



MANAGING VEGETATION AT
THE LANDSCAPE SCALE

DRAFT REPORT

September 2006



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SEPTEMBER 2006

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Submissions

There is no standard format for submissions. Submissions must be made in writing and sent to the postal address, fax number or email above clearly marked to refer to the review of landscape vegetation plans.

Submissions must be received by 22 December 2006.

Shortly after receipt, the NRC will make submissions publicly available unless clearly marked confidential. Claims for access to confidential submissions will be determined in accordance with the *Freedom of Information Act 1989*. All submissions will be treated in accordance with the *Privacy and Personal Information Act 1998*. Any personal information given to the NRC will not be used for any other purpose.

List of acronyms

CAP	Catchment Action Plan
CMA	Catchment Management Authority
CSIRO	Commonwealth Scientific and Research Organisation
DEC	Department of Environment and Conservation
DNR	Department of Natural Resources
LMU	Land Management Unit
LPLMC	Liverpool Plains Land Management Committee
NRC	Natural Resources Commission
NRM	Natural Resource Management
NSW	New South Wales
PAMS	Property Administration and Management System
PVP	Property Vegetation Plan
RAMA	Routine Agricultural Management Activity

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Foreword

The Natural Resources Commission (NRC) has been asked to review a range of issues associated with property vegetation planning at the landscape scale and multi-property vegetation plans. This Draft Report represents a significant piece of work, with NRC staff having undertaken consultation with a wide range of stakeholders and natural resource management experts, and detailed research on the subject.

The Draft Report outlines:

- what is meant by landscape planning and its importance in the effective management of natural resources
- the benefits that can be gained from multi-property vegetation plans when developed in the landscape context
- a proposed approach to assessing multi-property vegetation plans
- changes to improve the links between the various mechanisms influencing natural resource management in the State, for example, the Standard and state-wide targets, Catchment Action Plans and the Property Vegetation Plan Developer.
- market mechanisms that may be applied to natural resource management.

Before I am able to deliver my final advice to the Minister for Natural Resources and the Minister for the Environment on these matters, the NRC will undertake further consultation with interested stakeholders. As well as piloting the proposed approach to assessing multi-property vegetation plans, workshops will be held with stakeholders over the coming months on the issues raised in this Draft Report.

This review represents a significant opportunity to ensure that the mechanisms governing the management of natural resources in the State are effective. I look forward to all stakeholders inputting constructively to the process, before I provide my final advice to the Ministers.

Dr John Williams
Commissioner

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1 Introduction

In December 2005, the Ministers for Natural Resources and the Environment asked the Natural Resources Commission (NRC) for advice on:

- Whether vegetation management plans developed at a landscape scale (involving large areas of land or multiple landholders) had the potential to simultaneously achieve greater environmental and economic outcomes than plans developed at the scale of individual properties.
- How Catchment Management Authorities (CMAs) might assess proposed landscape scale vegetation plans where they extend across multiple properties, and for the NRC to illustrate this advice using any available case studies.
- Any improvements in the current *Environmental Outcomes Assessment Methodology* (Assessment Methodology), *Property Vegetation Plan (PVP) Developer* and CMA procedures necessary to implement such an approach under the *Native Vegetation Act 2003* (the Act), if it were viable.

The full terms of reference for the review are in Attachment 1. In December 2005 the NRC released an Issues Paper for this review and received 26 submissions in response.¹ A list of submissions is included in Attachment 2.²

The NRC also met with many stakeholders and held an expert workshop to explore the potential benefits of managing vegetation at the landscape scale.

The purpose of this Draft Report is to present and explain the NRC's findings and draft recommendations, and to seek any comment on these by 22 December 2006.

The NRC is also conducting a pilot case study to test and further develop the recommended assessment method CMAs might use for multi-property vegetation plans. The NRC has released a document outlining the pilot process.³ Further, the NRC will be conducting a series of workshops with interested stakeholders over coming months in order to discuss the issues raised in this Draft Report and to seek feedback on the Report's recommendations.

1.1 Benefits of managing vegetation at the landscape scale

There is strong evidence that managing vegetation more explicitly within its landscape context creates the potential to better align land-use with biophysical capacity and processes, allows more flexibility to optimise agricultural production through time, and helps target Natural Resource Management (NRM) investment.

Section 2.3 explains how managing vegetation at a landscape scale can increase the potential for CMAs and landholders to:

- manage ecosystem function at the optimal scale

¹ At the request of stakeholders, the NRC extended the date for submissions. The Minister granted the NRC an extension to the timeframe for this review given the timing of receiving these submissions and the complexity of the issues raised.

² Submissions can be accessed at <http://www.nrc.nsw.gov.au/submodule.aspx?id=45>

³ Natural Resources Commission (2006) *Pilot Process – Guide for multi-property vegetation plans*, September 2006, accessed at www.nrc.nsw.gov.au

- achieve integrated environmental, economic and social benefits
- optimise land-use across the landscape
- realise the value of environmental assets and services
- realise economies of scale
- optimise outcomes by creating greater choice
- increase environmental stewardship
- make greater progress towards regional, state and national resource condition targets.

A landscape based approach to managing vegetation reflects a broader principle; an essential element of managing all natural resources well is a good understanding of scale.⁴

Understanding scale includes, for example, the appropriate biophysical scale at which the natural environment functions, the relevant institutional and community scales affecting the management and use of natural resources, and the time scales over which the natural environment responds to any disturbance or management.

To improve CMAs' capability to manage vegetation at a landscape scale, this Draft Report recommends some improvements to the PVP Developer and a new assessment method for proposed vegetation plans that extend across multiple properties. If these recommendations are implemented, both mechanisms will:

- guide CMAs and landholders on how to manage native vegetation explicitly within its landscape context, and
- better assist CMAs to implement the Act consistent with the NSW Government's intent to end broadscale clearing of remnant native vegetation⁵ unless it improves or maintains environmental outcomes, and to encourage revegetation and rehabilitation of native vegetation.

CMAs should be better able to support landholders to manage vegetation at the landscape scale, whether this is via plans that cover individual properties or plans that extend across multiple property boundaries.

1.2 Multi-property vegetation plans

In Chapter 4, the NRC recommends how CMAs should work with landholders to develop vegetation plans that extend across multiple property boundaries, and how the CMAs should recommend these for approval by the Minister. The NRC believes such multi-property plans have the potential to achieve significantly better outcomes than plans developed at the scale of individual properties within the same landscapes.

However, previous experience with this type of planning in NSW suggests this is a challenging task. To realise this potential first requires landholders across a large geographic area to have enough common interests to negotiate a common management plan.

⁴ Natural Resources Commission, *Guide to Using the standard for Quality Natural Resource Management*, September 2005 pp. 13-18.

⁵ Remnant native vegetation is defined in Section 9 (1) of the Act as any native vegetation other than regrowth. Regrowth is native vegetation that has regrown since dates specified in the Act. In this paper the NRC generally refers to remnant native vegetation as native vegetation.

Where it is possible to negotiate a common management plan, there remain unique challenges to ensure all parties across multiple properties abide by the plan for its duration. The pilot process the NRC is undertaking will include consideration of the most effective method of monitoring implementation of the plan and enforcing its provisions. Ultimately, it may be necessary for a multi-property plan to be developed as a group plan, but enforced as a number of individual contracts with transparent 'off-farm offsets'. These offsets would involve a sub-set of landholders who are seeking to develop their properties (that involves clearing remnant native vegetation or protected regrowth) paying other landholders to offset the impact of the development by improving the management of native vegetation on their properties.

The NRC's proposed method for assessing multi-property vegetation plans (Chapter 4) could be implemented relatively quickly as either an additional chapter of the Assessment Methodology, or by amending Clause 26 of the *Native Vegetation Regulation 2005* to permit the proposed method as an alternate way in which a proposed plan can be assessed against the requirement to improve or maintain environmental outcomes.

1.3 Single-property vegetation plans

Where it is not practical to jointly develop plans across multiple properties, CMAs will still need to be able to promote and assess vegetation plans negotiated with individual landholders.

The NRC has recommended a series of 'second generation' improvements to the Assessment Methodology and PVP Developer software to help better support CMAs and landholders to better understand how landscapes function. These improvements will allow the negotiation of single-property vegetation plans that maximise the likelihood of the plan improving the health of those landscapes and contributing significantly to CMAs' Catchment Action Plan (CAP) targets.

These improvements to the PVP Developer would assist CMAs to achieve some of the potential benefits of managing vegetation at the landscape scale and are discussed in Chapter 5. These amendments would require significant enhancement to the current PVP software.

Given the significant work underway within agencies and CMAs to bed down the current PVP Developer, this work would ideally be done when the PVP Developer is migrated to a new technology platform in 12 to 18 months.

1.4 Using market mechanisms to manage vegetation

Whether CMAs develop vegetation plans at the scale of multiple or single properties, greater use of 'off-farm offsets' would open up significantly more opportunities to better engage landholders in improving and maintaining natural resources and the ecosystems and communities which depend on them.

In Chapter 6 the NRC explores how emerging work on environmental markets could build on elements of the PVP Developer and other NSW Government projects in this area.

1.5 Structure of this report

The following chapters discuss the NRC's recommendations on how CMAs might promote both multi-property and single-property vegetation plans to implement the *Native Vegetation Act 2003* and their CAPs to restore the health of our landscapes and make progress on the Government's state-wide targets to improve natural resources across NSW.

In this Draft Report:

- Chapter 2 defines what the NRC means by managing vegetation at the landscape scale and identifies the potential environmental and economic benefits of doing so.
- Chapter 3 explains why CMAs need to manage native vegetation at the landscape scale (and all natural resources at their appropriate scale) to successfully implement the Act and their CAPs and to achieve the NSW state-wide targets to improve the condition of our natural resources.
- Chapter 4 recommends a new assessment method CMAs could use to assess whether proposed multi-property vegetation plans are scientifically and economically viable and would deliver the potential environmental and economic benefits of managing vegetation at the landscape scale (including the amendments to the Assessment Methodology necessary to implement such an approach).
- Chapter 5 recommends 'second generation' improvements to the PVP Developer to better enable CMAs to negotiate single-property vegetation plans more explicitly within their landscape context and to deliver some of the potential environmental and economic benefits of managing vegetation at the landscape scale, and
- Chapter 6 explores how more flexible market mechanisms could be used to further enhance the effectiveness of multi-property and single-property vegetation plans in delivering the Government's policy to end broadscale clearing and improve the extent and condition of native vegetation across NSW.

1.6 Summary of key findings and draft recommendations

The following is a summary of each chapter's key findings and draft recommendations. The NRC is seeking formal submissions to these and piloting a new assessment approach for multi-property vegetation plans before finalising its advice to the Ministers.

Chapter 2 Benefits of managing vegetation at the landscape scale

Key findings

- 2.1 Environmental outcomes should not be traded off against economic or social outcomes. However, considering economic and social factors can help ensure the Government's policy objectives for native vegetation are achieved efficiently and have a greater likelihood of being sustained for the long term while delivering other benefits.
- 2.2 Managing vegetation more explicitly within its landscape context creates the potential to better align land-use with biophysical capacity and process, allows more flexibility to optimise agricultural production through time, and helps target natural resource management investment.

Draft recommendations

- 2.1 CMAs should have a choice of mechanisms - multi-property vegetation plans, single Property Vegetation Plans and market mechanisms - to support landholders in managing native vegetation at the landscape scale and in accordance with the *Native Vegetation Act 2003*.
- 2.2 Government should periodically review the effectiveness of the decision-support tools CMAs use to support landholders in achieving the potential environmental, economic and social benefits of managing native vegetation at the landscape scale and in accordance with the *Native Vegetation Act 2003*.

Chapter 3 Managing landscapes in the NRM regional model

Key findings

- 3.1 Different elements of NSW's new NRM model – *Native Vegetation Act 2003*, Catchment Management Authorities, Catchment Action Plans, state-wide targets and the *Standard for Quality Natural Resource Management* – have been implemented concurrently, which has created some sequencing problems and weakened the links between each of the elements.
- 3.2 CMAs managing vegetation (and all natural resources) at the appropriate scale will be the key to their success in administering the *Native Vegetation Act 2003*, implementing their CAPs and helping landholders and others make progress toward the state-wide targets.

Draft recommendations

- 3.1 The Departments of Natural Resources, Environment and Conservation, and Primary Industries should work collaboratively with CMAs to ensure all technical, scientific and modelling support to CMAs:
 - complies with the Government's *Standard for Quality Natural Resource Management*
 - will promote progress towards achieving the Government's state-wide resource condition targets and CMAs' targets expressed in their Catchment Action Plans.
- 3.2 CMAs should develop spatial maps, plans or other tools to express their CAP targets at sub-catchment or 'landscape' scales, demonstrate how the relevant landscapes function, and help CMAs and landholders explicitly link on-ground actions to CAP targets.
- 3.3 All decision-support tools and assessment processes (including the PVP Developer) used by CMAs to assess property vegetation plans and allocate incentive payments to landholders should reflect the CMAs' spatial representation of its CAP targets and investment priorities.

Chapter 4 Multi-property vegetation plans

Key findings

- 4.1 Multi-property vegetation plans have the potential to achieve significantly better outcomes than plans developed at the scale of individual properties within the same landscapes. However, they require robust and appropriate governance arrangements to ensure all parties abide by the plan for its duration.
- 4.2 Extending the current PVP Developer is not the most cost effective method to develop and assess proposed multi-property vegetation plans. The importance, complexity and likely

uniqueness of a multi-property vegetation plan suggest that a more expert-based system with more discretion would be appropriate.

Draft recommendations

- 4.1 Government should implement an additional new assessment method under which CMAs would work with groups of landholders to develop multi-property vegetation plans for approval by the Minister for Natural Resources, with the concurrence of the Minister for the Environment (Government should note that the NRC has developed a draft *Guide for Multi-Property Vegetation Plans* and intends to test and improve it through a pilot process).
- 4.2 The additional assessment method must be consistent with the Government's policy of requiring improved or maintained environmental outcomes, but should allow significantly more flexibility in how this is demonstrated by providing for expert scientific assessments of proposed plans based on the best available science, detailed analysis and consultations specific to the issues and circumstances at hand.
- 4.3 The additional assessment method should consider at a minimum, and use as appropriate, the datasets associated with the PVP Developer. It should not:
 - allow reduced biodiversity outcomes to be traded for improvements in other natural resource areas
 - allow clearing of very high conservation value vegetation, relative to the landscape context of that vegetation, regardless of the offsets proposed.
- 4.4 CMAs need to establish guidance material relevant to their region which a proposed multi-property vegetation plan would need to meet before progressing to detailed development and assessment under the Guide. This material must be made public by the CMA.

Chapter 5 Single-property vegetation plans

Key finding

- 5.1 Single property PVPs will continue to play an important role in managing vegetation in NSW. While mechanisms are in place to monitor and improve the PVP Developer, it should seek to better capture the benefits of managing vegetation at the landscape scale by establishing stronger links between PVPs and CAPs.

Draft recommendations

- 5.1 The science and decision rules underpinning the 'second generation' of the Assessment Methodology and PVP Developer should continue to be extended to enable CMAs and landholders to:
 - assess and maximise integrated environmental outcomes
 - incorporate socio-economic considerations in the assessment of whether the plan should be approved, recognising that a minimum requirement is that the plan must improve or maintain environmental outcomes.
- 5.2 The decision rules underpinning the 'second generation' of the Assessment Methodology and PVP Developer should continue to be extended to enable CMAs and landholders to incorporate the community's goals for landscapes (expressed in CAP targets).

- 5.3 If the 'second generation' of the Assessment Methodology and PVP Developer give CMAs significantly more flexibility and discretion, Government should consider requiring appropriate accountability and risk management arrangements, such as spot auditing of CMAs' decisions and processes.
- 5.4 The 'second generation' of the PVP Developer should include improvements to the Property Administration Management System (PAMS) information management system to allow it to manage information required to improve understanding of landscape function.
- 5.5 The Department of Natural Resources and Department of Environment and Conservation should identify practical monitoring and evaluation arrangements that will allow an assessment of the effectiveness of PVPs and should ensure PVP contractual arrangements are sufficiently flexible to support adaptive management.
- 5.6 The Department of Natural Resources and CMAs should develop links between PVPs and broader scale monitoring and evaluation activities, particularly NSW's monitoring and evaluation strategy.

