

State of the catchments 2010

Capacity to manage natural resources

Hawkesbury–Nepean 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.

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 Hawkesbury–Nepean 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). Twelve large-scale farmers who owned mixed agricultural enterprises and were representative of the large landholders in the Tarago area, attended the first workshop. Six owners (managers and retirees) of small properties attended the Windsor workshop. The Windsor participants, who were either professional or volunteer NRM managers, represented a smaller area of peri-urban hobby farms and private NRM activity.

Map of the catchment

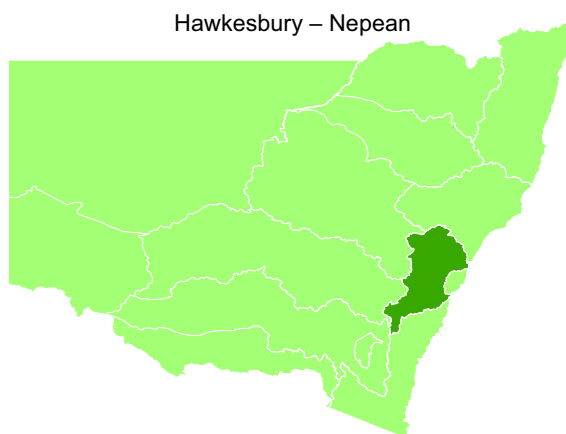


Figure 1 Tarago and Windsor areas represented by workshops

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 capitals 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).

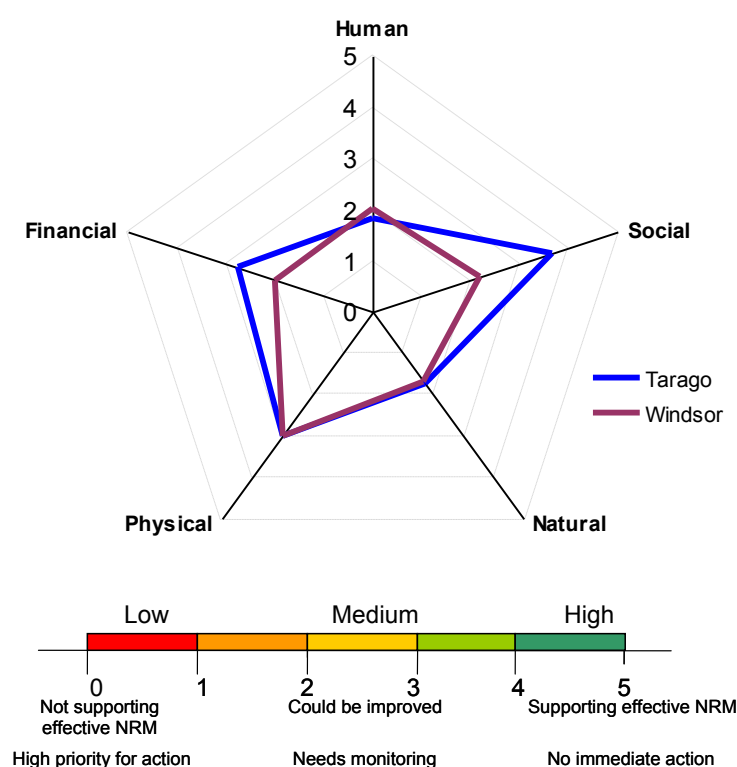


Figure 2 NRM capacity in the Hawkesbury–Nepean region

The combined assessment of each capital resulted in the following:

