

State of the catchments 2010

# Capacity to manage natural resources

## Hunter–Central Rivers region

### State Plan target

There is an increase in the capacity of natural resource managers to contribute to regionally relevant natural resource management (NRM).

### Background

The capacity to manage natural resources depends on a number of factors, such as the accessibility of resources, capability and expertise of natural resource managers and the institutional and policy environment in which the managers operate. Such factors are important when assessing capacity and identifying what enables and constrains effective NRM.

A livelihood framework of five capitals (Ellis 2000) provides a framework for understanding these factors. National indicators of adaptive capacity (Nelson et al. 2010a, b) lack relevance at a community level; as such, they cannot effectively aid in triggering a change in local management practices or livelihood activities.

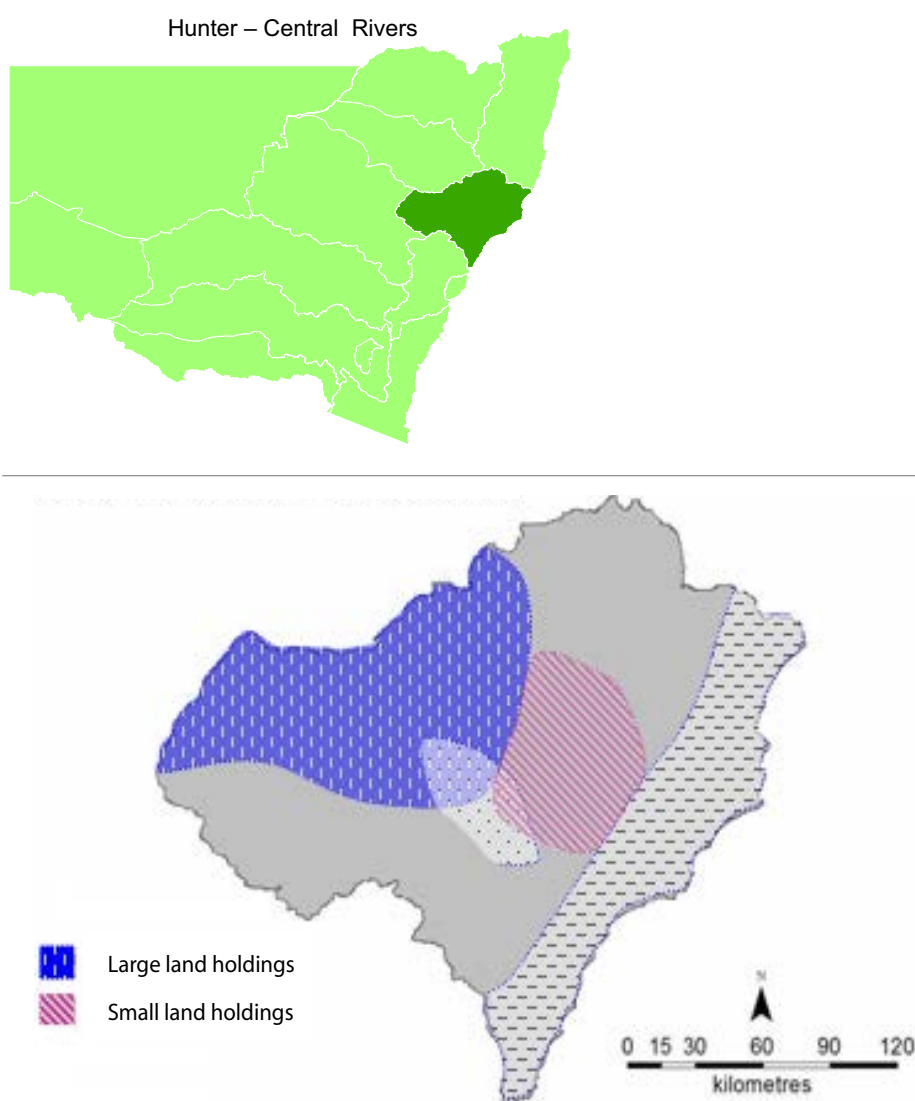
To ensure regional relevance, a participatory workshop approach was taken with participants drawn from pre-existing networks of natural resource managers, where available.