Chapter 6 Using market mechanisms to manage vegetation

Key finding

- 6.1 Off-farm offsets and trading (market mechanisms) could broaden the options to implement the Government's policy to end broadscale clearing and improve the potential for environmental gains.

Draft recommendation

- 6.1 Government should continue working towards using more flexible market mechanisms to implement its policy of an end to broadscale clearing while promoting improvements in landscape health and economic outcomes. Government's current work on the PVP Developer, the native vegetation structural adjustment package, and proposed BioBanking scheme provide a solid foundation for progressively introducing such measures.

2 Benefits of managing vegetation at the landscape scale

Native vegetation is integral to water and nutrient cycling, provides habitat for native fauna, shelter for grazing animals, and has other material and aesthetic functions that meet people's needs. This far from complete list of biophysical functions begins to show the interrelationships of vegetation with many other components of landscapes and sections of our community.

Managing native vegetation at a landscape scale allows explicit consideration of these processes, linkages and functions in ways that underpin the resilience of landscapes for the long term.

The remainder of the chapter is structured as follows:

- Section 2.1 defines landscapes and what it means to manage vegetation at a landscape scale consistent with the NSW policy framework for NRM
- Section 2.2 addresses a key concern of stakeholders that a landscape approach to native vegetation management must be consistent with the Government's policy to end broadscale clearing unless it improves or maintains environmental outcomes
- Section 2.3 identifies the benefits of managing at a landscape scale and how these can be drivers for achieving resilient landscapes that are sustainable for the long term
- Section 2.4 discusses the crucial role of transaction costs in selecting the most appropriate mechanisms to manage vegetation at the landscape scale.

2.1 What is a landscape and how do we manage at a landscape scale?

The NRC has developed definitions of a 'landscape' and 'managing at a landscape scale' that reflect the NRM policy framework in NSW, the views put forward in submissions, consultation with experts and their research on landscapes. The NRC considers that:

- **landscapes** consist of natural resources, their ecosystem and productive uses, and the communities that live within them and depend on them. They are characterised by the interrelationships between these components and the functions they provide. As described in the NSW Government's aspirational goal for NRM, a resilient landscape:
 - *maintains basic functions at all space scales including nutrient cycling, water cycling, provision of food and shelter for biota*
 - *maintains viable populations of all native species of plants and animals at appropriate space and time scales*
 - *reliably meets the long-term needs (material, aesthetic and spiritual) of people and communities.*⁶
- **managing at a landscape scale** is about taking account of the interactions between all of a landscape's components and their functions in an integrated way at any scale with the aim of achieving resilient landscapes.

⁶ Natural Resources Commission (2005) *Recommendations – State-wide standard and targets*, September 2005.

Several submissions proposed definitions of landscapes that emphasised particular biophysical characteristics or scales. For example, some stakeholders suggested landscape units consist of one or more sub-catchments⁷ and others emphasised the importance of vegetation formations in defining a landscape.⁸ Several described landscapes in terms of a combination of biophysical elements including lithology, geomorphology and vegetation.⁹

Some recognised that non-biophysical characteristics could be included as a defining element of a landscape such as 'communities of interest'.¹⁰ This view also emerged strongly in a workshop the NRC held with experts and through the NRC's research of relevant literature. For example, the Institute for Rural Futures describes landscapes as:

'a social construct, but they are also inherently diverse and embody a multitude of values for their inhabitants. Landscapes include people and communities, resource production and related industries, economies and political institutions, biodiversity and ecological systems'.¹¹

The NRC's proposed definition of landscapes includes environmental, economic and social components. However, the NRC recognises the primary influence of the biophysical components and that they have a critical role in determining the social and economic functions that can operate sustainably in the landscape. For example, the characteristics of soil and water and their interactions in a landscape strongly influence the possible productive uses.

The NRC also recognises the importance of scale in natural resource management and the definition of landscape. For example, it is often appropriate for water issues to be managed at a whole of catchment scale, while bio-regions are often the appropriate scale when considering a vegetation issue. However, the NRC has not defined a particular spatial extent as a landscape because it may vary depending on the nature and strength of relationships between all of the landscape components in a particular area i.e. environmental, economic and social. Although it is sometimes useful to define the spatial extent of a landscape, it is not always important and sometimes it can be limiting as the different components of the landscape may best be managed at different scales.

Most stakeholder submissions did not support defining landscapes in terms of boundaries of either single or multiple properties since these do not necessarily align with biophysical or other characteristics that define landscapes. The NRC supports this view. In this paper multi-property vegetation plans are distinguished from managing vegetation at the landscape scale. Single and multi-property vegetation plans can potentially both be used to ensure on-ground actions are informed by and contribute to a management approach developed at the landscape scale.

Potentially, multi-property vegetation plans may make it easier to manage vegetation at a landscape scale. However, even single property vegetation plans can be based on management ideas developed at the landscape scale if the essential functional relationships between the area in the plan and the broader landscape functions are understood.

Sections 3.3 and 4.5.1 discuss and explain why it is important for CMAs to set the 'landscape context' expressed as sub-catchment maps or plans. These will help interested parties

⁷ For example, Submission from Southern Rivers Catchment Management Authority, p. 2.

⁸ For example, Submission from Western Catchment Management Authority, p. 3.

⁹ For example, Submission from Northern Rivers Catchment Management Authority, p. 2.

¹⁰ For example, Submission from Future of Australia's Threatened Ecosystems, p. 5.

¹¹ Institute for Rural Futures (2006) *Coping with Sea Change: Understanding Alternative Futures for Designing More Sustainable Futures, Northern Rivers Case Study – Information sheet*, UNE, Armidale.

understand landscape function, NRM investment priorities and important land-use change or improved management in their area relative to change in other areas.

2.2 Consistency of this approach with the Native Vegetation Act

Several stakeholders raised concerns that incorporating social and economic considerations when managing vegetation at a landscape scale could undermine the Government's intent to end broadscale clearing unless it improves or maintains environmental outcomes.

For example the Total Environment Centre and Nature Conservation Council state:

'The removal of social and economic impacts from the assessment process for the broadscale clearing of native vegetation was one of the fundamental reasons for development of the [Native Vegetation Act 2003] and allowed the adoption of the policy to end broadscale clearing ... The failure of previous regulations to prevent massive clearing of remnant native vegetation was in large part because of the consideration of social and economic impacts in the assessment process'. (p. 1)

DNR also states that:

'It should be made clear that there will be no ability to trade-off environmental outcomes for social or economic benefits'. (p. 1)

The NRC recognises these concerns and does not propose that environmental outcomes should be traded off against economic or social outcomes. It is clear that a minimum requirement for any approach under the Act is that environmental outcomes are improved or at least maintained. The NSW Government's state-wide targets for natural resources also make explicit the priority to improve natural resource outcomes across all the key natural resource assets.

However, considering social and economic factors can help to ensure the Government's policy objectives for native vegetation are achieved efficiently and have a greater likelihood of being sustained for the long term while also delivering other benefits.

For example, if a plan is shown to improve environmental outcomes and also be financially viable, there is a greater chance that it will be successfully implemented and that the environmental gains will be sustained and increased in the long term. Central West CMA makes the point that:

'The only way landholders will implement the plan and stick to it, is if they can develop a whole farm plan that makes the whole property economically viable.' (p. 5)

An integrated view of landscapes is consistent with the Australian and NSW Government's triple bottom line approach to NRM which is expressed in key policies and legislation including the Act.¹² Ultimately, considering environmental, social and economic aspects of native vegetation management as part of a landscape approach allows us to achieve specific objectives, such as ending broadscale clearing (unless environmental outcomes are improved or maintained), while also improving resilience of the whole landscape.

¹² The first objective of the *Native Vegetation Act 2003* listed in clause 3(a) is 'to provide for, encourage and promote the management of native vegetation on a regional basis in the social, economic and environmental interests of the State'.

Key finding 2.1

Environmental outcomes should not be traded off against economic or social outcomes. However, considering economic and social factors can help ensure the Government's policy objectives for native vegetation are achieved efficiently and have a greater likelihood of being sustained for the long term while delivering other benefits.

2.3 Potential benefits

This section identifies potential environmental, economic and social benefits from managing native vegetation at a landscape scale compared to managing specific issues or individual properties in isolation from the landscape context. Many of the benefits are already widely recognised among NRM experts and are well supported by existing research and programs and so are only outlined briefly in the sections below.

2.3.1 Increased opportunity to manage ecosystem function at the optimal scale

Ecosystems function at scales that are often larger than single properties and are usually not neatly contained even within multi-property boundaries. Managing at a landscape scale can provide more opportunity to rehabilitate and manage ecosystem function and resilience at an appropriate biophysical scale compared to managing the issues within single or multi-property boundaries without landscape context.

For example, weeds need to be controlled at a landscape scale to prevent reinfestation from neighbouring properties, roads and public reserves. Managing dryland salinity requires understanding (typically by modelling) of the spatial and temporal links between recharge and discharge areas so managers know 'what to plant where' and how long it will take to see improvements.

The spatial arrangement of components within a landscape is also critically important to ecosystem function. For example, the arrangement of habitat in the landscape to support sustainable populations of native flora and fauna is increasingly important as the extent and condition of habitat declines.¹³

The ecological outcomes of maintaining, for example, 30 per cent of a particular habitat in a landscape will vary depending on whether the 30 per cent is made up of fragments on individual properties or if it consists of larger connected areas maintained across the landscape. In relatively cleared landscapes, managing at a landscape scale can provide more options to maintain and restore habitat in ways that maximise connectivity over greater areas than single properties.

The Coasts and Wetlands Society Inc submission identified this in its submission and states that larger scale plans have the potential to:

'Enhance biodiversity conservation through permitting the design of corridors and networks permitting the protection of large areas of contiguous habitat and through better protecting the maintenance of ecosystem values.' (p. 2)

¹³ McIntyre S., McIvor J. G. & Mcleod N. D. (2000) Principle for sustainable grazing in eucalypt woodlands: landscape-scale indicators and the search for thresholds, in *Management for Sustainable Ecosystems*. Eds. P. Hale, A. Petrie, D. Moloney & P. Sattler, Centre for Conservation Biology, the University of Queensland, Brisbane pp. 93-102.

2.3.2 Increased opportunity to achieve integrated outcomes

Managing at a landscape scale helps identify those actions on the ground that will improve the condition of a range of resources simultaneously, and avoid the risk of unintended problems. A CSIRO report on its 'Heartlands Initiative' states that:

*'Catchment planning should not be approached from the basis of any single issue (e.g. Environmental flows or salinity or biodiversity) but must be an active response to many relevant considerations and the interactions between them. Land use options for any particular part of a catchment must be evaluated in a way that recognises synergies, multiple benefits, resource competition and tradeoffs.'*¹⁴

For example, increasing the extent and condition of native vegetation to generate habitat and biodiversity benefits, might have a positive or negative impact on dryland salinity, water quality and agricultural uses depending on where it is located in the landscape.

An objective of CSIRO's Heartlands initiative in southern NSW and northern Victoria was to identify specific locations within a catchment for different land-use options in order to maximise overall societal benefits – both commercial and environmental. One of the outputs of this work was identification of where the establishment of woody perennial vegetation would confer multiple environmental benefits.¹⁵

DEC stated in its submission that:

'Planning vegetation management at a landscape scale also provides opportunities to better integrate consideration of soil, water and other landscape management issues which operate at property and landscape scales. Landscape vegetation planning provides an ideal mechanism to achieve this integration across issues, scales and with management systems.' (p. 3)

2.3.3 Increased opportunity to optimise land-use

Understanding the landscape, its functions and capabilities helps to inform the best mix of land-use in an area. Biophysical components of landscapes such as soil, topography, hydrology and vegetation combine to determine constraints for productive use as well as the value of environmental uses.

The aim is to promote better understanding of how to work with the landscape and allow it to inform the best mix of land-uses that are sustainable for the long-term.

This understanding underpins the work of the Liverpool Plains Land Management Committee's (LPLMC) auction based approach to achieving landscape scale management change. For this initiative, Land Management Units (LMU) were described based on a scientific understanding of soils, topography and hydrology. The LPLMC then identified the best management practices for each LMU that were considered sustainable for the long term and that link together multiple actions and benefits.

For example, it helped to identify that cropping was not a financially viable long term use of sedimentary slopes in the landscape and that grazing and establishing responsive perennial grasses was a better environmental and economic option.

¹⁴ CSIRO (2004) *Heartlands – Planning for Sustainable Land Use and Catchment Health*, Publication HL9-04.

¹⁵ Ibid.

Changing land-use from cropping to grazing also delivers significant environmental outcomes in many parts of the landscape. For example, responsive perennial pastures use water where it falls thus preventing recharge that contributes to high saline water tables as well as reducing erosion which can affect water quality.

2.3.4 Realising the value of environmental assets and services

Managing at a landscape scale can help us recognise the values of environmental assets and services. It provides the context to understand how ecosystems function and what contribution vegetation makes to sustaining the value of other landscape components. Examples of native vegetation related functions that are valued by people include:

- regulating essential ecological processes (e.g. nutrient cycling)
- providing refuge and habitat for plants and animals
- supporting productive uses such as grazing and cropping
- providing opportunities for reflection, recreation and aesthetic experience
- providing the space and land to support development.¹⁶

Appropriately recognising all of the values of a functioning landscape is complex. Many values are difficult to quantify in comparable units and all are dynamic over time as commodity prices, climate conditions and communities' values vary. Some values of landscapes could be undervalued or ignored without information about the landscape context. de Groot states that:

*'There is still a considerable lack of data on the many functions and values of natural and semi-natural ecosystems and landscapes and thus, we continue to take decisions on trade-offs between different land use options based on incomplete information.'*¹⁷

Explicitly considering landscape context can make it easier to identify these functions and measure or impute values so as to create the right investment signals for natural resource managers and landholders. In some cases, it may enable landholders to diversify their enterprise if the environmental services they provide are valued in ways that enable them to generate ongoing income streams.

2.3.5 Realising economies of scale

Managing at a landscape scale can also help achieve economies of scale. There is evidence that the larger the geographic area, the more likely landholders are to adopt sustainable practices because of economies of scale.¹⁸

For example, several farmers within an area may adopt similar management practices and together find ways of reducing their unit costs through sharing equipment and other resources. The NSW Farmers Association highlights in its submission that:

¹⁶ deGroot, R. (2005) Function-analysis and valuation as a tool to assess land use conflicts in planning for sustainable, multi-functional landscapes, in *Elsevier – Landscape and Urban Planning*.
¹⁷ Ibid.

¹⁸ Cary, J., T. Webb, and N. Barr (2002) *Understanding Landholders' Capacity to Change to Sustainable Practices: Insights about Practice Adoption and Social Capacity for Change*, Bureau of Rural Sciences, Canberra, and Curtis, A., MacKay, M. Van Nouhuys, M., Lockwood, M., Byron, I. and Graham, M. (2000) *Exploring Landholder Willingness and Capacity to Manage Dryland salinity: The Goulburn Broken Catchment*, Johnstone Centre Charles Sturt University, Albury.

'In the landscape plan initiated by Walgett farmers, agreement has been established to enhance natural areas of Mitchell grass as part of a shared sustainable farming strategy. The agreement makes it possible for the group of farmers to collectively purchase and share a specialised machine for harvesting this grass.' (p. 2)

2.3.6 Optimising outcomes by creating greater choice

Managing at a landscape scale can provide more choice for both use of land developed after any permitted clearing and for the public good uses of uncleared and replanted land. For example, managing at a landscape scale may make it easier to identify suitable areas for off-farm offsets for clearing native vegetation and can introduce a wider set of possibilities for conservation management. NSW Farmers states in its submission:

'The larger the area involved, the easier it is to develop 'win win' strategies, simply because there is a greater range of options. Not only can farmers negotiate with others to identify optimal offsets, the size/cost of the offset required may be reduced because it is part of an integrated and therefore more effective plan.' (p. 3)

2.3.7 Increased environmental stewardship

The collaboration required to manage at a landscape scale can promote learning amongst the participants that may increase landholders' environmental stewardship. Successfully managing at a landscape scale requires reconciliation of science and the practical knowledge of land managers. The learning of a group can provide a framework for:

- monitoring environmental condition of the sub-catchment
- building collective responsibility
- self-regulation, evaluation and adjustment.¹⁹

All of these are likely to contribute to long-term, sustainable outcomes. For example, DNR has found that:

'any mechanisms that can be used to assist land managers to focus on natural resources at a subcatchment scale and take ownership of the off site impacts of their actions will result in improved environmental outcomes.' (p. 1).

