NORTH EAST
Regional Catchment Strategy

Urban
Lifestyle
Agriculture
Forest
Alpine

Approved by Minister May 2013

Key stages in the North East Regional Catchment Strategy renewal 2011 - 2013

> **November 2011 - March 2012 Have Your Say**
The community, peak bodies and government stakeholders invited to take part in catchment wide survey about landscapes and the places people value.

> **May 2012 Join The Discussion**
A review and discussion of the landscapes identified across our catchment and the resilience issues associated with managing them.

> **August 2012 Make a Submission**
Catchment wide consultation to encourage discussion and comment on the draft North East RCS. Multiple opportunities to review and comment on proposals about how to integrate the management of the region's natural resource base.

> **September 2012 Review Draft**
Following the engagement program, the comments, suggestions and ideas received in August were considered in a review of the draft RCS coordinated and facilitated by the North East Catchment Management Authority (CMA).

> **October 2012 Seek Ministerial Approval**
On behalf of the region, the North East CMA Board submitted a finalised North East RCS to the Victorian Government for endorsement.

> **May 2013 Ministerial Approval**
North East RCS gazetted and ready to be implemented by the region's community and agency partners

Chair's Foreword

A new era for Natural Resource Management

The 2013 North East Regional Catchment Strategy signals a new era for management of natural resources in North East Victoria.

This Strategy:

- recognises the need to build on the achievements and lessons from the past
- provides a unifying vision for the ongoing use and management of natural resources in our region
- reinforces the clear link between natural resource management and productive agriculture
- reinforces the commitment to engage with the community.

The North East region is constantly changing in response to new and emerging environmental issues, and social and economic shifts.

One of our main challenges is to identify ways that we can work together to maintain and protect our region's natural resource assets.

The North East Regional Catchment Strategy opens the door for important conversations in our catchment. It is a 'blueprint' through which we can share ideas and make decisions.

To be effective, future management approaches and interventions in our region will need to take complexity into account. We will need to balance natural resource management priorities such as protection of water quality with the needs of agricultural production, manufacturing and other regional economies.

To respond to the community, industry and governments aspirations for the region we need to be flexible and adaptable in our planning and delivery. By adopting sustainable approaches to land management we can ensure the ongoing viability of productive land in our region. By maintaining the viability of our productive land we can also achieve improved natural resource outcomes.

At the heart of the North East Regional Catchment Strategy is the need to foster widespread community ownership and participation in natural resource management.

That's why community participation is built into the Strategy. Listening to and responding to the knowledge and experience of the local community will inform and support effective decision-making and help to facilitate ideas into action.

Finally, we will need to continually monitor the effectiveness of interventions identified in this Strategy and extend or adjust management approaches based on the information we gain.

A motivated community, sound science and increased knowledge are essential components for improving the future health, productivity and resilience of natural resources in our region.

Lyn Coulston
Chair - North East Catchment Management Authority

Acronyms

BOM	Bureau of Meteorology
CaLP Act	Catchment and Land Protection Act 1994
CEWH	Commonwealth Environmental Water Holder
CFA	Country Fire Authority
CMA	Catchment Management Authority
DEPI	Department of Environment and Primary Industries
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EVC	Ecological Vegetation Class
EWR	Environmental Water Reserve
G-MW	Goulburn Murray Water
MER	Monitoring, Evaluation and Reporting
NEW	North East Region Water Corporation
NRM	Natural Resource Management
PV	Parks Victoria
RCS	Regional Catchment Strategy
SES	State Emergency Service
VCMC	Victorian Catchment Management Council
VEWH	Victorian Environmental Water Holder
VFF	Victorian Farmers Federation

Glossary

Alternate state	Transformation of a system in terms of the way it functions and its defining structural characteristics, caused by a system's threshold(s) being crossed.
Drivers	External forces or conditions that cause a system to change.
Intervention	Activities that aim to improve the resilience of a system.
Landscapes	Linked systems of people and nature, taking into account the relationships between cultural, political, social, economic, ecological and technological components.
Practical ideal state	The desired state of a system in terms of the way it functions and its defining structural characteristics, recognising the current condition of a system.
Resilience	The amount of change a system can undergo (its capacity to absorb disturbance) and remain within the same regime – essentially retaining the same function, structure and feedbacks.
State and transition model	Diagrammatic representation of how a people and the environment interact and function, how they respond to natural or management-induced disturbances and what can be done to manage this response. The model identifies what drives the systems to a more degraded or desirable state.
System	The set of variables together with the interactions amongst them, and the processes and mechanisms that govern these interactions.
Stressor	Stressors are drivers that shift system towards a less desirable state. Stressors can be shocks (e.g. fires) or slow moving variables (e.g. climate).
Thresholds	Levels in underlying controlling variables of a system at which point feedbacks to the rest of the system change.

Contents

There's a sense of place - that people are an important part of the landscape.

Executive Summary

50 year vision for North East Victoria:
Diverse, healthy landscapes; vibrant communities.

The North East Regional Catchment Strategy (RCS) is the primary integrated planning framework for land, water and biodiversity management in North East Victoria.

Development of this Strategy has sought to build on information and approaches developed in previous North East RCS's released in 1997 and 2004.

Achieving our vision

The North East RCS includes a range of 20 and 6 year objectives and actions that recognise:

- the value communities place on the environment (goods and services)
- the strong connection that regional communities and associated economies have to North East Victoria's unique and diverse natural resources
- that a balance is needed to ensure we live within the sustainable limits of the environment and
- that active participation in the management and protection of natural resources is needed by the wider community, landholders, volunteer groups, agricultural industry and governments.

The North East RCS vision will be realised by achieving the following **20 year high level** objectives:

1. Whilst conserving the environment, we will maintain and enhance the health and condition of:
   a. **land** resources and their long term productivity
   b. **water** resources and their long term productivity and
   c. **biodiversity** resources.
2. People will identify with and value the:
   a. **Urban landscape** for its diverse economy, access to aggregated services and enhanced liveability through connection with the natural environment
   b. **Lifestyle landscape** for its environmental aesthetics, tourism, strongly connected communities and access to the regional economy
   c. **Agriculture landscape** for its productivity, quality land and water resources, and strongly connected communities that identify with their valleys, plains and plateaus
   d. **Forest landscape** for its national parks, recreation, water and forest resources
   e. **Alpine landscape** for its iconic status, high biodiversity, tourism and clean water resources.
3. The community will actively **participate** in the integrated management and protection of natural resources.
4. Agencies and the community will work together to **monitor and evaluate** the condition of natural resources and the effectiveness of protection measures to improve natural resource management.

We need to work with the dynamics in the climate to maintain resilient catchment landscapes.

How this Strategy was developed

The North East Catchment Management Authority CMA led the renewal of the North East RCS on behalf of the catchment community. It undertook this role as the Catchment and Land Protection Act 1994 (CaLP Act) specifies that each Victorian CMA must prepare a regional catchment strategy for its region and coordinate and monitor its implementation.

The renewal of the RCS was an important direction setting process for the multiple 'communities' of North East Victoria. As part of the renewal process, the North East CMA sought to gather local knowledge about landscapes within the region and how the community values and interacts with these. This knowledge was integrated with technical and formal knowledge to develop a more in depth understanding of the values and dynamics of the various landscapes in North East Victoria.

Key findings

Community feedback and research undertaken during the development of the North East RCS indicated that:

- the natural resources of North East Victoria are unique, valued and linked to the regional communities and economies
- we need to work with the dynamics in the climate to maintain resilient catchment landscapes
- even with droughts, floods and social and economic changes, the North East region and its communities are generally resilient; the community and its environment have the ability to adapt, accommodate and manage shocks or stressors and disturbances. It also has a framework in place for the response and recovery phases
- to accommodate the ever changing circumstances a sustained management effort is needed. Without this effort our natural resources may decline and the associated social, economic and environmental values along with this
- some trends are beyond our control or influence
- community driven solutions are needed to accommodate the likelihood of climate extremes
- a framework for supporting the community will need to deal with Federal, State, regional and local challenges and address conflicting values surrounding use and management of natural resources.

How this Strategy can be used

The North East RCS provides a framework of action that any individual, group or organisation can use to guide future natural resource management decisions in the Upper Murray, Kiewa and Ovens River valleys. In summary, it:

- sets a vision for the North East Region
- describes the links between various landscapes (environment) in the region and the people that live and work in them (society and economy)
- describes the challenges and opportunities that need to be addressed
- offers an overarching framework or blueprint, to guide natural resource management actions.

The combination of lifestyle blocks, farming and bush means the landscape is very rich and diverse – able to bounce back.

Future challenges and opportunities

Emerging trends that are likely to impact the extent to which the North East CMA and other agencies can influence the future management of natural resources in North East Victoria include:

- increasing population, especially in urban and surrounding landscapes
- land manager changes in agriculture landscapes
- sustained challenges from invasive plant and animal species (e.g. wild dogs, deer and willows)
- increasing living costs
- climate variability and capacity to accommodate more frequent extreme events and respond to slow moving variables such as increasing temperatures
- competing and conflicting land use in agriculture, lifestyle and forest landscapes.

Community participation is built into the North East RCS and is identified in the 20 year objectives. The RCS recognises the importance of:

- providing a forum for listening to the local knowledge and expertise of the regional communities to ensure local input is considered in catchment decision making
- a partnership between the community and government is essential
- collaborating and working with Traditional Owners, Elders and community
- supporting a collaborative and innovative approach to integrated NRM in the region, including:
  - o promoting and testing the shared visions for diverse healthly landscapes; vibrant communities
  - o creating practice change and
  - o investing in regional coordination services including the implementation of the RCS.

Age of resident community is getting older and almost at tipping point. 'Community' won't be as we know it now.

Implementing the Strategy

Implementation of the North East Regional Catchment Strategy will involve the community and partner agencies. A number of management measures have been identified to guide the implementation of the North East RCS (Part Two RCS). These management measures primarily relate to ensuring local input is considered in catchment decision-making and that catchment management is a partnership between the community and government.

Specifically, the North East RCS:

a) factors in a need for adaptive planning and delivery – this Strategy builds on the previous assets-based approach, incorporating new and emerging ideas around resilience. Resilience thinking recognises that integrated catchment management requires flexibility, adaption and consideration of the interconnections between people, places, environment and their economies.

b) recognises that landscapes provide a connection point – people in the North East expressed a strong connection to distinct landscapes in the region. Five key landscapes have emerged -
   - o Urban
   - o Lifestyle
   - o Agriculture
   - o Forest
   - o Alpine

   Key environmental, economic and social characteristics and stressors have been identified for each of these landscapes and a range of interventions suggested.

c) highlights the importance of community enabled decision making and that listening and responding to the knowledge and experience of the local community informs and supports effective decision-making.

Part one

Regional Catchment Strategy Main Report

Figure 1: North East region boundary

Introduction

Purpose of the Regional Catchment Strategy

A Regional Catchment Strategy (RCS) is the primary integrated planning framework for land, water and biodiversity management in each of the ten catchment management regions of Victoria.

The North East RCS aims to provide focused, integrated and coordinated direction for all natural resource management activities in the North East. It includes processes that can be used to assess the condition of land, water and biodiversity and seeks to encourage and support participation of landholders, resource managers and other members of the community in catchment management.

The boundary of the North East RCS aligns with the boundary of the North East Catchment Management Authority (CMA), as shown in Figure 1.

Cross-border cooperation

Although the North East RCS aligns with the boundaries of the North East CMA region, many natural resource assets and/or issues extend beyond this geographic boundary. Where appropriate the NRM partners within the North East will work with our direct neighbours and other jurisdictions to help achieve the RCS objective.

For example, the River Red Gum forests and the associated icon site River Murray Channel and the grassy woodlands bioregion are common to the North East, Goulburn Broken and North Central Catchment Management Authority and Murray (NSW) regions/areas. The alpine and sub alpine ecosystems are common with Murray (NSW), North East, East Gippsland and Goulburn Broken CMAs.

Strong partnership and collaboration between neighbouring catchment management authorities and Government agencies will be required to ensure a coordinated approach and effective implementation of the North East RCS. Cross border and intra regional cooperation will deliver broader and better natural resource management outcomes for the North East region.

What is included in the North East Regional Catchment Strategy?

Table 1 shows the high level nature of content within the RCS and the aspects which are more suitable for inclusion in regional sub strategy planning, or local action and management planning.

Table 1: What is included in the North East Regional Catchment Strategy?

What IS in the RCS?
> Descriptions of natural resource assets of national, state, and region-wide significance
> Examination of landscapes to understand stressors and appropriate intervention measures
> Descriptions of all land, biodiversity and water resources in the region (i.e. public and private land)
> 50 year vision for the region
> 20 year high level objectives for desired outcomes
> 6 year management measures that set priorities for landscape scale and asset based programs for the life of the RCS (Part Two RCS).
What IS NOT in the RCS?
> Assets of local scale significance
> Detailed risk and feasibility assessments
> Detailed condition targets
> Detailed activity planning, budgets and on ground works.

Policy context

The *Catchment and Land Protection Act 1994* (CaLP Act) specifies that each Victorian CMA must prepare a regional catchment strategy for its region and coordinate and monitor its implementation. The CaLP Act and the following guidelines have been used to develop the North East RCS.

The Victorian Catchment Management Council (VCMC) has prepared a set of guidelines for catchment management authorities to follow when developing their strategies. The guidelines provide a minimum set of requirements for an RCS to receive endorsement from the Minister for Environment and Climate Change and Minister for Water. Each new RCS must be submitted to these Ministers for approval.

Throughout 2011 and 2012 the now Department of Environment and Primary Industries (DEPI) issued a number of high-level policy and program requirements for consideration in preparing a RCS.

Development of the RCS is also informed by a suite of other State, Federal and International legislation and policies, which are listed in Appendix 2. Several other regional strategies inform or are informed by the RCS. The relationship between the RCS and relevant legislation, policies, strategies, planning schemes and plans is shown in Figure 2. As indicated by the extensive list in Appendix 2, integrated catchment management crosses many regulatory areas.

Integrated catchment management – Where the CMA fits

The North East CMA is responsible for facilitating and coordinating the management of land, biodiversity and water resources in an integrated and sustainable manner. Within this role, the North East CMA:

- Takes a sustainable approach by balancing social, economic and environmental outcomes
- Promotes and adopts an adaptive approach to integrated catchment management, including continuous review, innovation and improvement
- Plans and makes decisions within an integrated catchment management context.

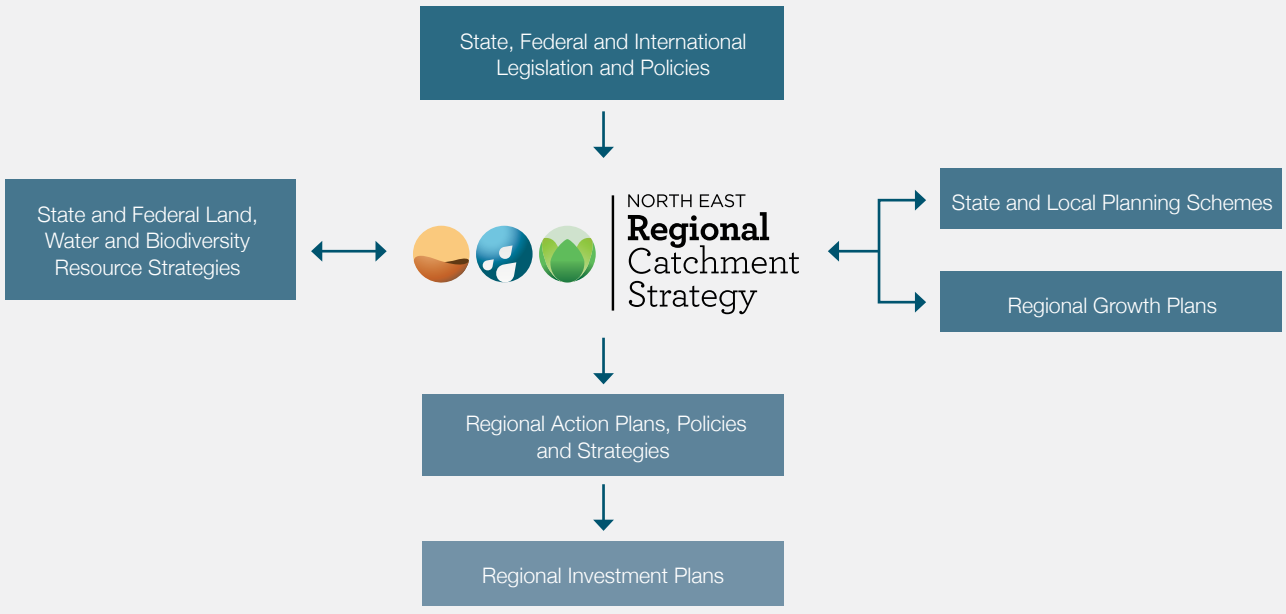
This is why the North East CMA coordinates development of the North East RCS.

The North East CMA, relevant government agencies and community will share responsibility for implementing the North East RCS.

According to Victorian Government legislation the North East CMA is also required to report on the condition and management of land, biodiversity and water resources. In line with this responsibility, the North East CMA collates and provides monitoring reports to Government on a regular basis. Additional roles and responsibilities for the North East CMA include:

- promoting community awareness and providing information, advice and education about effective integrated catchment management and guiding regional effort in catchment management
- delivery of on ground works
- managing the environmental water reserve and a number of statutory functions under the *Water Act 1989*, including floodplain management referrals and authorisation of works on waterways.

Figure 2: Relationship between RCS and relevant plans, strategies, legislation and policy (see Appendix 2)



What We've Learnt

Key findings from a review of previous North East Regional Catchment Strategies

In 1997, the North East Catchment Management Authority published the first North East RCS. An updated version was released in 2004. The vision for the catchment identified in the 2004 RCS was:

diverse, healthy landscapes; vibrant communities.

A review of the 2004 RCS was conducted in 2009. This review highlighted that:

- **Flexible planning and delivery is essential** – effective natural resource management requires constant adaptation to changing community priorities and climate variability. The RCS was overly prescriptive and the targets and priorities were not able to adequately respond to the changing environment.
- **Complexity, prescriptive targets and lack of ownership can restrict uptake of RCS recommendations and actions** - the RCS was hard to follow as there did not seem to be a logical flow between outcome targets and the resource condition and management action targets.
- **People matter** – Implementation of an RCS requires meaningful and ongoing engagement with stakeholders.

Many of these challenges remain. The North East RCS has sought to build on information and approaches developed in 1997 and revised in 2004 and respond to the key findings from the 2009 review by:

a) **Factoring in adaptive planning and delivery** – The 2004 North East RCS was developed through the use of an assets based approach. The renewal of the North East RCS builds on the assets based approach, incorporating new and emerging ideas around resilience. The resilience approach recognises that integrated catchment management requires flexibility and adaption and consideration of the interconnections between people, places, environment and their economic realities. The RCS features a main report and a set of adaptive management actions in Part Two of the RCS.

b) **Recognising that landscapes provide a connection point** – people in the North East have a strong connection to landscapes in the region. Five key landscapes (Urban, Lifestyle, Agriculture, Forest and Alpine) within the region have been identified in the RCS (see Making sense of the North East region). A range of stressors and suggested interventions have been devised for each of these landscape systems. The RCS has incorporated resilience thinking and a systems-based approach. These approaches help to describe the connections between people, their environment and economies in the region. These approaches also recognise that 'black and white' targets are ineffective.

c) **Highlighting the importance of community enabled decision making** – listening and responding to the knowledge and experience of the local community supports effective decision making. Community participation is built into the RCS and identified in high level 20 year objectives for the North East region (see High level objectives – How we can achieve this vision).

Renewing the Regional Catchment Strategy

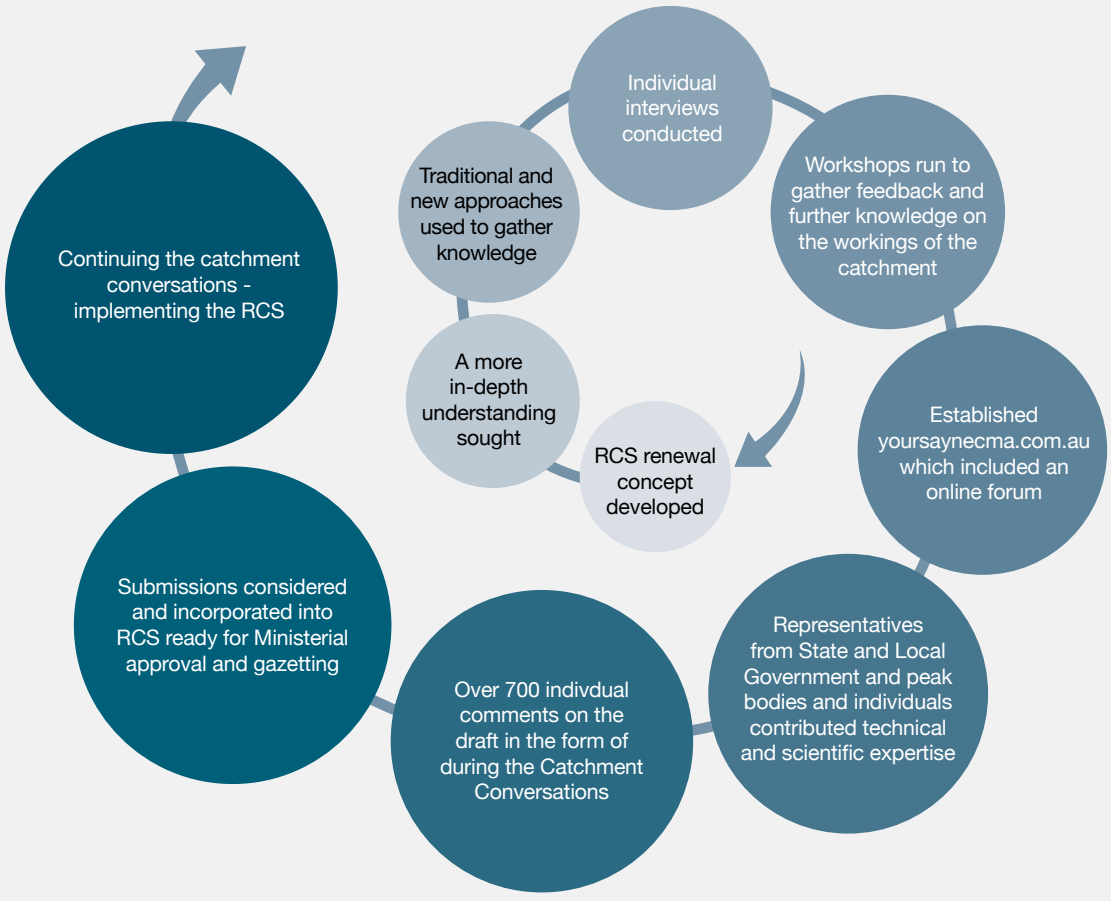
In the first phase of the renewal of the North East RCS the North East CMA sought to understand the key natural assets that have environmental, social and economic values in our catchment and drivers influencing change in the condition of these assets.

The North East CMA used a mix of traditional and new approaches to gather expertise and views from across the catchment. These included:

- conducting individual interviews with community members and other stakeholders to identify key themes of concern in our catchment
- encouraging people to tell us what landscape or place they most valued
- the promotion and establishment of an online forum at www.yoursaynecma.com.au to enable wide participation
- representatives from State and Local councils and peak bodies contributing technical and scientific expertise across many areas.
- natural asset class themed workshops (water, land and biodiversity)
- defining landscape systems for the North East region
- integrating strategic NRM measures and interventions (Identification and Integration)
- collaboration and innovation (how to work together).
- coordinating a set of informal meetings with a cross section of the community at 17 key locations across the region to give the community an opportunity to learn more about the renewed North East RCS, comment on major regional trends and landscapes and provide feedback on the draft North East RCS.

By integrating community feedback, technical and formal knowledge, the North East CMA sought to develop a more in-depth understanding of the values and dynamics at work in our catchment landscapes. Figure 3 depicts the key steps used to develop the North East RCS.

Figure 3: Key steps in the development of the North East RCS



Using resilience thinking and systems based approach (building on the Assets Based Approach)

Resilience thinking and systems based approach

Resilience is a measure of a system's capacity to cope with change while essentially retaining the same structure and function. As resilience declines, it takes progressively smaller disturbances to push the system into a different regime, in which its structure, function and the ecosystem services it generates are substantially different. The definition of resilience takes into consideration the biophysical, social and economic elements of a region; bringing them together as components of a system.

Resilience thinking and a system based approach helps communities better understand how their catchments work by identifying where and how we can best intervene to keep landscape systems operating effectively. It offers a way of understanding the connections between people and biophysical systems. It recognises that integrated catchment management requires flexibility and adaptation and builds on the assets based approach that has been applied in previous North East Regional Catchment Strategies.

The combination of lifestyle blocks, farming and bush means the landscape is very rich and diverse – able to bounce back.

Regional overview

North East Victoria - a snapshot

The Facts

Population	~100,000
Area	1,957,000 hectares
Public land	55%
Length of streams	10,602 km
Water supply	Upper Murray River, Kiewa and Ovens River Basins provides 38% of total water to the Murray Darling Basin (Figure 4)

Victoria's North East is rich in natural resource assets; snow topped mountains, river valleys, open plains and native forests. The region:

- covers approximately 1.9 million hectares, including three major catchments; the Upper Murray, Kiewa and Ovens
- is bounded by the River Murray in the north, the Victorian Alps in the south, the NSW border in the east and the Warby Ranges in the west
- includes the local council municipalities of Wodonga, Indigo, Wangaratta, Alpine and Towong, plus parts of the Moira and East Gippsland shires
- contributes an estimated $3.24 billion to the State and National economic wealth per year. Key industries include agriculture (dairy, beef, wool, cropping and horticulture), forest industries, tourism and value-added processing industries, particularly in the region's two largest centres of Wangaratta and Wodonga
- between 2001 and 2006 population growth in the region was among the highest of all regions in Victoria.
- ageing communities (persons in the 55+ age bracket), particularly in smaller rural settings, are predicted to increase significantly by 2026.

The North East has two major centres (Wangaratta and Wodonga) with smaller settlements spread across the region. This network of towns provides reasonable access to services for members of the region. Cross border towns along the Murray, such as Albury, also contribute to the region's access to services. Access to Melbourne and Sydney is also readily available through the major transport and infrastructure services centres in the North East.

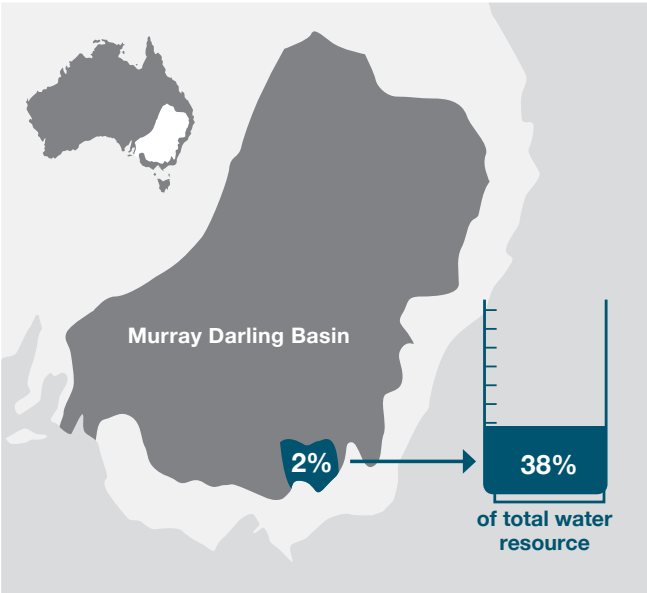
More than 55% of the North East consists of public land encompassing over 200 parks and reserves. These areas are vital for regional biodiversity, offering varying measures of protection to indigenous flora and fauna and important ecosystems. Natural resource assets in North East Victoria are a major drawcard for visitors. The region's rivers and streams offer some of the best recreational fishing opportunities in Victoria and the alpine region has two of Australia's major ski fields; Falls Creek and Mount Hotham.

North East Victoria plays a vital role in providing water resources for South Eastern Australia, as shown in Figure 4. The region comprises several major water storages, as listed in Table 2, and has significant groundwater resources (e.g. the deep and shallow Ovens aquifers).

Table 2: Major water storages in North East Victoria (at capacity)

Water Storage	Water Capacity
Dartmouth Dam	3,856,232 megalitres
Lake Hume	3,005,157 megalitres
Lake Buffalo	23,340 megalitres
Lake William Hovell	13,500 megalitres

Figure 4: The upper Murray, Kiewa and Ovens River Valleys contribute 38% of the total Murray-Darling Basin flows, whilst only comprising 2% of the total Murray-Darling Basin area



Responding to changing trends and influences

Emerging trends that are likely to influence the extent to which the North East CMA and other agencies can influence the future management of natural resources in North East Victoria include:

- Increasing population, especially in urban and surrounding landscapes
- Land manager changes in agriculture landscapes
- Sustained challenges from invasive plant and animal species (e.g. wild dogs, deer and willows)
- Increasing living costs and continued decline in agricultural terms of trade (that is, the ratio of prices received to prices paid)
- Climate variability and capacity to accommodate more frequent extreme events and respond to slow moving variables such as increasing temperatures
- Competing and conflicting land use in agriculture, lifestyle and forest landscapes.

