavily regulated. From 2001 onwards, however, the region's NRM plan set agreed foundations for resource condition targets being achieved through a wider range of management

actions, particularly landholder-driven practice changes and incentive-driven approaches, largely coordinated and supported by the region's NRM body, Terrain NRM.

It is expected that, in the coming decade, many of those activities conducted by landholders that are consistent with the regional NRM plan's management action targets could also further drive the achievement of resource condition targets through greenhouse gas (biosequestration and abatement) trading, earning investment for the landholders undertaking best practice activities within the landscape. In turn, this market-based incentive would contribute to reducing deforestation and soil and water degradation, increasing reforestation and improving agricultural community and industry uptake of best-management practices. Wider adoption of these practices would enhance the capacity of the region to secure the resource condition targets agreed to in the regional NRM plan.

## Southern Tasmanian region

The southern Tasmanian NRM region covers some 2.5 million hectares and comprises diverse ecosystems, from rugged coastlines and offshore islands to mountainous terrain, powerful river systems, highlands, forests and grasslands. The region includes five Interim Biogeographic Regionalisation of Australia regions and three Ramsar wetlands. These varied and significant ecosystems provide habitat for many endemic species, such as the swift parrot and the iconic Tasmanian devil. It is a region renowned for its natural values in that they support productive horticulture, fine wool, lamb production and sought-after nature- and culture-based tourism opportunities.

The region's population of approximately 250,000 is centred on Hobart, the state capital, and is also distributed in small towns and hamlets. There are 12 local government areas in southern Tasmania and many of these councils are key partners in NRM delivery.

Southern Tasmanians are active volunteers and there are over 100 local community groups caring for bushland, coastal areas and cultural heritage in the region. Local community groups are also active advocates for the conservation of natural resources. The Indigenous community is actively involved in land management and cultural interpretation of the landscape. Much of the region is protected in reserves, including the Tasmanian

Wilderness World Heritage area, Macquarie Island World Heritage Area, seven national parks and six marine reserves. Significantly, just 5 per cent of the region's land managers manage 75 per cent of the productive land.

Trends in natural resource-based economic activity include increasing lamb production, increased cherry and wine production and increased horticulture and aquaculture. In addition, there has been recent investment in the expansion of existing irrigation schemes and the development of new irrigation areas in Tasmania. While forestry in Tasmania has been a highly politicised issue, and the industry has recently been in decline, it is likely to continue into the future as an important part of the region's economy. Increasingly, residential development and subdivisions on the east coast threaten natural values, as do the effects of climate change, including increasing storm frequency, sea-level rise and associated coastal erosion. Southern Tasmania is a 'hot spot' for climate change effects and the region has benefited from the extensive science community located there. Natural resource managers are increasingly also seeking to adapt to changing conditions and make the most of biosequestration opportunities.

The regional NRM approach has been adopted in Tasmania more recently than elsewhere in Australia, with three statutory NRM regions being established in 2002. The regions work closely with federal, state and local governments to deliver coordinated NRM. The first regional strategy for southern Tasmania was developed in 2005 and was subsequently reviewed in 2010.

## Continuity, subsidiarity and integration: Long-term commitments to continuous improvement

In 2013, regional NRM bodies in both case study regions were a key point of long-term integrated NRM planning, coordinated effort alignment and delivery coordination, and they played an important role in the adaptive management of those more intractable natural resource problems that rely on institutional stability for their progressive resolution (e.g. halting and reversing biodiversity decline or improving water quality). The Australian Government's 2007 retreat from a longer-term systemic approach to the introduction of the more annualised and output-focused Caring for Our Country program initially heralded great financial uncertainty for regional bodies *and* delivery partners in both regions. This was only

partially resolved by the Australian Government eventually committing some 60 per cent of stable pre-2007 investment as guaranteed funding via regional NRM bodies and their delivery partners.