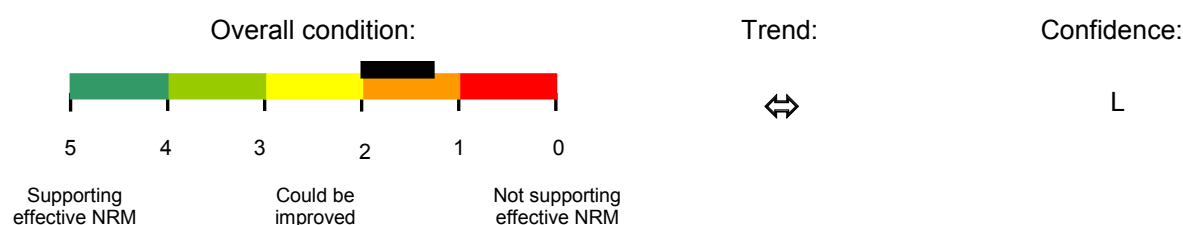
- the Windsor workshop assigned a low rating to all capitals except *physical*
- the Tarago workshop believed the support provided by *social*, *financial* and *physical* capitals was moderate to high. *Natural* and *human* capitals were rated lower
- the lack of enthusiasm for NRM among the community was identified by the Windsor workshop as a key constraint to NRM in the area
- the primary constraint to NRM identified in Tarago was the low profitability of farming; in particular, the trend for farmers' children to migrate, the ageing farming population and the lack of necessary time and labour
- in both areas, weeds were an indicator of *natural* capital that rated very low. *Social* capital was also limited, due to certain regulations and incentives and various responses to them.

The groups also identified action priorities for nearly all of the indicators; these are shown in Table 2 for the Tarago area and Table 4 for the Windsor area. Tables 3 and 5 outline the pressures on the various condition indicators identified for the Tarago and Windsor regions, respectively.

Table 2 Action priorities for the Tarago area

Indicator	Collective action priorities
Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)	
Age of farmers	Increasing the attraction of farming requires greater rates of return on work and investment; this requires price regulation, to improve commodity prices, and a cultural shift that sees farming more highly valued. This was considered unlikely.
People not staying on the land	See above.
Skills of new people in the district	No action specified.
Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)	
Communication among farmers	The local social networks and community attitudes are currently effective.
Community attitude	See above.
Too much red tape	Some participants suggested that the CMA should be approaching landholders with NRM opportunities rather than landholders approaching the CMA. This would increase the effectiveness of NRM.

Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)	
Weeds	No action specified.
Land capability	No action specified.
Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)	
Fencing	No action specified.
Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)	
Funding for NRM	Governments and CMAs need to monitor and adjust the ratio of incentive inputs versus farm inputs in relation to seasons and terms of trade. There is emphasis on the fact that self-funded NRM work only takes place when farms are profitable.
Farm profitability	Farmers can often benefit from diversifying their business. There has been a shift towards diversification of income streams which vary with seasonal conditions, according to farm-based income.

Table 3 Pressures on condition indicators in the Tarago area

■ = indicates overall condition

Indicator	Condition	Trend	Pressures/Importance of indicator
Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)			
Age of farmers		↓	An ageing farm population and the unwillingness of younger generations to return to farming limits the amount and type of work that can be achieved; thus NRM is not often a priority.