DEC considers that:

'Another key benefit of landscape level approaches is that this allows local communities and neighbouring farmers to collaborate and draw on the benefits of each others vision for vegetation management in a local district. The current emphasis on decision making at individual property and catchment scales, through PVPs and CAPs respectively, is less useful in providing a forum for local communities to engage directly in planning and collective decision making.' (p. 3).

¹⁹ Brunckhorst, D. (2002) *Creating a contemporary Common Property Resources (CPR) management institution – final report to Land and Water Australia on UNE 40*, Institute for Rural Futures, UNE, Armidale.

2.3.8 Achieving regional, state and national targets

All levels of Government and many other investors are seeking to bring about widespread improvement in landscape function while contributing to improved economic and social outcomes over specific time periods. Past Government investment in NRM has been criticised in successive audit reports because it has not been possible to demonstrate it has made a significant or measurable impact at state and national scales.²⁰

CMAAs have developed, in consultation with their communities, clear goals and targets for improvements in their regions that link to broader state and national targets. Enabling CMAAs to manage at a landscape scale will help target their investment to the best value options. This is unlikely to be achieved through property by property investment without landscape context. As stated by Lower Murray Darling CMA, a major benefit of landscape planning is the:

'Opportunity to achieve longer term, landscape scale thresholds and targets linked to Catchment Action Plans.' (p. 3).

Key finding 2.2

Managing vegetation more explicitly within its landscape context creates the potential to better align land-use with biophysical capacity and process, allows more flexibility to optimise agricultural production through time, and helps target natural resource management investment.

2.4 Potential costs

The discussion of potential benefits above also highlights some of the inherent complexity and challenges in NRM such as:

- difficulty in valuing the benefits of ecosystem services and the natural environment given issues such as inter-generational equity, incomplete information and economic externalities
- uncertainty in our understanding of biophysical systems, and their inherent non-linearity and unpredictability in how they respond to disturbance
- ethical controversies involved in putting prices on the costs of environmental degradation
- irreversibility of much environmental change, and a desire to be precautionary in assessing environmental functions, interdependencies, benefits and impacts.

While these issues make it particularly challenging to make natural resource management decisions using traditional benefit – cost frameworks, it is still important to consider the cost effectiveness of alternate mechanisms that CMAAs might use to manage natural resources in general, and to manage native vegetation in particular.

²⁰ For example see Australian National Audit Office (1998) *Audit Report No. 36 1996-97, Commonwealth Natural Resource Management and Environment Programs*, Australian National Audit Office, Canberra, and Australian National Audit Office (2001) *Audit Report No. 43 2000-2001, Performance Information for Commonwealth Financial Assistance under the Natural Heritage Trust*, Australian National Audit Office, Canberra.

The sections below introduce some of the considerations of costs that will help guide the selection of the most appropriate mechanism to apply in a particular circumstance.

2.4.1 Transaction costs

The types of transaction costs of the three mechanisms described in Chapters 4 to 6 – multi-property vegetation plans, single Property Vegetation Plans and market mechanisms - are similar and are listed in Table 2.1.

Aspects of multi-property vegetation plans that could increase transaction costs include:

- higher consultation and collaboration costs associated with negotiating with multiple landholders to develop a multi-property vegetation plan
- more complex and costly governance and contractual arrangements for multi-property vegetation plans
- managing the costs of potentially higher risks of multi-property vegetation plans, for example, if properties within the plan change ownership.

The transaction costs for a multi-property vegetation plan are likely to be higher than for a single-property plan because multi-property vegetation plans would rely on gathering and applying expert knowledge specific to each plan rather than using a standardised decision-support tool i.e. the PVP Developer.

In addition, fit-for-purpose governance arrangements would need to be developed for each plan rather than using standard contractual arrangements, and multi-property vegetation plans would be subject to independent peer review and audit.

These costs are partially offset by economies of scale that can be achieved when considering multiple contiguous properties together. For example, the unit costs of collecting field data for multiple properties together are anticipated to be lower than for single-property plans.

The more market based options discussed in Chapter 6 would avoid some of the costs of multi-property vegetation plans. For example, collaboration with others would be simplified through buying and selling in a market rather than requiring negotiation with neighbours. In addition, governance and contractual arrangements are likely to be simpler and defined up-front rather than tailored to specific situations.

Table 2.1: Transaction costs for delivering landscape benefits

Single-property plans	Multi-property plans	Market mechanisms ²¹
<ul style="list-style-type: none"> consultation between landholder and a CMA 	<ul style="list-style-type: none"> consultation between group of landholders and a CMA 	<ul style="list-style-type: none"> codifying property rights seeking out buyers or sellers of property rights
<ul style="list-style-type: none"> gathering information including field data collection 	<ul style="list-style-type: none"> gathering and sharing information and knowledge including field data collection 	<ul style="list-style-type: none"> measuring the quality and quantity of goods to be exchanged
<ul style="list-style-type: none"> developing a plan 	<ul style="list-style-type: none"> developing a plan 	-
<ul style="list-style-type: none"> operating PVP Developer 	<ul style="list-style-type: none"> assessing and judging proposal 	<ul style="list-style-type: none"> negotiating a sale
<ul style="list-style-type: none"> advice from accredited experts 	<ul style="list-style-type: none"> independent expert review audit of assessment 	-
<ul style="list-style-type: none"> any legal review of PVP (contract) 	<ul style="list-style-type: none"> developing and legal review of contractual and governance arrangements 	<ul style="list-style-type: none"> contracting specifications about the transfer of property rights
<ul style="list-style-type: none"> approval by CMA 	<ul style="list-style-type: none"> approval by Minister 	<ul style="list-style-type: none"> transfer of property rights
<ul style="list-style-type: none"> ongoing monitoring and evaluation 	<ul style="list-style-type: none"> ongoing monitoring and evaluation 	<ul style="list-style-type: none"> ongoing monitoring and evaluation
<ul style="list-style-type: none"> enforcing compliance 	<ul style="list-style-type: none"> enforcing compliance 	<ul style="list-style-type: none"> enforcing compliance

2.4.2 Fixed or up-front costs

In addition to transaction costs it is also important to consider the fixed or up-front costs of alternate mechanisms. Frequently these are related because more money spent up-front can reduce ongoing transaction costs. Higher fixed investment is generally more appropriate when a high volume of transactions is anticipated.

The up-front costs for establishing the legislation, PVP Developer and administrative arrangements to develop single-property plans are high. DEC and DNR have committed many staff and information technology resources to date. Proposed enhancements will also be costly to government. These large up-front costs could be considered justified if there is a large volume of PVPs.

The proposal for multi-property vegetation plans described in Chapter 4 has much lower up-front costs, but it will be more costly to run each assessment. These lower up-front costs relate mainly to the cost of developing and piloting the Guide. If the volume of multi-property vegetation plans is relatively low this balance of lower up-front costs and higher transaction costs (compared to single-property plans) could be considered to be cost-effective.

²¹ Whitten, S., Salzman, J., Shelton, D. and Proctor, W. (2003) *Markets for ecosystem services: Applying the concepts*. Paper presented at the 47th Annual Conference of the Australian Agricultural and Resource Economics Society, Fremantle.

Fixed or up-front costs of market mechanisms will involve significant investment in institutional arrangements and structures to facilitate and support a market. The size of the market and anticipated volume of transactions are important to assess the efficiency of any up-front investments.

Table 2.2: Fixed or up-front costs for delivering landscape benefits

Single-property plans	Multi-property plans	Market mechanisms ²²
<ul style="list-style-type: none"> ▪ development of Assessment Methodology and PVP Developer and investment in ongoing improvements 	<ul style="list-style-type: none"> ▪ development and piloting of guide for assessing multi-property plans 	<ul style="list-style-type: none"> ▪ designing and setting-up institutions and organisations that facilitate a market ▪ establishing rules for trading
<ul style="list-style-type: none"> ▪ specification of assessment method in legislation 	<ul style="list-style-type: none"> ▪ specification of assessment method in legislation 	<ul style="list-style-type: none"> ▪ definition of a property rights framework and design of exchange institutions (through contract law or enactment of legislation)
<ul style="list-style-type: none"> ▪ setting up and maintaining administrative system (PAMS) to monitor status of PVPs and store details 	<ul style="list-style-type: none"> ▪ build capacity in existing systems to monitor status of multi-property plans and store details 	<ul style="list-style-type: none"> ▪ setting up structures to manage and monitor market exchanges

2.4.3 A cost effective approach to managing vegetation at the landscape scale

The NRC believes that CMAs should have a choice of mechanisms - multi-property vegetation plans, single Property Vegetation Plans and market mechanisms - to manage native vegetation at the landscape scale, and should select the most practical and cost-effective mechanism for the circumstances at hand. These mechanisms should assist CMAs and landholders to:

- make best use of the available science and knowledge to inform decisions
- recognise the interrelationships between all components of landscapes (not just vegetation) and the functions they provide
- link actions on the ground to the community's goals for landscapes expressed in CAP targets
- facilitate integrated and sustainable environmental and economic outcomes that underpin the resilience of landscapes
- be rigorous and accountable, but permit sufficient flexibility to allow CMAs to manage natural resources at the appropriate scale
- adaptively manage the resulting agreements over time to ensure continued progress towards CAP targets
- manage the risk of potential adverse consequences and minimise transaction costs.

The costs of implementing any particular approach need to be considered to ensure the approach chosen maximises the net benefits when costs are taken into account.

²² Ibid.

Draft recommendation 2.1

CMAAs should have a choice of mechanisms - multi-property vegetation plans, single Property Vegetation Plans and market mechanisms - to support landholders in managing native vegetation at the landscape scale and in accordance with the Native Vegetation Act 2003.

Draft recommendation 2.2

Government should periodically review the effectiveness of the decision-support tools CMAAs use to support landholders in achieving the potential environmental, economic and social benefits of managing native vegetation at the landscape scale and in accordance with the Native Vegetation Act 2003.

3 Managing landscapes in the NRM regional model

Supporting CMAs to manage vegetation (and all natural resources) at the appropriate scale will be the key to their success in administering the Act, implementing their CAPs and helping landholders and others make progress toward the state-wide NRM targets.

The Act has commenced, Government has adopted the standard and state-wide targets, and CMAs have developed their CAPs. With these elements in place it is now important to ensure that together they steer CMAs' investments and landholders' on-ground actions most effectively towards achieving CAP targets.

This chapter describes the key features of the NRM regional model in NSW and how to bridge the current gap between CMAs' CAP targets and their current activities under the Act. In particular:

- Section 3.1 describes the key components of the NRM regional model
- Section 3.2 focuses on the standard and its potential to help guide CMAs and others in how to better achieve management of vegetation at the landscape scale
- Section 3.3 explains how the CAP targets should guide on-ground actions and investments, and what CMAs need to do to ensure they achieve this
- Section 3.4 sets out how the Act has been implemented to date.

3.1 NRM regional model

The NRM regional model now established in NSW flows from agreements between the Australian and NSW Governments, including a joint commitment for CMAs to invest \$436 million in integrated delivery of NRM. Since 2003, the NSW Government has passed new legislation²³ and taken action to:

- establish 13 regionally based CMAs responsible for engaging with their communities to develop a strategic NRM plan (i.e. CAPs) and to invest in NRM in their region
- establish the NRC as an independent body to recommend state-wide standards and targets for natural resources and to audit their effective implementation by CMAs
- adopt a *Standard for Quality Natural Resource Management*²⁴ that is designed to promote accountability, rigour, and continuity in NRM within an adaptive management framework
- adopt a set of 13 state-wide targets²⁵ that set out broad goals for improving our key natural resource assets and the priorities for managing them in ways that also contribute to economic sustainability and social well-being
- refocus NRM agencies on a set of strategic roles including leading the development of state NRM policy, providing technical and scientific expertise to CMAs, monitoring and evaluation, and compliance activities to enforce regulation.

²³ The *Native Vegetation Act 2003*, *Catchment Management Authorities Act 2003* and *Natural Resources Commission Act 2003* which were passed at the same time as a single package of reforms.

²⁴ As recommended by the NRC in *Natural Resources Commission (2005) Recommendations – State-wide Standard and Targets*, September 2005.

²⁵ Ibid.

Ideally these reforms should function as an integrated package:

- Within the constraints of the Act and other relevant legislation²⁶ CMAs should use the standard to develop and implement their CAPs
- CAPs should then guide CMAs and communities on how to achieve the state-wide targets in a way that best suits local and regional circumstances
- Consistent with the standard, the PVP Developer (and any other technical advice from agencies) should then be designed to help CMAs prioritise alternate investments in terms of their relative contribution to CAP and state-wide targets.

However, different elements of this new NRM regional model have been implemented concurrently, which has created some sequencing problems and weakened these links between each of the elements.

For example, most CMAs inherited Catchment Blueprints which pre-date the development of the standard and state-wide targets. All CMAs have now developed new 10 year CAPs, but some have struggled to find the right balance between developing a new CAP and their communities' desires to implement the previous Blueprints (for example, Blueprint targets do not always align with state-wide targets). The NRC and CMAs have worked through these issues and agreed how CMAs can meet their communities' expectations while moving towards CAPs that more fully comply with the standard and are more likely to make progress towards the state-wide targets.

Similarly the *Native Vegetation Regulation 2005*, Assessment Methodology and PVP Developer were developed under significant time pressure to allow the *Native Vegetation Act 2003* to commence. Essential to this was a robust method by which CMAs could administer the policy of an end to broadscale clearing unless it improves or maintains environmental outcomes. Consequently the PVP Developer was developed in parallel with (but without explicit linkages to) the standard, state-wide targets and CAP targets.

Ideally, the standard would have provided a quality assurance framework within which to develop the PVP Developer, and the PVP Developer would have explicitly incorporated the state-wide and CAP targets as decision-making criteria with weightings to express the community's priorities for native vegetation management at the state and regional scales respectively.

However, currently there are no explicit links between the standard, targets (state-wide or CAP) and the PVP Developer. Consequently CMAs use of the PVP Developer has been largely focussed on landholders' applications to clear vegetation, where its use is mandatory, rather than incentive applications that could contribute to CAP targets. To date, CMAs use a range of other tools and legal instruments to inform and implement their decisions on where they should invest to achieve their CAP targets.

²⁶ For example the *Water Management Act 2000* was also amended to require the NRC to review and report on whether water sharing plans are contributing to state-wide targets.

Key finding 3.1

Different elements of NSW's new NRM model – Native Vegetation Act 2003, Catchment Management Authorities, Catchment Action Plans, state-wide targets and the Standard for Quality Natural Resource Management – have been implemented concurrently, which has created some sequencing problems and weakened the links between each of the elements.

Draft recommendation 3.1

The Departments of Natural Resources, Environment and Conservation, and Primary Industries should work collaboratively with CMAs to ensure all technical, scientific and modelling support to CMAs:

- *complies with the Government's Standard for Quality Natural Resource Management*
- *will promote progress towards achieving the Government's state-wide resource condition targets and CMAs' targets expressed in their Catchment Action Plans.*

Chapter 5 makes some specific recommendations on how the 'second generation' of the Assessment Methodology and PVP Developer could be improved to bring them more into line with the standard and enable them to better guide CMAs and landholders on how to, and where best to, invest in NRM that help us to achieve state-wide and CAP targets.