The swing in Australian Government support away from (and now back towards) integrated regionalism and continuously improving regional NRM arrangements over the previous five years temporarily reduced institutional stability and increased financial and policy uncertainty in the short- to medium-term in both regions. In the Wet Tropics, while Terrain NRM fared well under the new national competitive system under the Caring for Our Country program (e.g. securing significant Reef Rescue funding), from 2007 there was a parallel short-term collapse in stable investment for other key areas (e.g. biodiversity, pest management and Indigenous land and sea management). It is also worth noting that the region's capacity to secure Reef Rescue funds was, in part, a legacy from the stable institutional arrangements operating pre-Caring for Our Country.

Additionally, in both states, the Australian Government's shift away from bilateralism had the potential to leave the regions more vulnerable to shifting policy environments within the state government.

In the Wet Tropics, introduction of the Caring for Our Country program also stalled progressive improvements in the development of regionally cohesive delivery systems in local government, the conservation sector, in Indigenous and the landcare and catchment management sectors. On the other hand, time-bound programmatic funding (with a specific investment horizon) via the Reef Rescue Program improved capability in the agricultural sector. This gain in capacity could, however, suffer setbacks in the absence of more modest and longer-term regional attention to improving delivery arrangements post-Reef Rescue, even though significantly improving reef water quality will be a multi-decadal enterprise.

In both regions, continued state government support for regional NRM has acted as a buffer against the changes to Australian Government programs. The commitment to regions and regional planning, while only minimally resourced by the states, provided some continuity. This, however, is not a uniform national picture, with some states stepping back from the regional model.

In solving longer-term natural resource problems, Australia's NRM governance arrangements will need to more reliably apply the subsidiarity principle, avoiding the 'roller-coaster' effect in investment in key assets and the 'lucky dip' effect in investment between different asset areas. Indeed, a longer-term, albeit modest, commitment to a holistic, regionally driven and bilaterally mobilised NRM framework would be needed to progress the delivery of the wider range of management actions required to achieve the national outcomes envisaged under programs like Caring For Our Country.

### **Holism, system orientation, relationship orientation and resilience: The national value of regional NRM plan development, coordination and effort mobilisation**

Perhaps one of the greatest regional implications of the federal Labor Government departing from structured bilateralism and the support for continuous improvement in regional NRM plan development and accreditation has been the significant retraction of the resources levered from other investors on the basis of the Australian Government's regional investment. This has reduced the purchasing power of federal and state government dollars for NRM action because local in-kind and cash investment became more difficult to attract and to retain in short-term and *ad hoc* projects. The shift to a nationally competitive grants-based approach (albeit with strategic regional guidance) diminished collaborative approaches in both regions and made strong priority-setting processes and the development of durable delivery systems less effective.

Under Caring for Our Country, the importance of regional NRM plans was diminished. Consequently, this diminished the influence of regional communities in setting federal and state government investment priorities in both case regions. The decline of federal/state bilateralism saw the Queensland Government withdraw significant investment from regional NRM, retreating to much narrower annual financial commitments. Towards the end of 2013, the implications in both regions had included:

- less alignment between state and federal government policy and investment priorities
- reduced state government investment via regional NRM bodies

- diminished alignment of local government, industry and community investment against agreed targets and government investment
- declining collaborative effort among major regional institutions, including state agencies, regional NRM bodies, statutory authorities, research institutions and voluntary regional organisations of councils. Increased competition increased the transaction costs facing all parties in securing investment, with no consequent increase in funding availability
- declining delivery capability within many NRM players involved in planning and delivery.

In the Wet Tropics and in southern Tasmania, for example, a retreat from bilateralism and coordinated regionalism significantly increased the overall transaction costs within regional communities, with multiple parties in all sectors having to spend considerable resources on developing project proposals with low success ratios. The transaction cost for communities developing multiple, poorly coordinated proposals increased, thereby reducing the cost-effectiveness of investment in the region.

From a Wet Tropics perspective, project decision-making became highly centralised, resulting in far less efficient decision-making and poorer regional-scale integration of multiple investments. The capacity of the regional NRM bodies in both regions to align strategic state government effort declined as a result. Cross-departmental coordination of effort (previously arranged through the state's regional coordination groups) evaporated, further marginalising the influence of regional institutions in policymaking.