The North East region is constantly changing in response to new and emerging environmental issues, and social and economic shifts.

The need to respond and adapt to these changes lies at the heart of the North East RCS. To be effective, this Strategy needs to enable adaptive management and highlight approaches that individuals and groups can use to respond to change while maintaining and protecting the North East regional environment.

These are some of the major challenges and opportunities in the North East region identified during renewal of the RCS.

Climate Variability and future projections: The North East region climate is naturally highly variable and the various landscapes in the region are impacted by this variability. In the future, our climate may be warmer and drier and we may experience heavier downfalls of rain when it does occur, especially during summer and autumn. We need to plan for potential flooding and more frequent droughts in urban and agricultural areas; fires in lifestyle, forests and alpine areas; and declining snow levels.

- **Insight:** Responding to climate variability in a tangible way should orientate management of the North East region in the years ahead.

Conflicting use of resources: Economic growth and population growth is increasing the demand for many natural resources. At the same time, many natural resource reserves are depleting. Coming decades will see a continued focus on productivity improvements through efficiency and better stewardship of natural resources for future generations. Water use efficiency, farm planning, farm enterprise consolidation, carbon markets and investment competition will impact on the use of land, water, labour and financial capital.

- **Insight:** Future management approaches and interventions in the North East region will need to take complexity into account. There will be a need to balance natural resource management priorities such as protection of water quality and quantity with the needs of agricultural production, manufacturing and other regional economies.

Biodiversity decline: Biodiversity has always been integral to the culture of Traditional Owners, Elders and Indigenous community of the North East region. In parts of the North East, ecosystems within altered landscapes are struggling with a relatively steady long term incremental decline in areas affected by land clearing, inappropriate livestock grazing, inappropriate land uses and invasive pest species. Symptoms include species threatened with extinction, the spread of invasive pests and weeds, and declining condition of some waterways. Biodiversity decline is most extensive on private land, with an estimated 17% of native vegetation originally on private land remaining. Conversely, the high percentage (55%) of the region designated as public land, which includes numerous National Parks, protects rare and threatened species.

- **Insight:** Significant work is required to improve and maintain the health and condition of landscapes in the North East region. It is important to recognise that the region's landscapes have been changed to provide goods and services, such as food and fibre. The resources needed to undertake this work are often beyond the reach of individual landholders, organisations, or Government, and will need a concerted and collaborative effort. We need to identify the level of biodiversity that can coexist within each of the changed landscapes. Recognising the values of each landscape and how this relates to biodiversity will help target effort and stem decline.

Connecting people with the right support: People want to feel in control and receive support targeted to their needs. At the same time, due to the vast array of support providers and specialisation, it is becoming harder for people to determine who they should contact for assistance.

- **Insight:** Community participation is built into the RCS. Listening to and responding to the knowledge and experience of the local community will inform and support effective decision-making and help to recalibrate ideas. New pathways are needed to help people connect with assistance for natural resource management.

Changing and divergent demographics: Demographic change is reconfiguring land use patterns in the North East region, influencing land management motivations, land values, and social structures. There are higher rates of absentee ownership of rural properties; lifestyle and urban areas are becoming more socially diverse; the population is ageing and there is an increasing trend in turnover of land managers.

- **Insight:** Engaging young people in land management is a significant challenge - many are interested in environmental issues but generally have little prospect of owning or managing land in their youth.

Declining volunteer base: More people are seeking one off (episodic) volunteering opportunities that they can fit into their busy lives, rather than committing to ongoing roles that they may find difficult to fulfil.

- **Insight:** New approaches are required to encourage voluntary participation in natural resource management. Innovative technology and communication tools can be used to harness new ideas and to connect people to the volunteering opportunities and maintain enthusiasm.

These trends have been taken into consideration in the development of the North East RCS.

Mapping out our future

Vision

The shared regional vision for the North East Regional Catchment Strategy is: ***Diverse, healthy landscapes; vibrant communities***

The vision is a 50 year statement of aspiration for communities, their economies and landscapes. It incorporates social, economic, cultural and environmental elements and recognises their interconnectedness. The shared regional vision was established during the development of the 2004 North East RCS and its currency was tested during development of this RCS. Feedback has been positive and the vision has been retained.

High level objectives

How can we achieve this vision?

The North East RCS vision will be realised by achieving the following 20 year high level objectives:

1. Whilst conserving the environment, we will maintain and enhance the health and condition of:
   a. **land** resources and their long term productivity.
   b. **water** resources and their long term productivity.
   c. **biodiversity** resources.
2. People will identify with and value the:
   a. **Urban** landscape for its diverse economy, access to aggregated services and enhanced liveability through connection with the natural environment.
   b. **Lifestyle** landscape for its environmental aesthetics, tourism, strongly connected communities and access to the regional economy.
   c. **Agriculture** landscape for its productivity, quality land and water resources, and strongly connected communities that identify with their valleys, plains and plateaus.
   d. **Forest** landscape for its national parks, recreation, water and forest resources.
   e. **Alpine** landscape for its iconic status, high biodiversity, tourism and clean water resources.
3. The community will actively **participate** in the integrated management and protection of natural resources.
4. Agencies and the community will work together to **monitor and evaluate** condition of natural resources and electiveness of protection measures to improve natural resource management.

These high level objectives were developed in consideration of objectives in the previous (2004) RCS, obligations under the CaLP Act, thematic asset classes, anticipated challenges, such as changing climate, and integration of the resilience thinking and systems based approach. Collectively these objectives will set broad direction for future action and will address the requirements of the CaLP Act and VCMC Guidelines for RCS. The linkage between the abovementioned asset based objectives and thematic asset classes (as defined by DEPI) is shown in Table 3.

Achieving the vision requires recognition that the biophysical assets or thematic asset classes, (land, water, plant and animal life) are only part of the story and consideration needs to be given to how people influence their environment according to their values and aspirations (landscape systems). Objectives that relate to community participation in natural resource management and how people value their landscape have been established to ensure the broader context is taken into consideration, ultimately improving the likelihood of maintaining or enhancing the quality of the region's natural resources. The objectives within this RCS recognise:

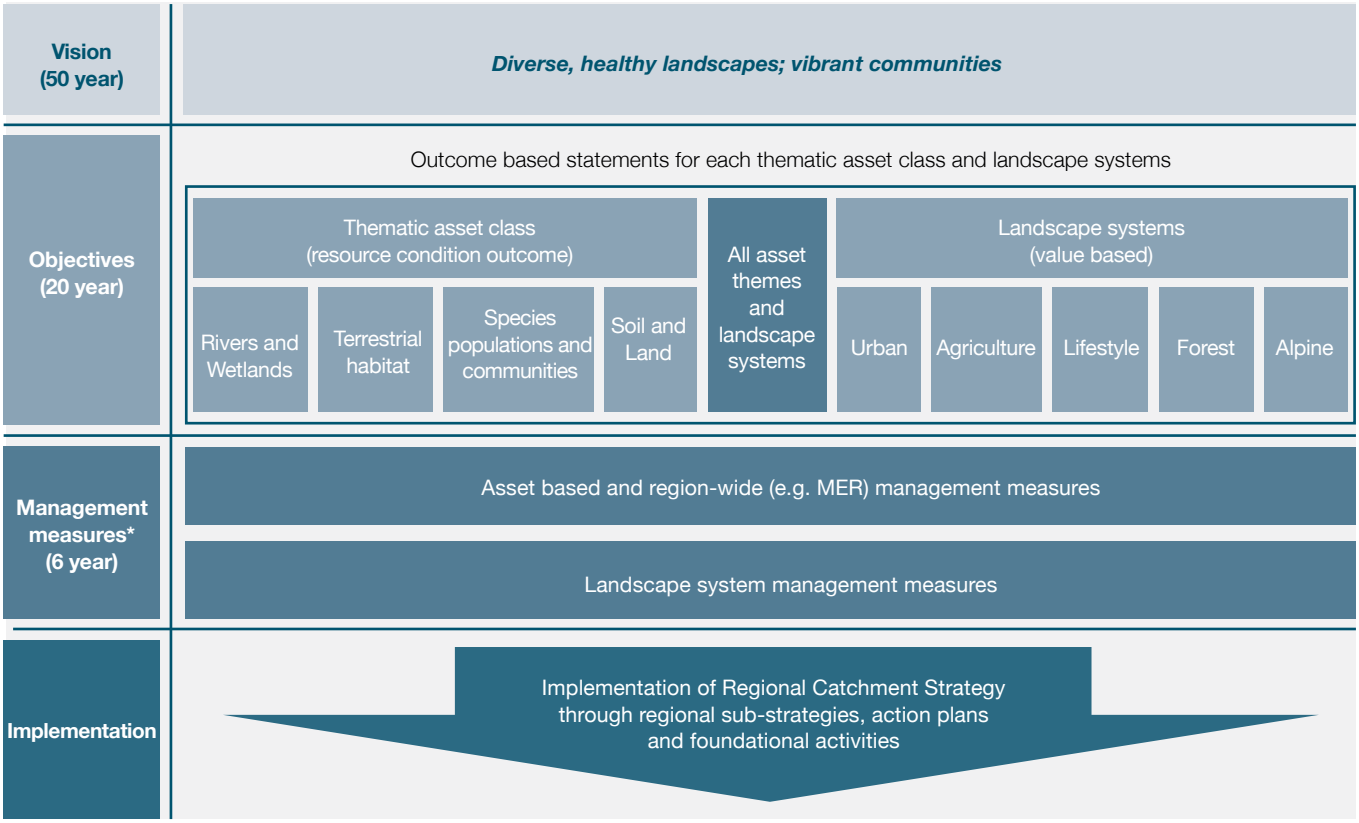
- the value communities place on the environment (goods and services)
- the strong connection that regional communities and associated economies have to the unique and diverse natural resource assets
- the communities dependency and relationship with the environment
- that a balance is needed to ensure we live within the sustainable limits of the environment
- the active participation needed by those concerned about our natural environment and its ongoing protection and enhancement (from the wider community, landholders and volunteer groups, to the agricultural industry and governments).

Table 3: Linkage between 20 year asset based condition objectives and thematic asset classes

Asset based objectives	Thematic asset class*	Thematic asset definition*
Whilst conserving the environment, we will maintain and enhance the condition of **land** resources and their long term productivity	Soil and land	Selected geographic areas of land and/or specific soil types
Whilst conserving the environment, we will maintain and enhance the health and condition of **water** resources and their long term productivity	Rivers	Individual river reaches, their associated riparian and floodplain ecosystems. Reaches can be grouped into larger components of a river system
	Wetlands	Individual wetlands, wetland complexes, and floodplain wetland ecosystems connected to waterways
Whilst conserving the environment, we will maintain and enhance the health and condition of **biodiversity** resources	Species populations and communities	Populations of threatened or significant species. Occurrences of threatened communities
	Terrestrial habitat	Individual ecological classes or spatial occurrences of Ecological Vegetation Classes based on their intrinsic value or their contribution to landscape processes (e.g. connectivity, refuge areas buffering)

** The Asset-Based Approach to Priority Setting - Applying the asset-based approach to developing Regional Catchment Strategies - DEPI 2011*

Figure 5: North East Regional Catchment Strategy program logic



**A complete list of 6 year management measures is included in Part Two of the RCS.*

Strategic framework – linking vision, objectives and measures

Overall the direction of the North East RCS is established through a 50 year vision, which is supported by a set of 20 year high level objectives and associated six year management measures. The sub strategies, action plans and foundation actives associated with the management measures are aligned with objectives, and should not be undertaken in isolation or consideration of other measures. The link from the 50 year vision through to the implementation of sub-strategies and action plans is shown in Figure 5.

Management measures – how we can achieve the objectives

The six year management measures that are valid for the life of the RCS are directly linked to the 20 year high level objectives. The management measures apply across the region and aim to maintain and enhance natural resource assets within the region. They have been developed in consultation with key stakeholders and in response to stressors identified in regional landscapes and threats/risks associated with thematic asset classes.

Within each landscape a recommended priority action has been identified. This action has been drawn from the six year management measure list for that landscape.

A summary of all management measures is included in Part Two of the RCS. Landscape management measures are also located within relevant landscape chapters, while region-wide and asset based management measures are only included in Part Two of the RCS.

It is assumed that through the delivery of the six year management measures that progress toward achieving the objectives will be made. The condition of the region's natural resources and implementation and effectiveness of these measures will be monitored and evaluated as per the requirements of the CaLP Act (refer to Monitoring implementation of the Regional Catchment Strategy section).

Identifying and understanding our natural resource assets

Key points

- Natural resource assets are the naturally occurring and tangible (or biophysical) elements of our landscapes that are identifiable by a particular geographic location
- These natural resource assets can be grouped into spatially explicit areas for priority attention. These are termed Catchment Assets (Figure 6).
- A detailed description of the environmental significance of these grouped natural resource assets and associated risks is provided in Appendix 3.
- The asset based condition objectives and thematic asset classes that relate to these natural resource assets are shown in Table 3.
- A number of asset based management measures have been listed in Part Two of the RCS.
- It is understood that the State Government will work with relevant NRM agencies over the next few years to further develop and refine Victoria's approach to priority setting in Natural Resource Management.

This section of the RCS identifies the natural resource assets and high priority Catchment Assets and their associated objectives in the North East region.

Setting objectives

The 20 year high level objectives devised for natural resource assets (refer to Table 3) in the North East are: whilst conserving the environment, we will maintain and enhance the health and condition of:

a) land resources and their long term productivity;
b) water resources and their long term productivity;
c) biodiversity resources.

It is important to understand the condition of natural resource assets in the North East region before making management decisions that will achieve these objectives as the region's landscapes have been changed to accommodate values such as food and fibre production and urban living. These changes will influence an assessment of the natural resource asset condition.

Future condition assessments should recognise the key social and economic values in addition to the environmental values that can be achieved.

The environmental value, current condition and risks of the natural resource assets themes relevant to the North East region (land, water, biodiversity - refer to Table 3) follows, with further detail provided in Appendix 3.

Natural resource assets

A range of factors need to be considered when building an understanding about natural resource assets like water, land and biodiversity. These include:

- value and location: What are these assets and where are they? What is the rationale for maintaining and enhancing their condition or productivity?
- status: What condition are they in?
- attitudes: Why do we value these assets?
- challenges: What are the challenges, risks and opportunities involved in maintaining and enhancing these assets?

Monitoring of natural resource condition is difficult. The information provided below was drawn from a number of sources with information collected at different times.

Future natural resource condition assessments in the region will need to:

- be place based
- related to values and context
- recognise key social, economic and environmental values that can be achieved.

The Monitoring, Evaluation and Reporting (MER) Plan being developed to support the RCS will take these needs into account.

Land – *land and soil*

Soil and land assets (Figure 7) support numerous land uses in the North East, such as public parks and reserves, remnant native vegetation, pastures, cropping, forestry, horticulture and urban environments. Overall, the region's soil and land asset is in moderate condition, with a declining trend in cleared areas (primarily private land), whereas public managed land is generally in moderate to good condition. There are significant soil health issues in the region. Key risks to soil and land assets include erosion, soil structure decline, organic matter loss, soil pathogens, acidity, salinity (dryland) and predicted increases in climate variability. Soil health problems are exacerbated in areas affected by land clearing, inappropriate land uses and management practices, and bushfires.

Water – *rivers and wetlands*

River and wetland assets, and the aquatic and terrestrial ecosystems that they support, are the most notable characteristics of the North East region. The major river valleys of the Ovens and King, Kiewa, Mitta Mitta and Upper Murray River are unique and integral to the environmental, economic and social values of the region. The rivers and wetlands often have crown land associated with them. The high value rivers and wetlands have been incorporated into the grouped Catchment Assets (Figure 6). Overall, river and wetland assets are in a relatively moderate condition, providing stable, clean water yield and quality and a diverse range of habitats for aquatic dependant species (Index of Stream and Wetland Condition and Sustainable Rivers Audit).

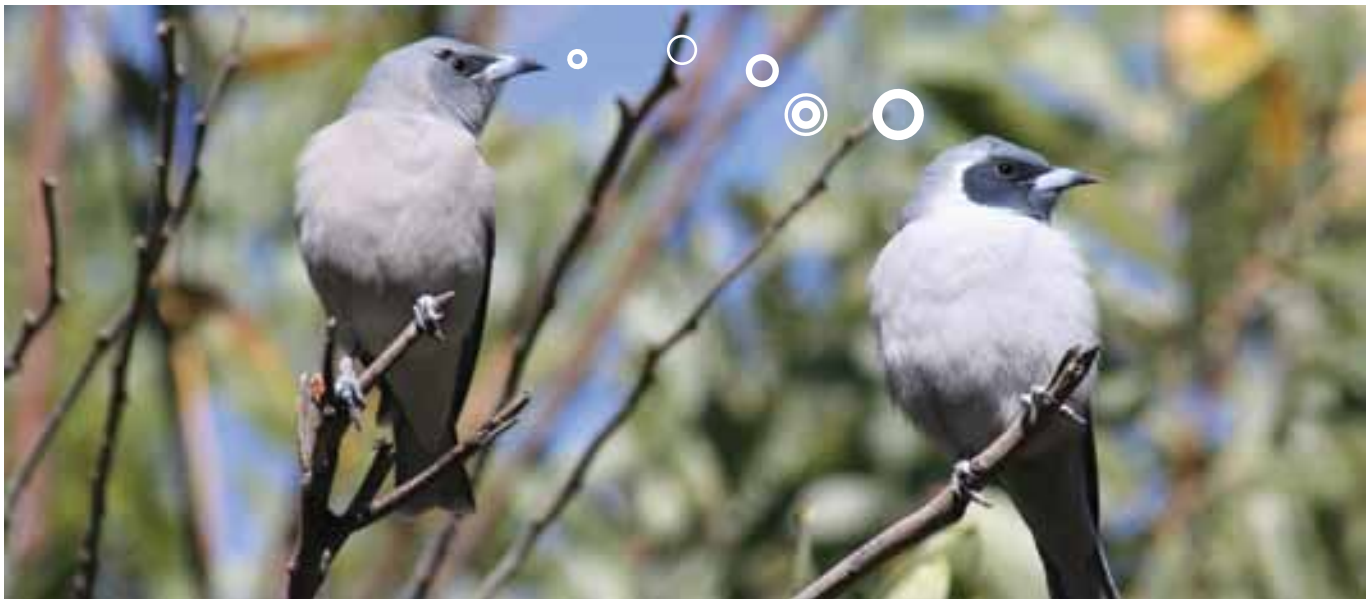
For example, of the 42 assessed wetlands in the North East CMA region, 24% were in excellent condition and 33% in good condition. However, there are significant river and wetland health issues in the region. The quality of rivers and wetlands can be affected over different time scales by bushfires, extent of ground cover, inappropriate land use, high intensity rainfall events, cold water releases from storages, de-silting weirs, water extraction and regulation and predicted increases in climate variability.

Biodiversity - *species populations and communities, terrestrial habitat*

The species populations, communities and terrestrial habitat assets of the North East region are remarkably diverse. Threatened species and communities are spread across the region in all landscapes (see Figure 6 for indication of locations). Their intrinsic value and contribution to landscape processes (e.g. connectivity, refuge areas, buffering) are interlinked with the region's identity. However, there are risks to these assets in the region. Overall, the quality and extent of the region's species populations and communities and terrestrial habitat are in moderate condition, with a declining trend in cleared areas (primarily on private land). There is a relatively steady long term incremental decline in areas affected by land clearing, inappropriate livestock grazing, inappropriate land uses, invasive pest species and predicted increases in climate variability including fire regime. The decline is most extensive on private land, with an estimated 17% of native vegetation originally on private land remaining. Conversely, the high percentage (55%) of the region as public land, including numerous National Parks, helps protect rare and threatened species.

Summary

The water, land and biodiversity assets are an integral part of the North East region. They contribute to maintaining quality of life and the regional economy. In particular, the high quality and reliable waters from the region are of national economic, social and environmental importance (Figure 4).



Catchment Assets

Grouping of natural resource assets and understanding their relevance to different thematic asset classes assists in setting clear direction and prioritising effort. This in turn improves the likelihood of maintaining and enhancing their condition and health.

By integrating available information about natural resource assets and setting broad directions for their management, natural resource management organisations and peak partner bodies, including DEPI, North East CMA, Trust for Nature and Parks Victoria, helped to map and group the thematic assets of the North East.

This grouping resulted in a number of spatially explicit areas for priority attention. These are termed Catchment Assets.

A number of Catchment Assets cross over land tenures as the value and function of the asset is often independent of this. The boundaries of these Catchment Assets have been deliberately blurred to define them at a scale that is appropriate for strategic regional planning. In addition, many of the Catchment Assets extend outside the North East region into neighbouring NRM regions.

Further filtering and assessment of the Catchment Assets and how they integrate with regional landscapes will occur during the implementation of the RCS.

Identifying our Catchment Assets

a) Water and biodiversity

Figure 6 shows the distribution and extent of priority Catchment Assets across the North East region. This map highlights high priority rivers, threatened species populations and sites for action. Note: areas outside a Catchment Asset (grey) also have water and biodiversity values. However, these were not easily grouped.

These water and biodiversity assets are intertwined with the quality of life and economic wellbeing of the region. In addition, the high quality and reliable waters from the region are of national economic, social and environmental importance (e.g. support downstream irrigation and flooding of Murray River Icon assets).

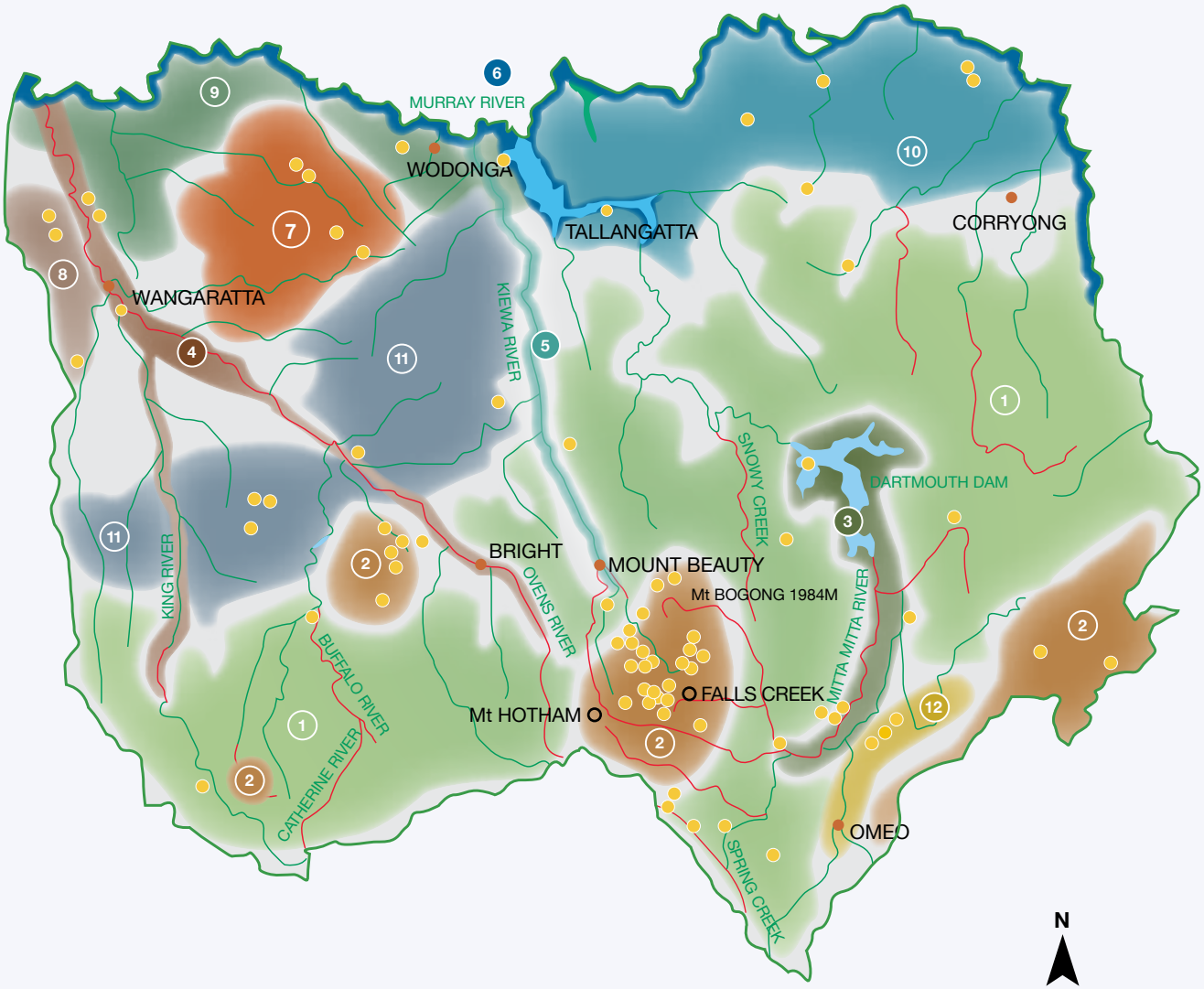
Table 4 shows the relevance of the thematic asset classes within each of the Catchment Assets. More detail on the values, functions and risks for each of these Catchment Assets is provided in Appendix 3.

Management measures identified to maintain and enhance biodiversity resources (plant and animal life), and the quality of water resources and their productivity are listed in Part Two of the RCS.

These management measures identify a number of existing and new sub strategies and action plans required for the various individual natural resource asset classes within the Catchment Assets, namely rivers, wetlands, threatened species populations and communities, and terrestrial habitat.

Management measures for integrated, region-wide natural resource management activities that were identified through extensive community and stakeholder consultation are also included in Part Two of the RCS.

Figure 6: North East Region Catchment Assets



Catchment Assets*

1. Great Divide Contiguous Forest
2. Alpine and Sub Alpine Landscapes
3. Lake Darmouth / Mitta Mitta Heritage River
4. Ovens and King River Corridors
5. Kiewa River Corridor
6. Murray River Corridor
7. Chiltern / Mt Pilot Landscape
8. Warby / Killawarra Landscape
9. Riverine Plains and Wetlands
10. Upper Murray Forests and Woodlands
11. Inland Slopes Forests and Woodlands
12. Omeo and Benambra Wetlands

Legend

- Towns
- Rivers, Lakes, Dams
- Ski Resorts
- High Priority Rivers
- Some High Priority Threatened Species at High Priority Locations identified in the Actions for Biodiversity Conservation (ABC) Database

**Grey areas outside of the Catchment Asset areas are lower priority asset areas.*
Source: Adapted from DEPI's Nature Print Version 2 biodiversity tool and DEPI's Actions for Biodiversity Conservation database.

*Table 4: Catchment Assets description and relevance to thematic asset classes**

	Catchment Assets	Asset values	Thematic Asset Classes			
			Rivers	Wetlands	Species populations and communities	Terrestrial Habitat
1	**Great Divide Contiguous Forest**	Largely intact forest with high social/recreational/ tourism values with national parks and economic values (production forestry and grazing)	••	••	•••	•••
2	**Alpine and Sub-alpine Landscapes**	Significant biodiversity values including rare and threatened species; important social values	•	•••	•••	•••
3	**Lake Dartmouth / Mitta Mitta Heritage River**	High social and economic value riverine system with relatively intact riparian vegetation and associated species	•••	•	•	•
4	**Ovens and King River Corridor**	High social and economic value riverine systems, with significant riparian and floodplain values in the Ovens River in and below Wangaratta	•••	•••	••	••
5	**Kiewa River Corridor**	High economic and social values, with key habitat within largely cleared landscape	•	•	•	
6	**Murray River Corridor**	Largely intact River Red Gum overstorey within floodplain system	•••	•••	•	•
7	**Chiltern / Mt Pilot Landscape**	High quality box-ironbark forest with significant flora and fauna		•	•••	•••
8	**Warby / Killawarra Landscape**	Good condition forest and woodland protected landscape providing habitat for threatened species		••	•••	•••
9	**Riverine Plains and Wetlands**	Productive agricultural area with significant remnant vegetation communities and regionally important wetlands		•••	•••	••
10	**Upper Murray Forests and Woodlands**	Relatively high quality remnant vegetation in fragmented rural landscape; hardwood forestry values	••	•	••	••
11	**Inland Slopes Forests and Woodlands**	High amenity values within fragmented rural landscapes; remnant vegetation provides important habitat	•	•	••	••
12	**Omeo and Benambra Wetlands**	Regionally valued wetland complexes; economic and social values within the landscape	•	•••		••

** More dots (•) reflects higher relevance of thematic asset classes within Catchment Asset.*

** More details on each catchment asset are included in Appendix 3.*

b) Land Assets

The soils of the North East region:

- contribute to regional economic viability;
- perform a range of environmental ecosystem services including provision of clean water, carbon, cycling/storage, support biodiversity, resist erosion;
- influence the quality of natural resources such as air, water and biodiversity; and
- provide a variety of services for a diverse range of stakeholders - from supporting remnant vegetation in forested areas through to intensive horticulture.

