

# **A SYNTHESIS REPORT ON THE AUDIT REGIONAL/CATCHMENT**

**May 2008**

*Hyder Consulting*



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# 1 Executive Summary

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## 1.1 Background

The National Land and Water Resources Audit (the Audit) published its first report on catchment condition reporting in 2002 during Audit 1. It is part of a larger Audit report titled *Australian Catchment, River and Estuary Assessment 2002*. The report is based on the linkages between catchment condition and river condition through to estuary condition. It became the first systematic and comprehensive study on the condition of Australian catchments, rivers and estuaries.

A major contribution was the development of a method for collecting and analysing data for catchment condition reporting. However, many data gaps and lack of a consistent national approach towards data management and reporting were identified and it was decided to address this in Audit 2 which came into effect from July 2002 to continue until June 2008.

## 1.2 This report

This synthesis report is a review of selected projects managed by the Audit on catchment condition reporting and the report card concept. This report includes:

- A categorisation and review of nine projects:
  - 1 Australian catchment, river and estuary assessment 2002 (Audit, State and Commonwealth agencies and CRC's)
  - 2 Report card review and concept development (C. Auricht, Information Systems Consultant, 2004)
  - 3 Regional and overseas case studies (Hyder Consulting 2005 – 2006)
  - 4 Integrated catchment (or regional) assessment – needs assessment and options for the Audit (Report on workshop by Thorman, R., Audit , 2005)
  - 5 National assessment of catchment condition – scoping study (Chesson, J., Kingham, R., Bureau of Rural Resources, 2005)
  - 6 Signposts for Australian Agriculture: a framework for developing economic and social indicators (Ashton, D., Goesch, T., Australian Bureau of Agricultural Economics, 2005)
  - 7 Regional integrated catchment condition reporting – catchments to the coast (Kingham, R., Chesson, J., Georgeson, L., Grant M. Bureau of Rural Sciences, 2007)

- 8 Triple bottom line indicators for a Victorian catchment management authority (L.Tiller, P. Fitzsimmons Department of Primary Industries Victoria, 2007)
- 9 Tasmanian integrated catchment reporting (Georges Catchment) (RMCG Consultants, Melbourne, 2007)
  - A summary of the projects and the results
  - The results of a telephone survey of NRM regions to determine current use of report cards based on indicators
  - Recommendations.

## 1.3 Results

### 1.3.1 There are different approaches

The work of the Audit shows that there are different methods that can be adapted to meet most needs. Two main methods are discussed in the reports. One of these is based on the work of the Bureau of Rural Sciences *Signposts for Agriculture* component tree and the other on the United Nations *Millennium Assessment Framework*. Both methods were trialled and met with varying levels of success and acceptance.

### 1.3.2 Integration with state and national requirements

The case studies of regional reporting show that most of the Australian NRM organisations reviewed are responding to local and regional reporting requirements rather than address the National Monitoring and Evaluation Framework (National M&E Framework). The authors noted that alignment with some of the National M&E Framework is readily achievable but the indicators need to be complimentary to regional needs.

### 1.3.3 Addressing the triple bottom line

A number of the Audit reports address the issue of reporting on environmental, social and economic issues – the triple bottom line (TBL). At least two of those reports, Tiller and Fitzsimmons (2007) and Ashton and Goesch (2005) focus on the TBL. It is well-recognised in all the reports that there is a need to integrate the social and economic dimensions of catchment condition reporting but this needs further work to develop appropriate methods and data sources.

### 1.3.4 Data availability

The reliability and availability of data at the regional level remains a serious impediment to comprehensive assessment of catchment condition.

Indicators need to be selected on the basis of quality data which is not always available. This data also needs to be in a form that can be analysed and processed with current staff and resources.

### 1.3.5 The capacity of the NRM organisations

The capacity of NRM organisations to undertake a report card process has not been assessed in the reports reviewed. However, it is clear from the review that developing report cards is not a simple process. They require considerable effort to:

- Define assets
- Define indicators for assets
- Source, organise and analyse data
- Agree on benchmarks and methods to assess condition.

Using a report card requires discipline and to provide value, must be repeated at regular intervals. Repeatability is therefore important. Given that the report card process could be at yearly, two-yearly, or five-yearly intervals, and that staff are likely to have moved on during these periods, it is important that the method is well documented and easily followed.

The reporting process could be streamlined with the development of agreed processes and supporting tools. For example, an on-line database combined with visual spatial outputs would increase capacity to make informed land management decisions.