Reforms in 2010/11 under the Clean Energy Futures framework were of great significance, as they had the potential to result in ecosystem service markets and products of international standing. It was envisaged that enhancing and updating the regional NRM plans had the potential to attract and guide these emerging ecosystem service markets, and that these in turn could become transformative in the way that they could support the agricultural and land-use sectors to trade in greenhouse gas abatement and other complimentary ecosystem services (like biodiversity) within their enterprises. Importantly, enabling mitigation and abatement activities to become ecosystem service commodities would have also allowed the regional model to adjust to climate change and its impacts rather than letting these highly vulnerable regions be overwhelmed by it. Consequently, under the current federal Coalition Government, regional

NRM plans in both regions have been upgraded and revitalised in recent years as a regionalised framework for guiding investment under the nation's currently unfolding Carbon Farming Initiative (see van Oosterzee et al. 2012).

In both regions, potential biosequestration and greenhouse gas abatement activities (most securing a range of multiple ecosystem service benefits) include avoided deforestation, avoided degradation, reforestation using native species and agricultural land management through increasing soil carbon, pasture cover and fertiliser-use reduction. Using an enhanced regional NRM plan (with spatially specific, regional priorities for action and practice improvement) that meets standards agreed at the national and state level is expected to provide a strategic framework for the aggregation of carbon sequestration activities for the market. This will enable the delivery of complementary biodiversity, agriculture, water quality and community benefits (Wentworth Group 2008). Ongoing and adaptive refinement of the regional NRM plan over time will further enhance its efficacy in guiding the market. Next generation NRM plans, for example, will need greater spatial detail. As such a cohesive national and state commitment to continuous improvement in regional NRM is required now more than ever.

## Innovation and accountability: Collaborative research and knowledge management

Without systemic knowledge brokerage and collaborative regional research frameworks, federal government and state investment in NRM research and development tends to be strongly researcher or funding agency driven. This reduces the regional impact of research and its ability to be strategically applied to long-term natural resource decision-making. From 2006 to 2010, the Wet Tropics region was well supported by a cohesive research program run through the Reef and Rainforest Research Corporation (RRRC), an independent research broker funded through the Australian Government's Marine and Tropical Sciences Research Facility. The RRRC's governance arrangements effectively represented and involved both researchers *and* regional end-users. Under these arrangements, the RRRC involved regional end-users in determining research priorities, selecting priority projects, project oversight and uptake. Indeed, as a precursor to the RRRC model, the region's original

Rainforest Cooperative Research Centre informed the regional NRM planning process. The arrangements were crucial in the development and implementation of major investments, such as the Reef Rescue Program.

After 2010, the federal Labor Government tended to centralise control and management of significant regional NRM and environment research programs, although broad regional consultation arrangements did remain in place. In the experience of the Far North Queensland region's four NRM bodies, this new approach focused more on better informing the Australian Government with regard to the operation of the *Environment Protection and Biodiversity Conservation Act 1999*. As a result, these regions consider that this represented a shift from well-negotiated and more regionalised program-based partnerships towards more fragmented and centralised project end-user relationships. In their view, this created higher transaction costs for regional communities, and regional NRM bodies were consequently less able to inform the development and monitoring of their internal programs with well-engaged science management arrangements. They also considered that this approach had reduced the capacity of their regional communities to influence policy and investment decisions affecting NRM in the north. Such observations concerning the importance of regionalised and localised knowledge brokerage arrangements are reflected in the findings of Petit et al. (2011) with regard to NRM approaches in Victoria.

### **Adaptability: Environmental accounts, reporting and adaptive management**

The value of establishing a clear national framework for measuring (and responding to) the actual regional (resource condition) outcomes from NRM policy and investment is one of the foundations needed for adaptive management of the nation's natural resources. A national framework could easily be informed, in a consistent way, by aligned approaches across all states and territories and, in turn, across all regions. Apart from such an approach enabling consistent and adaptive regional management systems, it would ensure a high-quality information base for national decision-making.

In the Wet Tropics, by 2013, regional NRM body effort towards reporting on resource condition was affected by the declining policy influence of regional NRM plans, the withdrawal of strategic funding and a government focus on monitoring and evaluating project-level outputs (Australian Government 2011b).