Soils vary greatly across the region, ranging from sand through to clays, with a range of physical and chemical properties. The diversity of soils and their capability for agriculture on private land is highlighted in Figure 7. This figure shows the agricultural land capability and mean annual rainfall for the North East region (Note - there has not been an investigation into the agricultural land capability on public land).

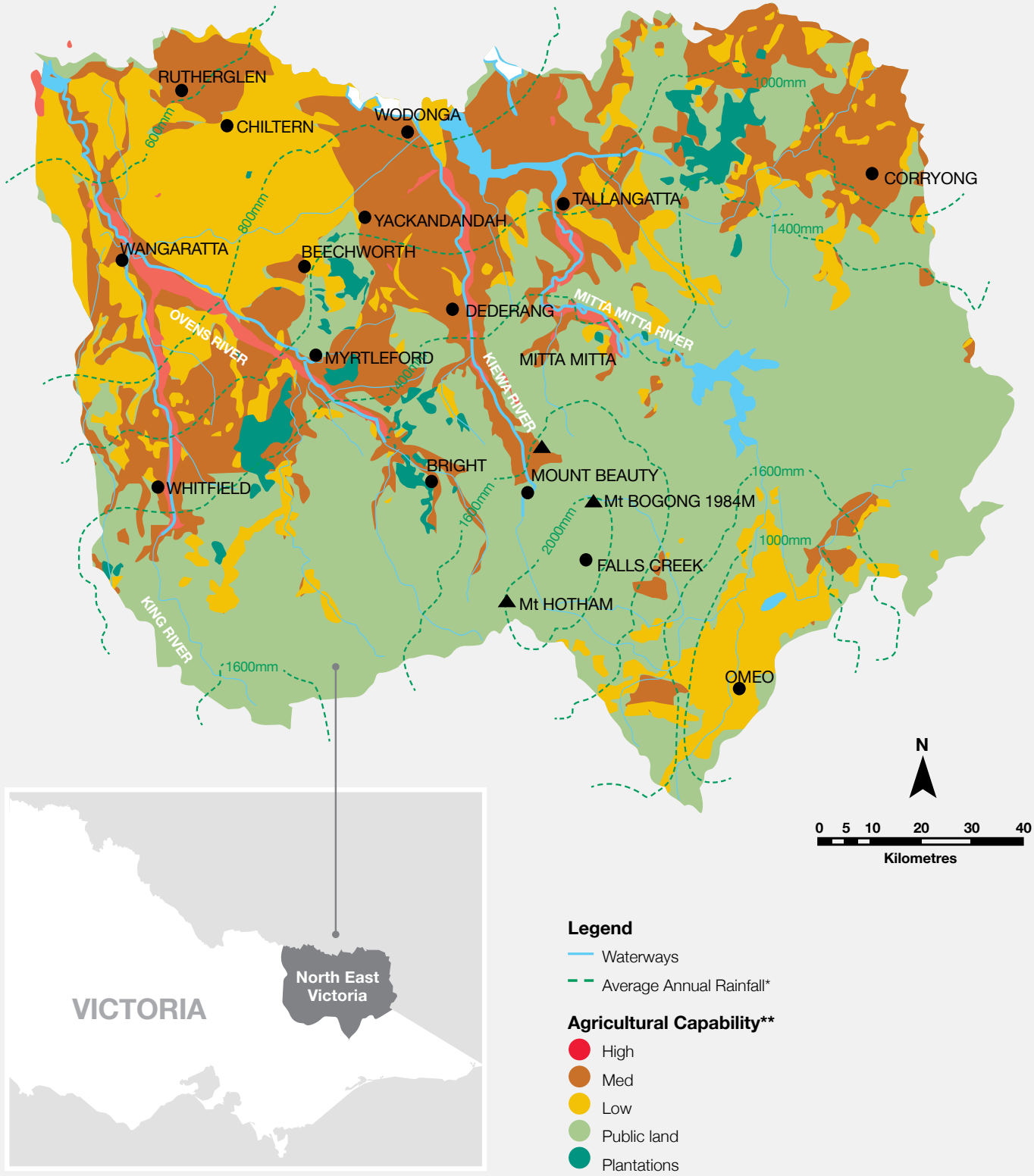
The extent to which the soil resource is utilised, maintained or enhanced is related to land manager understanding of the capacity, chemistry, structure and physical attributes of their soil. Soil carbon levels and acidity are common indicators used to assess the health of soils. Building land manager knowledge of soil management and on farm techniques will be fundamental to preventing further decline in soil health and its productive capacity.

Recognising agricultural land capability and rainfall focuses effort in areas where the greatest soil health and associated ecosystem services, such as productivity, can be achieved. Table 5 shows three agricultural land capability classes and the broad relationship between land capability, rainfall and opportunity for enhancing soil health and associated ecosystem services. This prioritisation considers both the productive and other environmental ecosystem services of land assets. The opportunity to improve soil health is indicated in Table 5.

Maintaining healthy soils and associated vegetation cover in areas of high rainfall and steep topography supports natural resource functions such as the production of clean water for the broader Murray Darling Basin (refer to Figure 4).

Finally, healthy soils and vegetation on public land provide benefits to agricultural productivity on private land. This is highlighted in public land, such as National Parks, which cover approximately 55% of the region.

Figure 7: Agricultural land capability and average annual rainfall across the North East CMA region



* *Average Annual Rainfall supplied by www.bom.gov.au*

** *Reynard et al (2002) Land Resource Assesment for the North East Catchment Management Authority Region*

Note: Poor data coverage may under represent high capability agricultural land in Upper Murray region.

Table 5: Agricultural land capability classes and opportunities to enhance soil health

Agricultural land capability[1]		Rainfall range mm	Opportunity to enhance soil health[2]
Class	**Description**		
High	High to moderate productivity on the alluvial floodplain and wider alluvial plain within proximity to water source. Soils are generally new and richer in natural elements and have favourable physical and chemical properties. Suited to horticultural applications and dairy on the floodplain and generally suited to grazing, viticulture and opportunistic cropping on the wider alluvial plain. Agricultural productivity and responsive nature of soils provides opportunity for further enhancement.	>1400	••
		600-1400	•••
		<600	•••
Moderate	Moderate productivity on moderate to gentle slopes. Soils generally have a lower cation exchange capacity, however, there is opportunity for improvement. Land class is suitable for lighter and less intensive land use and is commonly suited to cropping, grazing and horticulture.	>1400	••
		600-1400	•••
		<600	•
Low	Low to moderate productivity or severe landform constraints exist. Soils generally have lower chemical (fertility), physical (bleached) and environmental properties (organic matter). Agricultural pursuits are generally less intensive and profitable, and are typically utilised for forestry, marginal grazing, or nature conservation.	>1400	•
		600-1400	••
		<600	•

[1] Source: Reynard et al. (2002) Land Resource Assessment for the North East Catchment Management Authority Region
[2] More dots (•) reflects greater opportunity to enhance soil health and associated ecosystem services.

The soils in the North East CMA region provide a variety of services for a diverse range of stakeholders - from supporting remnant vegetation in forested areas through to intensive horticulture. Soil carbon levels and acidity are common indicators used to assess the health of soils. The extent to which the soil resource is utilised, maintained or enhanced is related to the land manager's understanding of the capacity, chemistry, structure and physical attributes of their soil. Accordingly, building on land managers' knowledge of soil management and on farm techniques will be fundamental in preventing further decline in soil health and its productive capacity (see Table 4).

Management measures that aim to maintain and enhance the quality of land resources and their productivity are included in Part Two of the RCS.

Summary

When implementing the RCS, relevant NRM agencies and community groups will find new and different ways to utilise information about the identified Catchment Assets. To this end:

- a set of asset based management measures are listed in Part Two of the RCS;
- the key catchment assets for each landscape are identified in the Landscape sections of the RCS; and
- management measures that aim to maintain and enhance the quality of land and water resources and their productivity are included in Part Two of the RCS.

Why people matter - Community participation in the management and protection of natural resources

Key points

- A 20 year high level objective of the RCS is that the community will actively participate in the integrated management and protection of natural resources.
- The protection of natural resources provides multiple community benefits.
- The community is an integral component in natural resource management and plays a significant role in maintaining and enhancing natural resource assets in the region.
- Providing opportunities for community networking, idea sharing and working together to achieve common goals is an effective way to address challenges involved in the protection of natural resources.

Collaboration, partnerships and integration of natural resource management go hand in hand.

There is already strong community commitment to improving the condition of natural resources across the region. This is evident with the uptake in partnership projects, active participation and the emergence of urban Landcare groups. Other programs conducted by natural resource management organisations also attract volunteers that play a significant role in data collection, on-ground works and feedback. While the primary objective of these community networks is to improve natural resource management, they also provide an opportunity for sharing ideas and a community support role.

Ongoing collaboration across the community, government agencies and industry sectors will continue to raise awareness of natural resource management issues and promote integrated catchment management. Building on the community's current commitment to natural resource management, the North East CMA will seek to foster collaboration and innovation to improve natural resource outcomes by bringing together the community and broader stakeholders.

Skilled and Capable Landcare Community

The implementation of the RCS will build on the Landcare philosophy when working with the communities of the North East region. The RCS recognises the knowledge, skills and expertise of the local community and the value of these stakeholders. It is essential that local input is considered in identifying issues and decision making within the region. Landcare groups and networks are key stakeholder representatives of the community and have been involved in the development of the RCS. This partnership between the community and government will be continued in the implementation of the RCS.

Listen to the community and let them know how that information is being used.

Fostering new ideas

Innovation and Collaboration

Key points

- The North East RCS seeks to foster collaboration and innovation to improve natural resource outcomes.
- Through this Strategy the community, local, State and Federal agencies can work together to assess and implement new, collaborative ideas focussed on local management of natural resource assets.
- A recent review of the Australian Government's *'Caring for Our Country'* program found that delivery of natural resource management programs could be improved by better encouragement of partnerships and increased investment in innovative practices.

The North East CMA will commit to taking a facilitating and coordinating role in fostering new ideas and progressing collaboration within the region. Whilst this is not a commitment of people and resources to any particular project or idea it will foster the collection and assessment of new collaborative ideas.

New ideas that meet the core principles and at least four of the key principles will be further assessed by the CMA.

Core Principles:

- That the execution of the idea will create a clear natural resource benefit for the North East region.
- That the execution of the idea involves a collaborative effort of local organisations and communities.

Key Principles:

- The potential for the idea to be scaled up to create natural resource outcomes across the catchment, across the rest of Australia, and possibly the world.
- The idea is either self funding or has the potential to be self funding.
- The idea creates engagement and connection with local organisations and communities in a way that provides a foundation for future ideas and projects to be developed.
- The idea strengthens the connections between urban populations (local and beyond) to the landscapes within our region.
- The idea strengthens the local economy without damaging the environment.
- The idea improves the resilience of one or more of the landscapes within our region (as described in this RCS).

Working with our Traditional Knowledge

The North East region has a rich and diverse Indigenous history. The Traditional Owners of this region, to this day, continue to hold a strong connection to Country. This rich history and strong connection to Country has meant that traditional knowledge on caring for Country still remains today. The North East community acknowledge the connection Traditional Owners have to the North East region and the significance of building on retained knowledge and re-connecting with knowledge that has been lost. The RCS is committed to ensuring the Traditional Owners, Elders and Indigenous Community of the North East region retain and enhance their connection to Country.

Understanding landscape systems and how people interact and make decisions helps identify management measures that can maintain and enhance natural resource assets and the resilience of the landscape system.

Active community participation is imperative

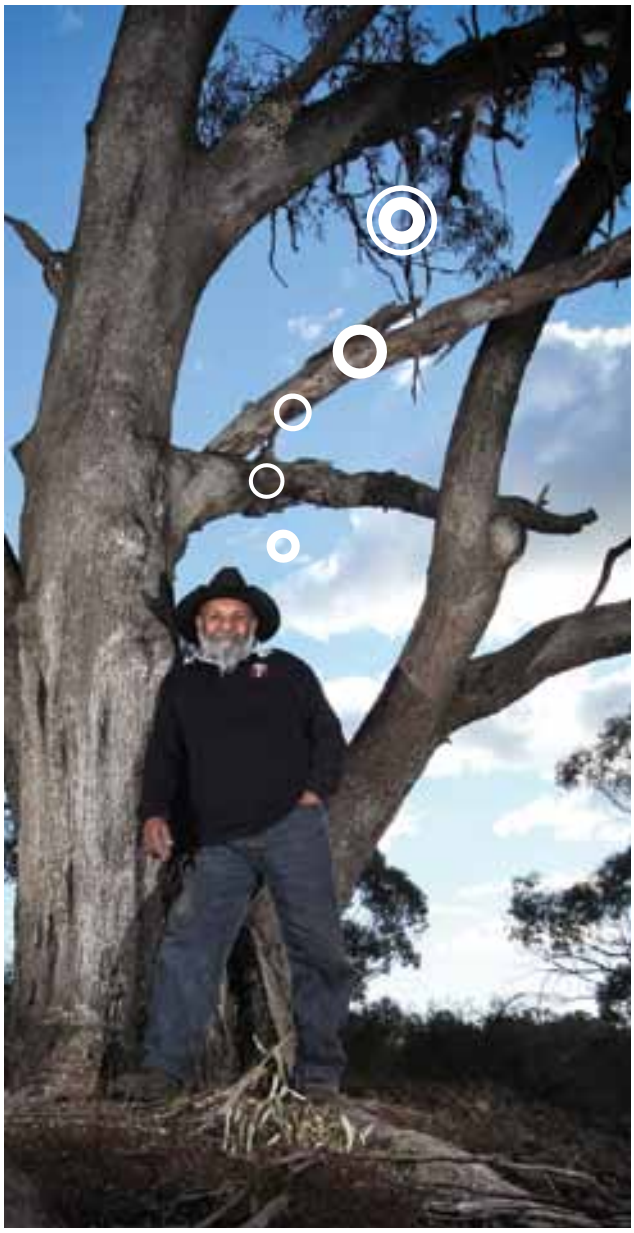
Management measures that encourage the community to actively participate in the integrated management and protection of natural resources and cultural heritage are included in Part Two of the RCS. Undertaking these management measures will also assist in achieving all natural resource asset based and landscape based 20 year objectives, which highlights the integrated nature of natural resource management and interconnectedness of people and how they relate to their environment.

Making sense of the North East region

Landscapes as a connection point

Key points

- Resilience thinking and a systems based approach considers landscapes as dynamic systems with interacting social and ecological components.
- People and their values are seen as an integral part of the landscape system.
- As part of the RCS renewal process we encouraged people to identify landscape systems that are meaningful to them and make sense.
- The responses received led to the identification of five key landscape systems in the North East region:
  - Urban
  - Lifestyle
  - Agriculture
  - Forest
  - Alpine



The North East RCS builds upon an assets-based approach used in 1997 and 2004. It takes a new approach to natural resource management planning by incorporating resilience thinking and a systems based approach.

The inclusion of these two additional approaches addresses significant gaps identified in a review of the previous Regional Catchment Strategies (see What we've learnt section – page 5). This new methodology:

- more fully recognises the complex nature and diversity of the North East region
- helps to prioritise natural resource management effort
- enables integrated catchment management across diverse communities, economies and landscapes
- recognises that flexibility and adaption is required maintain and enhance natural resource assets.

How this new approach builds on the Asset Based Approach

The assets based approach provides a structured process to identify areas for priority attention and to achieve targeted outcomes. In this context, assets are defined as tangible, biophysical elements that are valuable for their environmental, social and economic values.

Resilience thinking and systems based approach considers landscapes as dynamic systems with interacting social and ecological components. People and their values are seen as an integral part of the landscape system.

For each landscape the predominant catchment assets have been identified (Figure 6 and Appendix 3). This approach will enabled consideration of the natural resource assets when progressing the management measures for that landscape.

Understanding how landscape systems work in the North East Region

As part of the RCS renewal process we encouraged people to identify landscape systems that are meaningful to them and make sense.

By accessing community knowledge and technical expertise we developed a more in-depth understanding of the values and dynamics in each of these landscape systems (Urban, Lifestyle, Agriculture, Forest and Alpine). We then developed simple conceptual models or descriptions of how a 'social-ecological system' works to help describe relationships. These models broadly related to the three following characteristics:

- who we are - **People** (communities, political, and cultural)
- the **environmental** services we have to work with - Environment (land, water and biodiversity resources), such as snow topped mountains, river valleys, open plains and forests
- how we do things - **Economic** (transport, infrastructure and technology).

These conceptual models are referred to as 'state and transition models'. How people identify with their landscape is the key determinate into how they will influence its state. The conceptual models in the following sections are a representation of how people interact and function within the landscape systems. The state and transition models help identify and link peoples responses to natural or management induced disturbances (stressor) and what can be done (interventions) to manage this response. A guide to interpreting these models is presented in Figure 8.

Understanding how stressors operate within a landscape system

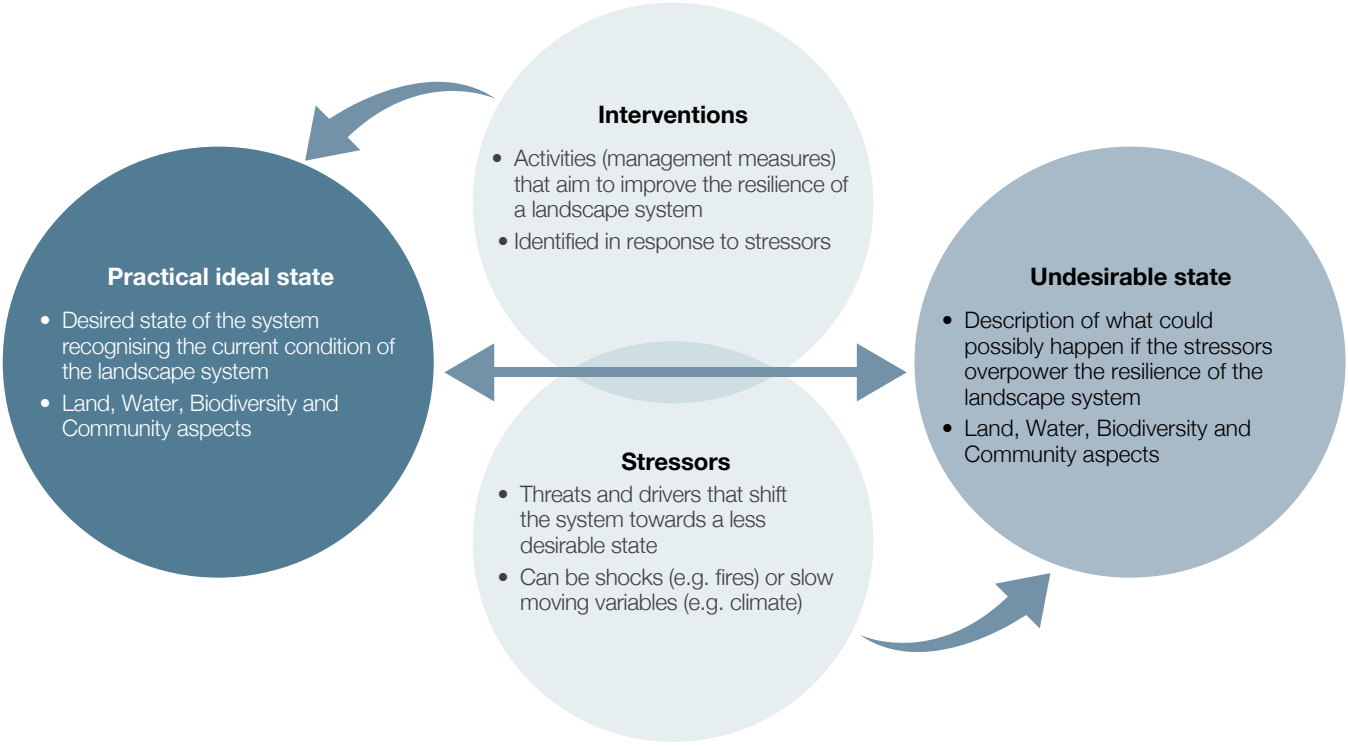
Applying resilience thinking and systems based approach to landscapes recognises the inter-connectivity between different elements and activities, and the influence an activity, or driver, can have on individual elements and the overall state of the landscape.

Some stressors operating with a system may be beyond our control and not directly related to natural resource management. Examples of this could include commodity prices and extreme climate events.

We can start to proactively manage or influence stressors in the landscape when we understand how they may change in the future and whether these changes will significantly affect the elements or functions that we care about. The decisions we put in place may have an immediate impact or cause change over a longer timescale.

Understanding relationships within a system can also help to identify thresholds, which if crossed, can transform the landscape system into an alternate state. Our landscapes have been changed to accommodate the values associated with them. for example the urban landscape has changed, or crossed a threshold(s) to an alternate state that now provide for an aggregation of services and housing.

Figure 8: A guide to state and transition models



How can we manage these landscape systems?

Each of these landscape systems has their own characteristics, functions, dynamics and aspirations. Consequently, each landscape warrants different objectives to achieve natural resource management outcomes. Importantly, these landscapes do not have clearly delineated boundaries, reflecting the dynamic nature of the systems over time.

The following sections describe each landscape system in terms of its objective (values and identity), condition, key stressors and how they relate to the natural resource assets.

The RCS has not mapped the landscape systems, however this could be done during the implementation of the RCS at a scale relevant to the choices and decisions being made.

Each landscape section concludes with recommended priority actions and a set of priority six year management measures that will help to achieve the high level 20 year objectives and the resilience of the landscape system. These 20 year objectives reflect the practical, ideal state of the landscape system and its social, economic and environmental functions.

Image: The Border Mail

Urban Landscape

Key points

- The **Urban** landscape system is the smallest landscape by area, but includes the greatest population in the region.
- The landscape is defined by significant urban centres with large employment, aggregation of services and a diverse economy (e.g. Wodonga and Wangaratta).
- Urbanisation has significantly altered land, biodiversity and water resources.
- The natural resource assets within Urban landscapes are typically altered/changed to meet the social and economic values required. However, some valuable natural resource assets are in close proximity to urban centres (e.g. the riparian zones of major river systems such as the Ovens, King, Kiewa and Murray).

High level objective - Urban Landscape

People will identify with and value the Urban landscape for its diverse economy, access to aggregated services and enhanced liveability through connection with the natural environment.

To give further meaning to this objective, in a practical ideal state the Urban landscape would consist of the elements listed and described in Table 6.

Table 6: Practical ideal state elements for Urban landscape

Element	Description
Liveable urban environment with connected urban reserves and parkland, accessible natural resource assets, and strong connection to the other landscapes in the region	Communities that access natural resource assets within the urban environment (e.g. swimming, fishing or walking along waterways) feel connected and have a greater sense of responsibility for their condition and management. That connection can then extend to connection with natural resource assets in the regional landscape.
Viable local and regional economy and access to quality aggregated services	Cities and towns with viable, diversified and connected (national and global market) economies attract and retain people. This leads to provision of aggregated services like reticulated water, sewerage, electricity and gas, broadband, health care, child care, education facilities, recreation facilities, public transport and cultural attractions. Regions with strong viable local and regional economies allow investment in natural resource management within the urban landscape and beyond.
Capacity to accommodate climate variability	Urban environments that can accommodate the extremes in climate variability (e.g. flood and storm events, reduced water supply reliability and extreme heat) reduce the stress on the community.
Functioning, connected habitat	Contiguous vegetation connected by corridors facilitates the movement and migration of native fauna and flora.

Key Catchment Assets

- Predominant Catchment Assets - priority rivers and wetlands (e.g. Priority Catchment Asset 4, 5 and 6 - Figure 6).

Tip for implementing management measures: Consider how to maintain and enhance the condition and health of these Catchment Assets. More detail on the Catchment Assets is contained in Appendix 3.

Condition

Historically many urban waterways, particularly small systems surrounded by urban development have been viewed as drains and have been significantly modified. Recently there has been a trend towards a greater appreciation of the aesthetic and environmental values of urban waterways resulting in actions to improve the condition of and access to these waterways. Hard impervious surfaces cover a significant portion of the landscape with only pockets of fragmented native vegetation remaining outside of the riparian corridor. These changes have led to the landscape system crossing a threshold and shifting to an alternate state. An overview of the current conditions of land, water and biodiversity natural resource assets within the Urban landscape is provided in Table 7.

Table 7: Condition of natural resource assets within the Urban landscape

Natural resource asset	Description of condition*
Land	Highly modified due to urbanisation. A significant portion of the land is covered with hard impervious surfaces, however urban reserves and parks exist throughout the urban landscape and along waterways.
Water	Highly modified due to urbanisation. Smaller urban waterways were historically valued as drains and have been significantly modified. Larger waterways are degraded, but have not undergone such modification.
Biodiversity	Highly modified due to urbanisation, with only pockets of fragmented native vegetation remaining. Linking remnant vegetation pockets will improve biodiversity.

**In the future the condition will have to be related to the values and context. Future condition assessments will need to be place based and recognise the key social, economic values in addition to the environmental values that can be achieved.*

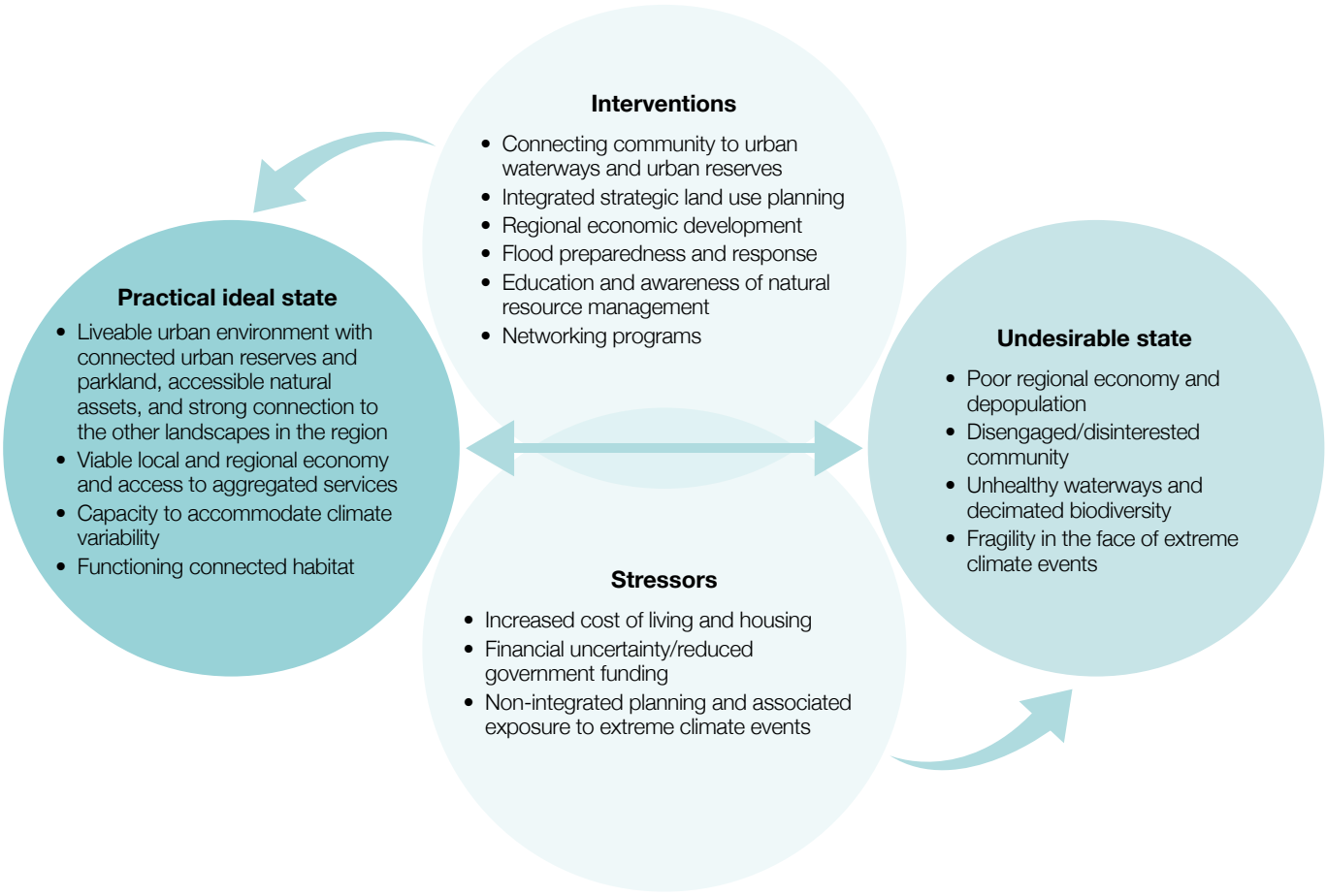
Key Stressors

The Urban landscape is faced with many stressors. Some are relatively slow variables (e.g. changing climate), and some are fast variables (e.g. flood). Others are a combination of both. Key stressors that have been identified for the Urban landscape listed and described in Table 8. The relationship between the practical ideal state, stressors and interventions is illustrated in Figure 9.