3.2 Using the Standard for Quality Natural Resource Management

One essential element of managing all natural resources well is a good understanding of scale.²⁷ Understanding scale includes for example the appropriate biophysical scale at which the natural environment functions, the relevant institutional and community scales affecting the management and use of natural resources, and the time scales over which the natural environment responds to any disturbance or management.

In May 2005, the NSW Government adopted a *Standard for Quality Natural Resource Management* (the standard) and a set of state-wide targets. The standard is a quality assurance framework for NRM, which requires (among seven key required outcomes) the:

Management of natural resource issues at the optimal spatial, temporal and institutional scale to maximise effective contribution to broader goals, deliver integrated outcomes and prevent or minimise adverse consequences.

The state-wide targets commit NSW to improving²⁸ the condition of the state's land, water and biodiversity natural assets, and the economic sustainability and social well-being that they support. Soon the NRC will recommend to Government whether it should approve Catchment

²⁷ Natural Resources Commission (2005), *Guide to Using the Standard for Quality Natural Resource Management*, September 2005 pp. 13-18.

²⁸ Twelve of the thirteen state-wide targets require improving trends in the condition of natural resource assets and the economic sustainability and social well-being of the communities that benefit from them. The remaining target requires maintenance of the currently good condition of NSW marine water.

Action Plans put forward by CMAs to comply with the standard and promote the state-wide targets.

In this Draft Report, the NRC has used the standard to develop recommendations on:

1. a proposed new approach for CMAs to facilitate multi-property vegetation plans, including the changes to the Assessment Methodology necessary to implement such an approach (Chapter 4)
2. ensuring the 'second generation' of the Assessment Methodology and PVP Developer software better aid CMAs and landholders to understand how landscapes function and negotiate single-property vegetation plans that maximise the chances of CMAs achieving their CAP targets (Chapter 5)
3. future work which could allow CMAs to use more flexible market mechanisms to engage landholders in improving and maintaining natural resources and the ecosystems and communities which depend on them (Chapter 6).

The importance and relevance of each component of the standard to managing at a landscape scale is outlined in Table 3.1.

Table 3.1: Importance of each element of standard to landscape planning

Component of standard	Why this is important to managing at a landscape scale
<p>Collection and use of knowledge <i>Use of the best available knowledge to inform decisions in a structured and transparent manner</i></p>	<p>Managing at a landscape scale requires an understanding of the interrelationships between parts of the landscape, how landscapes function and options for management. CMAs need to draw on the best available information at a range of scales. The types of knowledge required includes legislative and policy requirements, sound scientific and practical understanding of landscape functions, and knowledge of the community's priorities for landscapes.</p>
<p>Determination of scale <i>Management of natural resource issues at the optimal spatial, temporal and institutional scale to maximise effective contribution to broader goals, deliver integrated outcomes and prevent or minimise adverse consequences</i></p>	<p>Consideration of scale in decision-making facilitates integrated and optimal environmental, economic and social outcomes. It informs understanding of the impacts and interrelationships of actions in one part of a landscape on others and underpins linking action at a property scale to outcomes at regional, state and national scales. It facilitates application of state and national policies and legislation in practical ways at a local scale.</p>
<p>Opportunities for collaboration <i>Collaboration with other parties to maximise gains, share or minimise costs or deliver multiple benefits is explored and pursued wherever possible</i></p>	<p>Managing at landscape scale requires cooperation, negotiation and sound participatory processes. It can facilitate appropriate distribution of costs and responsibilities, leverage investment and help develop practical management options. It can also promote shared learning about the landscape and may result in increased environmental stewardship.</p>
<p>Community engagement <i>Implementation of strategies sufficient to meaningfully engage the participation of the community in the planning, implementation and review of natural resource management strategies and the achievement of identified goals and targets</i></p>	<p>Community engagement is critical to understanding the goals and priorities for landscapes, how action by landholders can contribute to these and what investment the community is prepared to contribute to achieving the goals. It can also reduce transaction costs by promoting change and adoption of new management options.</p>

Component of standard	Why this is important to managing at a landscape scale
<p>Risk management <i>Consideration and management of all identifiable risks and impacts to maximise efficiency and effectiveness, ensure success and avoid, minimise or control adverse impacts</i></p>	<p>As the geographic scale and overall complexity of a plan increases, the risks to its successful implementation may increase. There are also risks associated with ‘locking-in’ plans developed using data with high levels of uncertainty and in dynamic ecological environments subject to influences such as climate change.</p>
<p>Monitoring and evaluation <i>Quantification and demonstration of progress towards goals and targets by means of regular monitoring, measuring, evaluation and reporting of organisational and project performance and the use of the results to guide improved practice</i></p>	<p>Landscape planning is constrained by knowledge gaps and uncertainty associated with natural systems. Monitoring and evaluation is essential for continuing to build understanding of landscapes, their functions, and how best to manage them, for assessing effectiveness of management actions and to inform responses in an adaptive management framework.</p>
<p>Information management <i>Management of information in a manner that meets user needs and satisfies formal security, accountability and transparency requirements</i></p>	<p>Managing at a landscape scale is likely to involve more participants. Greater information management needs to publicly demonstrate the quality of management while respecting privacy and protecting commercial interests. Access to information that meets user needs is also critical for robust decision-making.</p>

3.3 Managing landscapes to link on-ground actions to CAP targets

Our goals for landscapes have evolved over time as land managers and governments have agreed on the need to manage our natural resources to support environmental, economic and social values for the long term. They are now expressed through national²⁹, state³⁰ and regional priorities and will shortly be consolidated into CAP targets when CMAs’ CAPs are formally adopted by Government.

It is important that we manage landscapes to achieve these shared priorities. As Southern Rivers CMA states:

‘Our key interest in vegetation plans, whether for a single-property or multiple properties, is that the plan be as consistent as possible with the Catchment Action Plan of the relevant CMA ... We appreciate that landholders will have personal objectives that guide their planning. But hopefully guidelines for the development of vegetation plans will also direct the landholder to these broader considerations in order to maximise on-ground outcomes at the property level that can contribute to regional targets.’ (p. 1)

Some CMAs have also developed spatial maps and plans that sit underneath their CAPs and show their NRM investment priorities between and within particular sub-catchments.³¹ These spatial maps provide the context for managing resources at a landscape scale and help establish

²⁹ The Australian Government has expressed its priorities for investment in natural resources through a range of policy initiatives including the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the National Framework for standards and Targets. See Natural Resource Management Standing Committee (2002) *National Framework for NRM Standards and Targets*, agreed at 6 September 2002 Meeting.

³⁰ Consistent with the National Framework, the NSW Government has now adopted the standard and 13 state-wide targets that align well with the National ‘matters for targets’.

³¹ For example, Central West CMA has included maps of priorities in each sub-catchment in its Investment Strategy that sits under its CAP and which outlines proposals for investment of NSW and Australian Government funding for the next three years.

explicit links between regional scale outcomes and management at the property level. An example of this approach is currently being piloted in Victoria (Box 3.1).

Box 3.1: Linking catchment, sub-catchment and farm scales in Victoria

Victoria is currently piloting a web-based catchment planning tool that links catchment, sub-catchment and property scales. Called eFARMER, it aims to:

- inform private land managers of NRM priorities within a Catchment Management Authority area
- provide landholders with high contextual spatial information that is unique for their property for planning and implementing on-ground activities
- potentially integrate catchment modelling and visualisation tools.

It is envisaged that users will be able to:

- view a range of datasets, including native vegetation, hydrology, soils and groundwater flow systems
- access aerial photography and satellite imagery at farm scale
- develop, visualise and analyse on-ground management scenarios, such as revegetation and pasture establishment at farm and landscape scale
- record property scale data, including soil tests and production information
- aggregate information from property scale actions across multiple properties.³²

Going forward it is important that all CMAs develop ways to express their CAP targets at landscape scales and help landholders and others to understand how landscapes function at these scales.

Key finding 3.2

CMAs managing vegetation (and all natural resources) at the appropriate scale will be the key to their success in administering the Native Vegetation Act 2003, implementing their CAPs and helping landholders and others make progress toward the state-wide targets.

Draft recommendation 3.2

CMAs should develop spatial maps, plans or other tools to express their CAP targets at sub-catchment or 'landscape' scales, demonstrate how the relevant landscapes function, and help CMAs and landholders explicitly link on-ground actions to CAP targets.

In practice this will involve the collaborative efforts of CMAs, agency staff, independent scientists and landholders in understanding and managing landscapes. The South West NSW Land Management Group states:

³² Australian Farm Journal BUSH, *eFarmer targets catchment planning*, July 2006 and Geoff Park, pers. Comm., North Central CMA, Victoria, August 2006.

'As farmers we have intimate knowledge of farming practices and how they fit in with our environment but we lack the knowledge of how all this fits into the regional context. ... Landscape planning brings all these people together so that we can help each other come up with solutions to major environmental problems.' (p. 4)

3.4 Property Vegetation Plans under the *Native Vegetation Act 2003*

The NSW Government passed the *Native Vegetation Act 2003* with the intent of managing native vegetation on a regional basis in the environmental, economic and social interests of the state and specifically to:

- end broadscale clearing unless it improves or maintains environmental outcomes
- encourage the protection, rehabilitation and restoration of native vegetation.

3.4.1 Property Vegetation Plans

The Act allows landholders to use Property Vegetation Plans to identify how they will offset the negative environmental impacts of proposed clearing by managing other native vegetation on the same property for conservation, or adopting land management practices that improve environmental outcomes (clearing PVPs).

In addition Property Vegetation Plans can be used to:

- attract incentives from CMAs for land management practices that aim to restore or enhance the condition of native vegetation (incentive PVPs)
- provide certainty to land managers that they can continue to use already established land management practices on their properties (continuing use PVPs).

The *Native Vegetation Regulation 2005* (the Regulation) defines:

- how CMAs should assess whether or not a clearing PVP will improve or maintain environmental outcomes (using the Assessment Methodology and PVP Developer software), and
- activities which are exempt from requiring a clearing approval – many of these are called Routine Agricultural Management Activities (RAMAs) and include activities such as clearing timber for fencing, and maintaining rural infrastructure.

3.4.2 The Assessment Methodology and PVP Developer

The Assessment Methodology and PVP Developer software incorporate the best available state-scale datasets and a detailed set of decision rules that must be applied to the assessment of each clearing proposal. On this basis, the Minister has delegated his authority to approve the plans to CMAs. The PVP Developer is considered very useful by many stakeholders since:

'the PVP Developer ... is a repeatable assessment that takes out the guesswork and personal leaning of the assessor.' ³³

³³ Submission from South West NSW Land Management Group, p. 3.

In effect, the Assessment Methodology and PVP Developer have primarily been designed to create a rule-based automated system which a CMA officer can use on a laptop computer out in the field to give landholders a rapid, consistent answer on clearing proposals.

This is an innovative and ambitious approach given the inherent complexities of NRM and vast differences between local environmental issues across the state.

The PVP Developer is heavily prescribed to help all CMA officers give quick, consistent answers on this traditionally controversial issue. The use of a standard tool ideally ensures consistent, repeatable assessments and makes available expert knowledge and data to the many CMA staff involved in developing and approving PVPs. Without this prescription, it would be reasonable to expect the CMA officer to more actively demonstrate they had considered all available scientific knowledge, and consulted relevant stakeholders.

Disadvantages are that the PVP Developer relies on coarse state-level data and uses a set of state-wide decision rules that are applied to diverse situations. This has necessarily required compromises and judgements to facilitate achieving the best 'average' outcome over all single-property plans rather than the best possible outcome in each case.

In addition, the tool has been primarily designed to assess clearing proposals. It does not include modules to assess socio-economic issues as these are not permitted to be traded-off against the environmental improve or maintain test.

The relationship between the Act, Regulation, Assessment Methodology and the PVPs is summarised in Figure 3.1.

The NSW and Australian Governments jointly committed \$120 million³⁴ for CMAs to invest in native vegetation management and anticipated that most of this would be delivered through incentive Property Vegetation Plans developed using the PVP Developer.

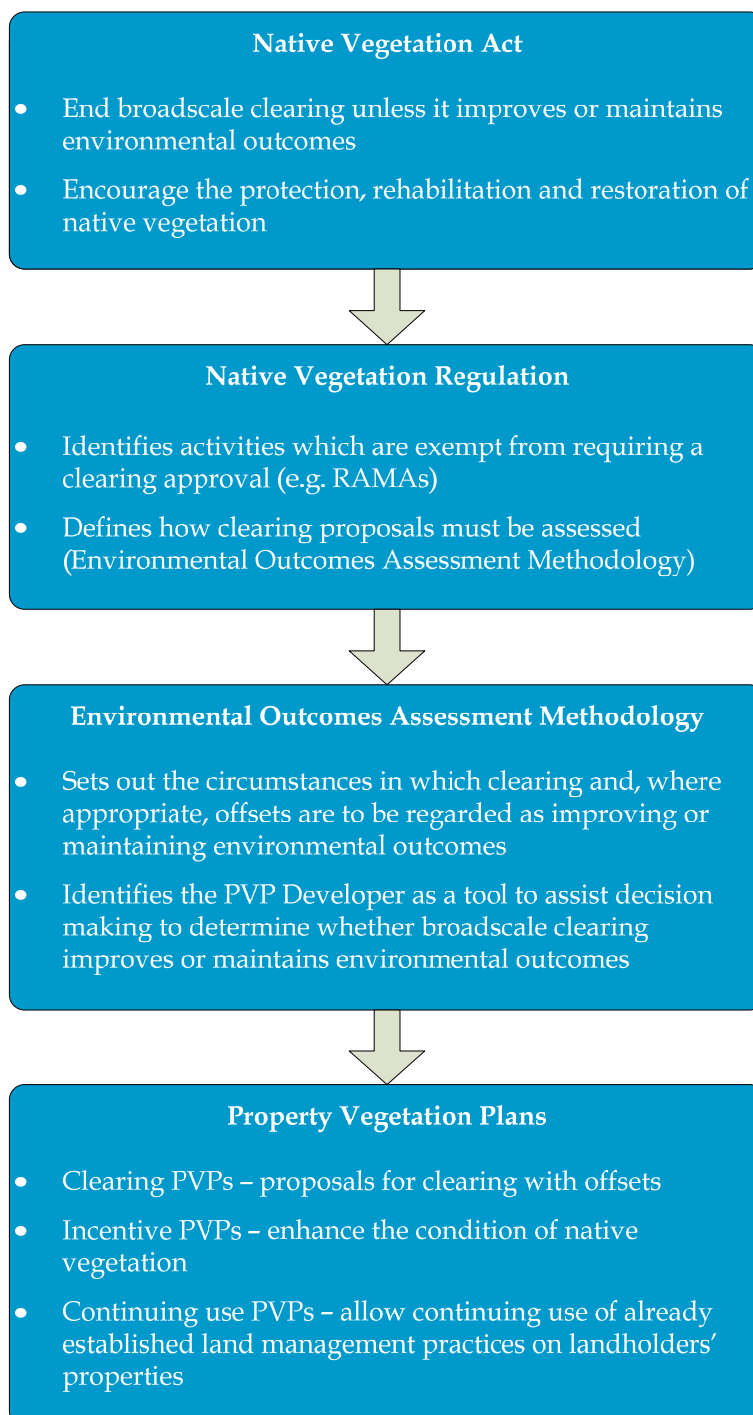
As required by the Act and Regulation, CMAs use the PVP Developer to assess proposals to clear native vegetation. However, to date most CMAs report that they find the PVP Developer impractical as a tool to assist them in deciding where to invest in incentive PVPs. Future PVPs should be better informed by a landscape approach to managing vegetation, and more closely align on-ground activities with CAP targets.

Draft recommendation 3.3

All decision-support tools and assessment processes (including the PVP Developer) used by CMAs to assess property vegetation plans and allocate incentive payments to landholders should reflect the CMAs' spatial representation of its CAP targets and investment priorities.

³⁴ This funding forms part of the \$436 million package, jointly funded by the Australian and NSW Governments, for NRM investment by CMAs.