Tasmanian regions had not stopped planning and reporting on their regional strategies and the three Tasmanian regions reviewed and renewed their strategies in 2010. These strategies, however, were developed in the absence of a national accounting system and before the identification of greenhouse gas abatement opportunities required updating to accommodate the expanded role.

From a regional perspective, making and maintaining a cohesive, science-driven and evidence-based argument about the condition and trend of critical natural resources greatly empowers the capacity of regions to devise effective solutions that might enable a policy change or investment response from governments. It also helps mobilise the inherent efforts of the region's key land managers.

Between 2007 and 2010, there was a shift away from building a nationally integrated resource condition monitoring framework that has clear mechanisms for influencing policy and investment. National monitoring frameworks for key assets were progressing (e.g. water and vegetation) through fragmented effort, and this weakened the capacity of both case study regions to influence state and national policy and investment agenda. It also made it more difficult to mobilise and motivate cohesive regional and local efforts with regard to aligning critical natural resource actions. Additionally, a less-focused national framework resulted in a decline in coordinative effort within the states with regard to holistic resource condition and trend monitoring. This had the potential to lead to a reactive regional governance culture. Being reactive versus proactive to major issues once they emerge would also increase the cost of the responses required.

Within both regions, Caring for Our Country focused more effort on fragmented, multiple project-based investments in monitoring and evaluation research. Many of these project-based approaches were poorly integrated, short-term and often did not contribute well to the building of a strong evidence-based case regarding regional natural resource decline. It could have been that more money was being spent on monitoring and

evaluation work, with less influence on improving the tractability of critical NRM problems. Progressing towards a more strategic resource condition monitoring framework would have been cheaper and more effective than a focus on multiple, project-oriented approaches at the regional scale.

In recognition of these issues, since 2007, collaborative, pilot-based work on monitoring and reporting regional natural resource condition and trend within a national accounting context has been progressing in partnership between regional NRM bodies and the Wentworth Group of Concerned Scientists. This could form the basis for positive new thinking and development in this area.

## Improving MLG: Potential national reforms to enhance outcomes at regional and local scales

The above illustrates that, over the last few decades, there has been dramatic maturation in Australia's multi-level framework for the governance of natural resources. While the health of different parts of the system may have waxed and waned along the chronology of events explored, overall the system now sets a strong foundation for sustainable governance of our resources in the longer term. Our intent here is to inform directions for continuous improvement rather than to simply articulate system weaknesses. Consequently, based on principles articulated in Ryan et al. (2010), through observations from the above case studies, and through the involvement of regional NRM bodies across Australia, we outline below several high-level reforms that are needed for a healthier and more integrated national multi-level NRM governance system to emerge.

### A more enduring national NRM infrastructure

We consider that a more enduring infrastructure would build upon the principles of subsidiarity, integration, holism, relationship orientation, innovation, accountability and adaptiveness. To avoid our national system oscillating from one governance approach to another, we consider that it is important for both the federal and state/territory governments to commit to long-term and durable NRM arrangements at national, state, regional and local scales.

First, we recommend better integration of strategic natural resource management issues within ministerial council arrangements under Australia's Council of Australian Governments (COAG) arrangements. At present, there remains the potential for fragmentation in the treatment of integrated NRM issues across the federal, state, territory and local governments. Consequently, the more integrated consideration of continuous improvements in the nation's NRM governance systems has the potential to fall through the cracks.

A new and effective national institution (or perhaps enhanced scope within the Productivity Commission) is also needed to fill an overview and evaluative gap within our national NRM governance system, particularly given the abolition of the National Water Commission in the 2014/15 Commonwealth budget and the demise of Land and Water Australia in 2009. A lean but independent body established with defined links to COAG arrangements could harness cross-sectoral and academic expertise and provide advice to governments and the Australian people on matters of national NRM interest. It could complement NRM commissions that already exist in some states (e.g. the NSW Natural Resources Commission). Such a body, with a wider and more integrated remit and a focus on the health of our NRM governance system, would provide considerable added value and continuity.