A detailed technical report describes the methods used to derive the information contained in this report. At the time of publication of the *State of the catchments (SOC) 2010* reports, the technical reports were being prepared for public release. When complete, they will be available on the DECCW website: [www.environment.nsw.gov.au/publications/reporting.htm](http://www.environment.nsw.gov.au/publications/reporting.htm).

**Note:** All data on natural resource condition, pressures and management activity included in this SOC report, as well as the technical report, was collected up to January 2009.

In consultation with the Hunter–Central Rivers Catchment Management Authority (CMA), two workshops were held in the region to assess the capacity of land managers to contribute to regionally relevant NRM (Figure 1). Nine large-scale farmers who owned mixed agricultural enterprises and were representative of the large landholders in the upper parts of the catchment, attended the workshop at Cassilis. Cattle production and cropping were the main enterprises for these landholders. Five small-scale landholders attended the workshop in Singleton; they were primarily lifestyle landholders with off-farm income and diverse farming enterprises.

## Map of the catchment



**Figure 1** Large-scale and small-scale landholders represented by the workshops

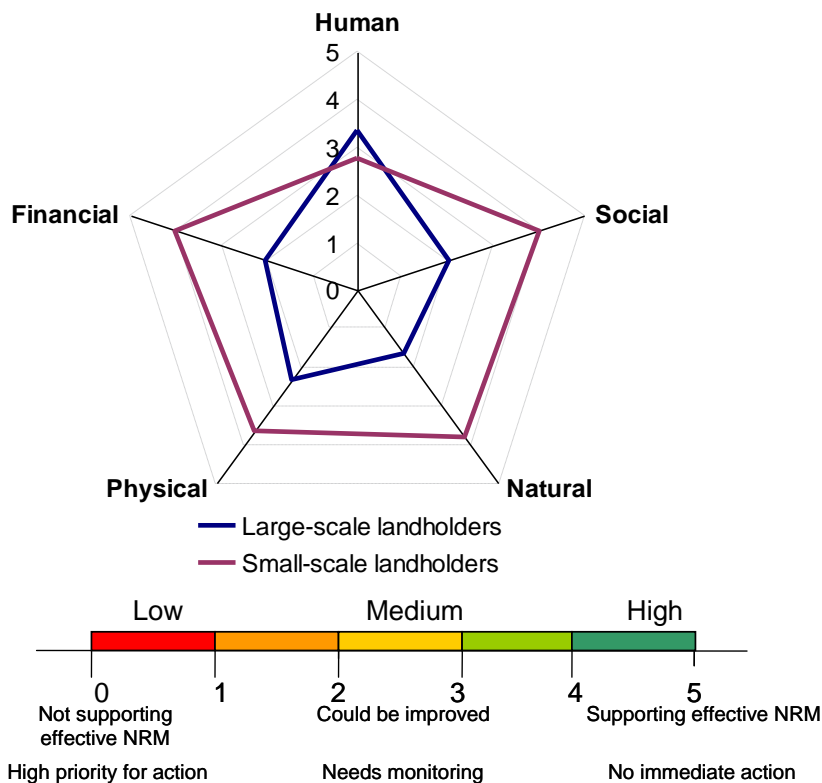
## Assessment

Each participant was asked to identify important indicators of *human, social, natural, physical* and *financial* capitals that either enabled or constrained NRM in their respective area. Examples of each of these indicators are provided in Table 1.

**Table 1** Definitions of the capitals

Capital	Examples
Human	skills, health and education
Social	family, community and other social networks and services
Natural	productivity of land, water and biological resources
Physical	infrastructure, equipment and breeding resources
Financial	access to income, savings and credit

Participants then rated each indicator on a scale of 0 to 5, according to the degree to which it supported NRM action in their area. A score of 0 indicated the support of the NRM was 'very low' and action was a high priority; a score of 3 indicated support of NRM could be improved and monitoring was required; and a score of 5 indicated that NRM support was 'very high' and no immediate action was necessary. Scores for each indicator were then combined to find an average for each capital (Figure 2).