Table 8: Key stressors within the Urban landscape

Key stressors	Description
Increased cost of living and housing	Increases in the cost of living (housing, electricity, water, food and fuel) place pressure on families and reduce their capacity to connect with their community, regional landscapes and participate in natural resource management.
Financial uncertainty/ reduced government funding	Reduced financial certainty and government funding in aggregated services raises caution within the community and can affect their willingness to invest (finances, time and emotion) into their community, regional landscapes and participate in natural resource management.
Non-integrated planning and exposure to extreme climate events	It is projected that there will be more extremes in climate such as intense storm and heatwave events. Development without due consideration of natural constraints (i.e. flooding, bushfire risk and heatwaves) will increase the impact of such events on communities and reduce the resilience of natural systems to recover from such events. Non integrated planning will lead to more exposure to extreme events.

Figure 9: Urban landscape state and transition model



Recommended Priority Actions

Presenting waterways, parks and reserves as a centre piece within an Urban landscape to improve liveability of a city and improve the community's connection with the environment. This also lays a foundation for networking programs that encourage community participation in natural resource management within the Urban landscape and beyond.

Management measures

The management measures are aligned with the 20 year objectives and aim to improve the resilience of a landscape system. The management measures relevant for the Urban landscape and supporting rationale are articulated in Table 9. The table also identifies the alignment between the natural resource asset objectives and management measure.

Table 9: Management measures for the Urban landscape

Management measures (6 years)	Rationale	Alignment with objectives			
		Land[1]	Water[2]	Biodiversity[3]	Community[4]
Support utilisation of urban waterways and urban reserves as centre pieces of liveability	Opening up and enhancing urban waterways parks and reserves can improve the community's connection with natural resource assets and the important role they play. Use the attraction of water and availability of flood prone land to connect communities to each other and the environment.	•	•	•	•
Undertake integrated strategic land use planning that incorporates natural resource management and climate variability	Integrated planning allows natural resource management to be considered in Greenfield developments and in re-development of existing urban areas. This allows important natural resource assets to be identified, reduces fragmentation of remnant vegetation areas which facilitate the movement and migration of native fauna and flora and appropriately manages water and waterways in the urban landscape. Amongst other things, an integrated planning framework is used to manage growth and urban density, water supply, and considers waterways, stormwater quantity and quality management, and terrestrial vegetation.	•	•	•	•
Support regional economic development to foster investment in natural resource management	Regional economic development stimulates local and regional economies. Cities with viable local and regional economies allow investment in natural resource management within the urban landscape and beyond. Regional economic development is broad. Regional economies can be stimulated by utilising local resources (e.g. farmers markets or local tourism) through to the introduction of a large industry to the region.	•	•	•	•
Maintain and enhance floodplain management and flood response arrangements	Development and land use in floodplains must recognise the inherent function of the floodplain to convey and store flood waters. Appropriate planning prevents an increase in the degree of community flood exposure (human safety, infrastructure, and environment). Flood preparedness and response minimise the impact of flooding on flood prone communities.	•	•	•	•
Build on existing community and government partnerships in the coordinated delivery of natural resource management education and awareness raising	Educating the urban community about natural resource management and their function (e.g. floodplain) improves their understanding and allows the community to connect with natural resource assets locally and regionally. Connectivity raises community awareness of the challenges and multiple benefits of liveable urban environments, which promotes ownership and willingness to conserve the natural resource assets. The community could be engaged via a spectrum of ways, including schools, community project champions, building on local natural resource assets and programs and celebrating success (e.g. Water eduction programs).	•	•	•	•
Support networking programs that encourage community participation in natural resource management. Build on traditional approaches to increase participation	Innovative approaches such as the uptake of new social media and greater availability of mobile broadband can be adopted to connect communities with local and regional natural resources and improve their participation in natural resource management. However, it will be important that the human and social aspects drive these changes, not the technology.	•	•	•	•

[1] Whilst conserving environment, we will maintain and enhance the health and condition of **land** resources and their long term productivity.
[2] Whilst conserving environment, we will maintain and enhance the health and condition of **water** resources and their long term productivity.
[3] Whilst conserving environment, we will maintain and enhance the health and condition of **biodiversity** resources.
[4] The community will actively **participate** in the integrated management and protection of natural resources.
N.B. Management measures that cover all landscapes can be found in Part Two of the RCS.

Lifestyle Landscape

Key points

- The **Lifestyle** landscape system is valued for its environmental aesthetics, solitude and local community.
- The dynamic landscape is characterised by communities which are transitioning from primarily an agricultural focus to more of a Lifestyle focus.
- There are numerous communities that identify themselves as Lifestyle land users. There is a concentration of this landscape within daily commuting distance to large urban centres.
- There are also numerous communities that identify themselves as Lifestyle land users outside of a typical commuting distance. Some communities are there because of their connection to the amenity and aesthetics, whilst other Lifestyle land users remain on their rural land to retire in the communities they are connected to (e.g. Upper Murray).
- The Lifestyle landscape is primarily within private ownership and intersects with all of the other landscapes. The distinction between this landscape and other landscapes is constantly evolving and is open to interpretation.

High level objective - Lifestyle landscape

People will identify with and value the Lifestyle landscape for its environmental aesthetics, tourism, strongly connected communities and access to the regional economy.

To give further meaning to this objective, in a practical ideal state the Lifestyle landscape would consist of the elements listed and described in Table 10.

Table 10: Practical ideal state elements for Lifestyle landscape system

Element	Description
Agricultural production, forested areas and lifestyle land uses coexisting	A diverse community lives in the Lifestyle landscape. The landscape is valued for its environmental aesthetics, solitude and local community. It is also valued for its agricultural productivity and surrounding forested catchments. Sometimes these values are in conflict and there is a need to recognise the spectrum of aspirations and their coexistence.
Socially and environmentally connected community	An environmentally informed community that is connected with agricultural communities is more likely to be aware of natural resource management issues (e.g. weeds) and how to best to manage them. In addition, informed lifestyle communities may also be able to assist agricultural communities with natural resource management. Connection with both urban and agricultural communities may also help bridge the urban rural divide.
Managed soil, wetlands, vegetation and waterways	Managing the impacts of the land use on the natural resource base (i.e. soil, wetlands, vegetation and waterways) improves water retention, water quality and soil productivity. For example: • Managing stock access to waterways (waterway fenced off with controlled grazing) and riparian revegetation will improve waterway health by reducing erosion and water quality risks (sediment, nutrients and pathogens) • Improving soil carbon and their biological health increases water retention, reduces runoff and improves agricultural productivity. • Managed fire regime that balances the protection of life and assets.
Managed impact from invasive species	Containing or reducing populations of invasive animals (e.g. foxes and deer) and plants (e.g. Patterson's curse and blackberry) will have biodiversity and agricultural productivity benefits.
Functioning connected habitat	Remnant, contiguous vegetation connected by corridors facilitates the movement and migration of native fauna and flora.
Recognition of the lifestyle landscapes for their clean green productions.	A diverse set of agriculturally based producers and industries that can position themselves as clean and green producers. Contribution to regional economy (e.g. On-property income from products and services such as leasing of land and small niche products) .
Managed recreational access	Encourage connection to natural resources through managed recreational access (e.g. fishing).

Key Catchment Assets

- Predominant Catchment Assets - priority forest, woodlands and rivers (e.g. Priority Catchment Asset 4, 5, 7 and 11 - Figure 6).

Tip for implementing management measures: Consider how to maintain and enhance the condition and health of these Catchment Assets. More detail on the Catchment Assets is contained in Appendix 3.

Condition

Land clearing, mining, agricultural land use practices and township settlements have altered the landscape in parts of the region. As a result, the landscape that was in place prior to European settlement has crossed a threshold, shifting the system to an alternate state that can now be described today as the Lifestyle landscape system. An overview of the current conditions of land, water and biodiversity natural resource assets within the Lifestyle landscape is provided in Table 11.

Table 11: Condition of natural resource assets within the Lifestyle landscape

Natural resource asset	Description of condition*
Land	The majority of the land resources have been impacted by historical land use practices however, areas unaffected by these activities remain in relatively good condition. The condition of land resources are being maintained and enhanced by improved land management practices and revegetation.
Water	Waterways have been highly modified by historical land use practices. Waterway reaches upstream of these impacts remain in relatively good condition. Active riparian revegetation and managed stock access to waterways is improving the condition of water resources within this landscape.
Biodiversity	Highly modified, therefore a reduced level of biodiversity from the levels that existed before historical land clearing. This has resulted in fragmented remnant vegetation. However, there is evidence of improvement with revegetation corridors linking remnant vegetation.

**In the future the condition will have to be related to the values and context. Future condition assessments will need to be place based and recognise the key social, economic values in addition to the environmental values that can be achieved.*

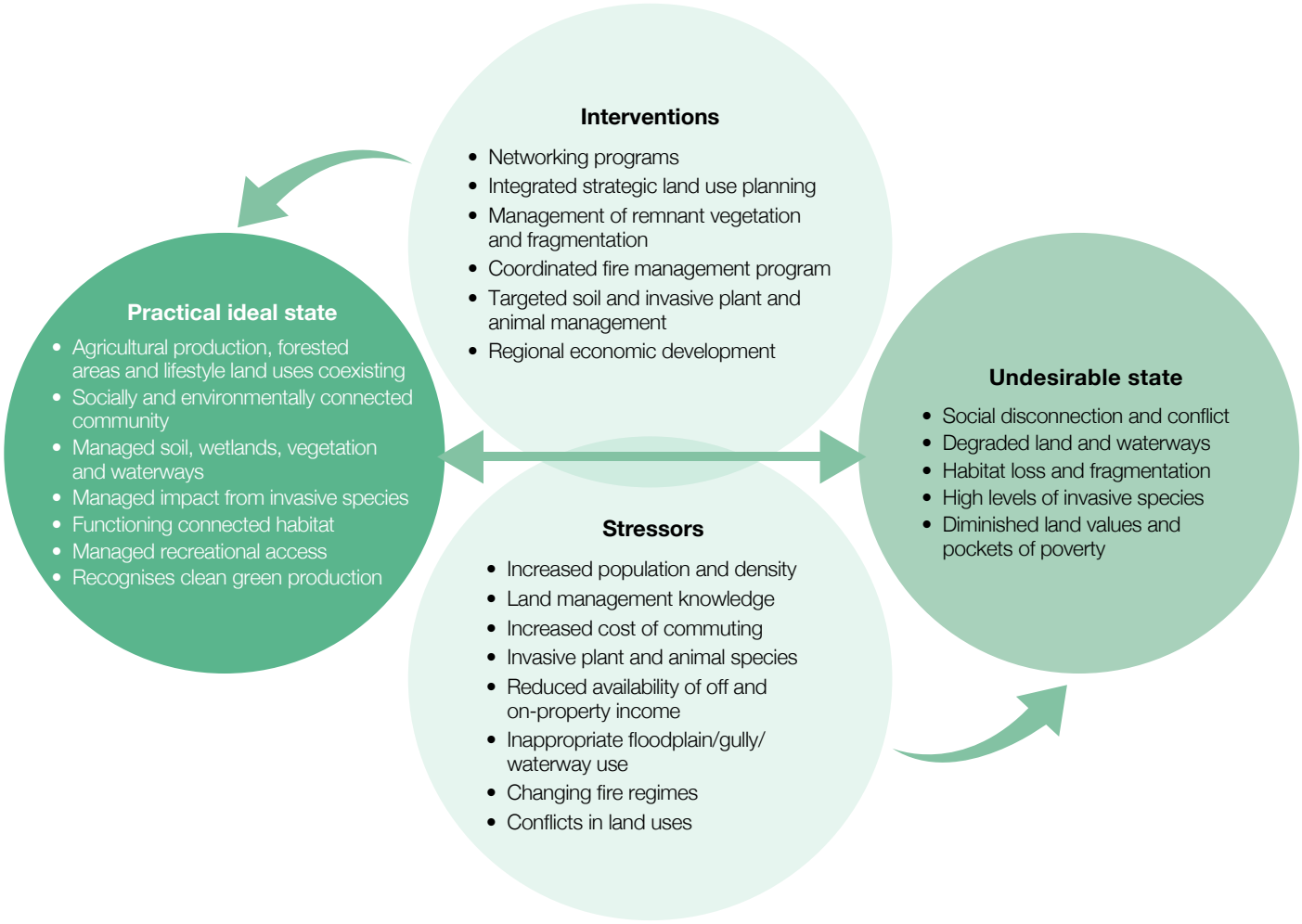
Key Stressors

The Lifestyle landscape is faced with many stressors, some are relatively slow variables (e.g. changing climate), some are fast variables (e.g. flood), while others can be both. Key stressors that have been identified for the Lifestyle landscape listed and described in Table 12. The relationship between the practical ideal state, stressors and interventions is illustrated in Figure 10.

Table 12: Key stressors within the Lifestyle landscape

Key stressors	Description
Increased population and density	Increased population places pressure on land, productive capacity and the environment. Increasing the number and density of land managers (owners) will increase the stress between the uses of that land. Increased population density can also increase surface and groundwater extraction (stock and domestic use) and can increase nutrient export in the catchment with onsite wastewater management (septic tanks).
Land management knowledge	Land managers can have insufficient experience and knowledge to adequately manage land. This may result in adverse outcomes such as spread of invasive plants and animals.
Increased cost of commuting	Increased fuel costs increase the cost of commuting to employment in urban areas, placing pressure on the financial viability of the lifestyle existence. Reduced profitability reduces the capacity for landholders to invest in land management (e.g. weed management) and natural resource management activities (e.g. fencing riparian areas).
Invasive plant and animal species	Invasive plant (e.g. Patterson's Curse and garden escapes) and animal (e.g. rabbits, deer and foxes) species have negative impacts on agricultural productivity and biodiversity. Invasive plants and animals can be a greater problem in areas adjacent to landscapes that are managed differently (e.g. Urban and Forest). Conversely, poor invasive management in this landscape can impact upon adjacent landscapes, such as Agriculture.
Reduced availability of off and on-property income	Off property income is vital for the existence of a lifestyle community. Off property income enables a lifestyle community to live and be involved in their community and can provide them with resources to invest in natural resource management.
Inappropriate floodplain/ waterway use	Inappropriate floodplain/waterway use includes dumping rubbish, inappropriate modification to the waterway embankment /gully and uncontrolled stock access to waterways, which can increase erosion and water quality risks (sediment, nutrients and pathogens).
Changing fire regimes	Whilst human life is afforded priority in fire management, the potential increase in fires (planned and unplanned) and associated smoke can affect the amenity of the Lifestyle landscape. The potential increase in the number and frequency of fires around and within the Lifestyle landscape could also change the perceptions of the natural aesthetic attributes of the landscape. Disturbance created by fires can also create opportunities for plants and animals.
Conflicts in land uses	Tension between Lifestyle and Agriculture land uses. For example, some typical agricultural activities are perceived inappropriate in more densely populated areas (e.g. weed spraying). Increased demand for land for lifestyle (amenity) reasons can increase the value of the land above that which can be paid for purely agricultural productivity purposes, which can create further conflict. There is also the need to manage potential tensions between new industries (e.g. mining) and Lifestyle land uses.

Figure 10: Lifestyle landscape state and transition model



Recommended Priority Actions

The land use conflict and associated tension between communities in the Lifestyle and Agriculture landscapes is a key resilience challenge. Networking programs that encourage collaborative community participation in natural resource and land management can improve the co-existence of communities in the Lifestyle and Agriculture landscapes. Integrated strategic land use planning that incorporates natural resource management, climate variability risks (e.g. fire, flood, drought) and specialisation of lifestyle land use can also prevent land use conflicts in the future.

Management measures

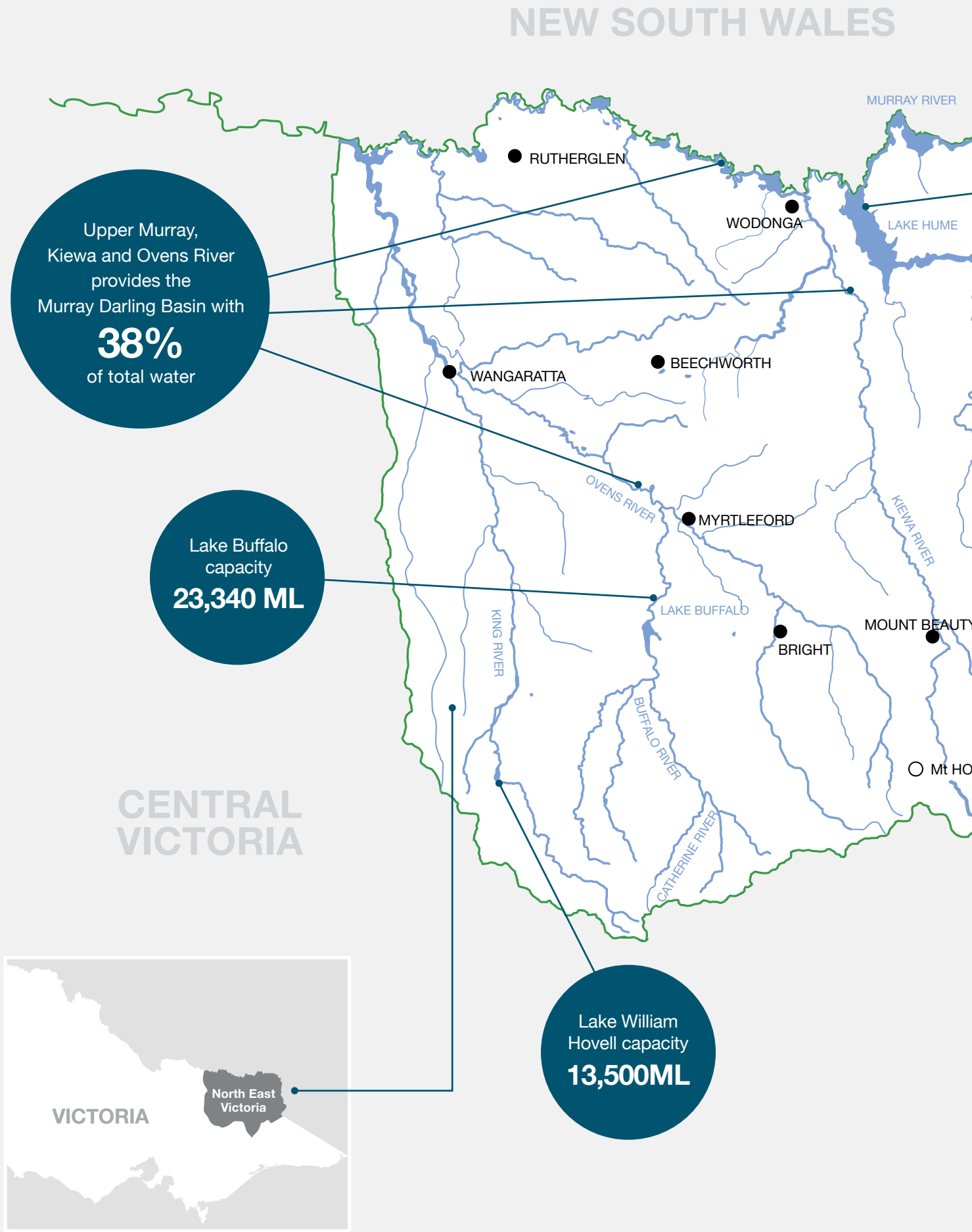
The management measures are aligned with the 20 year objectives and aim to improve the resilience of a landscape system. Management measures relevant for the Lifestyle landscape and supporting rationale are articulated in Table 13. The table also identifies the alignment between the natural resource asset objectives and management measure.

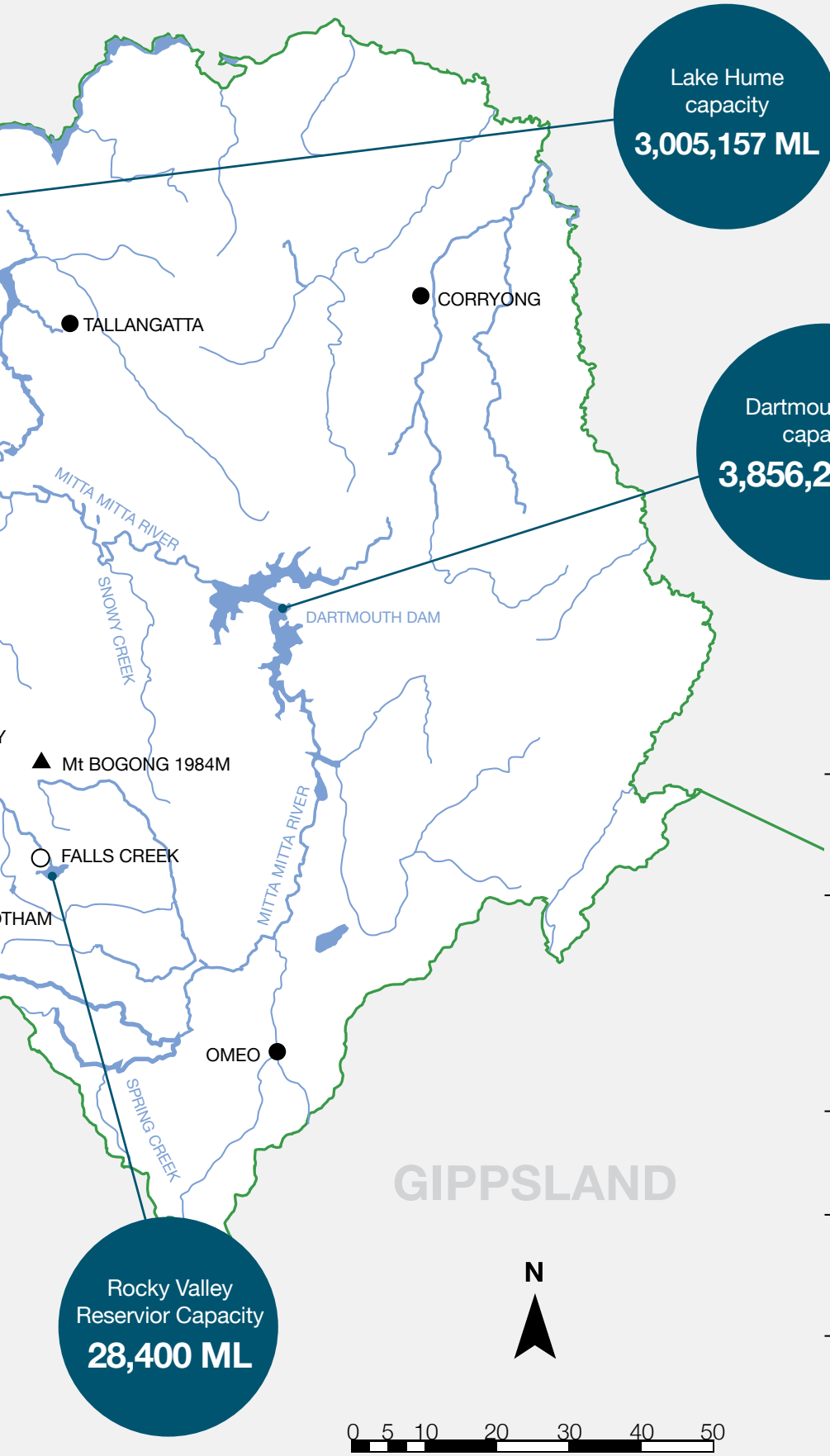
Table 13: Management measures for the Lifestyle landscape

Management measures (6 years)	Rationale	Alignment with objectives
Undertake integrated strategic land use planning that incorporates natural resource management, climate variability risks and specialisation of lifestyle land use	Strategic land use planning can be used to reduce the potential for conflict within the Lifestyle landscape due to its dynamic nature and its coexistence with adjacent Agriculture, Forest and Urban landscapes (e.g. domestic animals influence on stock and wildlife, water supply). Planning arrangements that prioritise access to lifestyle land use into less productive and capable landscapes whilst avoiding unnecessary fragmentation of habitat, fire and water quality risks. Careful consideration needs to be given to coexistence of landscapes and any unintended consequences that may arise from planning changes.	
Support networking programs that encourage community participation in natural resource management. Tailor traditional approaches towards the motivations, capacity constraints and opportunities of communities within the lifestyle landscape	Increasing land managers awareness and understanding of their role and how they influence the natural resource assets will reduce the risk of further degradation, and may in some cases improve the natural resource condition. In addition to traditional extension and advice programs, engagement will be more effective if tailored to the motivations and capacity constraints of communities that identify themselves as lifestyle land users. This may include the adoption of innovative engagement approaches, such as social media and new collaborative tools, due to the changing demographic, availability of mobile broadband and emerging technology. However, it is important that the needs of human and social aspects drive these changes, not the technology. Engagement and networking tools could be targeted towards new land users (e.g. welcome package accompanying land transfer) and encouraging networking within the landscape community and with other communities in adjacent urban and agricultural landscapes to identify conflicts and implement opportunities. For example, advice and education on land management, collective pooling of resources (infrastructure and share farming), build on local knowledge, local economies (produce) and use of champions to lead the way.	
Build on existing community and government partnerships in the coordinated management of remnant vegetation and fragmentation	Management and enhancement of remnant, contiguous vegetation areas (e.g. corridor planting) will facilitate the movement and migration of native fauna and flora (e.g. along waterways and drainage lines). Planning and management is required to avoid further fragmentation which is possible with further development and population densification in this landscape.	
Support the delivery of a fire management program in collaboration with key stakeholders which aims to: **• minimise the impact of major bushfires on human life, communities and infrastructure,** **• maintain an effective water yield and** **• maintain or improve the resilience of natural ecosystems**	Collaborate with key stakeholders to determine appropriate planned burning regime around and within lifestyle landscapes. Support research to improve our understanding of fire management requirements in and around the Lifestyle landscape.	
Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals	Targeted programs that assist with the containment or reduction of invasive animal (e.g. foxes and deer) and plant (e.g. Patterson's curse) populations on public and private land will improve agricultural productivity and reduce negative biodiversity impacts.	
Promote sustainable land management. Tailor traditional approaches towards the motivations, capacity constraints and opportunities of communities within the lifestyle landscape	Targeted soil health programs that recognise the motivations, constraints and opportunities of those within this landscape will help maintain the land resource base for productive use (e.g. water retention) and land management in accordance with land capability principles.	
Support regional economic development to foster investment in natural resource management	Regional economic development stimulates local and regional economies. Stimulated economies offer off property income, which is vital for the existence of a lifestyle community. Regional economic development is broad. Regional economies can be stimulated by utilising local resources (e.g. farmers markets or local tourism) through to the introduction of a large industry to the region.	

[1] Whilst conserving environment, we will maintain and enhance the health and condition of **land** resources and their long term productivity.
[2] Whilst conserving environment, we will maintain and enhance the health and condition of **water** resources and their long term productivity.
[3] Whilst conserving environment, we will maintain and enhance the health and condition of **biodiversity** resources.
[4] The community will actively **participate** in the integrated management and protection of natural resources.
N.B. Management measures that cover all landscapes can be found in Part Two of the RCS.

Snapshot of North East Victoria





Population
~100,000

Total area
1,957,000ha
Includes three major catchments; the Upper Murray, Kiewa and Ovens Rivers

Public land **55%**
Including over 200 parks and reserves

10,602km
of streams

Estimated
$3.24 billion
contributed to State and National economic wealth per year.

Agriculture Landscape

Key points

- The **Agriculture** landscape has a strong productivity focus and covers a vast area in the region.
- The Agriculture landscape intersects with the Forest landscape in the upper catchments and extends down the valleys to the plains in the west, intermingling with the Lifestyle landscape. The distinction between Agriculture and Lifestyle landscapes is constantly evolving and is open to interpretation.
- The Agriculture landscape is primarily within private ownership. Agricultural pursuits in the region are diverse, ranging from softwood plantations and intensive horticulture through to broad acre cropping and grazing.

High level objective - Agriculture landscape

People will identify with and value the Agriculture landscape for its productivity, quality land and water resources, and strongly connected communities that identify with their valleys, plains and plateaus

To give further meaning to this objective, in a practical ideal state the Agriculture landscape would consist of the elements listed and described in Table 14.