The role of such a body could encompass responsibility for coordinating the monitoring, collection and interpretation of national environmental accounts; setting standards and accrediting NRM service providers; developing national NRM knowledge strategies; coordinating national NRM knowledge activities; commissioning strategic research; providing advice to the Australian Government on national plans and strategies; and monitoring of the nation's overarching NRM governance system and its health. The benefits of an independent body carrying out such roles could include an increase in transparency and trust about NRM decision-making, increasing accountability and enhanced retention of the nation's corporate knowledge concerning such issues. Such an organisation could also be responsible for advocating the integration efforts across disparate policy elements (e.g. NRM and regional development), increasing the stability of some of the key ingredients of good NRM governance and giving public recognition to the importance of building stable NRM infrastructure in Australia.

## A national NRM framework and strategy and effort alignment across and within governments

While higher-level strategic policy reform at COAG level is important, it is equally important that there is serious effort taken to lead and integrate improved NRM governance systems across the nation's governments and within the Australian Government's administrative arm. We consider that such reform, in part, addresses the principles of permanence, subsidiarity, integration, holism, relationship orientation, innovation, accountability and adaptability. COAG effort could set the scene for a more outcomes-focused approach (e.g. perhaps via a national NRM framework and strategy) to ensure strategic thinking at the national scale. A national NRM strategy could identify the importance of the nation's assets, set national targets and result in a five- to 10-year integrated investment program for cohesive national and state/territory government Cabinet and Treasury consideration. Such a strategy would need to be genuinely strategic and collectively negotiated with the nation's peak sectors and stakeholders with an interest in NRM.

With a strong framework and strategy in place, effort alignment towards implementation could then focus on mobilising resources within and across governments and aligning the effort of a wide range of industry and community sectors across the nation. A genuinely collaborative Australian NRM framework and strategy would also need to be informed by state/territory objectives and regional NRM plans (and vice versa) in an iterative fashion. Under such a national NRM framework, key opportunities for targeted policy reform across the nation and within individual states and territories could be pursued via more policy *and* investment-oriented agreements that more directly involve local government.

Such reforms could better guide the Australian Government's contemporary NRM policy and investment funding arrangements in the longer term. Longer-term and outcome-focused national NRM targets could better guide mid-short-term program directions (Caring for Our Country, for example, was just one Australian Government program driven by an annual business plan). Some core, longer-term, flexible state-wide and regional investments need to be retained and enhanced to mobilise more adaptive state government, regional NRM, industry, local government and community capacities. Program and investment

alignment across Australian Government agencies would increasingly be required (e.g. water, climate change, drought and disaster assistance, employment programs, Indigenous health).

Additionally, administrative governance for major Australian Government investment programs need greater simplicity and more stable, longer-term contractual delivery systems (e.g. comprise less annual grant-based approaches and more strategic and stable devolved delivery systems that uphold the principles of market-based competitiveness). National programmatic components need to remain for significant cross-jurisdictional and cross-regional agendas where they are better delivered nationally to achieve the nation's agreed priorities. Any community-level grant-based systems that are retained nationally can be strengthened by better aligning them with devolved and integrated regional planning and delivery systems. Finally, a stronger mechanism is needed to bring together Australian Government and state investors with regional NRM bodies to ensure effort is coordinated and benefits maximised.

## **A framework for integrated regional planning and delivery**

This reform, in part, addresses the principles of permanence, subsidiarity, integration, holism, system orientation, relationship orientation, resilience, innovation, accountability and adaptability. Regional NRM bodies are a key component in the nation's NRM infrastructure, but they equally need to be focused on continuous improvement and on strengthening the capacity of key NRM delivery agents at regional, sub-regional and local scale (e.g. landcare groups, industry bodies, Indigenous groups, local government). Regional NRM plans, led and facilitated (but not solely owned) by regional NRM groups, are, in effect, a form of regional-scale strategic environmental assessment. Under an enhanced national NRM framework, the federal and state/territory governments could jointly monitor the health of regional NRM planning and its ability to deliver effective natural resource outcomes. Regional NRM bodies would also need to be more explicitly contracted to play these key planning, effort-mobilisation and capacity-building roles.