Figure 3.1: Native vegetation legislation in NSW



4 Multi-property vegetation plans

A multi-property vegetation plan may be a more effective mechanism than a single property vegetation plan to develop vegetation plans at the landscape scale where:

- a group of landholders have common objectives and their properties cover a sufficiently large area that it is possible within the plan to manage NRM issues at an appropriate scale
- the costs and benefits of the plan can be shared among landholders in a way that each remains financially viable and committed to implementing the plan over time
- adequate governance arrangements can be agreed and enforced to provide security to the landholders, CMA and other stakeholders that the plan will be implemented.

Feedback from experts in this field suggests that the circumstances in which this is possible may be comparatively uncommon. However, CMAs should have the option and capacity to assess such plans if they can be viably developed. Hence the NRC has developed a draft *Guide for Multi-Property Vegetation Plans* (the Guide) which CMAs could use to apply the standard and their CAP targets to assess such proposals.

Before being finalised, the Guide will be tested and improved through a pilot process which will inform the NRC's final advice to the Minister.

The remainder of this Chapter is structured as follows:

- Section 4.1 reviews the lessons from some previous attempts at multi-property planning
- Section 4.2 discusses some enforcement issues with multi-property vegetation plans
- Section 4.3 explains why the NRC proposes a new process to assess multi-property vegetation plans
- Section 4.4 explains why CMAs need to determine the cost-effectiveness of multi-property vegetation plans before they are developed
- Section 4.5 summarises the draft Guide
- Section 4.6 explains how the pilot process will run.

4.1 Lessons from previous attempts at multi-property plans

There have been previous attempts in NSW to manage vegetation and other natural resources using plans that span multiple properties. Some valuable thinking has gone into these attempts and important lessons have emerged. This work is the foundation for the NRC's recommendations in this area.

As Williamson *et.al.* points out, achieving integrated environmental, social and economic objectives within a degrading natural resource base is a challenging exercise because:

*"Many conventional attempts to address these issues [biodiversity and agricultural systems loss coupled with social consequences] invariably fail to capture resource 'wholes' and are hampered by narrowly-focused programs, entrenched individual property rights, institutional impediments, economic incentives and inappropriate spatial and temporal scales."*³⁵

³⁵ Williamson, S., Brunckhorst, D. and Kelly, G. (2003) *Reinventing the common: cross-boundary farming for a sustainable future*, The Federation Press, Sydney.

However, the authors believe that managing natural resources across multiple properties, in particular common property ventures, appear to contribute to ecological and social resilience.³⁶

This section describes some examples of the approaches proposed or tried to date, and some of the lessons learned from these.

4.1.1 Example 1: Tilbuster Commons

Tilbuster Commons Pty Ltd is a registered private company of landholders who collaboratively manage approximately 1,300 ha of prime grazing land in the New England Tablelands, NSW. The Tilbuster Commons are four adjacent farms located in the Tilbuster Creek sub-catchment 20 km north of Armidale. The landholders involved have been managing their lands collaboratively since 1999 and in 2001 registered the group as a company. Their approach is to manage the four farms as if they were one property.

The landholders share common values and objectives for the management of their lands. The objectives include: freeing up of time; improving the environment; resilience of the resource base; and financial returns. The individual landholders contribute land, livestock, infrastructure and labour to the management of the Common.

The benefits the landholders have experienced include:

- a 7-12% increase in income
- long-term conservation and maintenance of high conservation value ecosystems
- improved water quality of creeks (300%)
- improved pasture, weed, water and drought management
- more efficient accounting, book keeping and management practices
- farm diversification into organic certification and lavender oil production

The characteristics of the Tilbuster Commons project that has made it successful include:

- an ability to allocate available resources more efficiently across the larger area of land
- a core set of shared values across all landholders
- practical governance under a strong but flexible legal structure that defines how costs and profits are shared.³⁷

While the Tilbuster Commons example goes further than what might usually eventuate through multi-property vegetation plans, that is, collective management of multiple properties as a single 'whole' under a registered company, it clearly demonstrates the benefits of multiple properties working together to manage resources and the environment.

4.1.2 Example 2: Furracabad Valley

Furracabad Valley is located outside of Glen Innes in the New England Tablelands. The idea of establishing a group farming system arose out of the accomplishments of the Furracabad

³⁶ Ibid.

³⁷ Brunkhorst, D. (2002) *Creating a contemporary Common Property Resource management institution*, Final report to Land and Water Australia, Institute for Rural Futures, UNE, Armidale.

Landcare Group. Landholders involved in enhancing the environmental sustainability of the valley through Landcare were keen to explore innovative ways of addressing the economic and social sustainability of rural communities through local collective action.

The landholders' objective was to manage a group of farms as one entity to achieve efficiencies and develop better employment, social and economic conditions for the landholders and their surrounding community. Initiated in 2002, the process for developing the 'farm cluster' included: undertaking a resource audit of the valley; identifying the gains and outlining a structure for the cluster; and developing a business plan acceptable to landholders.

Although the valley consists of 25-30 farms, only 5 landholders expressed an interest in forming a cluster, which amounted to an area of approximately 2,500 ha. Additionally, as the process for developing the cluster progressed, fewer landholders were willing to commit to managing their property within a group farming company. Ultimately, it was concluded that the farm cluster was not a viable option for Furracabad Valley landholders.

The Furracabad Valley experience identified a series of key lessons for a successful multi-property plan. These included the need for:

- a critical mass of landholders within proximity to one another and with a willingness to commit to a group farming arrangement
- investment of time in changing the individualist attitude of landholders and building trust and confidence within a group in order to effectively negotiate equitable outcomes
- enshrining the social and environmental benefits in the group farming arrangement, including building children's skills to ensure long term sustainability of the 'family farm'.³⁸

4.1.3 Example 3: Land and Water Management Plans

Land and Water Management Plans were established during the privatisation of the formerly NSW Government owned Irrigation Areas and Districts in the Murray and Murrumbidgee regions. Plans were negotiated between irrigators and Government as part of the broader agreement by which the newly privatised entities took over managing the channels and other water supply and drainage infrastructure.

Land and Water Management Plans were designed to achieve multiple objectives across large areas of land and multiple properties. For example, Murray Irrigation Limited administers four plans covering the local districts of Berriqiu, Cadell, Denimein and Wakool. The objectives of the four plans are to achieve: sustainable agricultural productivity; protection and enhancement of the regions natural biodiversity; a stable community; and to avoid the creation of future downstream impacts.

The Murray plans are underpinned by a 30 year agreement between the local community and the NSW Government, under which Government makes ongoing payments to fund aspects of the plans. The plans are set within an institutional framework that, according to the Murray

³⁸ Marshall, G.R., Fritsch, S.J., and Dulhunty, R.V. (2005) Catalyzing Common Property Farming For Rural Sustainability: Lessons from the Furracabad Valley, *Australasian Agribusiness Review* Vol. 13.

Irrigation Limited, "demands commitment and accountability by landholders, the implementation au thorities and Government."³⁹

The plans are an integrated strategy of farm level and district scale works and education, monitoring and research and development programs. There are six main components of the strategy:

- improved community understanding involving education, research and development and monitoring and review
- increased adoption of better farm management practices
- enhancement of biodiversity
- managing stormwater runoff
- stabilising high watertable areas
- improving the efficiency of the irrigation supply system.⁴⁰

Each plan took considerable time and resources to negotiate. Essential to their successful implementation has been the well-resourced management and strong Board governance that each privatised irrigation corporation had already created to operate the privatised legal entity.

4.1.4 Example 4: Southern Mallee Guidelines

In June 2000, the Southern Mallee Regional Planning Committee prepared the *Southern Mallee Regional Guidelines for the Development of Land Use Agreements*⁴¹ (the Guidelines). A wide spectrum of stakeholders was represented on the Committee. The Guidelines cover approximately 47,000 square kilometres in the far south west of NSW (4.7% of the Murray-Darling Basin).

The Guidelines were not a multi-property vegetation plan in themselves, but formed a planning context within which landholders entered individual land-use agreements. The land-use agreements contain explicit landscape scale contextual linkages on issues such as biodiversity connectivity and the regional significance of vegetation.

The land-use agreements (i.e. single property plans) effectively integrated:

- the clearing consent process under the *Native Vegetation Conservation Act 1997* (repealed)
- the cultivation consent process under the Western Lands Act 1901
- actions to alter conditions of the Western Lands Lease
- registration of the development and conservation areas on Western Lands lease title
- a Property Agreement under the *Native Vegetation Conservation Act 1997* to identify associated management practices and incentives for land to be set aside for conservation.

³⁹ The Murray Land and Water Management Plans, accessed at <http://www.murrayirrigation.com.au/lwmp/>

⁴⁰ Ibid.

⁴¹ "Southern Mallee Regional Guidelines for the Development of Land Use Agreements" – to address clearing, cultivation, nature conservation and cultural heritage issues. Prepared by the Southern Mallee Regional Planning Committee, June 2000.

The Guidelines were developed as a result of the Natural Resource Management Strategy funded project 'Regional Planning for Clearing and Cultivation' (South West Land Management Group). Under the project, key clearing and cultivation issues were identified through consultation with stakeholders and interest groups. These issues were analysed, discussed and new data collected to resolve specific issues. A 'trade-off' model was developed and trialled under a property plan by a local landholder.⁴² Essentially, the property plans sets aside land for conservation in exchange for the approval to develop other parcels of land for dryland cultivation.

Subsequently, the Southern Mallee Regional Planning Committee formalised a range of Best Management Practices for conservation and sustainable development and maintenance of cultural heritage interests under the Guidelines.

The Guidelines demonstrate the benefits of landscape scale vegetation planning even where this vision for the landscape is enforced by individual property agreements.

The practicality of this system was also aided by the very large size of individual properties in the region. This made it comparatively easier to identify possible environmental improvements on individual farms that would offset proposed land-use changes on that farm.

4.2 Enforcing multi-property vegetation plans

A multi-property vegetation plan poses unique challenges to ensure all parties abide by the plan for its duration. It is therefore critical that any multi-property vegetation plan is underpinned by robust and appropriate governance arrangements that provide business efficacy and legal stability.⁴³ Section 4.1 provided examples of some governance arrangements for landholders managing multiple properties. For example, after considering various legal structures, landholders in Tilbuster Commons project opted to register as a private company (Pty Ltd). This form of business structure creates a 'conflict of interest' because individual landholders are also directors of the company. This has the advantage of creating 'tension' between the individual landholder's interest and the collective interests of all the landholders in the company.⁴⁴ As Brunckhorst states,

*"With both hats on, individuals are always considering the best options of benefit to themselves and the other members through the company."*⁴⁵

Other business structures landholders could adopt to manage multiple properties include partnerships, trusts and co-operatives. However, in the short-term, it may be necessary for a multi-property vegetation plan to be developed as a group plan, but enforced as a number of individual contracts with transparent 'off-farm' offsets. This is where a sub-set of landholders who are seeking to develop their properties are paying other landholders to offset this impact by improving and maintaining the management of native vegetation (and other natural resources) on their properties.

⁴² For more information on this model see 'The Southern Mallee Regional Guidelines' A Case Study in *Regional Native Vegetation Management Plans: a model*, Prepared for the World Wide Fund for Nature, December 2000, accessed at www.org.au/publications/regional_native_vegetation.pdf

⁴³ Williamson, S., Brunckhorst, D. and Kelly, G. (2003) *Reinventing the common: cross-boundary farming for a sustainable future*, The Federation Press, Sydney.

⁴⁴ Brunckhorst, D. (2002) *Creating a contemporary Common Property Resource management institution*, Final report to Land and Water Australia, Institute for Rural Futures, UNE, Armidale.

⁴⁵ Ibid.

Each of the structures has its benefits and disadvantages relative to each other. The NRC believes any governance arrangements should be fit-for-purpose and it is important that landholders have an understanding of the risk management and compliance processes in establishing and implementing the arrangements, and ultimately, the outcomes they are seeking. This ensures ownership and increases the probability of self governance and regulation.

It is not the NRC's intent to explore the detail of each arrangement in this report. However, the pilot process that the NRC is undertaking to further develop the Guide for multi-property vegetation plans (see Sections 4.5 and 4.6 for discussion on the Guide and pilot process) will include consideration of the most cost-effective method of monitoring implementation of the plan and enforcing its provisions. As required, the NRC will make recommendations on these matters in its final report to the Ministers.

Key finding 4.1

Multi-property vegetation plans have the potential to achieve significantly better outcomes than plans developed at the scale of individual properties within the same landscapes. However, they require robust and appropriate governance arrangements to ensure all parties abide by the plan for its duration.

4.3 A cost-effective method to assess multi-property vegetation plans

CMAs have worked in close consultation with their local communities to develop CAPs that are strategic plans for their regions, and which nominate integrated targets designed to deliver local, regional, state and national objectives for NRM. Analogous to the approach used in the Southern Mallee Guidelines, the NRC believes there is now a unique opportunity for CMAs to use their CAPs to provide the planning context for single and multi-property vegetation plans.

Given the significant upfront investment Government has made in creating the PVP Developer to negotiate single-property vegetation plans, the NRC has recommended in Chapter 5 how this mechanism could be extended to link to CAP targets and gain some of the advantages of managing at a landscape scale. On balance, the heavy up-front costs of developing and maintaining the PVP Developer would appear to be justified to ensure the potentially large number of small scale clearing PVPs are assessed comparatively quickly and consistently.

DNR and DEC have indicated that they currently intend to upgrade the PVP Developer to help it deal with the technical computing challenges of assessing property vegetation plans at very large spatial scales.⁴⁶ The PVP Developer would require extensive modification if it were to assist CMAs to measure all the potential benefits of managing vegetation at the landscape scale outlined in Chapter 2, and to cater for the complexity of issues encountered in previous attempts at multi-property planning (Section 4.1)

However, there is an opportunity to review what is the most cost-effective mechanism to negotiate multi-property vegetation plans. From the examples the NRC has reviewed, and our consultations with experts in this field, we believe that the circumstances under which a multi-property vegetation plan will be practical are comparatively rare, and will involve complex

⁴⁶ For example, vegetation's 'landscape value' under the Biometric tool in the PVP Developer is assessed up to only 1,000 ha.

issues unique to the particular circumstances. As such, the NRC does not believe that extending the current PVP Developer is the most cost effective method to develop and assess proposed multi-property vegetation plans within the context of CAP targets. However, any new method used to develop and assess multi-property vegetation plans should consider at a minimum, and use as appropriate, the datasets associated with the PVP Developer, such as the Threatened Species Module.

The importance, complexity and likely uniqueness of each multi-property vegetation plan suggests that a more expert-based system with more discretion would be appropriate. Such a system needs a similarly high level of rigour and accountability as the current process for developing PVPs, but it would be more cost effective for this to be done as one-off detailed assessments based on science, analysis and consultations particular to the issues and circumstance at hand. However, the NRC believes a multi-property vegetation plan developed under an expert-based system should not:

- allow reduced biodiversity outcomes to be traded for improvements in other natural resource areas
- allow clearing of very high conservation value vegetation, relative to the landscape context of that vegetation, regardless of the offsets proposed.

Such a system would be significantly cheaper to establish, requiring mainly that the decision-making criteria, required process, and accountability measures are clearly specified. However, it would be significantly more resource intensive to assess each plan as it would require a range of expert advice and assessments. That is, it would have lower fixed or up-front costs, and higher transaction costs (Section 2.4).

Given that such a system would have significantly more scope for a CMA's discretion and expert judgement in how the plan was assessed, it would be more appropriate for the Minister for Natural Resources to approve the plan, with the concurrence of the Minister for the Environment.

The development of a new assessment method for multi-property vegetation plans rather than relying on the PVP Developer was supported by the submission from NSW Farmers, which indicated:

'The Association is hoping that the NRC will develop a project-based methodology that brings together experts and stakeholders to gather data and develop landscape scenarios that maximise the environmental, social and economic benefits.' (p. 8)

Using such an approach is also likely to shift the costs of the assessment from agencies (via their upfront investment in reworking the PVP Developer) to either CMAs or landholders depending on who ultimately pays for the expert advice and assistance needed to finalise the assessment.