Table 14: Practical ideal state elements for Agriculture landscape

Element	Description
Connected community with leadership	Connected communities, within and with other landscape communities (i.e. Urban and Lifestyle), with strong leadership can promote best practice and resolve conflicts.
Profitable, diversified farm businesses with succession plans	Profitable farm businesses allow investment in natural resource management. Diversified farms may reduce financial risk and succession planning promotes a longer term view ie. Farming enterprises.
Managed vegetation, soil and water resources	Managing agricultural production with land use capabilities maximises production and avoids damaging the natural resource base (i.e. soil, wetlands, vegetation and waterways) For example: • Managed stock access to waterways (waterway fenced off with controlled grazing) and riparian revegetation will improve waterway health by reducing erosion and water quality risks (sediment, nutrients and pathogens) while maintaining functional local water cycles. • Improved soil carbon, groundcover and biological health of soils and increases water retention, reduces contaminated runoff and improves agricultural productivity. • Functioning connected habitat leads to biodiversity benefits by facilitating the movement of native flora and fauna. Contiguous native vegetation helps stabilise soil, minimising the risk of erosion, and provides protection for stock which improves agricultural productivity.
Managed impact from invasive species	A high level of collaboration and coordination between land managers in the prevention, containment and/or reduction of invasive animals (e.g. foxes, deer and wild dogs) and plants (e.g. Patterson's curse and blackberry) populations to maintain agricultural productivity and reduce the risk of detrimental impacts on the natural resource base.
Managed recreational access	Encourage connection to natural resources through managed recreational access (e.g. fishing).
Sustainable timber industry	Financially and ecologically sustainable timber harvesting.
Functioning connected habitat	Remnant, contiguous vegetation connected by corridors facilitates the movement and migration of native fauna and flora.
Recognition of the agricultural landscapes for the clean green production	A set of agricultural based producers and industries that can position themselves as clean green producers.

Key Catchment Assets

- Predominant Catchment Assets - rivers, wetlands and woodlands (e.g. Priority Catchment Asset 3, 4, 5, 6, 7, 9, 10 and 11 - Figure 6).

Tip for implementing management measures: Consider how to maintain and enhance the condition and health of these Catchment Assets. More detail on the Catchment Assets is contained in Appendix 3.

Condition

Land clearing, mining, agricultural land use practices and township settlements have altered the landscape in parts of the region. As a result, the landscape that was in place prior to European settlement has crossed a threshold, shifting the system to an alternate state that can be described today as the Agriculture landscape system. Many agricultural ventures are relatively stable, however, there has been significant and rapid change in other areas, including the demise of the tobacco industry and spread of grape vines in the region. These changes, combined with the ageing nature of land owners, could impact on the Agriculture landscape system. An overview of the current conditions of land, water and biodiversity natural resource assets within the Agriculture landscape is provided in Table 15.

Table 15: Condition of natural resource assets within the Agriculture landscape

Natural resource asset	Description of condition*
Land	The majority of the land resources have been impacted by historical land use practices however, areas unaffected by these activities remain in relatively good condition. The condition of land resources are being maintained and enhanced by improved land management practices and revegetation.
Water	Waterways have been highly modified by historical land use practices. Waterway reaches upstream of these impacts remain in relatively good condition. Active riparian revegetation, management of effluent and stormwater and managed stock access to waterways is improving the condition of water resources within this landscape.
Biodiversity	Highly modified , therefore a reduced level of biodiversity from the levels that existed before historical land clearing. This has resulted in fragmented remnant vegetation. However, there is evidence of improvement with revegetation corridors linking remnant vegetation.

**In the future the condition will have to be related to the values and context. Future condition assessments will need to be place based and recognise the key social, economic values in addition to the environmental values that can be achieved.*

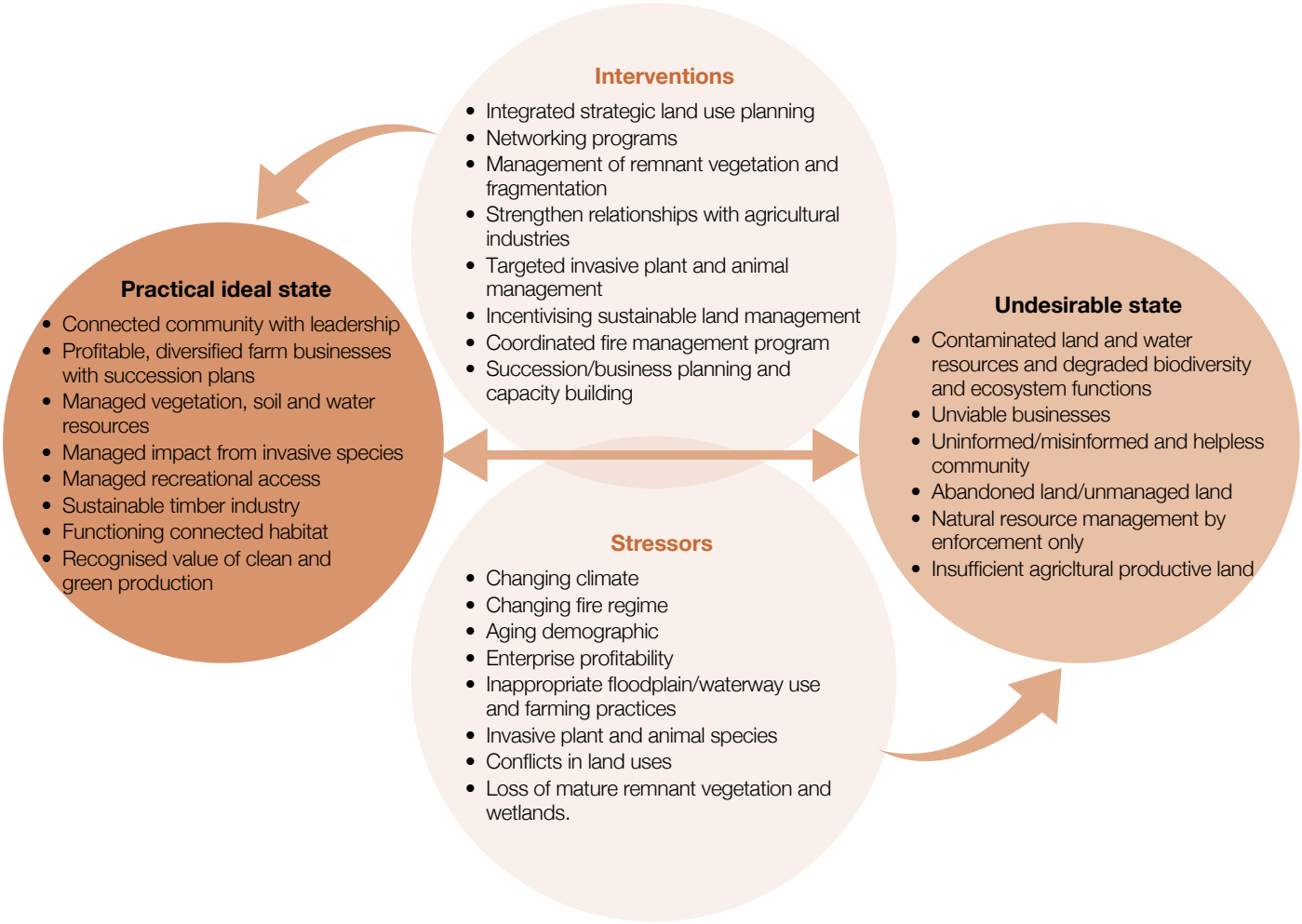
Key Stressors

The Agriculture landscape is faced with many stressors, some are relatively slow variables (e.g. changing climate), some are fast variables (e.g. flood), while others can be both. Key stressors that have been identified for the Agriculture landscape listed and described in Table 16. The relationship between the practical ideal state, stressors and interventions is illustrated in Figure 11.

Table 16: Key stressors within the Agriculture landscape

Key stressors	Description
Changing climate	It is projected that there will be increased temperatures, reduced rainfall, altered rainfall pattern and more intense storm events, which can impact the viability of some agricultural ventures (e.g. climate sensitive horticulture varieties) and affect the availability water for crops, stock, domestic and irrigation purposes.
Changing fire regime	Whilst human life is afforded priority in fire management, the potential increase in fires (planned and unplanned) and associated smoke can affect productivity within the Agricultural landscape, for example smoke taint in wine grapes and impacts on water quality and quantity. However, planned burning will also help protect and maintain catchment water yield by strategically removing the fine fuels in a mosaic across the landscape, reducing the risk of intensive fires leaving bare ground. Disturbance created by fires can also create opportunities for plants and animals.
Aging demographic	The average age of farmers is increasing and approaching a threshold where there will be significant change in land ownership in a relatively small time frame. Ownership change presents an opportunity and a challenge, there could be a significant loss in local land management knowledge and opportunity to improve agricultural viability and natural resource management through the introduction of new ideas and innovation.
Enterprise profitability	Enterprise profitability can be constrained by land capability, planning constraints and historic land use. It can also be constrained by global market and policy changes. These stressors can have significant impacts locally. Competitive market pressures in agriculture can reduce farmers' capacity to make a reasonable profit but at the same time the high cost of land means that there are significant barriers to entry. Reduced profitability can reduce the capacity for landholders to invest in land management (e.g. weed management) and natural resource management activities (e.g. fencing riparian areas).
Inappropriate floodplain/gully/ waterway use and farming practices	Uncontrolled stock access to waterways reduces waterway health by increasing erosion and water quality risks (sediment, nutrients and pathogens). Dumping rubbish in waterways also impacts waterway health. Overstocking reduces groundcover, which reduces water retention, resulting in increased erosion, and export of sediments and nutrients. Poorly managed gullies are particularly vulnerable to erosion in high rainfall events. A reduction in biodiversity across this landscape can also has negative impacts on the long term viability of land.
Invasive plant and animal species	Invasive plant (e.g. Patterson's Curse and blackberry) and animal (e.g. foxes, wild dogs) species can impact agricultural productivity and biodiversity. Invasive plants and animal species can be a greater problem adjacent to more landscapes that are managed differently (e.g. Urban, Lifestyle and Forest).
Conflicts in land uses	Tension between Lifestyle and Agriculture land uses. For example, amenity values conflicting common agricultural practices (e.g. weed spraying). Increased demand for land for lifestyle (amenity) reasons can increase the value of the land above that which can be paid for purely agricultural productivity purposes, which can create further conflict. There is also the need to manage potential tensions between new industries (e.g. mining) and Agricultural land uses.
Loss of remnant vegetation and wetlands	A reduction in remnant vegetation and alteration to wetlands in this landscape can have negative impacts on the long term viability of agricultural land and its connection with surrounding landscapes. Management of remnant vegetation, particularly paddock trees, will contribute to important ecosystem services and contribute to agricultural production.

Figure 11: Agriculture landscape state and transition model



Recommended Priority Actions

The average age of farmers is increasing and approaching a threshold where there could be significant land management challenges prior to land ownership change in a relatively short timeframe. Supporting the development of community based solutions will encourage sustainable land management through this transition period.

Management measures

The management measures are aligned with the 20 year objectives and aim to improve the resilience of a landscape system. Management measures relevant for the Agriculture landscape and supporting rationale are articulated in Table 17. The table also identifies the alignment between the natural resource asset objectives and management measure.

Table 17: Management measures for the Agriculture landscape

Management measures (6 years)	Rationale	Alignment with objectives			
		Land[1]	Water[2]	Biodiversity[3]	Community[4]
Undertake integrated strategic land use planning that incorporates natural resource management and land productivity	Strategic land use planning can be used to reduce the potential for conflict with adjacent Lifestyle land use. Aligning planning arrangements (e.g. Municipal Strategic Statement) with land capability can assist in defining Lifestyle and Agriculture land use areas. Careful consideration needs to be given to any unintended consequences that may arise from planning changes.	●	•	●	●
Support networking programs that encourage community participation in natural resource management. Tailor approach towards the motivations, capacity constraints and opportunities of communities within the agricultural landscape	Strengthening relationships within the agriculture industry through programs such as Landcare help farmers identify common ground, work through challenges (e.g. changing climate) together and fosters the adoption of best practice management. Linking urban and agricultural communities can improve consumer knowledge and build on awareness of the link between healthy economies, communities and environment. Broadening networks can also lead to diversification and exploitation of niche market opportunities (e.g. clean and green, local and gourmet). Farmers participating in regional, state and federal forums can influence policy decisions.	•	•	•	●
Build on existing community and government partnerships in the coordinated management of remnant vegetation and fragmentation	Management, protection and enhancement of remnant, contiguous vegetation areas (e.g. corridor planting) will facilitate the movement and migration of native fauna and flora (e.g. along roadside, waterways and drainage lines). Existing partnership such as those under the threatened grassy woodland and targeted biolinks could be built on. In addition new partnerships with major land managers and users (forestry)	●	●	●	•
Build on existing partnership with large agricultural based industries within the region to improve environmental outcomes (e.g. Forestry)	Strengthening relationships and integrating objectives with large agricultural based industries within the region (forestry, dairy, beef and horticulture) may result in regional economic, environmental and community outcomes.	●	•	•	●
Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals	Programs on public and private land that assist with the containment or reduction of invasive animal (e.g. foxes, deer and wild dogs) and plant (e.g. Patterson's curse) populations can improve agricultural productivity and reduce negative biodiversity impacts.	●	●	●	●
Promote sustainable land management	Supporting practice change and sustainable land management in accordance with land capability principles may result in improved natural resource management. For example, improving soil structure to increase water retention and transitioning from grazing on hills to agro-forestry/ timber industry.	●	•	•	●
Support Agricultural industries in developing new land manager models that address barriers to entry (high capital costs) and succession of ageing land owners. (refer Management Measure 1.10)	Supporting broader agricultural industry groups (e.g. Victorian Farmers Federation) to develop new models of farm ownership to deal with the barriers to entry of high capital costs, can lead to succession of ageing land owners with new land manager (e.g. mentoring). This may result in improved natural resource management. Diverse adaptive programs for maintaining land management capacity, including one for ageing demographic, are needed.	•	•	•	●
Support the delivery of a fire management program in collaboration with key stakeholders which aims to: **• minimise the impact of major bushfires on human life, communities and infrastructure,** **• maintain an effective water yield** **• maintain or improve the resilience of natural ecosystems**	Collaborate with key stakeholders (e.g. DEPI, Parks Vic, DEPI, CFA, local councils and timber industry) to determine appropriate planned burning regime around and within agriculture landscapes. Support research to improve our understanding of fire, animal stress, fire frequency and smoke taint in and around the Agriculture landscape.	•	●	●	●
Support Agricultural industries in the promotion of succession/ business plans to maintain land management capacity through transition of ownership and management. (refer to Management Measure 1.10)	Succession and business planning maintains the longer term management view and improves the transition of ownership and ongoing land management. Building the management capacity and marketing skills of the farming community will contribute to increasing the profitability of farms.	•	•	●	●

[1] Whilst conserving environment, we will maintain and enhance the health and condition of **land** resources and their long term productivity.
[2] Whilst conserving environment, we will maintain and enhance the health and condition of **water** resources and their long term productivity.
[3] Whilst conserving environment, we will maintain and enhance the health and condition of **biodiversity** resources.
[4] The community will actively **participate** in the integrated management and protection of natural resources.
N.B. Management measures that cover all landscapes can be found in Part Two of the RCS.

Forest Landscape

Key points

- The **Forest** landscape includes relatively intact and diverse native vegetation ranging from Montane forests to floodplain forests.
- Forest landscapes include National, State and Regional Parks as well as forests on private land and crown land river frontages and reserves.
- In this context, softwood plantation forests are not included in the forest landscape, rather the Agricultural landscape.
- Forests above the Montane level (which is approximately the commencement of Snow Gums), including sub-alpine and alpine ecosystems are included in the Alpine landscape.
- Forest landscapes are used for reserve, recreation and resource purposes.

High level objective - Forest landscape

People will identify with and value the Forest landscape for its national parks, recreation, water and forest resources.

To give further meaning to this objective, in a practical ideal state the Forest landscape would consist of the elements listed and described in Table 18.

Table 18: Practical ideal state elements for Forest landscape

Element	Description
Healthy waterways, wetlands and high biodiversity	Contiguous vegetation that supports diverse populations of unique plants and animals allowing connectivity, and provides a range of ecosystem services (e.g purification of water, carbon storage and nutrient management).
Balanced conservation and recreation uses	Contribution to regional economies by providing opportunities for recreation and tourism whilst minimising the environmental impact from these activities on the landscape, particularly for sensitive ecosystems (e.g. fishing). Provide places to recreate relax and connect with nature.
Minimal impact from invasive species	A high level of collaboration and coordination between land managers in the prevention, containment and/or reduction of invasive pest animals and plants and their impact on biodiversity, water quality, in-stream and river bank ecosystems.
Provision of high quality water yield	The reliable water sourced from the Forest and neighbouring Alpine landscape is used for urban potable water supply, farms and businesses and contributes to local economies through industries such as boating, fishing and tourism. The vegetated areas naturally filter the water, provide critical ecosystem services such as carbon storage and nutrient cycling and temper the flow downstream. The reliable water sourced from the Alpine and neighbouring Forest landscapes supports many of the 2.1 million Australians living in the Murray–Darling basin and is used for the production of dairy goods, fruit, nuts, wine and cereals and potable supply for many communities, including throughout the North East and downstream along the River Murray to Adelaide.
Sustainable hardwood industry	Financially and ecologically sustainable timber harvesting. Strategic hardwood harvesting that minimises the impact on biodiversity and clean water yield from the Forest landscape.
Sustainable firewood collection	Well managed, sustainable firewood harvesting that minimises the direct impact on biodiveristy, displaces collection from more environmentally sensitive and vulnerable locations and provides affordable home heating for the local community.
Functioning connected habitat	Remnant, contiguous vegetation connected by corridors facilitates the movement and migration of native fauna and flora.

Key Catchment Assets

- Predominant Catchment Assets - rivers, woodlands and forests (e.g. Priority Catchment Asset 1, 4, 5, 6, 7, 8,10 and 11 - Figure 6)

Tip for implementing management measures: Consider how to maintain and enhance the condition and health of these Catchment Assets. More detail on the Catchment Assets is contained in Appendix 3.

Condition

The Forest landscape system is generally unmodified and includes relatively intact and diverse native vegetation ranging from Montane forests to floodplain forests. The high quality and reliable waters from the Australian Alps are of national economic, social and environmental importance. There is evidence that the frequency of significant bushfire events is changing the vegetation class mix in the Forest landscape and subsequently may cross a threshold in the future and alter the state of the landscape system. An overview of the current conditions of land, water and biodiversity natural resource assets within the Forest landscape is provided in Table 19.

Table 19: Condition of natural resource assets within the Forest landscape

Natural resource asset	Description of condition*
Land	Relatively stable condition with decline in areas affected by bushfire and subsequent erosion.
Water	Relatively stable condition with decline in areas significantly affected by bushfires.
Biodiversity	Relatively stable with decline in areas significantly affected by bushfires and invasive plant and animal species.

**In the future the condition will have to be related to the values and context. Future condition assessments will need to be place based and recognise the key social, economic values in addition to the environmental values that can be achieved.*

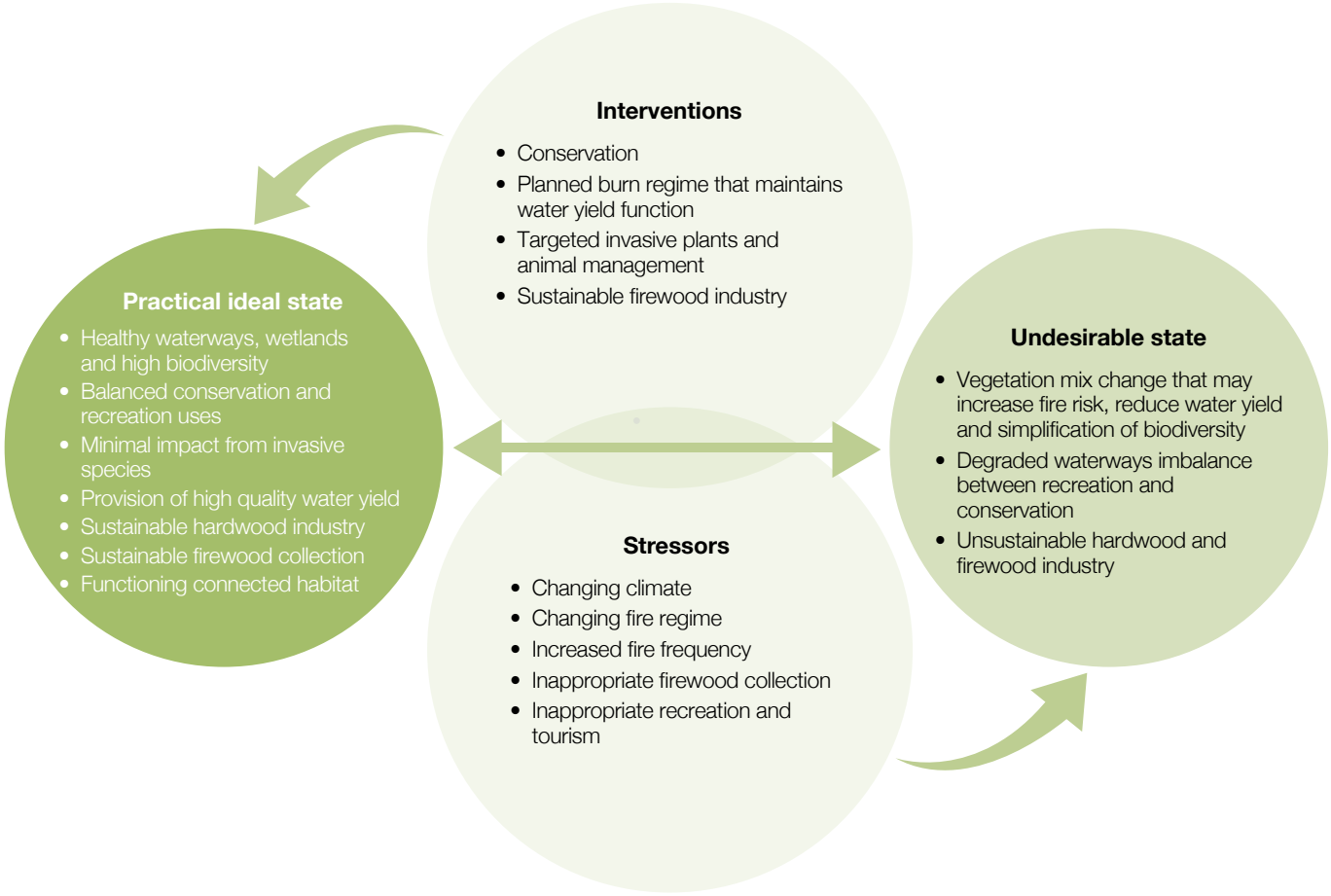
Key Stressors

The Forest landscape is faced with many stressors, some are relatively slow variables (e.g. changing climate), some are fast variables (e.g. flood), while others can be both. Key stressors that have been identified for the Forest landscape listed and described in Table 20. The relationship between the practical ideal state, stressors and interventions is illustrated in Figure 12.

Table 20: Key stressors within the Forest landscape

Key stressors	Description
Changing climate	Projected increases in climate variability may result in longer periods of low river flow, more frequent extreme events and more frequent and intense bushfires. This can alter biodiversity (both terrestrial and aquatic) and impact on waterway flow regime, sub-surface runoff and storage capacity as well as destabilisation of river bed and banks. Events such as floods can also increase the sediment load entering a waterway, alter water quality and affect towns, farms and businesses.
Invasive plant and animal species	Invasive animals such as horses, goats, deer and pigs, impact waterways and wetlands by pugging and increasing nutrients through faeces. Other pest animals, foxes, rabbits, cats, wild dogs and introduced aquatic fauna such as carp, impact native fauna, flora and biodiversity through preying on and competing with native wildlife as well as damaging vegetation communities (aquatic and terrestrial). Inappropriate livestock grazing (state forests and private forests) also has an effect on vegetation composition. The spread of willows, English Broom, Himalayan and Japanese Honeysuckle, Blackberries, Gorse and Hawthorne are of particular concern due to their impact on the natural land forming processes and biodiversity.
Changing fire regime	The fires in 2003 burnt a significant area of the North East Forest landscape. This was followed by the fires in 2006, which affected the King, Ovens and Kiewa catchments. The fires burnt vast amounts of vegetation in the Forest landscape, which had many impacts on local waterways and the forest ecosystems. Fire impacts can include excessive runoff after heavy rains which can exacerbate flooding and carry high loads of sediments and nutrients into waterways. This can have many impacts on the health of downstream water bodies and aquatic fauna including algal blooms and low oxygen levels. It can affect water resources for human and agricultural use. In wetlands the vegetation composition and structure can change after fire and decrease their bio-filtering capacity, increase soil erosion and increase the risk of weed invasion. Fires in water supply catchments can have significant water quality and yield impacts. Disturbance created by fires can also create opportunities for pest plants and animals.
Inappropriate firewood collection	Inappropriate collection of firewood in forests with vulnerable remnant vegetation and habitat can have significant local impacts. The problem of inappropriate firewood collection may worsen with an increase in the cost of alternative fuels, such as electricity and gas.
Inappropriate recreation and tourism	Increasing recreation and tourism in the area benefits the economy and community. However, increased visitation in the forest landscape can have localised impacts on biodiversity (e.g. introduction of pest animals and plants) and may increase the risk of erosion.

Figure 12: Forest landscape state and transition model



Recommended Priority Actions

There have been three significant fire events in the last decade that have burnt vast areas, which are impacting the high quality water yield from the Forest landscape. As a priority, it is recommended that a bushfire management program be delivered that aims to:

- minimise the impact of major bushfires on human life, communities and infrastructure
- maintain an effective water yield
- maintain or improve the resilience of natural ecosystems.

There is also an opportunity to build on existing community and government partnerships to develop a sustainable firewood industry and divert firewood collection away from vulnerable remnant vegetation and habitat.

Management measures

The management measures are aligned with the 20 year objectives and aim to improve the resilience of a landscape system. Management measures relevant for the Forest landscape and supporting rationale are articulated in Table 21. The table also identifies the alignment between the natural resource asset objectives and management measure.

Table 21: Management measures for the Forest landscape

Management measures (6 years)	Rationale	Alignment with objectives			
		Land[1]	Water[2]	Biodiversity[3]	Community[4]
Build on existing community and government partnerships to identify opportunities that benefit both tourism and park conservation	Build on existing community and government partnerships to maintain a balance between conservation, recreation, tourism and hardwood harvesting by collaborating with Parks Vic, Alpine resorts, local councils, DEPI and the tourism industry to identify opportunities that benefit both tourism and conservation.	•	●	●	●
Support the delivery of a fire management program in collaboration with key stakeholders which aims to: **• minimise the impact of major bushfires on human life, communities and infrastructure** **• maintain an effective water yield** **• maintain or improve the resilience of natural ecosystems**	Collaborate with key stakeholders to determine appropriate planned burning regime to maintain an effective water yield function. For example, supporting research and development.	•	●	●	•
Further develop community and government partnerships in the coordinated and targeted management of invasive plant and animals	Targeted invasive plant and animal programs on public and private land can reduce the impact on high value vegetation communities and fauna habitats.	•	•	●	•
Build on existing community and government partnerships to build a sustainable firewood industry to divert collection away from areas with vulnerable remnant vegetation and habitat	Build on existing community and government partnerships to develop a sustainable firewood industry. The objective of the industry would be to divert collection from vulnerable remnant vegetation and habitat and potentially support local businesses and community organisations.			●	•

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[3] Whilst conserving environment, we will maintain and enhance the health and condition of **biodiversity** resources.
[4] The community will actively **participate** in the integrated management and protection of natural resources.
N.B. Management measures that cover all landscapes can be found in Part Two of the RCS.

Alpine Landscape

Key points

- The **Alpine** landscape system encompasses the high altitude areas of the Murray, Mitta Mitta, Kiewa, Ovens and King catchments, with its lower boundary defined by the snowline, which roughly corresponds with the boundary between snow-gums and other (usually Alpine Ash) forest types.
- The Alpine landscape system is mostly comprised of parts of the Alpine and Mt Buffalo National Parks, together with smaller areas of State forest, alpine resorts (Falls Creek and Mt Hotham), and freehold land (Dinner Plain).
- Key stakeholders are the principle land managers (Parks Victoria, DEPI and alpine resort management boards) and the Kiewa Hydro-electric Scheme operator, AGL.
- The Alpine landscape adjoins areas in East Gippsland, and Goulburn Broken catchments, within Victoria, and the Murray Catchment in NSW.
- The Alpine and Mt Buffalo national parks are managed as part of the Australian Alps co-operative management program, coordinated by the NSW, ACT, Victorian and Commonwealth park management agencies.
- The landscape is enjoyed throughout the year, with visitation peaking during the snow season. Recreation and tourism contribute significantly to the local economy, both within the Alpine landscape and in the wider region.

High level objective - Alpine landscape

People will identify with and value the Alpine landscape for its iconic status, high biodiversity, tourism and clean water resource.

To give further meaning to this objective, in a practical ideal state the Alpine landscape would consist of the elements listed and described in Table 22.