Formal federal, state and territory government commitment to progressively improving the standard and effect of regional NRM plans would ensure regional NRM bodies could (see Dale et al. 2013):

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- ensure and sustain effective community-wide engagement and capacity building
- effectively undertake regional NRM planning and mobilise community support
- ensure effective partnership development, governance and program delivery
- ensure alignment of national, state and regional priorities
- better align regional NRM plans with statutory land-use plans.

The Australian Government could, by agreement, work with the states to continue to actively support continuous improvement in regional NRM planning and governance. The current system of aspirational, resource condition and management action targets has served regions well to this point and could be continued, taking account of Australian Government planning, state NRM plan and regional plan priorities. This needs to be refined, however, towards an increasing focus on building more resilient landscapes. Most importantly, regional NRM plans should remain the foundation for continuous adaptive management based on regional effort alignment to secure agreed targets, ensuring plan currency and a focus on monitoring plan implementation. Annual regional progress reports could be compiled to keep a focus on target achievement. Regional state of the environment (SoE) or a set of regional natural resource accounts could then influence state and national SoE reporting or accounting systems. State and national SoE reporting or accounting would need to better influence policy-setting and resource allocation within their respective governments than is currently the case.

### More collaborative frameworks for research and knowledge management

This reform, in part, addresses the principles of integration, system orientation, relationship orientation, resilience, innovation and adaptability. Stronger alliances between research funders (including Commonwealth environment research facility hubs), state agencies, research providers, regional NRM bodies and other sectors could provide better models for linking more coordinated and brokered NRM research within a stronger strategic governance framework. Research users, such as regional NRM bodies, could have stronger 'purchasing power' through better regional collaborative science partnership and brokerage

arrangements, creating additional efficiency with shared research, knowledge and information management at appropriate scales. Increased investment in applied NRM research would increase the evidence base for NRM policy and management at a range of scales across the nation (see Campbell 2005). Since the wind up of the research and development corporation Land and Water Australia there is also no clear national framework for NRM knowledge management and brokerage.

### **A national system of environmental accounts, reporting and adaptive management**

This reform, in part, addresses the principles of integration, holism, accountability and adaptability. Currently, SoE reporting does report on resource condition and pressure indicators for our key natural assets, but there is no clear adaptive framework to identify, implement and evaluate the key actions required (see Wentworth Group 2008). There is also no link between SoE reporting and major direction-setting and resource allocation by Australian and state/territory government cabinets and treasuries. This could be changed by linking the reporting process to the proposed national NRM framework and strategy and via development of a standardised set of national natural resource accounts, perhaps resulting in a major five-year program cycle for Cabinet consideration and the potential for alignment of effort across all sectors (including industry, conservation and landcare).

Such an approach could effectively align effort across existing biodiversity, water and sustainable agriculture programs across federal and state/territory governments. Based on evidence from the national accounts, and coordinated through a national independent NRM body or institution (as mentioned above) and revitalised ministerial council arrangements, a process for continuous improvement in the effectiveness of the nation's NRM governance systems is also required. This could incorporate a strong focus on building a culture of continuous improvement within and among regional NRM bodies. Regional bodies across the nation are increasingly adopting standardised approaches to continuous improvement specifically developed for the NRM sector. Examples of strong emerging approaches can be found in New South Wales, Queensland and South Australia (e.g. Vogel and Zammit 2004). These approaches should continue to be enhanced, supported and coordinated, enabling regional NRM bodies to undergo regular performance reviews focused on continuous

improvement and perhaps securing specific investment to facilitate strategic approaches to performance enhancement at the regional scale or collectively.

## Conclusions

This chapter has outlined some key principles that are needed to underpin the effective operation of our nation's natural resource governance system at multiple scales. These principles, applicable at any level in the system, include permanence, subsidiarity, integration, holism, system orientation, relationship orientation, resilience, innovation, accountability and adaptability. In this context, we have reviewed the evolution of the current multiple layers that exist within Australia's NRM governance system, but we have focused our attention on the interaction between the national and regional scales. We have intentionally explored these issues from the viewpoint of regional NRM bodies and consider that debate on such reforms needs to be genuinely cross-government and cross-sector.