Key finding 4.2

Extending the current PVP Developer is not the most cost effective method to develop and assess proposed multi-property vegetation plans. The importance, complexity and likely uniqueness of a multi-property vegetation plan suggest that a more expert-based system with more discretion would be appropriate.

Draft recommendation 4.1

Government should implement an additional new assessment method under which CMAs would work with groups of landholders to develop multi-property vegetation plans for approval by the Minister for Natural Resources, with the concurrence of the Minister for the Environment (Government should note that the NRC has developed a draft Guide for Multi-Property Vegetation Plans and intends to test and improve it through a pilot process).

Draft recommendation 4.2

The additional assessment method must be consistent with the Government's policy of requiring improved or maintained environmental outcomes, but should allow significantly more flexibility in how this is demonstrated by providing for expert scientific assessments of proposed plans based on the best available science, detailed analysis and consultations specific to the issues and circumstances at hand.

Draft recommendation 4.3

The additional assessment method should consider at a minimum, and use as appropriate, the datasets associated with the PVP Developer. It should not:

- ***allow reduced biodiversity outcomes to be traded for improvements in other natural resource areas***
- ***allow clearing of very high conservation value vegetation, relative to the landscape context of that vegetation, regardless of the offsets proposed.***

4.4 Determining if a multi-property vegetation plan will be cost-effective

As multi-property vegetation plans are likely to be significantly more resource intensive than a single-property assessment, CMAs will need to establish if the proposal is likely to be the most cost-effective way of contributing towards CAP targets (while also complying with relevant legislation). This decision point should also ensure landholders clearly understand the accountability and approval criteria multi-property vegetation plans must meet before they are approved (more detail on approval criteria is explained in section 4.5).

The NRC considered establishing a practical threshold which a multi-property vegetation plan proposal would need to meet before CMAs and landholders proceeded with further development. However, establishing a state-wide threshold would probably be inappropriate considering the biophysical, social and economic variability under which multi-property vegetation plans could be proposed across the state. The NRC will consider this further during the pilot process.

For example, a multi-property vegetation plan proposed over two properties in the western parts of the state may cover a sufficient scale to capture enough potential benefits for a CMA to warrant the higher transaction costs of its development and assessment. However, a multi-property vegetation plan proposal over two small properties in the coastal fringe may deliver

insufficient benefits to warrant the proposal being developed and assessed under the more resource intensive method. In this case, a CMA would find it more cost effective to assess (and develop) the proposal with the PVP Developer.

CMAs should establish ways to assist groups of landholders to gauge whether there is any prospect of successfully developing a multi-property vegetation plan that would comply with relevant legislation and sufficiently contribute towards CAP targets and priorities. Ideally, each CMA should establish 'threshold' criteria that are relevant to its region and which a multi-property vegetation plan proposal would need to meet before being developed and assessed under the new assessment method.

Draft Recommendation 4.4

CMAs need to establish guidance material relevant to their region which a proposed multi-property vegetation plan would need to meet before progressing to detailed development and assessment under the Guide. This material must be made public by the CMA.

4.5 Summary of the proposed Guide

The NRC has developed a draft *Guide for Multi-Property Vegetation Plans*⁴⁷ (the Guide) which could serve as this new, more flexible assessment method for proposed multi-property vegetation plans. The Guide covers how such plans would be developed by CMA staff and landholders, reviewed by the CMA Board, audited by the NRC and considered for approval by the Minister.

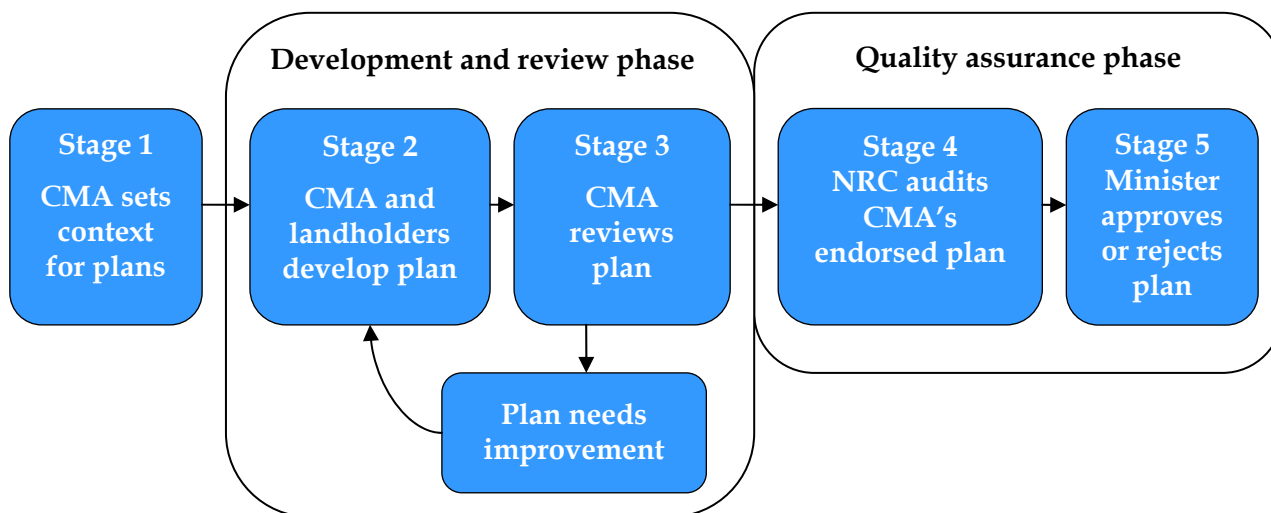
The draft Guide incorporates decision-making criteria that are consistent with those hard-coded into the PVP Developer, but would permit significantly more flexibility in how CMAs and landholders would use expert scientific advice to demonstrate how these are met by a particular plan.

If endorsed by the Ministers for Natural Resources and Environment, the method proposed in the Guide could be implemented relatively quickly as either an additional chapter of the Assessment Methodology, or by amending Clause 26 of the *Native Vegetation Regulation 2005* to permit the proposed method to be used as an alternate way to assess a proposed plan against the requirement to improve or maintain environmental outcomes.

The Guide's process and the parties involved are illustrated in Figure 4.1.

⁴⁷ Available at www.nrc.nsw.gov.au

Figure 4.1: Process for developing and reviewing multi-property vegetation plans



The draft Guide effectively requires CMAs to use the standard and their CAP targets to review proposed multi-property vegetation plans. It explains the:

- processes that the CMAs, landholders and NRC need to follow
- templates the CMAs should use to complete the main steps in each process
- decision-making criteria that the CMAs needs to apply
- evidence that must be retained
- peer review, auditing and reporting required to ensure the quality of decisions.

The following sections discuss each stage in Figure 4.1 in more detail.

4.5.1 CMA sets context for plan

The purpose of this stage is for a CMA to ensure interested community members can easily understand how:

- they can contribute towards a CMA's investment priorities within their local area⁴⁸
- achieving important land-use change or improved management is in their locality, relative to change in other locations.

Application of the 'Community Engagement' component of the standard is of particular relevance in understanding the context of the multi-property vegetation plan. CMAs can build upon their existing strategies to engage their communities and participating landholders on:

- legislative and state policy requirements, such as the need to improve or maintain environmental outcomes and instruments such as Priority Action Statements
- CAP targets and priorities and a CMA's investment and funding priorities, such as priorities targeting revegetation of riparian areas

⁴⁸ By applying the standard, CMA priorities link to state and national priorities, for example NSW's Priority Action Statements and World Heritage Areas.

- opportunities to contribute to other landscape planning initiatives, such as those implemented by other land managers in the local area, and
- any vegetation management actions which the CMA considers will not be approved, such as significant clearing of good quality endangered ecological communities.

The CMA should work towards having spatial maps that represent their CAP targets and illustrate broad landscape functions and processes.

It is also equally important in this stage that the CMA assists landholders to communicate their objectives. The main outcome of this stage will be to identify whether there is a nexus between the CMA's priorities and landholders' objectives prior to undertaking any detailed planning. The criteria that the CMA will apply to assess proposed plans need to be clearly available and the CMA will need to establish ways to assist groups of landholders to rapidly gauge whether there is any prospect of successfully developing a multi-property vegetation plan that would comply with relevant legislation and be supported by the CMA as contributing sufficiently towards its CAP targets.

4.5.2 Helping landholders develop the plan

The purpose of this stage is for CMA staff, landholders and appropriate experts to:

- conduct fieldwork and research, and use best available information, models, tools and datasets to better understand the landscape proposed to be covered, its natural resource assets, current pressures on these, and the land's productive capacity
- develop and iteratively test plan scenarios to optimise the configuration of land-use and management actions against relevant detailed prescriptions representing Government's policy positions on certain issues, the landholders' objectives, landscape planning priorities and landscape function, and the CAP targets and priorities.

Any multi-property vegetation plan must demonstrate that it:

1. is based on the best available scientific understanding of landscape function
2. can improve or maintain environmental outcomes
3. contributes sufficiently strongly towards CAP targets and priorities
4. is feasible to sustain in the long term
5. is designed so management actions can be continually improved over time to achieve the plan's objectives.

In developing the *Environmental Outcomes Assessment Methodology*, Government established a range of detailed prescriptions in consultation with relevant stakeholders. These include such matters as:

- a threshold test that proposed plans must at least improve and maintain environmental outcomes
- a restriction against allowing reduced biodiversity outcomes to be traded for improvements in other natural resource themes
- restrictions on clearing of very high conservation value vegetation regardless of the offsets proposed.

The Guide will allow the CMA, landholders and the relevant experts more flexibility in how they use more locality-specific science and expertise to demonstrate the proposed plan meets these prescriptions. Ultimately, the application allows users to meet multiple needs and deliver sustainable outcomes across a range of issues relevant to that landscape.

As discussed in Section 4.3, the NRC believes a multi-property vegetation plan should not:

- allow reduced biodiversity outcomes to be traded for improvements in other natural resource areas
- allow clearing of very high conservation value vegetation, relative to the landscape context of that vegetation, regardless of the offsets proposed.

In addition to the current requirement that environmental outcomes be improved and maintained, the NRC believes there may be further detailed prescriptions on how this should be assessed. These may include:

- specifying trading ratios:
 - between offset credits and trading losses (these are already defined in the PVP Developer)
 - between non-equivalent outcomes
- defining 'no-go' areas where it is considered that no offset will be sufficient to compensate for the loss or there is too great a risk that unique values will be lost
- determining the extent to which trading is limited to 'like-for-like' outcomes
- incorporating weightings or other links with targets and priorities in CAPs.

These issues are discussed in more detail in Chapter 6. The NRC will explore and test how this should be done in a pilot process (section 4.6).

4.5.3 CMA reviews plan

The objective of this stage is for the CMA Board to assess whether the proposed plan:

1. is based on the best available scientific understanding of landscape function
2. can improve or maintain environmental outcomes
3. contributes sufficiently strongly towards CAP targets and priorities
4. is financially feasible and supported by robust governance arrangements to sustain outcomes in the long-term
5. is designed so management actions can be continually improved over time to achieve the plan's objectives.

This stage would be led by CMA Board members or their delegates, and a staff member with relevant expertise who has not been involved in facilitating the plan.

The draft Guide also requires the CMA to engage independent experts to peer review the plan to establish that it is based on the best available science, and is otherwise consistent with the Guide.

The CMA would publicly exhibit the draft plan and peer review(s), and consider and report on any submissions before making a final endorsement to the Minister.

4.5.4 NRC audits CMA's endorsed plan

The NRC will independently audit that the CMA has assessed the proposed plan in accordance with the Guide.

The NRC audit will not reassess the detail of the proposed plan, which has been assessed by the CMA and an independent peer review. Instead, the NRC will audit whether the processes followed by the CMA and landholders, and the science used, were sufficient to comply with the Guide (and hence the standard).

4.5.5 Minister approves or rejects plan

The Minister will make the final decision on whether the proposed plan complies with the objectives of the *Native Vegetation Act 2003* and should be approved.

4.6 Pilot of the draft Guide

The NRC will pilot the draft Guide to:

- improve the draft Guide in consultation with CMAs, landholders and other stakeholders
- identify required actions by agencies to support the implementation of the Guide
- develop a preferred multi-property vegetation plan for the piloted properties.

The NRC will consult with CMAs as to whether landholders in their CMA would be interested in piloting the Guide in their catchment. Details of the pilot process can be accessed via the NRC website.⁴⁹

⁴⁹ Natural Resources Commission (2006) *Pilot Process – Guide for multi-property vegetation plans*, August 2006, accessed at www.nrc.nsw.gov.au

5 Single property vegetation plans

Now that the PVP system, CAPs and the standard and state-wide targets have been established, it is important that they be better integrated to encourage land use and management that will contribute most to restoring the health of landscapes and delivering the desired environmental, economic and social outcomes from our natural resources. Vegetation management plans negotiated at the scale of individual properties are likely to remain the most common method by which CMAs work with landholders to deliver these improved NRM outcomes. It is therefore important that agencies' ongoing improvement of the PVP Developer seeks to better capture the benefits of managing vegetation at the landscape scale by establishing stronger links between PVPs and CAPs, and that CMAs provide input to this process by expressing their CAP targets and investment priorities at a sub-catchment scale.

The NRC recognises that the Act and the Regulations have only been operational since December 2005 and CMAs, DNR and DEC need time to bed down their implementation. However, the NRC considers it is now possible to map out what might be termed 'second generation' improvements in the Assessment Methodology and PVP Developer.⁵⁰ These improvements will ensure PVPs are more fundamentally based on how land-use and management on an individual property fits within its landscape context and its relative importance in contributing towards CAP targets.

This chapter uses the quality assurance framework of the standard to recommend how the 'second generation' of the PVP Developer could be improved to better realise the potential benefits of managing at a landscape scale.

Key finding 5.1

Single property PVPs will continue to play an important role in managing vegetation in NSW. While mechanisms are in place to monitor and improve the PVP Developer, it should seek to better capture the benefits of managing vegetation at the landscape scale by establishing stronger links between PVPs and CAPs.

5.1 Improving the decision rules

The PVP Developer includes a set of detailed decision rules that are based on expert knowledge of available science and judgements on the circumstances in which clearing and any proposed offsets will improve or maintain environmental outcomes. It has been designed to lead CMA staff through a structured process of applying the decision rules to a clearing proposal.

The nature of the decision rules in most of the tools in the PVP Developer means that the assessment process gives regard to the impact of clearing at a landscape scale to some degree. DEC states:

⁵⁰ The Ministers for Natural Resources and Environment have established a Ministerial Review Committee to supervise implementation of the Regulation, Assessment Methodology and PVP Developer. The NRC provides Secretariat support to that committee and reports on the Committee's recommendations and summaries of actions taken by agencies. The Ministerial Review Committee has already recommended some improvement to the Assessment Methodology and the PVP Developer, and these recommendations are not repeated here.

'The biodiversity module, for example, considers issues such as contribution of vegetation to landscape connectivity and regional significance of the vegetation type in question.' (p. 3)

However others also identify limitations to the PVP Developer. Southern Rivers CMA states:

'The current PVP Developer seems to undervalue the benefits of landscape-scale benefits and, whilst valuing connectivity, has a limited treatment of broadscale outcomes and the benefits of strategically managing native vegetation at a landscape scale.' (p. 2)

The decision rules in each of the tools generally only take account of the environmental outcomes related to a particular aspect of the landscape. For example, the assessment made by the biodiversity tool does not credit improvements in soil biodiversity in its assessment of whether biodiversity outcomes are improved or maintained.

Central West CMA states:

'Elements such as soil and biodiversity are currently considered in isolation with each other creating a less than holistic or integrated approach' (p. 2)

A further issue is that the decision rules intentionally exclude social and economic considerations as the Regulation and Assessment Methodology explicitly excludes these factors as part of the assessment of whether environmental outcomes are improved or maintained. However, as with multi-property vegetation plans, the NRC considers that a landholder's financial viability is critical in sustaining improved or maintained environmental outcomes over time and should be considered in single PVP assessments. It is not intended that social and economic considerations override environmental outcomes, rather they will be an additional consideration in assessing a proposed PVP.