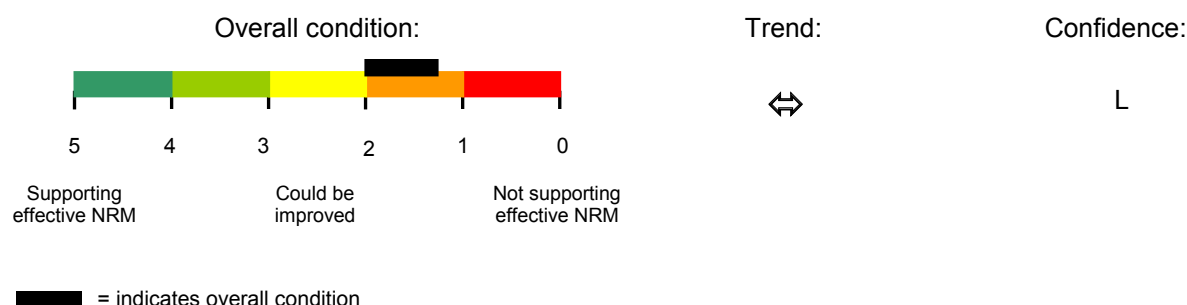
People not staying on the land		↓	Migration of people out of farming is driven by increasing land prices and retirement of farmers. This has led to changing regional demographics, reduced time for land management and decreased productivity.
Skills of new people in the district		↓	New people moving onto the land often lack the skills to successfully manage land for productivity and NRM; however, they have other skills which can improve NRM.
Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)			
Communication among farmers		↔	Strong social networks and communication provide a release from stress, ensure farmers are not isolated, keep minds active, ensure the spread of innovation and create a more positive attitude to farming.
Community attitude		↓	A positive community attitude signifies that members of the community are looking out for one another and that there is a group consensus towards achieving effective NRM.
Too much red tape		↓	The impacts of regulation, compliance and accountability are a burden as most farmers are already time poor, and the work associated with 'red tape' is time consuming and can reduce NRM action.
Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)			
Weeds		↔	Weeds are a financial and physical disturbance and take a great deal of time to manage, especially serrated tussock for which there is no effective control.
Land capability		↔	This is a complex indicator relating to the mix of land classes on any given property, which determine how productive a farm can be. Dry conditions and poor terms of trade reduce farmers' ability to improve soils.
Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)			
Fencing		?	Fencing influences methods and costs of lands management. Fencing areas (vegetation or soil types) can make stock management easier, reduce soil erosion, and improve native vegetation and groundcover.

Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)			
Funding for NRM		?	External funding for NRM enables work to be completed that would otherwise not get done. The ability of farmers to contribute in kind is limited by time constraints that affect who can access funding.
Farm profitability		?	Farmers need profit above a threshold before funds can be allocated to NRM. Off-farm income tends to pay for upkeep of property and livelihoods in dry periods.

Table 4 Action priorities for the Windsor area

Indicator	Collective action priorities
Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)	
Time-poor land managers	Partnerships between community, CMA and governments are needed to develop enthusiasm for NRM and prioritise NRM action. This can be achieved through showcasing local projects and using multiple forms of media.
People are not interested in NRM	There was a suggestion that schools could be more closely involved with NRM projects.
Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)	
Lack of volunteers	Volunteering needs to be more socially engaging and interesting.
Recognition of NRM actions and follow up	More follow up of NRM projects may be required to recognise achievements and assess project success.
Impact of recreational activities	Law enforcement regarding recreational vehicle use is required, as well as more signage.
Lack of trust in government (fear of interference)	Obligations associated with grants need to be clarified; examples of projects should be publicly showcased to reduce fear of engagement.
Local networks	Greater levels of CMA-initiated community engagement may help to build local NRM networks.
Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)	
Subdivision of properties/ fragmentation	Local governments need to ensure NRM is a priority consideration in land-use planning and zoning decisions.
Feral animals	There is a need for effective controls of feral and native animal populations.

Weeds	State and local governments should review and reinvigorate organisations charged with weed management. Giving responsibility to an NRM-oriented organisation, such as the CMA, was suggested.
Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)	
Chemicals from intensive production	Monitoring of chemical usage and of chemicals in rivers is required.
Fencing	No actions specified.
Rubbish	Legislation regarding dumping of rubbish could be more strictly enforced through effective policing and disciplinary measures.
Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)	
Allocation of financial resources to NRM	Public education about NRM is required. Some participants suggested incentives for NRM expenditure may increase engagement.

Table 5 Pressures on condition indicators in the Windsor area

Indicator	Condition	Trend	Pressures/Importance of indicator
Human Capital (the skills, health and education that contribute to the capacity to manage natural resources)			
Time-poor land managers		↓	The lack of time spent on NRM activity reflects other commitments of land managers, which range from working off-property, to raising children and participating in weekend leisure activities.