By applying these key principles, we have considered how current MLG arrangements are playing out at the regional scale through the practical experiences of both Wet Tropics and southern Tasmanian regional case studies. Observations from these case studies draw out current system strengths, weaknesses and trajectories. The experiences outlined in our case studies have been frequently echoed by our regional body colleagues and other key natural resource stakeholders across the nation. We have used these principles and case study observations to guide our thoughts and discussion concerning the sort of reforms required in the overall national multi-level NRM governance system that would have particular resonance for Australia's regions. While the principles articulated need to be operative at all scales, we have applied them specifically to identify key national reforms that might improve the operating environment for NRM at the regional scale. Resolving the health of governance arrangements at all scales, however, will ultimately be required.

Our aim has been to spark increased national debate about what constitutes an effective national system of multi-level natural resource governance and to encourage active dialogue on the sort of targeted reforms that might help improve the health of the system. It should be stressed, however, that in international terms, Australia has a world-class national system

for the governance of natural resources, with many strong features and characteristics. This chapter explores some of the current opportunities for progressive and continuous reform and improvement.

At the time of writing, both the Australian Government and, in our case study regions, the Queensland and Tasmanian governments, have been actively engaged in discussion with regional NRM bodies and other sectors about directions for further improvement in the nation's multi-level NRM governance system. There continues to be much scope for all of the nation's governments (federal, state, territory and local) to continue to work closely with all parties involved in NRM towards progressive reform opportunities.

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## References

- ANAO (2008). *Regional Delivery Model for the National Heritage Trust and the National Action Plan for Salinity and Water Quality: Audit Report 21*. Australian National Audit Office, Canberra.
- Australian Government (2001). *Intergovernmental Agreement on a National Action Plan for Salinity and Water Quality between the Commonwealth of Australia, New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, the Northern Territory and the Australian Capital Territory*, [nrmonline.nrm.gov.au/downloads/mql:2419/content](http://nrmonline.nrm.gov.au/downloads/mql:2419/content) [Accessed: 26/12/2014].

- . (2011a). *The Review of Caring for our Country: Australia's Natural Resource Management Initiative*. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- . (2011b). *Monitoring, Evaluation, Reporting and Improvement Strategy*. Department of Sustainability, Environment, Water, Population and Communities, Canberra.
- Australian Government & Queensland Government (2009). *Reef Water Quality Protection Plan: For the Great Barrier Reef World Heritage Area and Adjacent Catchments*. Reef Water Quality Protection Plan Secretariat, Queensland Department of the Premier and Cabinet, Brisbane.
- Campbell, A. (2005). *Knowledge for Managing Australian Landscapes: Analysing the Australian NRM Knowledge System*. Land and Water Australia, Canberra.
- Cash, D., Adger, W., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L. & Young, O. (2006). Scale and Cross-Scale Dynamics: Governance and information in a multilevel world. *Ecology and Society*, 11(2): 8. doi.org/10.5751/ES-01759-110208
- Commonwealth of Australia (1999). *Managing Natural Resources in Rural Australia for a Sustainable Future: A Discussion Paper for Developing a National Policy*. Commonwealth Government Publishers, Canberra.
- . (2004). *Interim Biogeographic Regionalisation of Australia*. Commonwealth of Australia, Canberra.
- . (2009). *Carbon Pollution Reduction Scheme Bill: Commentary*. Department of Climate Change, Canberra.
- Dale A., McDonald G. & Weston N. (2008). Integrating Effort for Regional Natural Resource Outcomes: The wet tropics experience. In: Stork, N. & Turton, S. (eds) *Living in a Dynamic Tropical Forest Landscape*. Blackwell Publications, Malden. doi.org/10.1002/9781444300321.ch32
- Dale, A., McKee, J., Vella, K. & Potts, R. (2013). Carbon, biodiversity and regional natural resource planning: Towards high impact next generation plans in Australia. *Australian Planner*, 50(4): 328–39. doi.org/10.1080/07293682.2013.764908