**Figure 2** NRM capacity in the Hunter–Central Rivers region

The combined assessment of each capital resulted in the following:

- the large-scale group had relatively low levels of *social, natural, physical* and *financial* capitals; however, *human* capital was relatively high. The small-scale landholders had relatively high levels of all capitals except *human* capital, which was rated moderate
- for large-scale landholders, the primary constraints to NRM were the low profitability of farming and aspects of groundwater management (particularly in relation to the impacts of mining on aquifers). Also identified as a constraint was the level of government engagement with landholders in NRM decision-making
- the small-scale landholder group believed a lack of community enthusiasm, interest and engagement in NRM was the key constraint to NRM. Off-farm income, largely acquired through employment in the mining sector, was identified as strongly supportive of NRM
- both landholder groups believed that, within their communities, the experience and ability in farm management of many landholders effectively supported NRM.

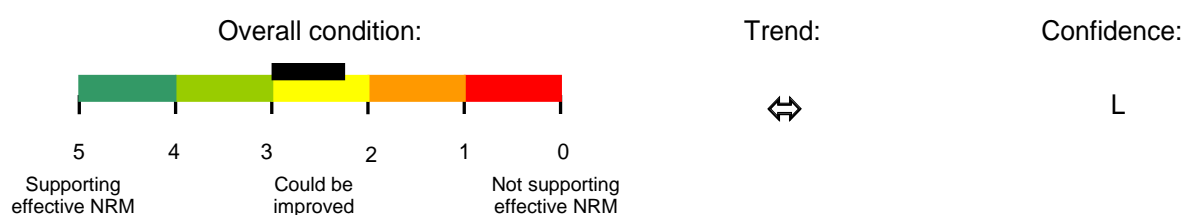
The groups also identified action priorities for nearly all the indicators; these are shown in Table 2 for the large-scale landholder workshop and Table 4 for the small-scale landholder workshop. Tables 3 and 5 outline the pressures on the various condition indicators identified for the large-scale workshop and small-scale workshop, respectively.

**Table 2 Action priorities identified by the large-scale workshop**

Indicator	Collective action priorities
<b>Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)</b>	
Awareness of NRM issues	Improved NRM awareness of absentee landowners through lifestyle goals and weekend activities.
<b>Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)</b>	
Sense of community	Involve schools in NRM awareness campaigns as they are often a focal point of the community.
Trust of government	Provide opportunities for agricultural land managers to have further input into future NRM policies. Community-based, rather than top-down, approaches (eg Landcare, Hunter Trust in the 1950s) provide opportunities for meaningful engagement in NRM issues.
<b>Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)</b>	
Groundwater management	Improved monitoring of groundwater resources and connectivity across bores are needed to assess the impact of mining on resources. Research is needed on groundwater connectivity, recharge rates and extent of aquifers.
Groundcover maintenance	Continue support for ProGraze courses (Industry & Investment NSW) to improve skills in monitoring and management of groundcover.

<b>Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)</b>	
Fencing	Improved awareness, knowledge and availability of funding required, to ensure the adoption of appropriate fencing for NRM.
Strategic water points	Improved awareness, knowledge and availability of funding required, to ensure the adoption of appropriate on-farm water infrastructure for NRM.
Groundwork maintenance	Encourage regular maintenance of existing structures (eg graded banks) to ensure their continued effectiveness.
<b>Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)</b>	
Cost of equipment	Provide increased incentive funding for NRM equipment.
Farm profitability	Recognise the capital value of well-managed land so that the investment in NRM is reflected in the price of land.
Farm Management Deposits (FMDs)	The retention of the FMD scheme is critical to ensuring the viability and resilience of farmers.






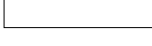
**Table 3 Pressures on condition indicators identified by the large-scale workshops**



Indicator	Condition	Trend	Pressures / Importance of indicator
<b>Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)</b>			
Awareness of NRM issues	█	?	Necessary for land managers to recognise NRM issues before they can manage them effectively.
Openness and ability to learn	█	?	Responding to NRM issues requires change and adoption of new practices.
Farm management ability	█	?	Acquired through experience rather than formal education. Helps farmers make timely management decisions.