Table 22: Practical ideal state elements for Alpine landscape

Element	Description
Recognition of Alpine landscape as a unique icon	Broad community recognition of the Alpine landscape as a unique icon. A landscape which is enjoyed and respected by the community for its unique ecological, recreation, tourism and Indigenous and European heritage values. Development and land use consistent with Alpine identity and values (e.g. visual amenity).
Healthy wetlands, waterways and vegetation communities	Healthy, functioning wetlands and waterways contribute to the rich aquatic and terrestrial biodiversity of the Alpine landscape and protect fragile soils on steep slopes.
High biodiversity including threatened species and communities	Snow gum forests and woodlands, alpine heathlands, grasslands, snow patch herb fields and alpine wetlands provide habitat for a wide array of native flora and fauna, including many alpine endemic and threatened species.
Viable and sustainable recreation and tourism industry	Profitable, diverse, sustainable recreation and tourism opportunities, ventures and facilities, which can operate across multiple seasons.
Containment or reduction of invasive plant and animal populations	A high level of collaboration and coordination between land managers in the prevention, containment and/or reduction of invasive animals and plants and their impact on the sensitive Alpine environment. Invasive animals include hard hoofed species, such as horses and pigs, introduced predators, such as feral cats and foxes, and small herbivores, such as rabbits and hares. Invasive plants of greatest concern in the Alpine region include Grey Sallow Willow, Hawkweeds, Ox-eye Daisy, English Broom and a range of exotic grasses and wetland weeds.
Provision of reliable, high quality water yield	The high value wetlands and waterways that provide waters from the Australian Alps are of national economic, social and environmental importance. The healthy wetlands, waterways and riparian areas contribute to the quality of the water that is valued downstream and throughout the catchment. The reliable water sourced from the Alpine and neighbouring Forest landscapes supports many of the 2.1 million Australians living in the Murray–Darling basin and is used for the production of a variety of goods, including the potable supply for many communities, throughout the North East and downstream along the River Murray to Adelaide.
Functioning connected habitat	Remnant, contiguous vegetation connected by corridors facilitates the movement and migration of native fauna and flora.

Key Catchment Assets

- Predominant Catchment Assets - rivers and wetlands (e.g. Priority Catchment Asset 2 - Figure 6)

Tip for implementing management measures: Consider how to maintain and enhance the condition and health of this Catchment Asset. More detail on the Catchment Assets is contained in Appendix 3.

Condition

The Alpine landscape is characterised by its outstanding biodiversity, its remarkable geodiversity and landscape and scenic values. The high quality and reliable waters from the Australian Alps are of national economic, social and environmental importance. An overview of the current conditions of land, water and biodiversity natural resource assets within the Alpine landscape is provided in Table 23.

Table 23: Condition of natural resource assets within the Alpine landscape

Natural resource asset	Description of condition*
Land	Relatively stable condition with decline in areas affected by bushfire and subsequent erosion.
Water	Relatively stable condition with decline in areas significantly affected by bushfires, which has also altered the state of the landscape system.
Biodiversity	Relatively stable with decline in areas affected by bushfire and invasive plant and animal species.

**In the future the condition will have to be related to the values and context. Future condition assessments will need to be place based and recognise the key social, economic values in addition to the environmental values that can be achieved.*

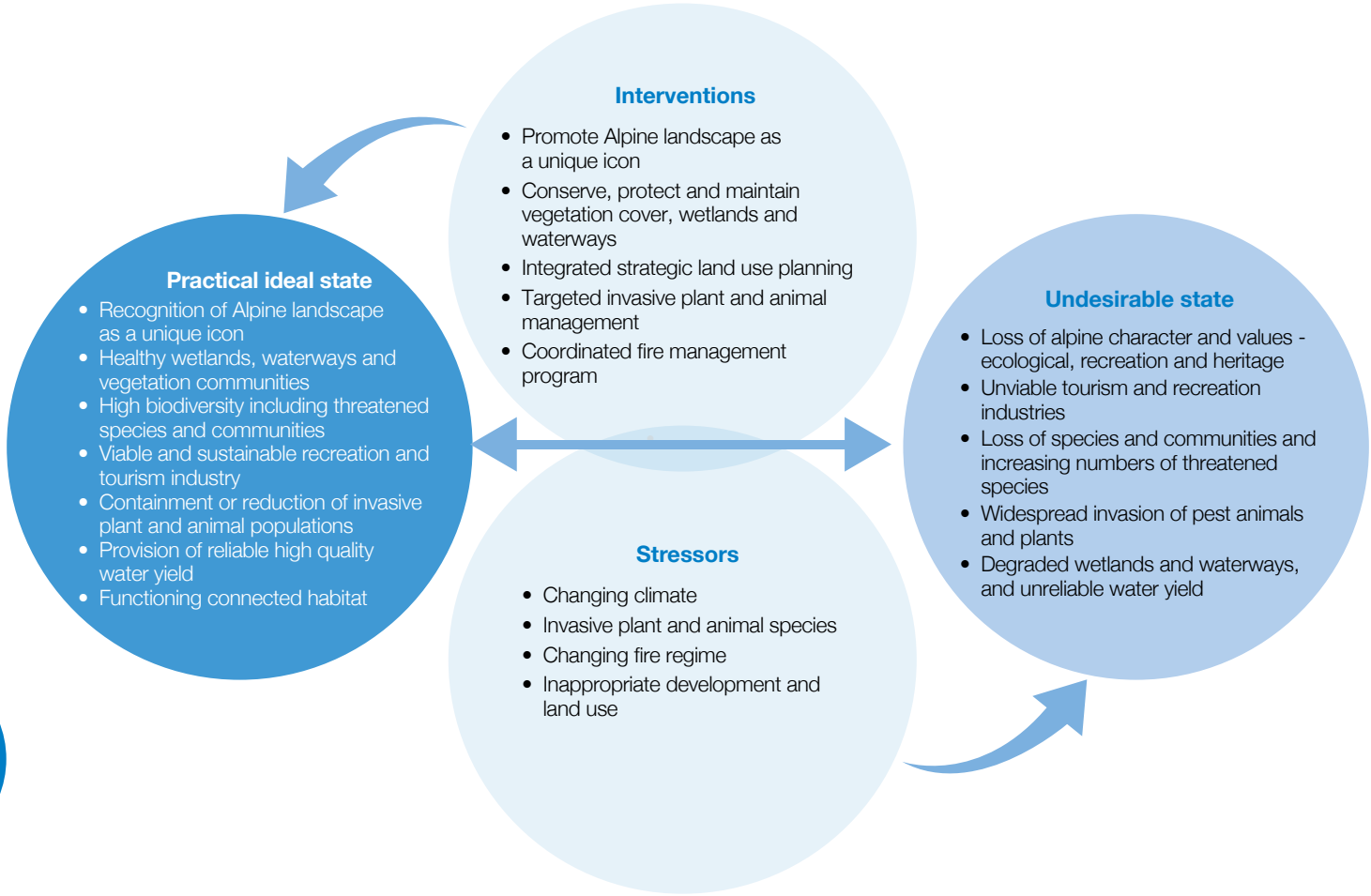
Key Stressors

The Alpine landscape is faced with many stressors, some are relatively slow variables (e.g. changing climate), some are fast variables (e.g. fire), while others can be both. Key stressors that have been identified for the Alpine landscape listed and described in Table 24. The relationship between the practical ideal state, stressors and interventions is illustrated in Figure 13.

Table 24: Key stressors within the Alpine landscape

Key stressors	Description
Changing climate	It is projected that there will be more extremes in climate (including intense heat wave events, increasing temperatures, decreasing precipitation and snow cover, longer and more intense droughts, increasing fire frequency and severity and more frequent and intense storms) which may significantly alter biodiversity and could lead to increased erosion.
Invasive plant and animal species	Hard hoofed animals (e.g. horses and pigs) impact by pugging and wallows on wetlands and waterways. Invasive animals damage sensitive components within the landscape, which increases the risk of weed germination. Introduced predators, particularly cats and foxes, endanger native wildlife, including threatened species such as the Mountain Pygmy Possum. The spread of invasive plants across the Alpine landscape is of great concern due to their impacts on biodiversity and amenity values.
Changing fire regime	The 2003 Alpine Fires burnt most of the Alpine landscape. The 2006 Great Divide Fires re-burnt some areas (including parts of Mount Buffalo plateau and the Bogong High Plains) as well as most of the Alpine landscape not burnt in 2003. The Mount Buffalo area has been burnt four times in the past forty years and seven times in the past hundred years. Almost all vegetation communities have been burnt, including most alpine wetlands and wet heaths; only snow patch herb fields and some grasslands remain mostly unburnt. Due to slow post-fire regeneration in alpine areas, bare soil in burnt areas can remain exposed for considerable periods, increasing the risk of erosion and providing a substrate for opportunistic weed invasion. Too-frequent fire can permanently change vegetation communities by eliminating fire-sensitive species, promoting more fire-tolerant, or even fire-promoting, species in their place. This can result in the replacement of wetter and more fire-sensitive communities (and the plant and animal species that depend on them) being replaced by drier and more fire tolerant communities and species.
Inappropriate development and land use	Increasing tourism and recreation (including skiing and snow play in winter, bush walking, vehicle touring, mountain bike and horse riding, and sightseeing in other seasons) in the area benefits both the economy and community. However, increased visitation in the sensitive Alpine landscape can have localised impacts on biodiversity (e.g. introduction of invasive animals and plants) and may increase the risk of erosion, if not carefully managed. Increased visitation may also lead to an increase in permanent residence rates, which can also place additional pressure on the sensitive environment. Hydro electricity and other infrastructure like roads can also alter the hydrology and create barriers in the sensitive alpine environment.

Figure 13: Alpine landscape state and transition model



Recommended Priority Actions

The Alpine landscape is a highly sensitive and vulnerable environment with threatened species and communities. Promoting the Alps as a unique icon, due to the value of its outstanding biodiversity, landscape and scenic values will improve the connection of the broader community (North East region and beyond) with the landscape and encourage investment in the protection of its natural resource assets.

Management measures

The management measures are aligned with the 20 year objectives and aim to improve the resilience of a landscape system. Management measures relevant for the Alpine landscape and supporting rationale are articulated in Table 25. The table also identifies the alignment between the natural resource asset objectives and management measure.

Table 25: Management measures for the Alpine landscape

Management measures (6 year)	Rationale	Alignment with objectives			
		Land[1]	Water[2]	Biodiversity[3]	Community[4]
Promote the Alps as a unique icon to enhance value of its outstanding biodiversity, landscape and scenic values	Build on existing community and government partnerships to identify opportunities that benefit both tourism/ recreation and conservation (e.g. raising awareness of unique characteristics using technology and social media). Recreation and tourism opportunities may extend into the adjacent Forest landscape. Support community driven enterprises that assist in maintaining Alpine landscape identity and secure awareness and understanding of the Alps' values and threats.	·	·	·	●
Actively protect, maintain and enhance high conservation wetlands, vegetation, and waterways in the Alpine landscape	Targeted restoration of alpine wetlands, riparian areas and vegetation communities that also improves the management of threatened fauna and their habitat. Build on existing community and government partnerships to promote greater understanding of the sensitive alpine environment and how they can help reduce risks (e.g. invasive plants, animals and pathogens).	●	●	·	·
Undertake integrated strategic land use planning to ensure future development and land use complements the Alpine landscape and incorporates natural resource management	Work with communities and stakeholders to ensure future development and activities complement the Alpine landscape and do not have adverse impacts on biodiversity and the healthy functioning of wetlands and waterways.	●	●	●	●
Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals	Targeted invasive plant and animal programs can reduce the impact on high value species, vegetation communities and fauna habitats. Eradicating new and emerging weeds, climate-induced incursions and isolated occurrences of weeds will reduce impact on biodiversity and water regime.	·	●	●	·
Support the delivery of a fire management program in collaboration with key stakeholders which aims to: **· minimise the impact of major bushfires on human life, communities and infrastructure,** **· maintains sensitive natural resource assets** **· maintain or improve the resilience of natural ecosystems**	Identify and execute opportunities to minimise the bushfire risk on human life, and sensitive natural and built assets.	·	●	●	·

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[4] The community will actively **participate** in the integrated management and protection of natural resources.
N.B. Management measures that cover all landscapes can be found in Part Two of the RCS.

Implementation and integration

Bringing it all together

Key points

- There are significant and complex challenges involved in protecting and enhancing natural resource assets in the North East region whilst also maintaining productivity.
- Collaborative approaches to these challenges will be most effective.
- Successful implementation will require integration of many different approaches.
- Natural resource assets often intersect with multiple landscapes (e.g. the lower Ovens River is a Heritage River that passes through Urban, Lifestyle, Agriculture and Forest landscapes).
- The landscape systems will be used for RCS implementation.

Why effective management interventions are needed at multiple scales

The North East RCS applies a new approach to planning natural resource management in our region. It builds on the assets based approach to catchment management by incorporating resilience thinking and the systems based approach:

- priority natural resources (land, biodiversity and water) in the North East region identified through the assets based approach are described in the Identifying and understanding our natural resource assets section of this document
- the five landscape systems developed and explored through use of the resilience thinking and systems based approach are described in the Urban, Lifestyle, Agriculture, Forest and Alpine sections along with associated management measures.

The combination of these approaches recognises the complex nature and diversity of the North East region and the inter-connection between people and biophysical components in dynamic landscape systems.

The following example illustrates how integration of resilience thinking, a systems based approach and an assets based approach can improve the likelihood of achieving a successful resource management result.

Situation
A waterway within a primarily Agricultural landscape provides important fish habitat and a source of water supply (see Figure 14). The local community recognises that fish habitat is a significant asset that requires protection.

Technical experts believe fish habitat in that reach can be maintained and protected by fencing off the waterway reach and undertaking riparian restoration works. While this approach may be very successful, it may fail if broader landscape systems and challenges are not taken into account.

Designing Interventions

Considering resilience challenges in the landscape may change the method or effort used to protect the asset (fish habitat). For example:

- the motivations and capacity of land managers in Agriculture and Lifestyle landscapes need to be recognised to ensure ongoing practices don't undermine the investment (e.g. for profitability reasons the Agricultural land manager may disregard the fish habitat and allow stock access to waterway after it has been fenced off)
- the resilience challenges of the land manager in the Lifestyle landscape system across the other side of the waterway also need to be taken into account (e.g. absent land manager may not have the time to manage stock access);
- the unknown (reduced) reliability of high quality water yield and resulting stream flow from the Forest landscape may present a far greater threat to the fish habitat than either of the adjacent land managers.

In order for this new approach to be effective, people managing natural resources in the North East will need to better understand the context (values) for each landscape, and how these relate to practical ideal state when designing interventions.

Achieving the 20 year high level objectives

Part Two of the Regional Catchment Strategy details the management measures identified for the North East region. These measures were devised by using each of the three approaches to catchment management– i.e. the assets based approach, resilience thinking and a systems based approach.

These management measures:

- link to the high level 20 year objectives
- outline expected community and organisational involvement
- link to the five landscape systems
- require integration of different approaches.

Using the management measures to design NRM interventions in the North East

The management measures suggested in Part Two of this RCS are inter-related. They are relevant to community participation, monitoring, natural assets and each of the landscape systems identified for the North East region.

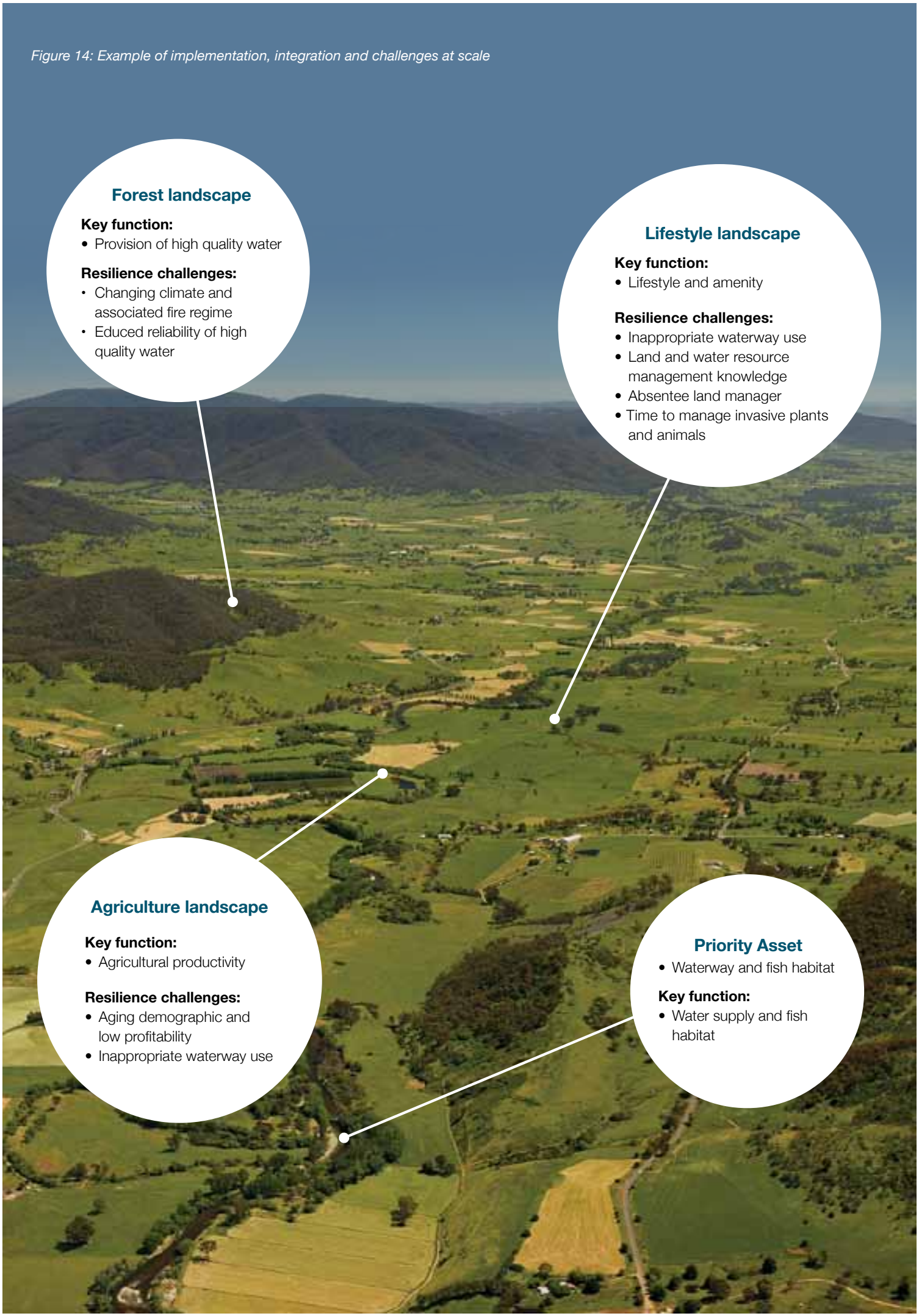
When designing natural resource management interventions:

- review the relevant landscape system chapter (Alpine, Forest, Agriculture. Lifestyle, Urban), including the state and transition model/s and suggested management measures
- cross check these with the measures suggested for the relevant natural resource asset – land, biodiversity or water (see Part Two)
- refer to community participation and monitoring measures
- consider how these measures can be integrated and translated into action.

The landscape management measures recognise that the protection of assets (e.g. Murray River) may require management of threats that arise outside the immediate asset area (i.e. upstream, up-catchment) and in agricultural landscapes (e.g. unsustainable land management practices) (Figure 14). For example, the management measures for the 'agriculture' landscape will help maintain and enhance the land, water and biodiversity resources associated with that landscape.

Another example is in strategy development such as the development of a Biodiversity Strategy as outlined in Part Two - 3.1. When developing this strategy specific consideration should be given to management measures within the Agriculture and Lifestyle landscape systems and those that fall under the Biodiversity, Active Community Participation and Monitoring and Evaluation objectives.

Figure 14: Example of implementation, integration and challenges at scale



Monitoring implementation of the Regional Catchment Strategy

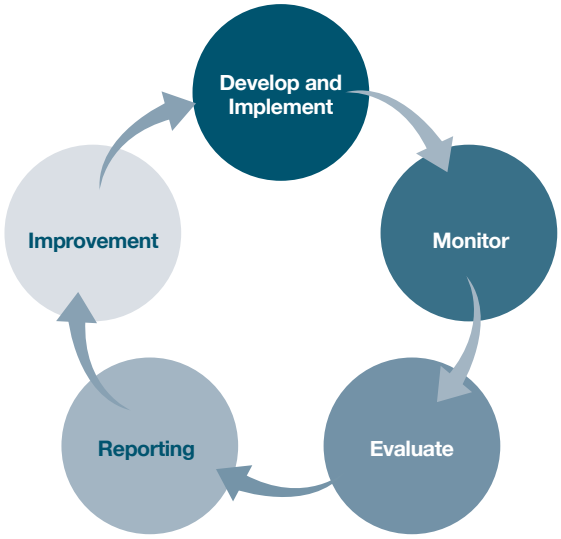
Monitoring, evaluation and reporting (MER) are integral to management of natural resources. A 20 year high level objective of the RCS is:

> ***Agencies and the community will work together to monitor and evaluate the condition of natural resources and effectiveness of protection measures to improve natural resource management.***

This all encompassing objective applies to asset based objectives and landscape objectives. The North East CMA will collaborate with partner agencies to collect and collate the data required to help achieve this objective. The measurement of condition change and landholder practice change is relatively resource intensive (an example being the Index of Stream Condition assessments conducted approximately every six years) and specific funding will need to be allocated for this purpose.

The MER framework shown in Figure 15 relates to all aspects of the North East RCS, from planning through to implementation of on ground works, and from an activity through to a program. Embedding this cyclical and interactive approach allows us to better understand the efficiency and effectiveness of programs and works, and ultimately supports the continual improvement of natural resource management.

Figure 15: Monitoring, Evaluation and Reporting (MER) Framework



Monitoring implementation of the Regional Catchment Strategy

The North East CMA will develop a RCS MER Plan in consultation with DEPI and key stakeholders by July 2014.

The MER Plan will be developed in accordance with the DEPI MER Framework and include:

- a program logic which will identify the relationship between objectives and management measures. This will include the relationship between asset class and landscape objectives
- documented assumptions associated with the program logic
- monitoring that needs to be undertaken to enable evaluation
- a process to monitor trends within the region that influence the practical ideal state for each landscape
- a process to monitor progress on RCS implementation through the use of the practical ideal state characteristics of each landscape
- a process to make information available on the region's landscapes and natural resource assets (e.g. maps)
- detailed evaluation questions that relate to the impact, appropriateness, effectiveness, efficiency and legacy of objectives and management measures, and ultimately set the direction for monitoring and reporting
- an evaluation and reporting plan that clearly states the responsibilities and procedures associated with evaluation and reporting.

As the RCS is building on previous natural resource management efforts and frameworks, the MER Plan will need to define what success looks like. To do this, the Plan will need to identify how the current state for each landscape relates to both the practical ideal state and undesirable state. As these states will vary greatly across the region, monitoring will need to occur at a high level.

As a starting point, key indicators that relate to, or influence, the practical ideal state for each of the five landscapes will be used to measure progress towards attainment of the 20-year landscape objectives within the RCS. Over time, these indicators will be applied to the region's natural assets and identified community participation objectives.

In summary, the MER Plan will recognise that:

- monitoring will be undertaken at a high-level, integrated manner to reflect the nature of the region's program delivery
- natural resource condition change can occur over a long time frame and is also subject to other factors beyond the control of natural resource management organisations (such as drought and fires)
- communities and ecological systems co-evolve and there will be a need to create flexibility to cope with change
- there is a need to collate, analyse and interpret data collected through monitoring, so providing valuable data about regional trends and patterns. This data can be used to inform and support adaptive management.

Evaluation and Reporting

To fulfil requirements under section 19B of the Catchment and Land Protection Act 1994, the North East CMA is required to annually report on the condition and management of land and water resources in the region. The North East CMA will commit to:

- providing an annual progress report to the RCS partners. This will include a summary of activities delivered by the North East region's NRM partners throughout the year
- undertaking a mid-term evaluation of the RCS by July 2016. This review will allow redirection of management measures if new supporting information has become available
- undertaking a major review of the RCS by July 2019.

The ability to adapt is critical to resilience. Appropriate evaluation will inform this process.

While government funding requirements for evaluation often change and differ between and within agencies, the North East CMA believes evaluation processes should remain constant. Monitoring against benchmarks will provide the data needed to understand long-term progress.

Working Together

The implementation of the RCS will use a collaborative partnership approach to refine priorities, review success, and respond to trends.

The North East CMA commits to facilitating a community and government approach to co-ordinate and monitor the RCS implementation and promote co-operation in the management of land, water and biodiversity resources in the region.

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Appendix 1: Roles and responsibilities of partners

RCS Partners	Role and Responsibility in Natural Resource Management
Aboriginal Affairs Victoria (AAV)	Aboriginal Affairs Victoria is the Victorian Government's key agency for advice on Aboriginal affairs. It promotes knowledge and understanding about Victoria's Aboriginal people within the wider community, and also administers legislation that protects Aboriginal cultural heritage.
Alpine Resort Management Boards	Responsible for the development, promotion, management and use of each Alpine Resort. They also provide or arrange required basic services and utilities including water and energy supply, and sewerage and garbage disposal. The Boards are required to carry out their functions in an environmentally sound way and in accordance with an approved strategic management plan. Each Board is represented on the Alpine Resorts Co-ordinating Council.
AGL Hydro	Operator of Hydro electricity infrastructure (e.g. Kiewa Hydro Scheme).
Commonwealth Environment Water Holder (CEWH)	Manager of Commonwealth environmental water entitlements.
Community and Peak Body Groups (e.g. Landcare Networks/ Groups, Greening Australia, Environmental Networks/Groups, Friends Groups)	Community groups often have many different roles in caring for local natural resource assets including education and awareness building; on ground works (weeding, planting etc); coordinating projects, events and workshops; working in partnership with agencies and community group. This category also includes community groups, land managers, management committees, education networks).
Department of Agriculture, Fisheries and Forestry (DAFF)	Federal department that has the role to develop and implement policies and programs that ensure Australia's agricultural, fisheries, food and forestry industries remain competitive, profitable and sustainable.
Department of Environment and Primary Industries (DEPI)	The DEPI leads the Victorian Government's efforts to sustainably manage water resources and catchments, climate change, bushfires, parks and other public land, forests, biodiversity and ecosystem conservation. It also designs and delivers government policies and programs that enable Victoria's primary and energy industries to sustainably maximise the wealth and wellbeing they generate, by providing essential goods and services, employment, investment and recreational opportunities.
Department of Transport, Planning and Local Infrastructure (DTPLI)	DTPLI develop long-term plans for Victoria's regions and cities, invest in infrastructure and services and support the development of local communities. They also provide urban and transport planning and local infrastructure services, policy and planning advice, undertake research, administere legislation and regulations.
Department of Sustainability, Environment, Water, Population and Communities (SEWPAC)	Federal department responsible for implementing the Australian Government's policies to protect our environment and heritage, and to promote a sustainable way of life.
Emergency Services (SES, CFA, Police, BOM)	Responsible for leading relevant emergency responses in accordance with the Victorian Emergency Management Act 1986
Environment Protection Authority Victoria (EPA)	EPA was established in 1971 under the auspices of the Environment Protection Act 1970. Their role is to be an effective environmental regulator and an influential authority on environmental impacts.
Goulburn-Murray Water (G-MW)	G-MW is the rural water authority in the North East. G-MW is responsible for the management of headwork assets (storages) and the delivery of bulk water services. G-MW is also responsible for the delivery of rural water services to customers in irrigation areas and along river and groundwater systems of northern Victoria. Services provided by G-MW include gravity irrigation, pumped irrigation, surface and sub-surface drainage. It is also responsible for allocation of groundwater entitlement and licenses the diversion of surface and groundwater resources. G-MW provides significant natural resource management services to Government under contract. These services support land and water management programs in northern Victoria.
Indigenous Groups, Traditional Owners and Individuals	Provide advice on areas of interest to Indigenous communities.