People are not interested in NRM		?	Lack of interest in NRM was a concern to participants and was seen to be improving locally but difficult to estimate over the broader area.
Finding and retaining competent/knowledgeable staff		?	Experienced staff often leave the NRM field to work in national parks or take up more professional careers; however, the CMA provides a list of recommended contractors.
Social Capital (the family and community support available, and networks through which ideas and opportunities are accessed)			
Lack of volunteers		↓	There is a general lack of volunteers at community NRM-related events, which limits the capacity to complete work done and reflects the lack of interest in NRM.
Recognition of NRM actions and follow up		↑	Participants stressed the need to follow up on funded projects, encourage proper completion and monitor projects for non-compliance.
Impact of recreational activities		↑	Recreational vehicles on waterways and land have negative impacts on natural resources, particularly in riparian areas.
Lack of trust in government (fear of interference)		↔	People are often wary of getting involved in NRM projects as they believe it will involve government intrusion in their private lives.
Local networks		↑	Local networks currently support NRM quite effectively through exchange of information, labour and skills.
Natural Capital (the productivity of land, water and biological resources from which rural livelihoods are derived)			
Subdivision of properties/fragmentation		↔	Natural resource values can be lost through development and when properties change hands and new owners misinterpret the value of assets.
Feral animals		↓	Feral animals can have substantial impacts on natural resources, such as tree plantings. Many are viewed as endearing (in the case of deer) and in need of protection, which can lead to conflict.
Weeds		↔	Weeds are often poorly managed by private landholders and public authorities. Participants suggested that councils currently avoid having to take responsibility for weeds.

Physical Capital (the infrastructure, equipment and breeding improvements to crops and livestock that contribute to rural livelihoods)			
Chemicals from intensive production		?	Fertilisers and other chemicals may threaten aquatic systems, yet there is insufficient monitoring of these systems, and of chemical application, to understand the impacts.
Fencing		?	There was a minor concern about fencing keeping stock and people out of areas in order to protect native vegetation.
Rubbish		?	Dumping of rubbish can reduce the value of parks and areas of native vegetation.
Financial Capital (the level and variability of the different sources of income, savings and credit available to support rural livelihoods)			
Allocation of financial resources to NRM		?	Funds are not being allocated to NRM because of a general lack of interest in NRM issues, rather than a shortage of financial resources.

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:

Capacity building

- 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 (I&I) land management and property planning courses. See www.dpi.nsw.gov.au/agriculture/profarm/courses.

Regional level

The Hawkesbury–Nepean CMA is undertaking the following in relation to the NRM capacity target:

- offering targeted education, extension and training opportunities to landholders, community groups and local and state government. These are offered through both Hawkesbury–Nepean CMA-led programs and external partners such as I&I, DECCW, councils and community organisations
- supporting and encouraging landholder engagement in the Hawkesbury–Nepean CMA's six incentive projects, located in targeted areas of the catchment – River Restoration Project, Bushland Conservation Project, Catchment Protection Scheme, Wetlands Management Project, Saltmarsh Restoration Project and Strategic Weed Management Project. All programs include capacity building elements and further landholder training
- providing training programs in land management for Aboriginal communities. These will support acquisition of skills and certified training in bush regeneration techniques, provide incentive funding for NRM works on Aboriginal-owned land and integrate knowledge and protection of cultural sites into the Hawkesbury–Nepean CMA's on-ground programs
- implementing a communication strategy to promote involvement in targeted areas of the catchment. The strategy will deliver important information to key clients such as landholders and councils
- monitoring all projects delivered through Hawkesbury–Nepean CMA funding to verify outcomes as well as outputs. Information will then be reported to the catchment community and individuals to support decision-making.

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*.

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

Nelson R, Kokic P, Crimp S, Meinke H & Howden M (2010a), The vulnerability of Australian rural communities to climate variability and change: Part I – Conceptualising and measuring vulnerability, *Environmental Science & Policy* 13: 8-17.

Nelson R, Kokic P, Crimp S, Martin P, Meinke H, Howden M, DeVoi 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.

Published by: Department of Environment, Climate Change and Water NSW, 59–61 Goulburn Street, PO Box A290, Sydney South 1232.

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DECCW 2010/458 ISBN 978 1 74232 771 6 November 2010

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