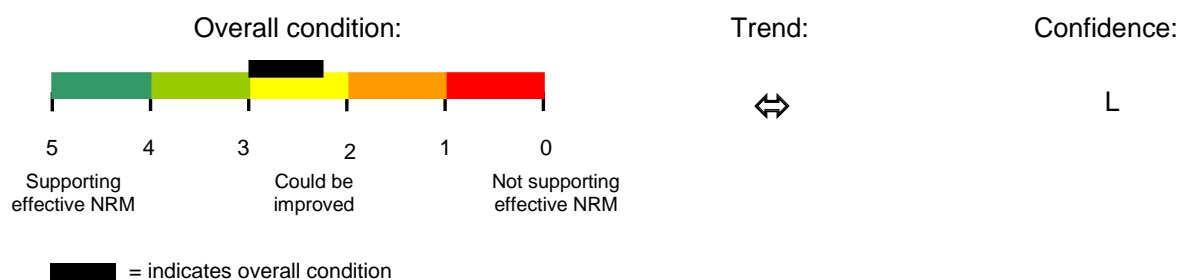
<b>Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)</b>			
Sense of community	?	?	Essential to support collective action to manage natural resources.
Volunteerism	?	?	Indicates the community's health and viability necessary to support NRM.
Trust of government	?	?	Leadership by governments essential to enable collective action for NRM.
<b>Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)</b>			
Soil erosion	?	?	Influenced by location of the farm in the valley and affects crop production.
Groundwater management	?	?	Secure access/good management can increase stocking rates.
Groundcover maintenance	?	?	Moderates the impact of soil erosion and groundwater resources.
<b>Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)</b>			
Fencing	?	?	Allows land managers to effectively manage grazing impacts and reduce soil erosion.
Strategic water points	?	?	Strategic watering points can reduce soil and stream impacts from grazing pressure and improve crop production.
Groundwork maintenance	?	?	Construction/maintenance of graded banks reduces soil erosion in heavy rainfall events.
<b>Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)</b>			
Cost of equipment	?	?	High cost of tillage equipment for effective NRM out of reach of many farmers.
Farm profitability	?	?	Poor profitability reduces capacity of farmers to implement NRM on farms.
Farm Management Deposits	?	?	Allows enterprises management to preserve natural resources (eg timely destocking).

Condition	Trend	Data confidence
 Very good	↑ Improving	H High
 Good	↔ No change	M Medium
 Fair	↓ Declining	L Low
 Poor	? Unknown	
 Very poor		
 No data		

**Table 4 Action priorities identified by the small-scale workshop**

Indicator	Collective action priorities
<b>Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)</b>	
Age and physical capacity	Recruit younger families in the region into NRM groups to offset the ageing trend in NRM participants. Increase profile of NRM at family friendly events and provide opportunities for involvement at times that suit people working off-farm.
Interest in NRM	Raise awareness and redesign NRM training opportunities to increase adoption by groups currently under-represented in participation.
NRM training – field days and short courses	Redesign NRM training opportunities to be more flexible, particularly for younger families and people working off-farm, by building and promoting the social aspects of these events.
<b>Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)</b>	
Sense of community	Maintain a strong sense of community to ensure high participation in NRM groups.
NRM group participation	
<b>Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)</b>	
Weeds in riparian zone	Increase awareness of the importance of weed control in riparian zones.
Soil quality	Increase awareness and management of acid and saline soils.
<b>Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)</b>	
Fencing for riparian zone	Increase awareness of the need for fencing in riparian zones and of the availability of incentive funding
<b>Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)</b>	
Access to NRM grants	Increase awareness of funding opportunities for NRM; this will encourage small-scale landholders to strive for NRM outcomes leading to on-farm expenditure