RCS Partners	Role and Responsibility in Natural Resource Management
Industry and Industry Groups	Individual industries and industry groups that have an interest in the regions natural resources and associated communities (e.g. Victorian Farmers Federation (VFF), timber, tourism, manufacturing industries, associated investors and small business).
Landholders	Manage natural resource assets on private land including measures to conserve natural resource assets and prevent off-site impacts of degradation.
Local councils (Alpine, Indigo, Wangaratta, Wodonga, Towong and parts of Moira and East Gippsland)	An important influence on natural resource management through their responsibility for land-use planning, development approvals, programs that aim to conserve and improve the environment, rates and a variety of services such as road construction and maintenance. Local councils also own and manage large areas of land.
Murray Darling Basin Authority	Legislated authority responsible for the integrated management of rivers, streams and wetlands in the Murray Darling Basin.
North East Catchment Management Authority (CMA)	Facilitate and coordinate the management of North East catchments in an integrated and sustainable manner including as it relates to land, biodiversity and water resources. Within this role, the North East CMA: • Takes a sustainable approach by balancing social, economic and environmental outcomes • Promotes and adopts an adaptive approach to integrated catchment management, including continuous review, innovation and improvement • Plans and makes decisions within an integrated catchment management context. • Managing the environmental water reserve and a number of statutory functions under the Water Act 1989, including floodplain management referrals and authorisation of works on waterways.
Parks Victoria (PV)	Within the North East, Parks Victoria manage the State's parks system, including National Parks, Wilderness Parks, State Parks, reserves and numerous heritage properties and historic places. Through effective environmental and visitor management Parks Victoria is dedicated to preserving the natural and heritage values of the parks, including full protection of sensitive areas.
Research and education Institutions CSIRO, Universities	Provide scientific evidence (e.g. BOM) on the condition of natural resource assets and information and advice on appropriate management tools/directions. This category includes suppliers of education services (e.g. TAFE).
Urban water corporations (North East Water (NEW), East Gippsland Water)	Urban water corporations provide potable water and wastewater services to urban water customers.
Trust for Nature	Help land owners place covenants on their land to permanently protect it from subdivision, clearing or other threatening activities. The mission of the Trust is to ensure that all significant natural areas in private ownership in Victoria are conserved. Trust for Nature focuses on landscape scale conservation using land purchase, conservation covenants and a Revolving Fund.
Victorian Catchment Management Council (VCMC)	The VCMC advise the Minister for the Environment and the Minister for Water, and any other Minister as requested, on land and water management issues; to report annually on the operation of the CaLP Act; and to report every five years on the environmental condition and management of Victoria's land and water resources, through the VCMC Catchment Condition Report.
Victorian Environmental Water Holder (VEWH)	Statutory body that manages the environmental water on behalf of the Minister for Environment and issues seasonal watering statements for CMAs to conduct environmental water releases.
Vic Roads	Manager of major Victorian road infrastructure and associated roadsides.

Appendix 2: Relevant Legislation Policies and Strategies

	Legislation, Policies, Plans and Strategies	
Federal	• *Aboriginal and Torres Strait Islander Heritage Act 1994* • Australia's Biodiversity Conservation Strategy 2010–2030 • Australian Pest Animal Strategy 2007 • *Environment Protection and Biodiversity Conservation Act 1999* • *Fisheries Management Act 1991*	• National Framework for the Management and Monitoring of Australia's Native Vegetation (2001) • Strategy for Australia's National Reserve System 2009-2030 • *Native Title Act 1993* • The Australian Weeds Strategy revised 2007 • *Water Act 2007*
State	• *Aboriginal Heritage Act 2006* • *Alpine Resorts (Management) Act 1997* • Alpine Resorts Strategic Plan 2004 ('Alpine Resorts 2020 Strategy') • *Archaeological and Aboriginal Relics Preservation Act 1972* • Biosecurity Strategy for Victoria 2009 • *Catchment and Land Protection Act 1994* • *Climate Change Act 2010* • *Conservation, Forests and Lands Act 1987* • *Crown Land (Reserves) Act 1978* • Dryland Salinity Statement (pending finalisation) • *Environment Effects Act 1978* • *Environment Protection Act 1970* • *Fisheries Act 1995* • *Forests Act 1958* • Flora and Fauna Guarantee Act 1988 • Future Farming Strategy 2008 • Indigenous Partnership Framework 2007-10 • Invasive Plants and Animal Policy Framework 2010 • *Heritage Rivers Act 1992* • *Land Act 1958* • *Murray-Darling Basin Act 1992* • *National Parks Act 1975* • Native Vegetation Management – A Framework for Action (Revised 2005) • Northern Regional Sustainable Water Strategy 2009	• Nutrient Management Strategy for Victorian Inland Waters 1995 • *Parks Victoria Act 1998* • *Planning and Environment Act 1987* • Policy for Sustainable Recreation and Tourism on Victoria's Public Land 2002 • *Reference Areas Act 1978* • State Environment Protection Policy (Waters of Victoria) 2003 • Sustainable Charter for Victoria's State Forest 2006 • *Sustainable Forests (Timber) Act 2004* • *Traditional Owner Settlement Act 2010* • *Victorian Conservation Trust Act 1972* • *Victorian Environment Assessment Council Act 2001* • *Victorian Environmental Assessment Council Act 2001* • Victorian River Health Strategy 2002 • Victoria's Nature Based Tourism Strategy 2008 – 2012 • Victoria's Biodiversity Strategy 1997 • Victoria's Salinity Management Framework 2000 • Victorian Action Plan for Second Generation Landcare 2002 • Victorian Bushfire Strategy 2008 • Victorian Flood Management Strategy 1998 • Victorian Planning Provisions 1998/99 • Victorian Pest Management Framework 2000 • Victorian Salinity Management Framework • Victorian's Native Vegetation Management - A Framework for Action 2002 • *Water Act 1989* • *Wildlife Act 1975*
Regional	• Consultation Draft North East Regional Invasive Plants and Animals Strategy 2011 • Hume Strategy for Sustainable Communities 2010-2020 - 2010 • Lake Hume Land and On-Water Management Plan • North East Floodplain Management Strategy 1999 • North East Forest Management Plan 2001 • North East Landcare Support Strategy 2004-2009 • North East Native Vegetation Plan 2005 • North East Regional Forest Agreement 1999 • North East Resource Smart Strategy 2010 • North East Regional River Health Strategy 2006 • North East Sustainable Irrigation Action Plan 2009 • North East Willow Management Strategy 2007	• North East Regional Wetland Management Strategy 2009 • Ovens Basin Water Quality Strategy 2000 • Regional National and State Park Plans • Regional Waterway Action Plans • River Management Plan Wodonga Reach Management Zone 2005 • River Management Plan Ryans Reach Management Zone 2008 • Flood Studies • Lake Moodemere Management Statement 2007 • Lake Moodemere Water Management Plan 1996 • Upper North East Water Quality Strategy 2001 • Water Management Plan for the Upper Ovens River Water Supply Protection Area 2011

Appendix 3: Detailed description of Significant Catchment Assets*

Catchment Assets	Description of Environmental Characteristics and other Values	Threats and threatening processes to Assets
1. Great Divide Contiguous Forest	Containing the headwaters and upper catchments of the Kiewa, Mitta Mitta, Ovens, Buffalo and King Rivers, this forested landscape plays a critical role contributing to water quality and quantity for the Murray River. Public land covers approximately 1 million hectares of these landscapes and includes parts of the Alpine National Park (660,000 hectares – some of which falls into East Gippsland) and Mount Buffalo National Park (31,000 hectares), and striking granite massif on the west side of the Ovens River valley recognised internationally for its conservation and recreation values. The montane forests of Peppermint gum, Snow Gum woodlands and stands of Alpine Ash can be found. These vegetation communities also support several nationally significant plant species and threatened animal species, including the Hairy Anchor Plant, Spotted Tree Frog, and Broad-toothed Rat. Outside of the national parks, the public land is used predominantly for hardwood and softwood production and are under the management of HVP Plantations, or for use as forest areas (multiple use, with low-intensity hardwood production). This landscape also supports extensive sheep and cattle grazing on private and leased land. The cultural heritage of both Indigenous and European use of the area is extensive. The vegetation is in relatively good condition although significant 'repeat' fire events in 2003 and 2006 have impacted some values.	• Invasive plants and animals • Inappropriate land uses and/ or development associated with existing land uses • Changed fire regime (planned and unplanned) affecting vegetation mix, water quality and quantity • Extreme weather events (e.g. increased fire frequency and intensity) and long term trends (e.g. reduced snow cover leading to vegetation change).
2. Alpine and Sub-alpine Landscapes	Alpine and Sub-alpine Landscapes are directly linked to the Great Dividing Range Contiguous Forest, which are described above. This landscape is characterised by rugged topography, a harsh climate and high rainfall, with mountains and plateaux generally above 1200 m elevation, interspersed with peaks exceeding 1500 m. The landscape supports flora and fauna species that have evolved in the harsh conditions of high altitudes, with many endemic species which have limited distribution and highly specialised habitat requirements. Above the treeline, the alpine zone is a mosaic of heathland, grassland, herbfield and wetlands, interspersed by bare protruding rock and rock pavements. The plants here are mostly ground-hugging and reach no more than a metre in height. Soils are shallow and vary enormously. The most extensive communities of the alpine zone are tall alpine herbfields and tussock grasslands that grow on sheltered, gentle slopes and hilltops where soils are moderately deep and well-drained. At the bottom of the basin-like valleys, and on poorly drained slopes where soils are deep and waterlogged and decay of organic material is incomplete, Sphagnum bogs and wet heathlands are found. There are a number of threatened species reliant on this alpine zone, including the Mountain Pygmy Possum, Alpine She-oak Skink, Guthega Skink and Alpine Bog Skink. Mount Buffalo Peatlands and Davies Plain are listed under the Directory of Nationally Important Wetlands. Mount Buffalo Peatlands consist of two distinct wetlands, Crystal Bog (3 ha) and nearby Bunyip Bog (4 ha), situated at about 1300 m elevation on the Mount Buffalo plateau. Davies Plain, a complex of wet heathland areas is located on the headwaters of the Davies Plain Creek and its tributaries east of Mount Murphy on Davies Plain and King Plain, in a Wilderness Area of the Alpine National Park. There are four wetlands in the complex, two smaller (6 and 1 ha) and two larger (24 and 25 ha).Alpine wetlands occur in the subalpine and alpine zones on permanently wet sites and are dominated by hummock forming Sphagnum Moss (*Sphagnum cristatum*) growing with sedges, rushes and wetland heaths. Wetlands are generally spring-fed seepages on hillsides and edges of valleys. In wetter parts - such as valley floors - Sphagnum disappears and the sedges form a fen. Other key species are Pineapple Grass *(Astelia alpina)* and Swamp Heath (*Epacris paludosa)*. Alpine Sphagnum Bogs and Associated Fens is a listed threatened ecological community on the federal Environmental Protection and Biodiversity Conservation Act (1999). The area is also important the cultural heritage of both Indigenous and European use of the area. The vegetation is in relatively good condition although significant 'repeat' fire events in 2003 and 2006 have impacted some values in the sub-alpine and alpine areas.	• Invasive plants and animals - e.g. horses • Changed fire regime (planned and unplanned) • Extreme weather events (e.g. increased fire frequency and intensity) and long term trends (e.g. reduced snow cover leading to vegetation change in alpine communities). • Inappropriate recreational activity including associated development of infrastructure in highly sensitive areas

CONTINUED: Appendix 3: Detailed description of Significant Catchment Assets*

Catchment Assets	Description of Environmental Characteristics and other Values	Threats and threatening processes to Assets
3. Lake Dartmouth / Mitta Mitta Heritage River	This asset encompasses the Upper Mitta Mitta River and its impoundment in Lake Dartmouth. Listed as one of the two Heritage Rivers in Victoria, the Upper Mitta Mitta River (above the lake) is one of the State's premier fishing, canoeing and rafting venues, providing challenging white water and attractive river environment. Lake Dartmouth is the largest storage in the Murray-Darling system, with a gross capacity of 3,856,232 ML and is used for flood control, hydroelectricity, irrigation, urban supplies and is important for recreational fishing for both introduced and native species. Its 180m high earth and rockfill retaining wall is the tallest of its type in Australia. Lake Dartmouth and the Mitta Mitta River upstream of the lake are listed as wetlands of national importance. Lake Dartmouth and the Mitta Mitta River is listed due to its outstanding historical and cultural significance. The Mitta Mitta River is also recognised for its role as a drought refuge for fauna, particularly those that are endangered or vulnerable. This includes providing habitat for the largest naturally occurring population of Macquarie Perch in Victoria, which is a significant threatened species asset.	• Invasive plants particularly English Broom, Sycamore Maple and Willow • Invasive animals, including carp • Inappropriate grazing regime - riparian vegetation • Changed fire regime (planned and unplanned) - affecting vegetation mix, water quality and quantity • Extreme weather events (e.g. increased fire frequency and intensity) and long term trends (e.g. warmer and drier).
4. Ovens and King River Corridors	This riparian asset is a linear ecosystem that includes the floodplain, banks, terraces and in-stream habitat of the mid – and lower Ovens and King Rivers. The low-gradient ephemeral and intermittent flood runners and billabongs contain remnants of Riverine Grassy Woodlands and Floodplain Riparian Woodlands, forming a major regional bio-link between high elevation bioregions of Victoria and the nationally important Murray River corridor. In the middle sections of these two rivers, grazing, horticulture and some cropping are important economic activities. The Ovens and King River system remains the only substantial, essentially un-regulated Victorian tributary of the Murray River (small storages exist on the Buffalo and King Rivers), thereby creating an almost natural flow regime for the floodplain of the lower Ovens River. Maintaining natural flooding is important for water quality in the Murray River system and downstream assess like Barmah Forest. A significant number of wetlands are formed within the floodplain of Ovens and King River Corridors due to movement of the rivers over time. These wetlands; mostly Deep Freshwater Marshes or Freshwater Meadows cover an area of approximately 5,000 ha. Parolas Bend and a number of unnamed wetlands are recognised as being regionally significant. The Lower Ovens River floodplain is listed as a Heritage River and as a nationally important wetland. The river contains intact River Red gum forests and woodlands and is important habitat for many threatened fish species including the nationally listed Trout and Murray Cod. The area also supports significant habitat for egrets, spoonbills, White-bellied Sea-Eagle, and many frog species. The Lower Ovens River floodplain also contains 4367 hectares of crown land, of which 3200 hectares are now included in the Warby Range – Ovens River National Park.	• Invasive plants, particularly willow and blackberry • Unsustainable water extraction • Inappropriate grazing regime - riparian vegetation • Recreational over-use • Barriers to fish migration - Sydney and tea garden weir • Extreme weather events (e.g. increased fire and storm frequency and intensity) and long term trends (e.g. reduced base flow) • Fragmentation of riparian vegetation corridors and habitat • Land use change • Invasive animals, including carp • legacy from mining activities
5. Kiewa River Corridor	The Kiewa River below Mt Beauty has a flat floodplain affected by sedimentation and constructed levees, typical of a river valley used extensively for grazing and agricultural pursuits. Sparse riparian vegetation includes Plains Grassy Woodlands and Floodplain Riparian woodlands. Willows and low water quality due to land management activities affect environmental values, however, the social values of the river are high as it is popular for fishing and camping, and the river also supports significant dairy farming, including irrigated pasture. The Kiewa River is promoted as one of three state Premier Rivers for fishing, it flows through the picturesque Kiewa Valley in north eastern Victoria. The cooler sections of the river downstream of Mount Beauty provide quality trout fishing and the lower section of the river towards Wodonga offers the opportunity to target Murray Cod. Management opportunities include re-snagging, invasive species control; riparian revegetation.	• Invasive plants, particularly willow and blackberry • Inappropriate grazing regime - riparian vegetation • Extreme weather events (e.g. increased fire and storm frequency and intensity) and long term trends (e.g. reduced base flow) • Inappropriate water regimes - inc. operation of water storages (and river flows across floodplain) • Fragmentation of riparian vegetation corridors and habitat • Land use change • Invasive animals, including carp

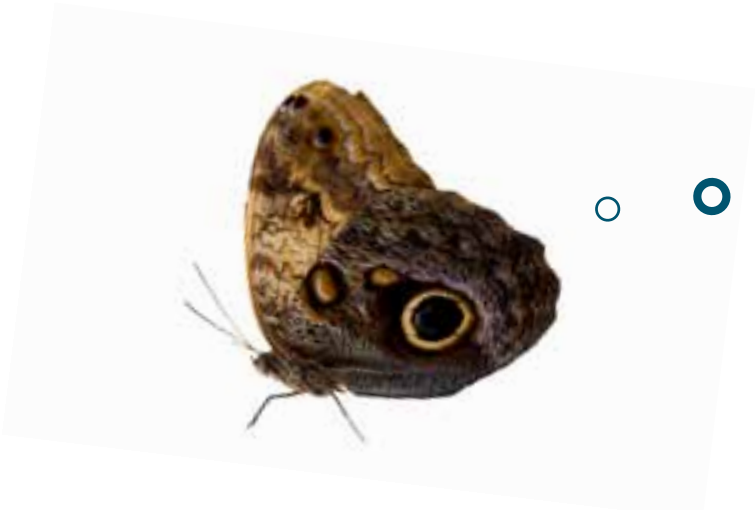
Catchment Assets	Description of Environmental Characteristics and other Values	Threats and threatening processes to Assets
6. Murray River Corridor	The River Murray corridor is characterised by River Red Gum forests and woodlands, with floodplain anabranches playing an important role in maintaining the overall health of the river. Natural remnant vegetation provides a critical refuge and corridor for terrestrial species whilst also contributing to in-stream habitat. Two nationally significant wetlands occur with the Murray River Corridor; Lake Hume and Ryans Lagoon. Ryans Lagoon is a complex of five river red gum dominated deep freshwater marshes in the floodplains of Murray and Kiewa Rivers and like Lake Hume is recognised for its outstanding historical and cultural significance. The floodplain is largely dominated by Deep Freshwater Marshes (below Lake Hume) and Freshwater Meadows (upstream of Lake Hume), and they contain a number of depleted wetland plant communities. The River Murray corridor is an important recreation destination in the region and also contains numerous sites of archeological and cultural significance wetlands (e.g. Lake Moodemere). Lake Hume is a critical part of the Murray Darling System and maintaining water quality for downstream use and on lake recreation and tourism. Below Lake Hume: The Murray River below Lake Hume is significantly affected by river regulation and a decrease in flooding frequencies, however, much of the floodplain vegetation remains, creating and maintaining an important biodiversity corridor along the river. The floodplain has been mainly used for grazing and recreational activities, including camping. This is a large riparian system with associated floodplain qualities including wetlands and nationally threatened aquatic species.	• Inappropriate grazing regime - riparian vegetation • Inappropriate recreational use inc excessive firewood collection from riparian areas • Inappropriate water regimes - inc. operation of water storages (and river flows across floodplain) • Invasive animals, including carp • Invasive plants , particularly willow and blackberry • Fragmentation of riparian vegetation corridors and habitat • Land use change
7. Chiltern / Mt Pilot Landscape	The Chiltern Mt Pilot National Park contains the most intact Box-Ironbark fauna assemblage in Victoria including the highest number of birds, mammals and reptiles recorded at any Box-Ironbark site. Supporting many vegetation communities that are significantly different from those in the surrounding area, the area encompasses stands of Mugga Ironbark north of Chiltern, and Black Cypress-pine and Blakely's Red Gum around Mt Pilot. Priority species for management and protection include Brush-tail Phascogale, Barking Owl and Regent Honeyeater. Twenty one fauna species and ten flora species are listed as Threatened and are found in the park. Private land outside the park also contains important habitat values and efforts are being made to develop buffer zones and links between public land parcels, roadsides and riparian corridors as part of the Chiltern Biolink project. The primary feature of the area is Mt Pilot (544m), although Mt Barambogie (480m) and Skeleton Hill (350m) are also important landscape features. In several localities, alluvial outwashes provide deeper soils and are often associated with natural spring soak wetlands. These wetlands support a localised, herb rich community of moisture dependent plants beneath a low woodland overstorey frequently of Blakely's Red Gum and Apple Box. Spring Soaks are uncommon, and the Spring Soak Woodland EVC is listed as Endangered in the Bioregion. Relatively good condition (despite mining history and associated weed invasion); Gradual improving of status due to increasing time since harvesting cessation (older tree status).	• Habitat fragmentation • Land use change • Invasive plants and animals - e.g. Noisy Miner on edges to Park areas (e.g. impacts on Regent Honeyeater and other small nectivorous species) feral animals, herbivores (e.g. goats) • Changed fire regime (planned and unplanned) • Inappropriate fire regimes (natural and prescribed) • Inappropriate recreational use
8. Warby / Killawarra Landscape	The Warby Ranges and Killawarra forest encompasses the granite, metamorphic and sedimentary lower foothills north of the Great Dividing Range, intruding into the Victorian Riverina bioregion. Now mostly in the Warby Range – Ovens River National Park, the area contains three distinctive vegetation types – the granitic woodlands of the Warby Ranges, the Box-Ironbark of the Killawarras and the riverine forests and wetlands of the Ovens River. Because of this diversity, as well as the relatively large contiguous patch of vegetation within the landscape, the area has rich flora and fauna species. It includes an array of threatened species such as Northern Sandalwood, Turquoise Parrot, Regent Honeyeater and Carpet Python within the Box Ironbark forest and woodland vegetation communities. The Warby Range is the only known habitat of Spur-Wing Wattle in Victoria. It is rare in Victoria, but not threatened. A number of Spring Soak Woodland occurs within the Warby Ranges. Spring Soaks are uncommon, and the Spring Soak Woodland EVC is listed as Endangered. Relatively high condition (despite mining history and associated weed invasion); Gradual improving status due to increasing time since harvesting cessation (older tree status).	• Invasive plants and animals • Changed fire regime (planned and unplanned) • Inappropriate recreational use

CONTINUED: Appendix 3: Detailed description of Significant Catchment Assets*

Catchment Assets	Description of Environmental Characteristics and other Values	Threats and threatening processes to Assets
9. Riverine Plains and Wetlands	This area of open riverine plain parallel to the northern end of the Ovens River and south of the Murray River floodplain includes remnant vegetation communities of Pine-Box Woodland and Plains Grassy Woodland. High conservation value areas exist, however, large sections are degraded and under increasing invasive weed threat. Clearing for agriculture, extensive grazing, hydrological disturbance through draining of wetlands and historical gold mining have reduced the native vegetation and habitat values to small isolated fragments where ecological functions are significantly modified to non-existent. Roadside vegetation, remnant vegetation on private land, unused road reserves, and wetlands play an important role in providing corridors and linkages with the Ovens River and the Murray River. In comparison with other parts of the region this asset area contains an enormous number and area of wetlands, owing largely to the geomorphology of the area and the changes to the river course over time. The area has 1,000 hectares of wetlands, and the majority is made up of freshwater meadows. Black Swamp is included in the Australian Directory of Important Wetlands for its ecological, educational, scientific, cultural and scenic features. It supports a high diversity and number of birds, is largely incorporated into the Black Swamp Wildlife Reserve and the Conservation Reserve, and being the only public wetland in the area, has escaped much of the devastation and is therefore a very significant remnant of what was once possibly a relatively common wetland type in the area. Black Swamp is a group of five Red Gum, cane grass and herb shallow freshwater marshes in the floodplains of the Murray and Ovens Rivers, in the Black Dog Creek catchment. Four are less than ten ha in area, the fifth is 18 ha, and the largest is 138 ha.	• Invasive plants and animals • Inappropriate water regimes - drainage and damming of wetlands and ephemeral flood runners • Changed fire regime (planned and unplanned) • Fragmentation of habitat, especially habitat corridors and linkages between blocks of remnant vegetation • Land use change • Reduction in quality and quantity of paddock trees (habitat) • Inappropriate grazing regime
10. Upper Murray Forests and Woodlands	This landscape asset is comprised of the minor ranges with five occurrences where the elevation exceeds 1000 m above sea level—Mount Lawson (1041 m), Pine Mountain (1062 m), Mt Big Ben (1158 m), Black Mountain (1219 m) and Mount Burrowa, (1300 m). This area presents some striking physiographic contrasts with steep and rugged rocky ridges, broad, fertile plains and riparian corridors. Valley Grassy Forest (on fertile, gently undulating sites) and Grassy Dry Forest (more upslope, on somewhat drier sites of steeper gradient) are the most common vegetation communities but have been largely cleared from the region. Forestry is a major industry in the area with hardwood production targeting Narrow-leaved Peppermint and Messmate and softwood production on public land around the Shelley–Koetong area. Tourism is an important element of the local economy, with diverse recreational opportunities associated with the Murray River, parks and wilderness areas, scattered smaller reserves, historic areas and structures, dramatic scenery and other rural activities. Relatively high quality native vegetation. A large concentration of rare wetland types occur in the area, most (98%) are on private land and they are generally in poor condition. Freshwater Meadows are the dominant wetland type with herb dominated vegetation communities at an average size of 3 ha.	• Invasive plants and animals • Changed fire regime (planned and unplanned) • Fragmentation of habitat, especially habitat corridors and linkages between blocks of remnant vegetation • Land use change • Reduction in quality and quantity of paddock trees (habitat)

Catchment Assets	Description of Environmental Characteristics and other Values	Threats and threatening processes to Assets
11. Inland slopes Forests and Woodlands	This landscape encompasses the western foothills and ranges of the northern inland slopes including some impressively steep and rocky ridges including Mt Lady Franklin rising to 546 m near Barnawartha, and the north-east end of Baranduda Range reaching 687 m. Grassy Woodlands dominate the granitic and sedimentary terrain while the valleys are dominated by Valley Grassy Forest. Some Spring Soak Woodlands occur in the landscape and a few other wetland types also exist on the slopes and floodplains surrounding the King and Ovens River Corridors. Sheep and cattle grazing, horticulture, especially viticulture, and rural residential properties are the major land uses, resulting in fragmented vegetation communities and isolated riparian areas. Public land tenures and uses are limited to Cookinburra NCR, portions of Chiltern–Mt Pilot National Park and Baranduda Range RP. Hardwood and softwood forest production is also a major land use in the western part of the area.Relatively high quality remnant vegetation exists within a highly fragmented landscape.	• Invasive plants and animals • Drainage and damming of wetlands and ephemeral flood runners • Changed fire regime (planned and unplanned) • Fragmentation of habitat, especially habitat corridors and linkages between blocks of remnant vegetation • Land use change • Reduction in quality and quantity of paddock trees (habitat) • Inappropriate grazing regime
12. Omeo and Benambra wetlands	The cliffs of the Morass Gorge are characterised by basalt flows. The natural damming of Morass Creek, by these flows, has given rise to extensive alluvial deposits to the north and east of Benambra. The Morass, Hinnomunjie swamp and Lake Omeo are important wetlands within this region. Draining of The Morass, weed invasion, intensive grazing, extensive clearing for agriculture and mining across this area has reduced the biodiversity values significantly while also being a major economic stimulus for development.	• Invasive plants and animals • Drainage and damming of wetlands • Inappropriate fire regimes (natural and prescribed) • Fragmentation of habitat, especially habitat corridors and linkages between blocks of remnant vegetation • Land use change • Reduction in quality and quantity of paddock trees (habitat) • Inappropriate grazing regime - riparian vegetation • Extreme weather events (e.g. increased fire and storm frequency and intensity) and long term trends (e.g. reduced base flow, drier)

** Refer to Table 4 and Figure 6 with Part 1.*



Part two

Summary of objectives, management measures and recommended priority actions for the North East Regional Catchment Strategy

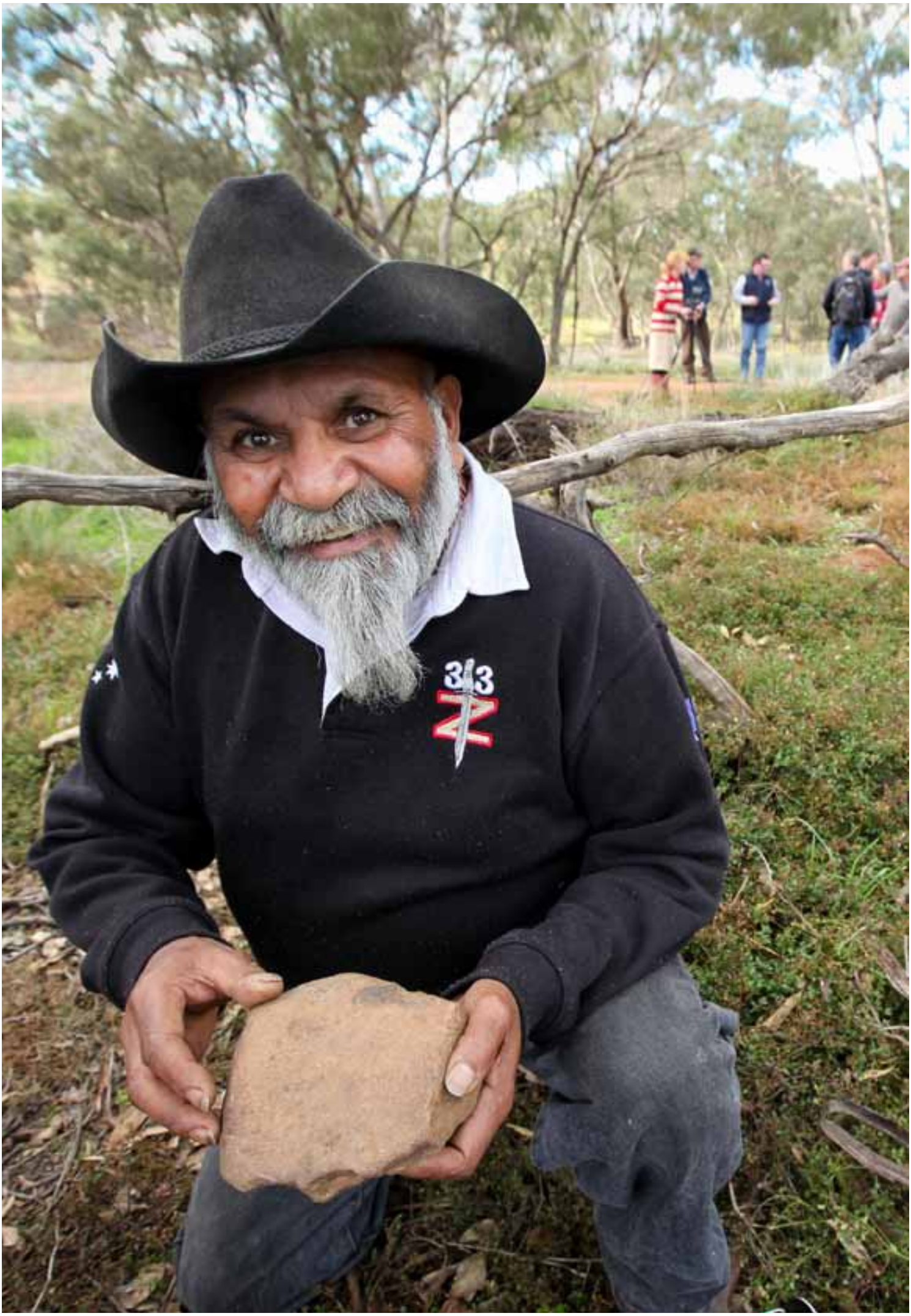
Utilising Part One and Part Two of the North East RCS

Part Two of the North East RCS contains a summary of all the management measures that have been identified during the renewal of the RCS, which are outlined under each of the high level objectives in the table below. Implementation partners have been identified for each management measure as well as its link to the five landscape systems. The relevance of the management measures for each of the five landscape systems has been denoted by a (•) and emphasised by a bolded (•). For each of the landscapes a recommended priority action is listed. This action has been drawn from the identified management measures for that landscape.