The benefits of landscape planning described in Chapter 2 suggest that there are improvements that can be made to the use of Decision Rules in the PVP Developer to better capture landscape benefits. These are:

- improving integration of the assessment of the various landscape components – the use of separate modules means that impacts on different parts of the landscape are considered separately and there is no capacity to assess overall benefits in an integrated way or to facilitate optimisation of land-use by considering the relationships between all of the proposed actions and outcomes⁵¹
- recognising the contribution of the social and economic components of landscapes to achieving environmental outcomes – no consideration is currently given to the likely contributions of the social or economic components of landscapes to achieving improved environmental outcomes despite the integral links between them.

Application of the 'Determination of Scale' component of the standard is critical to improving the capacity of the PVP Developer to support achieving landscape outcomes. The aim is to maximise the contribution of actions on a property to broader goals in an integrated way. It requires, for example, consideration of what offsetting actions might achieve the best result

⁵¹ The Assessment Methodology foreshadows the need to better integrate the assessment of environmental outcomes. It provides that once an appropriate method is approved and incorporated in the Assessment Methodology, the *net* effect of impacts and benefits on water quality, land degradation and salinity will be assessed but biodiversity outcomes will still be assessed separately. This would improve to some extent the capacity of the PVP Developer to better capture landscape benefits.

across a range of landscape components rather than assessing each environmental outcome separately.

Draft recommendation 5.1

The science and decision rules underpinning the 'second generation' of the Assessment Methodology and PVP Developer should continue to be extended to enable CMAs and landholders to:

- ***assess and maximise integrated environmental outcomes***
- ***incorporate socio-economic considerations in the assessment of whether the plan should be approved, recognising that a minimum requirement is that the plan must improve or maintain environmental outcomes.***

5.2 Incorporating CAP priorities into PVPs

Currently, during the development of PVPs no specific consideration is necessarily given to the communities' broad goals and values for landscapes expressed in CAPs although these may inform CMAs' decisions on incentive PVPs. This is partly because CAPs are not yet final and there has not been opportunity to integrate them in a systematic way with the PVP Developer.

In the future, priorities expressed in CAPs could be used to weight potential offsets or to value different possible combinations of environmental outcomes. This would better enable an assessment of whether PVPs contribute to landscape goals.

Draft recommendation 5.2

The decision rules underpinning the 'second generation' of the Assessment Methodology and PVP Developer should continue to be extended to enable CMAs and landholders to incorporate the community's goals for landscapes (expressed in CAP targets).

5.3 Governance arrangements

Currently, CMAs have primary responsibility for both developing and approving a PVP. Commonly, functions like these are separated to improve governance arrangements and accountability. However, the nature of the PVP Developer and the limited capacity for CMAs to vary the result of an assessment mean that there is a high degree of central control on what CMAs can approve. The current situation also facilitates a one-stop shop for PVPs, making the entire process more streamlined. Separating the roles by requiring the Minister to approve each single property PVP would not be cost-effective.

The proposals outlined in recommendations 5.1 and 5.2, if implemented, have the potential to increase flexibility of the process and discretion applied by CMAs. These could warrant changes to accountability mechanisms to ensure appropriate risk management. For example, a program of spot audits might be instituted to assess the soundness of CMAs' decisions. These could

feasibly be integrated with CAP implementation audits⁵² which would reinforce the links between PVPs and CAPs.

Draft recommendation 5.3

If the 'second generation' of the Assessment Methodology and PVP Developer give CMAs significantly more flexibility and discretion, Government should consider requiring appropriate accountability and risk management arrangements, such as spot auditing of CMAs' decisions and processes.

5.4 Improving information systems

Once a PVP has been signed and approved, final details of the PVP are uploaded by the CMA to PAMS. PAMS is a central database that retains all client and property information in one system.

Currently, PAMS is only used to generate administrative information on PVPs. Potentially, other information it contains could be captured in ways that enhance our understanding of landscape context and functions. For example, the detailed field data captured on individual properties may be incorporated in tools, such as DEC's Biodiversity Forecasting tool that aim to capture information from all scales and a variety of sources to inform landscape planning. DEC states that:

'Biodiversity Forecasting makes use of best-available spatial data and scientific knowledge in a flexible manner, thereby allowing incremental refinement of the underlying information base over time ... the capacity for Biodiversity Forecasting to integrate planning and evaluation components of vegetation planning across multiple scales has significant implications in relation to development of approaches to linking catchment action planning to property vegetation planning.' (p. 4.)

Applying the 'Information Management' component of the standard should guide improving the functionality of PAMS and accessibility to information that will improve landscape planning. As required by the standard, potential privacy issues need to be addressed in any system that makes use of the information.

Draft recommendation 5.4

The 'second generation' of the PVP Developer should include improvements to the Property Administration Management System (PAMS) information management system to allow it to manage information required to improve understanding of landscape function.

5.5 Improving monitoring and evaluation

There are no explicit review triggers or adaptive management mechanisms incorporated in 15 year PVPs although it is possible to change a PVP by replacing it with a new PVP following a new assessment. This creates some level of certainty about the agreements. However, it also limits the potential for PVPs to change over time in response to improvements in understanding

⁵² The NRC is required to audit the implementation of CAPs under s.13 (1) c of the *Natural Resources Commission Act 2003*.

of landscape function. It also creates risks that unintended adverse consequences of PVPs approved now may not be corrected for a period of 15 years.

Monitoring and evaluation is a critical part of the standard and it is intended that it be used to inform adaptive management. It requires cooperative efforts of agencies, CMAs and others that collect relevant information. PVPs provide an opportunity to build our knowledge of landscape function and to use the knowledge to guide improved practice. The information could potentially contribute to monitoring programs at state and national scales that are used to inform NRM policy and investment decisions. NSW is in the early stages of implementing a state monitoring and evaluation strategy for NRM.

Draft recommendation 5.5

The Department of Natural Resources and Department of Environment and Conservation should identify practical monitoring and evaluation arrangements that will allow an assessment of the effectiveness of PVPs and should ensure PVP contractual arrangements are sufficiently flexible to support adaptive management.

Draft recommendation 5.6

The Department of Natural Resources and CMAs should develop links between PVPs and broader scale monitoring and evaluation activities, particularly NSW's monitoring and evaluation strategy.

6 Using market mechanisms to manage vegetation

Both single and multi-property vegetation plans are regulatory mechanisms that will help to achieve the Government's policy to end broadscale clearing unless it improves or maintains environmental outcomes. Off-farm offsets and trading (market mechanisms) could broaden the options for implementation and improve the potential for environmental gains.

Market mechanisms are a means of changing behaviour using financial incentives rather than regulation or voluntary cooperation. In certain circumstances this can be efficient and effective, particularly where it helps to establish values of assets and environmental services that are under-valued because they deliver public rather than private benefits. The potential benefits of a market based approach are that:

- landholders who want to develop land have a wider choice of options for meeting their obligations under Government regulations whilst also achieving regional, state and national targets for improving the health of landscapes overall
- landholders can generate income from improving and maintaining natural resource assets on their properties which increases their incentive for conservation and their capacity to manage their land to produce positive environmental outcomes as well as productive services
- investors in natural resources have the opportunity, within a market, to strategically invest to achieve their goals and targets.

There are substantial challenges in establishing markets for environmental outcomes including the need for consistent metrics, defining trading rules that will prevent loss of unique values, generating sufficient demand and supply for the market to operate efficiently, and developing efficient administrative arrangements.

This chapter discusses the potential role of market mechanisms to complement legislation and regulation to improve the prospects for achieving landscape benefits through management of native vegetation:

- Section 6.1 outlines reasons for exploring market mechanisms to complement the existing framework for managing native vegetation
- Section 6.2 describes the challenges and risks of trading in native vegetation and environmental services
- Section 6.3 sets out the key variables that need to be considered in establishing an effective market
- Section 6.4 outlines existing work that may help to facilitate markets for native vegetation in NSW and DEC's proposed BioBanking scheme.

6.1 Why consider market mechanisms?

The policy options that are currently being used to implement the Act are largely regulatory and depend on a detailed rule-based approach to assessment of clearing and financial incentive proposals. These have helped to signal the Government's intent to end broadscale clearing and have effectively defined clear constraints within which landholders must operate. Now these are in place, there is scope to incrementally explore how off-farm offsets and trading can be integrated within this framework to achieve greater environmental and economic gains. This

follows similar developments for other natural resources, for example, markets for trading water allocations, and increasing experience overseas and in Australia⁵³ that provide valuable lessons for establishing these markets.

6.1.1 Create incentives to value retention and management of native vegetation

The Act is effective in establishing the legal basis for ending broadscale clearing. However, it means that retaining native vegetation on a property can be perceived as a liability because it limits management options. This creates incentives for landholders who want to develop their land to find ways to clear by:

- using legal exemptions such as RAMAs under the Act
- developing PVPs (or multi-property plans) that allow clearing while meeting the legislative requirement to improve or maintain environmental outcomes
- risking penalties or enforcement action for illegal clearing.

Financial incentives are part of the Government's policy to counter this effect. The NSW and Australian Governments committed \$120 million over three years for incentives that it expected would be largely delivered through incentive PVPs. The Native Vegetation Reform Implementation Group⁵⁴ recommended that financial incentives be designed to:

- place a positive value on environmental work and provide meaningful incentives for landholders
- trigger investment at a scale sufficient to promote permanent change that is in the interests of the catchment or wider community and beyond the interests of individual land users
- as far as practicable, use contestable allocation processes via the use of transparent and evidence based indices that implement catchment plans
- include consultation with stakeholders to maximise return on investment
- complement and reinforce the effectiveness of PVPs and other policy instruments and processes.

These criteria lend themselves to broader use of market based mechanisms. Experience suggests they can be used to efficiently make greater gains in improving environmental outcomes more so than grants and subsidies. For example, evaluations of the Victorian Bush Tender program indicate that this auction based approach resulted in the preservation of 25 per cent more vegetation than a grants scheme making the same investment.⁵⁵

6.1.2 Potential for greater gains at a regional or state scale

Past clearing patterns mean that parts of the state, particularly the central agricultural belt, now have highly fragmented vegetation communities that are not viable for retaining biodiversity. In other parts, including western NSW, vegetation has been largely retained but changed

⁵³ For example, the Wetlands Mitigation Banking scheme in the US and Bushbroker in Victoria, Australia.

⁵⁴ Native Vegetation Reform Implementation Group (2003), *Final Report*, NSW Department of Infrastructure Planning and Natural Resources.

⁵⁵ Australian Government (2004), *Managing Our Natural Resources: Can Markets Help?*, Investigating Market Based Instruments in NRM, accessed at <http://www.nrm.gov.au/publications/nrm-mbi/index.html>

management practices including fire regimes, grazing practice and other factors have resulted in highly modified and often simplified vegetation communities including Invasive Native Scrub. This means that there is often a declining trend in the condition of these environmental assets even if clearing pressure has ceased. In many cases, it is not feasible or worthwhile for landholders to invest in management actions that will help to arrest the decline. Lower Murray Darling CMA states that:

'Under the current single farm or small scale scenario, there is unlikely to be future offsets for conservation, and therefore landuse [in LMD region] will remain as predominately grazing, despite being recognised by CSIRO, DEC and other scientists as having a major impact on biodiversity.' (p. 3)

The uneven distribution and condition of vegetation is a regional and state scale issue. Currently, the 'line in the sand' on clearing is applied at a single property level. For example, clearing an unviable fragment can only be offset if there is a conservation offset available within a single property's boundaries.

Trading mechanisms potentially provide more scope to achieve improvements by facilitating off-property offsets at larger scales than single or multi-property vegetation plans. This offers more scope to optimise the location and type of offset rather than restrict options within property boundaries. The benefits increase if the markets are linked to the targets and investment priorities in a region, as offsets are then more likely to align with landscape goals.

Offsets, relative to the cleared areas to which they apply, must at least maintain environmental outcomes but ideally will improve them. Market mechanisms facilitate achieving larger overall improvements because of the potentially increased number and quality of offsets that become possible. Trading should complement legislation that has effectively set a baseline for the amount and quality of native vegetation that must be retained in NSW. This creates an effective signal of scarcity which is necessary for a market to operate effectively.

Key finding 6.1

Off-farm offsets and trading (market mechanisms) could broaden the options to implement the Government's policy to end broadscale clearing and improve the potential for environmental gains.

6.2 What are the challenges and risks?

The development of markets is challenging because native vegetation is dynamic and diverse and is inter-related with many other components of landscapes. In NSW, markets for environmental services have been successfully established where a common unit of credit and regulatory goals have been well defined. Two examples are the NSW greenhouse gas abatement scheme⁵⁶ and the Hunter salinity trading scheme.⁵⁷

However, the difficulties of establishing markets for other environmental services such as native vegetation or biodiversity are widely recognised. These include:

- dealing with diversity in products which makes it difficult to measure and compare them using consistent units. For example, is a small fragment of high conservation value

⁵⁶ NSW Greenhouse Gas Abatement Scheme, accessed at <http://www.greenhousegas.nsw.gov.au/>

⁵⁷ NSW EPA (2003) *Hunter River Salinity Trading Scheme – Working together to protect river quality and sustain economic development*, NSW Environmental Protection Authority, Sydney.

ecological community more or less valuable than an extensive yet highly modified community?

- operating with limited understanding of the relationship between on-ground actions (that might be readily quantified) and environmental outcomes, the time lags involved, and the unpredictability of outcomes caused by variables such as rainfall and temperature
- creating scarcity of a resource by imposing a baseline and/or cap in the absence of detailed information on the status and condition of the resource
- managing the risks and legal responsibility for underwriting environmental improvements given the uncertainty associated with the issues above.⁵⁸

These challenges give rise to concerns that:

- unique environmental values, particularly biodiversity, will be lost if trading is allowed as there can never be a perfect alignment of 'like-for-like' products
- credits or offsets purchased through a market mechanism may not deliver the anticipated environmental outcomes
- no-one will ever know exactly what has been achieved as monitoring and evaluation is inadequate.

As a result, market mechanisms can give a sense of a 'loss of control' compared to the detailed prescription of regulations that focus on maintaining native vegetation, to the degree possible, in its present extent and condition.

There are means of safeguarding against unintended losses or consequences in a market environment. For example, trading rules can be imposed that place limits on 'what can be traded for what' either spatially (e.g. trading might only be allowed within a specified geographic area such as a bioregion), or functionally (e.g. only credits related to the same or similar ecological communities could be traded).

In addition, the ratio of credits or offsets required to achieve an acceptable environmental outcome can be increased to create a 'buffer'. This in turn increases the probability that the activities that produce credits to offset consumption of credits will be sufficient to improve or maintain environmental outcomes (for example, three units of credit might be required to offset the loss of one credit resulting from clearing). The ratio would depend on the level of uncertainty and acceptable risk. The PVP Developer already imposes these types of controls within a single property's boundaries.

Exercising these controls has implications for geographic market size and the likely volume of transactions. Hence, there is a trade-off between maximising the potential of the market to achieve the largest quantum of improved environmental outcomes and managing for uncertainty and the risk of unintended consequences. An appropriate balance needs to be achieved that ensures that the overall operation of the market results in an improvement in environmental outcomes achieved at an efficient cost. The less rigid the controls, the more scope there is to achieve greater environmental gain (but with potentially larger risks depending on the strength of underpinning science, governance and accountability arrangements).

⁵⁸ van Bueren, M. (2001) *Emerging markets for environmental services – Implications and opportunities for resource management in Australia*, Rural Industries Research and Development Corporation (RIRDC) No 01/162, Canberra.

Section 6.3 discusses some of the key variables that must be considered in establishing a market for environmental outcomes in NSW.

6.3 Incremental steps towards a market based approach

van Bueren has identified a set of key variables that influence the shape and form of a trading program.⁵⁹ The NRC has used these as headings to explore the steps the NSW Government might take to incrementally introduce trading mechanisms to support effective implementation of the Act. Some of these steps are currently being explored in related contexts in NSW. For example, DNR is developing a framework under the Native Vegetation Assistance Package to facilitate off-farm offsets as a way of alleviating financial hardship directly caused by the Act (Box 6.1). In addition, DEC is developing a biodiversity banking scheme that will facilitate offsets for the impacts on biodiversity of urban developments. This scheme potentially provides a platform for broader application of offsets across NSW and is described in Section 6.4.