**Table 5 Pressures on condition indicators identified by the small-scale workshops**



Indicator	Rating	Trend	Importance of indicator
<b>Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)</b>			
Farming experience	■	?	Assists in selecting appropriate management response to changing circumstances and extremes of climate.
Age and physical capacity	■	?	Population is ageing and future physical capacity for NRM could diminish.
Interest in NRM	■	?	Effective NRM depends on awareness of issues and a commitment to change.
NRM training – field days and short courses	■	?	Provides awareness, knowledge and skills for NRM in a way that contributes effectively to NRM across the region.
<b>Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)</b>			
Sense of community	■	?	Basis of collaboration. Allows flow of ideas through community and supports networks for CMA interaction.
NRM group participation	■	?	Provides confidence/motivation for NRM, builds social/support networks.
<b>Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)</b>			
Pasture management	■	?	Need to effectively manage stocking rates to avoid land degradation.
Weeds in riparian zone	■	?	Results in overgrown creeks, reduces stock access to water and affects general livestock health.
Soil quality	■	?	Affects carrying capacity; acidity and salinity is poor in some regions.
Salinity of waterways	■	?	Reduces stocking rates and land productivity.
Remnant vegetation	■	?	Controls erosion, provides shade for livestock and absorbs carbon.



<b>Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)</b>		
NRM farm equipment	■ ?	Access and availability essential for NRM activities.
Fencing for riparian zone	■ ?	Important to control grazing impacts around riparian zones.
Trees – vegetation	■ ?	Trees and vegetation improve biodiversity.
<b>Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)</b>		
Off-farm income	■ ?	High in this area because of mines. Allows landholder expenditure on NRM.
Access to NRM grants	■ ?	Access provided by the CMA; other sources to undertake activities to improve NRM.
Equity levels	■ ?	High in the region. High levels generate investment in NRM improvements.

## Management activity

New South Wales government agencies and CMAs are actively involved in building aspects of adaptive capacity through numerous programs; such programs include CMA community engagement strategies and CMA and NSW agency training in NRM practice change.

### State level

State level activities include:

- developing a state-wide Aboriginal land and NRM Action Plan ‘Healthy Country – Healthy Communities’. This will assist in developing clear policies, principles and tools to improve socio-economic outcomes for Aboriginal people through enhanced capacity to participate in land management and NRM
- measuring the increase in the capacity of Aboriginal communities to contribute to regionally relevant NRM. This will be guided by the State Government’s *Two Ways Together* strategy that assists in building Aboriginal community resilience
- DECCW is facilitating the delivery of enhanced decision-support tools to CMAs for targeting NRM actions at both catchment and property levels
- DECCW is augmenting CMAs’ capacity to monitor and report on the condition of natural resources, socio-economic outcomes and community capacity by developing a monitoring, evaluation and reporting system to track progress against the state-wide NRM targets
- coordinating NSW Waterwatch, a national community water quality monitoring network that encourages all Australians to become active in protecting their waterways.

### Education

- Industry & Investment NSW land management and property planning courses. See [www.dpi.nsw.gov.au/agriculture/profarm/courses](http://www.dpi.nsw.gov.au/agriculture/profarm/courses).

## Regional level

The Hunter–Central Rivers CMA is undertaking the following activities in relation to the NRM capacity target:

- employing a team of community support officers to provide support and advice to landholders. This team was established through consultation with local councils
- promoting CMA functions and activities through newsletters, websites, landholder field days and involvement in regional field days
- directly engaging with landholders, through the exchange of advice and funding, to implement environmental actions on properties
- providing landholders with funding to attend a range of property management training courses; these courses will take into account the impact on the environment
- focusing NSW Waterwatch activities in the region on building student and landholder knowledge of riverine ecosystems, and providing support and equipment to monitor the water quality of streams in their local area.

## Further reading

Brown PR, Nelson R, Jacobs B, Kokic P, Tracey J, Ahmed M & DeVoi P (in press), Enabling natural resource managers to self-assess their adaptive capacity, *Agricultural Systems*.

Ellis F (2000), *Rural Livelihoods and Diversity in Developing Countries*, Oxford University Press, Oxford, UK.

Jacobs B & Leith P (in press), Adaptive capacity for climate change: principles for public sector managers, *Public Administration Today*.

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Nelson R, Kokic P, Crimp S, Martin P, Meinke H, Howden M, Devoil P & Nidumolu U (2010b), The vulnerability of Australian rural communities to climate variability and change: Part II – Integrating impacts with adaptive capacity, *Environmental Science & Policy* 13:18-27.

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