As resources become available the management measures will be implemented by identified partners during the six year life of the RCS. Funding applications that are aimed at achieving RCS objectives will be supported by robust, well costed project proposals.

There is some repetition and inter-dependence of management measures, for example integrated strategic land use planning is included in all landscape systems. It will therefore be important to review other management measures that are related through an objective, natural resource asset or landscape system when implementing management measures. For example, if resources were available to develop a Biodiversity Strategy, consideration should be given to other management measures that fall under the biodiversity objective and management measures within the landscape systems that have been identified as in most need of a Biodiversity Strategy (e.g. Agriculture and Lifestyle landscape have bolded (●).

The rationale supporting this approach is that whilst biodiversity planning needs to be incorporated Forest, Alpine and Urban landscapes, the biggest opportunities for improvement are in Agriculture and Lifestyles landscapes - i.e. more robust biodiversity planning is needed in these landscapes.



Urban Lifestyle Agriculture Forest Alpine

High level 20 year Objectives and associated 6 year Management Measures	Implementation partners*
1. Whilst conserving the environment, we will maintain and enhance the health and condition of land resources and their long term productivity	
1.1 Develop a regional Soil Health Strategy that incorporates the Regional Salinity Management Plan (draft 2010) in accordance with the RCS that considers: • healthy soils on public and private land and the productive values on private land • impacts of soil threatening processes and increases the resilience of soils • a broad range of environmental services: soil, nutrient, water and vegetation outcomes • soil biological health and improve productivity • benchmarks for ground cover and total soil organic carbon • benchmarks for sustainable soils (stable-state targets) • establishment of a soil database that can be utilised by soil health groups.	CMA, community groups, DEPI, land managers, PV
1.2. Implement the Soil Health Strategy.	CMA, community group, DEPI, land managers
1.3 Support land managers in meeting their responsibilities to conserve soil resources and protect water resources.	CMA, community groups, DEPI, land managers
1.4 Support land managers to incorporate environmental outcomes into their management systems.	CMA, community groups, DEPI, land managers
1.5 Continue development and communication of land capability information to guide land-use change decisions.	CMA, community groups, DEPI, land managers
1.6 Increase levels of awareness of threats to soil health and adoption of best practice soil management techniques through support education programs that promote soil as a finite, valuable resource.	CMA, community groups, DEPI, land managers
1.7 Support research into: • understanding physical, biological and chemical attributes of the region's soils • the soils that are in greatest risk of decline and show little resilience to the current management and uses • the productivity of land.	CMA, DEPI, research bodies, universities
1.8 Support programs that enhance the recruitment, training, retention and succession capabilities of land managers.	CMA, DEPI, industry and rural lenders
1.9 Encourage greater collaboration between the education and environmental sectors to ensure: • agricultural education providers add environmental stewardship components to their courses • environmental education providers recognise that agriculture has unique characteristics that make it worthy of particular focus and specific service delivery.	CMA, DEPI, industry, TAFE, universities
1.10 Support collaboration between the agricultural industry, financial industry, environmental services, government and the education and training sector to develop long term, region specific strategic thinking and support for the agricultural workforce (refer to 6.7, 6.9).	CMA, DEPI
1.11 Support innovation in regional agriculture practices that enhance productivity whilst conserving the environment.	CMA, DEPI
1.12 Identify opportunities for land capability studies, overlays and planning controls.	CMA, DEPI, local councils
1.13 Explore the necessity, and where appropriate, prepare special area plans for the region.	CMA, DEPI, local councils

High level 20 year Objectives and associated 6 year Management Measures		Implementation partners*	
2.	**Whilst conserving the environment, we will maintain and enhance the health and condition of water resources and their long term productivity**		
2.1	Review the Regional River Health Strategy (2006) and develop the Regional Waterway Strategy in accordance with the RCS that considers how to: • incorporate the regional wetland strategy (2009) • identify priority wetlands • improve river health in relation to riparian extent connectivity, hydrological regime and water quality • identify and plan for State and local community needs relating to the use and to the economic, social and environmental values of land and waterways enhance values of floodplains • maintain diversity of wetland types • supports a works and measures program • improve the condition of waterways, floodplains and wetlands • coordinate waterway management efforts.	CMA, DEPI, G-MW, NEW, local councils, PV	
2.2	Implement the Regional Waterway Strategy.	CMA, community groups, DEPI, G-MW, land managers, NEW, PV	
2.3	Develop and implement schemes for the use, protection and enhancement of land and waterways.	CMA, community groups, DEPI, land managers	
2.4	Implement waterway related restoration works programs	CEWH, CMA, Commonwealth Government, DEPI, G-MW, MDBA, VEWH	
2.5	Develop and implement waterway specific action plans in accordance with the RCS.	CMA, community groups, G-MW, land managers	
2.6	Actively seek environmental water resource outcomes through collaboration water holders and managers.	CEWH, CMA, DEPI, G-MW, NEW, VEWH	
2.7	Review and update the Regional Floodplain Management Strategy (2009).	BOM, CMA, DPI, DSE, G-MW, land managers, local councils, NEW, SES	
2.8	Develop a Flood Response Action Plan in accordance with the RCS that considers how to: • mitigate impacts of flooding and impacts on people and property whilst conserving the environment • develop a framework for upgrading flood warning systems • identify and undertake flood studies • amend planning schemes to reflect best available flood information • develop guidelines for appropriate use and management of floodplains • coordinate flood response efforts.	BOM, CMA, DEPI, G-MW, land managers, local councils, MDBA, NEW, SES	
2.9	Implement the regional plans for flood response and floodplain management.	BOM, CMA, DEPI, G-MW, land managers, local councils, MDBA, NEW, SES	
2.10	Develop a regional plan for drainage management that identifies a coordinator.	CMA, DEPI, G-MW, local councils, NEW	
2.11	Implement the regional plan for drainage management.	CMA, DEPI, G-MW, local councils, NEW	
2.12	Continue the development and implementation of regional blue-green algal blooms contingency plans.	CMA, DEPI, G-MW, land managers, local councils, NEW	
2.13	Develop strategic management plans for priority wetlands.	CMA, DEPI	
2.14	Establish a management framework for reinstating hydrological regime in priority wetlands.	CMA, DEPI, G-MW, land managers	
2.15	Support projects associated with the management and conservation of priority wetlands in partnership with key stakeholders.	CMA, community groups, DEPI, G-MW, land managers, Traditional Owners	
2.16	Improve wetlands inventories and assessment procedures.	CMA, DEPI	

High level 20 year Objectives and associated 6 year Management Measures		Implementation partners*	Urban	Lifestyle	Agriculture	Forest	Alpine
2.17	Increase public awareness, appreciation, use and management of wetlands through education, scientific investigation and on-ground means.	CMA, DEPI	•	•	•	•	•
2.18	Work with councils to establish wetland-specific strategic planning arrangements.	CMA, DEPI, local councils	•	•	•	•	•
2.19	Participate in planning referral processes to protect the water resource.	CMA, DEPI, G-MW, local councils, NEW	•	•	•	•	•
2.20	Consolidate and integrate programs that support land managers in meeting their responsibilities to protect water resources.	CMA, DEPI, G-MW, local councils, NEW	•	•	•	•	•
2.21	Consolidate and integrate programs that support land managers in meeting their responsibilities to use water resources efficiently (e.g. irrigation efficiency programs)	CMA, DEPI, G-MW, local councils, NEW	•	•	•	•	•
2.22	Support land and water use practices that enhance productivity and the quality of water resources (e.g. irrigation efficiency programs).	CMA, DEPI, G-MW, land managers	•	•	•	•	
2.23	Support the management of new irrigation development through the implementation of the Irrigation Development Guidelines.	CMA, community, DEPI, G-MW, local councils	•	•	•	•	•
2.24	Support innovation in recreational fisheries management that enhances visitation whilst conserving the environment.	CMA, DEPI, G-MW, local councils, research bodies					
2.25	Maintain and enhance groundwater dependent ecosystems and support research to improve our understanding of surface and groundwater connectivity.	CMA, community groups, DEPI, G-MW, NEW, land managers, local councils, universities					
3.	**Whilst conserving the environment, we will maintain and enhance the health and condition of biodiversity resources**						
3.1	Develop a regional Biodiversity Strategy that in accordance with the RCS that considers: • application of the Assets Based Approach and enhance the Catchment Assets information identified in Appendix 3: Detailed description of Significant Catchment Assets, • ecosystem function, quality and condition of natural resource assets • aquatic and terrestrial species diversity • invasive species • a fire management program which aims to maintain or improve the resilience of natural ecosystems • resilience to climate variability and associated extremes • programs for the improvement of health of the region's key populations of threatened species and communities - awareness through to on ground actions • programs for improving the connectivity of habitat for species populations and communities • use of values, threats, environmental significance of natural assets to identify priorities • use of a rigorous transparent repeatable methodology to prioritise management actions and resourcing • the coordinator of actions.	CFA, CMA, community groups, DEPI, G-MW, local councils, NEW, land managers, Police, PV, timber industry	•	•	•	•	•
3.2	Update the 2005 Regional Native Vegetation Plan in accordance with the RCS and incorporate into the regional Biodiversity Strategy (when developed) (refer to management measure 3.1)	CMA, DEPI, land managers, local councils, PV	•	•	•	•	•
3.3	Implement the Biodiversity Strategy and Native Vegetation Plan (refer to management measures 3.1 and 3.2)	CMA	•	•	•	•	•
3.4	Develop and implement Park, reserve and forest management plans.	CMA, DEPI, local management committees, PV	•	•	•	•	•
3.5	Finalise the Draft North East Regional Invasive Plants and Animals Strategy 2011 in accordance with the RCS including considerations for invasive species and over abundant native wildlife	CMA, community groups, DEPI, G-MW, industry groups, local councils, NEW, land managers, PV	•	•	•	•	•

	High level 20 year Objectives and associated 6 year Management Measures	Implementation partners*					
3.6	Implement the North East Regional Invasive Plants and Animals Strategy.	CMA, community groups, DEPI, G-MW, industry groups, local councils, NEW, land managers, PV, Vic Roads	•	•	•	•	•
3.7	Develop and implement of Roadside Vegetation Plans.	CMA, DEPI, local councils, Vic Roads	•	•	•	•	•
3.8	Utilise existing databases, such as NaturePrint and ABC database, to regularly identify, describe, and prioritise regional natural resource assets in the terrestrial habitat.	CMA, DEPI	•	•	•	•	•
3.9	Support research into: • improving understanding of the function, structure and connectivity within and between the region's landscape systems • understanding the thresholds of significance within the landscape systems and how this relates to their management.	CMA,Commonwealth Government, community groups, DEPI, land managers	•	•	•	•	•
3.10	Develop a regional climate ready action plan in accordance with the RCS that considers: • extremes in climate variability into decision making associated with the management and protection of natural resources • adaptation to climate variability in the management and protection of natural resources • adaptation and mitigation actions to address climate variability impacts on natural ecosystems • best available information to develop actions • the use of meaningful engagement of community and stakeholders • collaboration between government, community and other stakeholders • Response to new information and guide improvements as knowledge improves • integration climate change mitigation and adaptation with the RCS management measures in the context of the Climate Change Act 2010 and other relevant state and Commonwealth NRM policies • identification of priority landscapes for carbon plantings and strategies to build landscape connectivity and integrity • integration of biophysical, socio-economic and climate change information to fine tune strategies for improving landscape connectivity, function and resilience • provision of guidance on avoiding and minimising impacts carbon sequestration activities may have on the landscape • future carbon sequestration activities in the region that maximise environmental benefits and avoid and mitigate environmental impact.	Australian Government, CMA, community, community groups, DEPI, G-MW, land mangers, local councils, other CMA's	•	•	•	•	•
3.11	Support the development of regional-level information about the impacts of climate variability (water, temperature, storms) which can be used for medium term regional NRM planning.	Australian Government, CMA, community, community groups, DEPI, G-MW, land managers, local councils, other CMAs	•	•	•	•	•
4.	**People will identify with and value the Urban landscape for its diverse economy, access to aggregated services and enhanced liveability through connection with the natural environment.**						
4.1	Support utilisation of urban waterways and urban reserves as centre pieces of liveability.	CMA, community, community groups, DEPI, education networks, G-MW, local councils, NEW	•	•	•	•	•
4.2	Undertake integrated strategic land use planning that incorporates natural resource management and climate variability.	CMA, DEPI G-MW, land managers, local council, NEW	•	•	•		
4.3	Support regional economic development to foster investment in natural resource management.	CMA, DEPI, local council	•	•	•		
4.4	Maintain and enhance floodplain management and flood response arrangements (refer to management measures 2.6, 2.7, 2.8, 2.9).	CMA, DEPI, G-MW, local councils, SES	•	•			

Urban Lifestyle Agriculture Forest Alpine

	High level 20 year Objectives and associated 6 year Management Measures	Implementation partners*
4.5	Build on existing community and government partnerships in the coordinated delivery of natural resource management education and awareness raising.	CMA, community groups, DEPI, educations networks, G-MW, local councils, NEW
4.6	Support networking programs that encourage community participation in natural resource management. Build on traditional approaches to increase participation.	CMA, community groups, local councils

Recommended Priority Action for Urban landscape: Presenting waterways, parks and reserves as a centre piece within an Urban landscape to improve liveability of a city and improve the communities connection with the environment. This also lays a foundation for networking programs that encourage community participation in natural resource management within the Urban landscape and beyond.

5. People will identify with and value Lifestyle landscape for its environmental aesthetics, tourism, strongly connected communities and access to the regional economy

5.1	Undertake integrated strategic land use planning that incorporates natural resource management, climate variability risks and specialisation of lifestyle land use.	CMA, DEPI, G-MW, local councils, NEW
5.2	Support networking programs that encourage community participation in natural resource management. Tailor traditional approaches towards the motivations, capacity constraints and opportunities of communities within the lifestyle landscape.	CMA, community groups, DEPI, land managers, local councils
5.3	Build on existing community and government partnerships in the coordinated management of remnant vegetation and fragmentation.	CMA, community groups, DEPI, land managers
5.4	Support the delivery of a fire management program in collaboration with key stakeholders which aims to: • minimise the impact of major bushfires on human life, communities and infrastructure • maintain an effective water yield • maintain or improve the resilience of natural ecosystems (refer to management measure 10.17).	CFA, CMA, community groups, DEPI, G-MW, land managers, local councils, NEW, Police, PV, timber industry
5.5	Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals.	CMA, community groups, DEPI, land managers
5.6	Promote sustainable land management. Tailor traditional approaches towards the motivations, capacity constraints and opportunities of communities within the lifestyle landscape (refer to management measures 1.3, 1.4, 1.5, 1.6).	CMA, community groups, DEPI, land managers, local councils
5.7	Support regional economic development to foster investment in natural resource management.	CMA, DEPI, local councils

Recommended Priority Action for Lifestyle landscape: The land use conflict and associated tension between communities in the Lifestyle and Agriculture landscapes is a key resilience challenge. Networking programs that encourage collaborative community participation in natural resource and land management can improve the co-existence of communities in the Lifestyle and Agriculture landscapes. Integrated strategic land use planning that incorporates natural resource management, climate variability risks (e.g. fire, flood, drought) and specialisation of lifestyle land use can also prevent land use conflicts in the future.

6. People will identify with and value Agriculture landscape for its productivity, quality land and water resources, and strongly connected communities that identify with their valleys, plains and plateaus

6.1	Support integrated strategic land use planning that incorporates natural resource management and land productivity.	Councils, CMA, DEPI, North East Water
6.2	Support networking programs that encourage community participation in natural resource management. Tailor approach towards the motivations, capacity constraints and opportunities of communities within the agricultural landscape.	CMA, Councils, community groups, DEPI, land managers
6.3	Build on existing community and government partnerships in the coordinated management of remnant vegetation and fragmentation (e.g. corridor planting and enhancement).	CMA, community groups, DEPI, land managers

	High level 20 year Objectives and associated 6 year Management Measures	Implementation partners*
6.4	Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals.	CMA, community groups, DEPI, land managers
6.5	Build on existing partnership with large agricultural industries within the region to improve environmental outcomes (e.g. Forestry).	Industry groups, VFF, land managers, Government
6.6	Promote sustainable land management (refer to management measure 1.3, 1.4, 1.5, 1.6).	CMA, Councils, industry and community groups, DEPI, land managers
6.7	Support Agricultural industries in developing new land manager models that address barriers to entry (high capital costs) and succession of ageing land owners (refer to management measure 1.10).	CMA, community groups, DEPI, land managers, VFF
6.9	Support Agricultural industries in the promotion of succession/ business plans to maintain land management capacity through transition of ownership and management. (refer to Management Measure 1.10).	CMA, community groups, DEPI, industry, land managers, local councils

Recommended Priority Action for Agriculture landscape: The average age of farmers is increasing and approaching a threshold where there could be significant land management challenges prior to land ownership change in a relatively short timeframe. Supporting the development of community based solutions will encourage sustainable land management through this transition period.

7 People will identify with and value Forest landscape for its national parks, recreation, water and forest resources

7.1	Build on existing community and government partnerships to identify opportunities that benefit both tourism and park conservation.	Alpine resorts, DEPI, local councils, PV, tourism industry, Tourism Victoria
7.2	Support the delivery of a fire management program in collaboration with key stakeholders which aims to: • minimise the impact of major bushfires on human life, communities and infrastructure • maintain an effective water yield • maintain or improve the resilience of natural ecosystems (refer to Management Measure 10.17).	CFA, CMA, community groups, DEPI, G-MW, land managers, local councils, NEW, Police, PV, timber industry
7.3	Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals.	CMA, community groups, DEPI, land managers, PV
7.4	Further develop community and government partnerships to build a sustainable firewood industry to divert collection away from areas with vulnerable remnant vegetation and habitat.	CMA, community groups, DEPI, land managers, VicForests

Recommended Priority Action for Forest landscape: There have been three significant bushfire events in the last decade that have burnt vast areas, which are impacting the high quality water yield from the Forest landscape. As a priority, it is recommended that a fire management program be delivered that aims to:

- minimise the impact of major bushfires on human life, communities and infrastructure
- maintain an effective water yield
- maintain or improve the resilience of natural ecosystems.

There is also an opportunity to build on existing community and government partnerships to develop a sustainable firewood industry and divert firewood collection away from vulnerable remnant vegetation and habitat.

High level 20 year Objectives and associated 6 year Management Measures		Implementation partners*	Urban	Lifestyle	Agriculture	Forest	Alpine
8	**People will identify with and value the Alpine landscape for its iconic status, high biodiversity, tourism and clean water resources.**						
8.1	Promote the Alps as a unique icon to enhance value of its outstanding biodiversity, landscape and scenic values.	Alpine resorts, CMA, community and peak body groups, DEPI, local councils, tourism industry, PV	•				•
8.2	Actively protect, maintain and enhance high conservation wetlands, vegetation and waterways in the Alpine landscape.	Alpine resorts, CMA, DEPI, G-MW, local councils, PV					•
8.3	Undertake integrated strategic land use planning to ensure future development and land use complements the Alpine landscape and incorporates natural resource management.	Alpine resorts, CMA, DEPI, G-MW, local councils	•			•	•
8.4	Build on existing community and government partnerships in the coordinated and targeted management of invasive plant and animals.	Alpine resorts, CMA, community groups, DEPI, PV				•	•
8.5	Support the delivery of a fire management program in collaboration with key stakeholders which aims to: • minimise the impact of major bushfires on human life, communities and infrastructure • maintains sensitive natural resource assets • maintain or improve the resilience of natural ecosystems (refer to Management Measure 10.17).	CFA, CMA, community groups, DEPI, G-MW, land managers, local councils, NEW, Police, PV, timber industry		•	•	•	•

Recommended Priority Action for Alpine landscape: The Alpine landscape is a highly sensitive and vulnerable environment with threatened species and communities. Promoting the Alps as a unique icon to enhance due to the value of its outstanding biodiversity, landscape and scenic values will improve the connection of the broader community (North East region and beyond) with the landscape and encourage investment in the protection of its natural resource assets.

9	**Agencies and the community will work together to monitor and evaluate condition of natural resources and effectiveness of protection measures to improve natural resource management**						
9.1	Develop a RCS MER plan by July 2014 that considers how to: • set up a monitoring and evaluation framework (logic) that enables adaptive implementation of NRM interventions and identifies indicators to change what we are doing • identify the monitoring that needs to occur to assess RCS implementation • review the effectiveness and appropriateness of measures outlined in the RCS to achieve the identified objectives • outlines the collaborative processes for setting and changing management measures • tell people about the progress successes and lessons learnt through RCS implementation • outlines the review of the RCS MER plan.	Australian Government, CMA, community and peak body groups, DEPI, Industry groups, G-MW, land managers, local councils, NEW, PV, Research Institutions	•	•	•	•	•
9.2	Coordinate: • the annual reporting on the condition and management of land and water resources in the North East region • a mid term review of the RCS by July 2016 • a final review of the RCS by July 2019.	CMA	•	•	•	•	•
9.3	Collaborate and work together in the collection and collation of data on catchment conditions change and land manager practice change.	CMA, community groups, DEPI, G-MW, land managers, local councils, NEW, PV	•	•	•	•	•
9.4	Develop strategic research partnerships to better understand whole-of-catchment NRM efforts and outcomes.	CMA, community groups, DEPI, land managers, PV, Universities	•	•	•	•	•
9.5	Apply tools (e.g. INFFER) to assist in evaluating and improving activities in accordance with the North East RCS.	CMA, DPI, DSE, land managers, local councils, PV, research bodies	•	•	•	•	•

Urban Lifestyle Agriculture Forest Alpine

High level 20 year Objectives and associated 6 year Management Measures	Implementation partners*	Urban	Lifestyle	Agriculture	Forest	Alpine
10 The community will actively participate in the integrated management and protection of natural resources.						
10.1 Develop and deliver a suite of targeted community education, awareness and extension programs that provide opportunities and encourage participation in: • improving the regions natural resource base through supporting community capacity in the integrated management of catchments • understanding of the importance of land and water resources, their sustainable use, conservation and rehabilitation • raise awareness of the importance of environmental stewardship • activities that represent the objectives associated with regions Landscapes • nurturing innovation and collaboration through the application of principles contained within the RCS • the ongoing listening and effective communication of community NRM related knowledge, experience and views (e.g. web based collaboration tools, ongoing NRM reference groups) • river health and waterway management programs • the management of the Environmental Water Reserve • the monitoring of river health and • create practice change and promote best management land and water resource management practices • connecting urban based communities to the region's landscapes.	CMA, community, community groups, DEPI, G-MW, land managers, local council, PV, NEW	•	•	•	•	•
10.2 Collaborate and work with traditional owners, elders and community to: • develop partnership projects and joint initiatives • build and maintain trust • build capacity and facilitate the management and protection of traditional knowledge, sites and natural resource assets • enhance capacity of Indigenous communities to conserve and protect natural resources (land, water and biodiversity) • facilitate opportunities for Indigenous youth to develop traditional skills and knowledge • support the use and reinvigoration of Traditional ecological knowledge.	AAV, Commonwealth Government, CMA, DEPI, PV, Traditional Owners	•	•	•	•	•
10.3 Support knowledge transfer and capacity building programs to enhance the role of traditional ecological knowledge in plant and animal conservation.	CMA, community groups, DEPI, land managers in partnership with Indigenous peoples, land managers, PV	•	•	•	•	•
10.4 Update the North East Regional Landcare Support Strategy (2009) in accordance with the RCS to: • support the facilitation of Landcare programs that aim to achieve a shared responsibility for a healthy environment • maintain and enhance skills and capabilities of the Landcare community • outline the scope of the associated regional action plan.	CMA, community groups, DEPI	•	•	•	•	•
10.5 Implement the Regional Landcare Support Strategy and associated Regional Landcare Action Plan.	CMA and community groups	•	•	•	•	•
10.6 Continue to use community engagement processes to provide advice to the CMA on the development and implementation of the Regional River Health Strategies, floodplain and drainage programs.	CMA , community, DEPI, G-MW, local councils, NEW	•	•	•	•	•
10.7 Provide for a forum for listening to the local knowledge and expertises of the regional communities to ensure local input is considered in catchment decision making and that catchment management is a partnership between the community and government.	community and Government	•	•	•	•	•
10.8 Support the building of social capacity within and between the region's landscapes to provide effective networks (refer to Part One RCS).	CMA, community, community groups, DEPI, PV, resesarch bodies	•	•	•	•	•

Urban Lifestyle Agriculture Forest Alpine

High level 20 year Objectives and associated 6 year Management Measures		Implementation partners*
10.9	Support research into the motivations of the regional communities to provide advice on how to build social capacity and achieve the vision and objectives of the RCS.	Government, local councils, research bodies
10.10	Support the provision of infrastructure and services to rural communities to assist them to remain viable.	Government and local councils
10.11	Establish a mechanism that institutionalises staged practice change in key landscapes through education and associated accreditation to promote best practice land stewardship.	CMA, community groups, DEPI, Goverrnment, land managers, PV
10.12	Support cross sector collaborative leadership and mentoring programs.	community, Government, industry, small business
10.13	Develop and implement a coordinated response to fire management to minimise the impact of major bushfires on human life, communities and infrastructure, improve the resilience of natural ecosystems and their ability to deliver services such as biodiversity, water carbon storage and forest products.	CFA, CMA, DEPI, local councils, PV
10.14	Support a collaborative approach to integrated NRM in the region, including: • promoting and testing the shared visions for the diverse healthily landscapes, vibrant communities • investing in regional coordination services including the implementation of the RCS • diversifying funding sources • investigating the need and support for a regional partnership forum with associated principles and measures of effectiveness.	CMA, community groups, DEPI, G-MW, land managers, local councils, NEW
10.15	Support and pursue multi regional collaboration opportunities that take advantage of like natural resource assets or issues.	North East CMA, East Gippsland CMA, Goulburn Broken CMA, Murray CMA, NRM organisations
10.16	Support and facilitate partnerships and collaboration between neighbouring CMAs and Government agencies where there are natural resource assets and or issues that cross jurisdictional boundaries.	CMA, DEPI, neighbouring CMAs, PV
10.17	Where appropriate support the delivery of an expanded planned burning program on public land (refer to 3.1, 5.4, 6.8, 7.2, 8.5 for other fire related management measures).	CFA, CMA, community groups, DEPI, G-MW, land managers, local council, PV
10.18	Support building community resilience and capability, and seek to foster innovation that improves natural resources that are collaboratively delivered and owned by the community. This would involve testing the principles for progressing new ideas, included in section Fostering new ideas - Innovation and Collaboration.	CMA, community, DEPI
10.19	Support and facilitate collaboration between DSE Forest managers, Parks Victoria and other key stakeholders,including local councils and Traditional Owners as appropriate, in the management of forests and parks.	CMA, community groups, DEPI, land managers, local councils, PV, Traditional Owners

** The Implementation partners listed are an indication of those who would typically be involved in the progression the management measure.*

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NORTH EAST Regional Catchment Strategy

NORTH EAST CATCHMENT MANAGEMENT AUTHORITY

Coordinating renewal of the North East Regional Catchment Strategy