Box 6.1: Offsets under the Native Vegetation Assistance Package

The NSW Government has funded a \$37 million Native Vegetation Assistance Package to address the potential social and economic impacts of an end to broadscale clearing on some landholders. It is only available to landholders assessed as suffering relative hardship and real financial loss as a direct result of the Act. The degree of disadvantage of landholders is assessed based on the level of retention of native vegetation on a property relative to the average for properties in the region and on a number of other factors. The package consists of three components:

1. sustainable farming grants – grants of up to \$80,000 are available if a clearing proposal receives a red light
2. farmer exit assistance – purchase of a property at pre-Act values will be offered if a clearing proposal receives a red light
3. offset pools – access to off-farm offsets will be offered if a clearing proposal receives an amber light and a suitable offset cannot be made on the property.

DNR is currently developing proposals for operating the offset pools. It is possible that this work could inform further development of broader application of off-farm offsets.

6.3.1 Specification of property rights

Trading requires that commodities and their ownership are clearly defined so that transfers can take place. The *Native Vegetation Act 2003* and the Regulation have helped to define the commodities in that they have:

- set a baseline that means only actions that result in improving or maintaining environmental outcomes attract credits that can be used to offset clearing
- established metrics for a series of environmental outcomes in the PVP Developer that are used to quantify potential losses and gains
- defined the duration of rights, for example, management actions in 15 year PVPs.

The metrics account separately for biodiversity, salinity, land capability and water quality outcomes. Currently these are not translated into common units or ratios that would facilitate

⁵⁹ Ibid.

'cross-theme' trading. In addition the style and quality of metrics varies so some are better suited to measuring credits at a single property scale than others. However, they do provide a useful starting point and clearly defined metrics are essential for effective functioning of a market and for ensuring environmental outcomes.

Staged development of a market could involve:

- adopting metrics consistent with those included in the PVP Developer as the basis for measuring credits for trading (initially, only one or two of the metrics may be considered sufficiently robust for this purpose)
- further developing the metrics to improve their scientific credibility and their potential for use in 'cross-theme' trading.

6.3.2 Scope of the market

The greater the number of participants and the wider the geographic area for market operation, the greater potential there is for economic efficiency. However, it can also increase the risk that the credits generated at different locations have unequal impacts. The *Native Vegetation Act 2003* applies in rural areas and not urban areas and trading across these areas could undermine the Government's policy intent in each area.

Steps towards establishing the scope of the market may be:

- allowing off-farm offsets as individual agreements between landholders – initially these might be used without substantial market infrastructure but they could provide scope to test demand for and effectiveness of off-farm offsets
- researching the likely volume of transactions and whether there will be sufficient numbers for effective and efficient market operation at a larger scale
- establishing regional trading pools, for example, by CMA region - this may reinforce links between the objectives of the market and a CMA's targets
- exploring expansion of trading pools to a single state-scale pool using experience gained from smaller-scale operations.

6.3.3 Trading rules

Trading rules establish the constraints within which the market will operate. They need to be sufficient to ensure that environmental outcomes are improved or maintained. In addition they need to facilitate effective market operation. The more prescriptive and limiting the rules, the less efficient the market will be.

A number of factors need to be considered including:

- specifying trading ratios:
 - between offset credits and trading losses (these are already defined in the PVP Developer)
 - between non-equivalent outcomes.
- defining 'no-go' areas where it is considered that no offset will be sufficient to compensate for the loss or there is too great a risk that unique values will be lost
- determining the extent to which trading is limited to 'like-for-like' outcomes
- incorporating weightings or other links with targets and priorities in CAPs

- deciding whether ‘borrowing’ and ‘banking’ is allowed – these add flexibility to a market by allowing generation of credits before or after an offset is required, but they can create risks if there is uncertainty about the environmental outcomes that will be delivered using the credits.

6.3.4 Organisation of transfers

Institutional arrangements are needed to administer and track exchanges of credits. In addition, brokering services can be established to facilitate connection of buyers and sellers. The initial exploratory steps of establishing a market might favour decentralised arrangements that are primarily the responsibility of a CMA. However, if market expansion is envisaged there are likely to be efficiencies and economies of scale in centralised administration. An independent administrator is appropriate if CMAs and government are likely to be major investors in the market.

Suggested steps include:

- allowing CMAs to administer off-property offsets in the short-term
- developing a model for efficient, independent administration of the market for the long term.

6.3.5 Monitoring and enforcement

Monitoring will be required to check the performance of those using credits to offset clearing and for verification and certification of credits. Enforcement mechanisms are also needed to

- check on the performance implementation of clearing approval and generation of credits
- track ownership and status of credits.

Suggested steps include:

- requiring DNR to extend its PVP Developer accreditation procedures to include how CMAs verify any trading credits created
- using PAMS to track the ownership and status of trading credits
- ensuring that the state monitoring and evaluation strategy monitors landholders’ compliance with PVPs.

Table 6.1 summarises possible steps Government could take to incrementally work towards greater use of market mechanisms.

Table 6.1: Possible steps toward more flexible market mechanisms to manage vegetation

Aspects of a market	Initial steps to progress
Specification of property rights	<ul style="list-style-type: none"> ▪ Adopting metrics consistent with those included in the PVP Developer as the basis for measuring credits for trading (initially, only one or two of the metrics may be considered sufficiently robust for this purpose). ▪ Further developing the metrics to improve their scientific credibility and their potential for use in ‘cross-theme’ trading.

Aspects of a market	Initial steps to progress
Scope of the market	<ul style="list-style-type: none"> ▪ Allowing off-farm offsets as individual agreements between landholders – initially these might be used without substantial market infrastructure but they could provide scope to test demand for and effectiveness of off-farm offsets. ▪ Researching the likely volume of transactions and whether there will be sufficient numbers for effective and efficient market operation at a larger scale. ▪ Establishing regional trading pools, for example, by CMA region which can reinforce links between the objectives of the market and a CMA’s targets. ▪ Exploring expansion of trading pools to a single state-scale pool using experience gained from smaller-scale operations.
Trading rules	<ul style="list-style-type: none"> ▪ Specifying trading ratios: <ul style="list-style-type: none"> - between offset credits and trading losses (as defined in the PVP Developer). - between non-equivalent outcomes. ▪ Defining ‘no-go’ areas where it is considered that no offset will be sufficient to compensate for the loss or there is too great a risk that unique values will be lost. ▪ Determining the extent to which trading is limited to ‘like-for-like’ outcomes. ▪ Incorporating weightings or other links with targets and priorities in CAPs. ▪ Deciding whether ‘borrowing’ and ‘banking’ is allowed – these add flexibility to a market by allowing generation of credits before or after an offset is required but can create risks if there is uncertainty about the environmental outcomes that will be delivered using the credits.
Organisation of transfers	<ul style="list-style-type: none"> ▪ Allowing CMAs to administer off-property offsets in the short term. ▪ Developing a model for efficient, independent administration of the market for the long-term.
Monitoring and enforcement	<ul style="list-style-type: none"> ▪ Requiring DNR to extend its PVP Developer accreditation procedures to include how CMAs verify any trading credits created. ▪ Using PAMS to track the ownership and status of trading credits. ▪ Ensuring that the state monitoring and evaluation strategy monitors landholders’ compliance with PVPs.

6.4 Establishing biodiversity banking

DEC is developing a market based biodiversity offsets and banking scheme called BioBanking. Introduction of the scheme is being considered by the NSW Parliament in parallel with its more detailed design. If approved by Parliament, amendments will be made to the *Threatened Species Conservation Act 1995* to facilitate the scheme. The scheme is a voluntary alternative to existing threatened species assessments required by Development Application processes. The

development of broader based market mechanisms could build on this existing work by increasing options to capture the benefits of managing vegetation at the landscape scale.

Currently, impacts on biodiversity in urban areas are assessed through application of planning controls that may require Species Impact Statements or application of a 'seven part test' to determine potential impacts of a development on threatened species.⁶⁰ These impacts are then considered alongside a range of social and economic factors before developments are approved. A loss of biodiversity is not necessarily the deciding factor in whether or not developments are approved.

The objective of the scheme is to facilitate using offsets for impacts of development on biodiversity where these will result in better biodiversity outcomes. This provides an alternative to current arrangements where biodiversity outcomes are sometimes traded-off against social and economic outcomes in planning decisions.

The proposed scheme also recognises that past clearing has resulted in a highly fragmented and modified landscape in urban areas and that many of these fragments are not able to support long term biodiversity conservation. In some cases, there is greater potential to achieve an improvement in environmental outcomes if clearing of degraded or unviable fragments is permitted for development in an urban area and offset by management actions that will improve the condition of viable vegetation communities in moderate to good condition at another site.

In his second reading speech, the Minister for the Environment states:

*'The death by a thousand cuts, that is the cumulative losses caused by hundreds of individual developments, must be reversed. At the same time, of course, we still need the social and economic benefits of development... [and] the focus is on offsetting the sum of small losses to achieve an overall environmental benefit.'*⁶¹

BioBanking has four main components:

1. establishing BioBank sites on any land⁶² using an agreement between a land owner and the Minister for the Environment
2. creating biodiversity credits for management actions that, when implemented, improve or maintain BioBank assets
3. trading credits that are created and registered
4. enabling the credits to be used as an offset against the impact of development on biodiversity assets in urban areas.⁶³

Table 6.2 describes the elements of the BioBanking proposal.

⁶⁰ As required under s. 5A *Environmental Planning and Assessment Act 1979* (s.5A) and s. 15 (2) *Plantations and Reafforestation Act 1999*.

⁶¹ Threatened Species Conservation Amendment (Biodiversity Banking) Bill 2006, Second reading speech, Hon. R.J. Debus, MP, Minister for the Environment, accessed at <http://www.parliament.nsw.gov.au/prod/parlment/NSWBills.nsf/0/E5FB44CF76E29FB0CA2571870025A52A>

⁶² Credits can be created on rural as well as urban zoned land.

⁶³ DEC (2006) *Guide to the Threatened Species Conservation (Biodiversity Banking) Bill 2006*, NSW.

Table 6.2: Summary of key aspects of BioBanking proposal

Variable	Characteristics
Specification of property right	<ul style="list-style-type: none"> ▪ The commodity being traded is biodiversity credits ▪ Biodiversity credits are generated by landholders who commit to actions that will enhance and protect biodiversity values on their land ▪ The credits will be measured using a refined 'Biometric' tool ▪ The credits are valid in perpetuity ▪ The credits can be used to offset impacts of development for which there is a valid BioBanking Statement which sets out the number and class of credits required
Scope of the market	<ul style="list-style-type: none"> ▪ Offsets can only be sought for development on land in urban areas where the <i>Native Vegetation Act 2003</i> does not apply but credits can be generated on any land ▪ 'Red light' or 'no go' areas will be defined where it is considered that it is not possible to achieve improved environmental outcomes using offsets for clearing, for example, areas of high conservation value vegetation ▪ Developers, landholders and groups of landholders, non-government organisations and Government agencies can participate in the market ▪ Trades will only be allowable within specified areas depending on the location requirements for different classes of credits
Trading rules	<ul style="list-style-type: none"> ▪ Trading will occur on a like-for-like or better basis (credits will be categorised in classes) ▪ Trading is only in biodiversity credits and these cannot be traded for benefits in other environmental values ▪ Credits must be secured as offsets before a development proceeds and cannot be in-lieu but they can be 'banked'
Organisation of transfers	<ul style="list-style-type: none"> ▪ DEC will oversee transactions and all trading of credits must be registered by the Director-General ▪ A BioBanking Trust Fund will be established to hold funds for future costs of owners who have committed to carry out certain management actions and the Fund will be administered by a Fund Manager appointed by the Minister ▪ There are provisions allowing for accredited conservation brokers to facilitate participation – these could include CMAs, consultants, Aboriginal organisations and the Nature Conservation Trust
Monitoring and enforcement	<ul style="list-style-type: none"> ▪ The Director General of DEC must register biodiversity credits and the register will track the ownership and status of the credits ▪ DEC is primarily responsible for monitoring of the scheme ▪ The Minister will have power to order a landowner to carry out work at their own cost if there is a breach of a BioBanking agreement ▪ Any person may bring proceedings in the Land and Environment Court to remedy or restrain a breach of a BioBanking agreement

Variable	Characteristics
	<ul style="list-style-type: none">▪ The Minister may apply to the Land and Environment Court for land which is subject to a BioBanking agreement to be transferred to the Minister or a nominated person (compensation would be payable in this case).

DEC has established five focus groups and a reference group to oversee ongoing design of the scheme. These groups are specifically considering:

- the rule-based assessment tool and trading rules
- legal agreements
- finance
- process development
- establishing markets for BioBanking credits.

Draft recommendation 6.1

Government should continue working towards using more flexible market mechanisms to implement its policy of an end to broadscale clearing while promoting improvements in landscape health and economic outcomes. Government's current work on the PVP Developer, the native vegetation structural adjustment package, and proposed Biobanking scheme provide a solid foundation for progressively introducing such measures.

Attachment 1 Terms of Reference

Landscape Vegetation Plans

Terms of Reference

When Catchment Management Authorities are asked to consider vegetation plans developed at the landscape scale (involving areas of large land and/or multiple landholders), they must assess whether the proposals will 'maintain or improve native vegetation'. However, CMAs should also be encouraged to promote plans which are designed in a way which optimises economic and productive outcomes.

A landscape approach to vegetation management offers many potential environmental, economic and productive benefits over property-scale management because individual farm plans can be aggregated into a single landscape unit, involving a review of corridors and habitat areas to ensure connectivity and biodiversity is maximised whilst achieving greater economic and productivity gains.

The Natural Resources Commission will provide advice to the Ministers for Natural Resources and Environment on the potential for Landscape Vegetation Plans to produce better economic as well as environmental outcomes than single-farm, or small-scale property vegetation plans, as part of the process to develop an approach for assessing landscape scale vegetation management that may be submitted by multiple landholders under the *Native Vegetation Act 2003* and its associated regulations.

For this task the Commission will provide advice on:

1. The scientific and economic viability of multi-farm Landscape Vegetation Plans, commenting specifically on the general issues and any case studies with regard to:
 - a) biophysical characteristics and environmental assets;
 - b) potential threats to environmental assets;
 - c) sustainability of potential land management systems; and
 - d) anticipated economic benefits and potential risks of the approach over single farm property vegetation plans.
2. A robust 'landscape design' for sustainable management of a project area, commenting specifically on general issues and any case studies with regard to:
 - a) landscape and property scale actions necessary to manage threats which will improve or maintain environmental outcomes; and
 - b) management options which would increase productivity and would be sustainable over the longer term.
3. Any improvements that should be made to the *Environmental Outcomes Assessment Methodology*, *PVP Developer* and CMA procedures to facilitate landscape scale Property Vegetation Plans consistent with the *Native Vegetation Act 2003*.

Timeframe for advice: to be received before 31 May 2006, or sooner as is reasonably possible.

Attachment 2 List of submissions

The NRC received public submissions to its December 2005 Issues Paper from the organisations listed below. The submissions can be accessed at www.nrc.nsw.gov.au.

- Australian Plants Society NSW
- Central West Catchment Management Authority
- Coast and Wetland Society Incorporated
- Cobar Vegetation Management Committee (x 2)
- Department of Environment and Conservation
- Department of Natural Resources
- Department of Primary Industries
- Environmental Research and Information Consortium
- Future of Australia's Threatened Ecosystems
- Greening Australia
- Hawkesbury-Nepean Catchment Management Authority
- Lower Murray Darling Catchment Management Authority
- Nature Conservation Council and Total Environment Centre
- Nature Conservation Trust of NSW
- New South Wales Minerals Council Limited
- Northern Rivers Catchment Management Authority
- NSW Farmers Association
- South West NSW Land Management Group
- Southern Rivers Catchment Management Authority (x 2)
- The Wilderness Society
- Western Catchment Management Authority
- Western Lands Advisory Council