- Farrelly, M. (2005). Regionalisation of Environmental Management: A case study of the National Heritage Trust, South Australia. *Geographical Research*, 43(4): 393–405. doi.org/10.1111/j.1745-5871.2005.00342.x
- Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T. & Rockström, J. (2010). Resilience Thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4): 20. doi.org/10.5751/es-03610-150420
- Gunningham, N. (2009). The New Collaborative Environmental Governance: The localization of regulation. *Journal of Law and Society*, 36: 145–66. doi.org/10.1111/j.1467-6478.2009.00461.x
- Keogh, K., Chant, D. & Frazer, B. (2006). *Review of Arrangements for Regional Delivery of Natural Resource Management Programs*. Departments of Environment Water Heritage and the Arts, Agriculture, Forestry and Fisheries, Canberra.
- Lane, M., Robinson, C. & Taylor, B. (2009). *Contested Country: Local and regional natural resources management in Australia*. CSIRO Sustainable Ecosystems. CSIRO Publishing, Collingwood, Australia.
- Lockie, S. & Vanclay, F. (eds) (1997). *Critical Landcare*. Key Paper Series No. 5. Centre for Rural Social Research, Charles Sturt University, Wagga Wagga, New South Wales.
- McDonald, G. & Weston, N. (2004). *Sustaining the Wet Tropics: A Regional Plan for Natural Resource Management*. Rainforest CRC and FNQ NRM Ltd, Cairns, Australia.
- MDBA (2010). *Guide to the Proposed Murray–Darling Basin Plan*. Murray–Darling Basin Authority, www.mdba.gov.au/kid/guide/ [Accessed: 24/12/2014].
- Ostrom, E. & Cox, M. (2010). Moving beyond Panaceas: A multi-tiered diagnostic approach for social–ecological thinking. *Environmental Conservation*, 37: 451–63. doi.org/10.1017/S0376892910000834
- Parker, C. & Braithwaite, J. (2003). Regulation. In: Cane, P. & Tushnet, M. (eds) *The Oxford Handbook of Legal Studies*. Oxford University Press, p. 119.

- Petit, C., Ewing, S., Coffey, B., Geraghty, P., Hocking, G., Meyers, N., Butters, S. & Weston, M. (2011). Exploring the Potential of Knowledge Brokering to Enhance Natural Resource Management: Findings from the Catchment Knowledge Exchange project in Victoria. *Australian Journal of Environmental Management*, 18(4): 233–47. doi.org/10.1080/14486563.2011.623337
- Productivity Commission (2003). *Impacts of Native Vegetation and Biodiversity Regulations: Draft Report*. Australian Government, Canberra.
- Ryan, S., Broderick, K., Sneddon, Y. & Andrews, K. (2010). *Australia's NRM Governance System: Foundations and Principles for Meeting Future Challenges*. Australian Regional NRM Chairs, Canberra.
- van de Koppel, J. & Rietkerk, M. (2000). Herbivore Regulation and Irreversible Vegetation Change in Semi-Arid Grazing Systems. *OIKOS*, 90: 253–60. doi.org/10.1034/j.1600-0706.2000.900205.x
- van Oosterzee, P., Preece, N. & Dale, A. (2010). Catching the Baby: Accounting for biodiversity and the ecosystem sector in emissions trading. *Conservation Letters*, 3(2): 1–8. doi.org/10.1111/j.1755-263x.2009.00090.x
- . (2012). An Australian Landscape-Based Approach: AFOLU mitigation for smallholders. In: Wollenberg, E., Nihart, A., Tapio-Biström, M.-L. & Grieg-Gran, M. (eds) *Climate Change, Mitigation and Agriculture*. Earthscan, London.
- Vogel, N. & Zammitt, C. (2004). *Performance Excellence for Regional Natural Resource Management Organisations*. AKM Group and University of Southern Queensland, Toowoomba.
- Wentworth Group (2008). *Accounting for Nature. A Model for Building the National Environmental Accounts of Australia*. Sydney.
- Williams, J., Beeton R. & McDonald, G. (2005). Means to Ends: Success attributes of regional NRM. In: Kungolos, A., Brebbia, C. & Beriatos, E. (eds) *Proceedings of Second International Conference on Sustainable Development and Planning: Sustainable Development and Planning II*. Bologna, Italy, pp. 691–720.

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