## 1.4 Results of the survey of NRM regional delivery organisations

A telephone survey of 57 regional NRM organisations was undertaken. The main findings were:

- A variety of staff are responsible for reporting and this is reflected in their position title, however, 16 out of the 49 staff of the regional organisations responsible for reporting described themselves as the monitoring and evaluation officer, or very similar title.
- All 57 organisations had an active website.
- All of the 49 organisations interviewed stated that they had reporting obligations for boards, governments, annual reports and State of Environment reporting.
- Only 10 respondents stated that they specifically addressed catchment condition reporting and only four of those used a report card based on indicators made available to the public on the website.
- The intention to use report cards is not high with only five organisations stating that they intend to use them.

## 1.5 Recommendations

### 1 Develop a common set of core indicators with quality data

There is a need to reinforce a core set of national indicators with reliable data sources attached to them. There needs to be a clear role and responsibility for data collection and resources allocated to developing partnerships to undertake that role. It is easy to list numerous potential indicators. It is very difficult to narrow them down to the assets and targets of each CMA and then attach data sources to them. This is a priority project.

### 2 The need to scale indicators from the regional through to national and state level

The core indicators that are developed need to solve regional reporting problems but they also need to allow comparisons at state and national level.

### 3 There is an urgent need to identify social and economic indicators at the regional level

Many of the indicators that are labelled as biophysical do encapsulate a large amount of social and economic data. For example, any measure of water quality or extent of vegetation cover is also a surrogate measure of social and economic history of the region as well as current impact. Regions need a great deal of assistance in disentangling overall condition from individual indicators. Broad statistics such as population growth, employment and gross regional product are very difficult to use for NRM.

### 4 Capacity building in report card development and use

Some of the methods of report card development and presentation require a high level of skills and resources. Some regional organisations will require training and capacity building in the appropriate techniques such as data storage and manipulation through techniques such as multi-criteria analysis.

### 5 A Commonwealth Government requirement attached to funding

There are good reasons for catchment condition reporting using the report card that is transparent and used to measure investment outcomes. One reason why some NRM organisations are not undertaking this reporting is because it has not been a necessary condition of funding.

## 2 Introduction

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### 2.1 National Land & Water Resources Audit

The National Land & Water Resources Audit (the Audit) was established by the Commonwealth Government under the *Natural Heritage Trust of Australia Act 1997 (Cwlth)*. The Act states that the Audit will collate, process and present data on the state of Australia's natural resources with the role of providing

*... the baseline for the purposes of carrying out assessments of the effectiveness of land and water degradation policies and programs, ... [and] ... to improve Commonwealth, State and regional decision-making on natural resource management. .*

The Audit was funded for the period 1997-2002 and this is known as Audit 1. The Audit was funded again in 2002 to continue until 2007 with this second phase known as Audit 2.

The Audit has coordinated and commissioned a range of assessments that encompassed the nation's land, water and biodiversity. Assessments were based on the development and agreement of national data quality standards with ongoing monitoring to establish clear and coherent trends. The Audit also established web-based sources and repositories for natural resources information to facilitate systematic updating and use of the data. These were the Australian Natural Resources Atlas and the Australian Natural Resources Data Library. The underlying principles for all this work was to ensure that information:

- Serves to underpin policy development
- Assists in building an ethos of natural resource responsibility and stewardship across the entire community
- Aids planning and decision making
- Helps to prioritise investment opportunities
- Guides the development of programs leading to improvements in the effective and sustainable use of our natural resources.

The Audit published its first report on catchment condition reporting in 2002 during Audit 1. It is part of a larger Audit report titled *Australian Catchment, River and Estuary Assessment 2002*. The report is based on the linkages between catchment condition and river condition through to estuary condition. It became the first systematic and comprehensive study on the condition of Australian catchments, rivers and estuaries.

A major contribution was the development of a method for collecting and analysing data for catchment condition reporting. However, many data gaps and lack of a consistent national approach towards data management and reporting were identified and it was decided to address this in Audit 2 which came into effect from July 2002 to continue until June 2008.

The first step in the process of developing a consistent method of catchment condition report cards for Audit 2 was for the Audit to conduct a workshop attended by 40 participants representing Commonwealth and state agencies, Cooperative Research Centers, research institutions and catchment management authorities. One of the main outcomes of the workshop was for the Audit to play a leadership role in identifying national, state and regional reporting needs and then developing reporting methods that would assist its partners and NRM organisations.

The Audit commissioned nine reports with the following objectives:

- The development of a consistent method of catchment condition reporting based on indicator selection and data management that also met state and national requirements.
- The application of the method to suit the reporting requirements of regional NRM organisations
- To establish the situation in respect to existing regional reporting by a case study approach that involved six Australian and two overseas regional NRM organisations.

A requirement of all the reports was to include social and economic aspects and the need to develop appropriate indicators for measuring this dimension of catchment management and reporting.

## 2.2 Catchment reporting and the report card process

The timing and relationships of the nine reports that have been included in this synthesis report is presented in Figure 2-1. This shows the evolution of the report card process coordinated by the Audit.

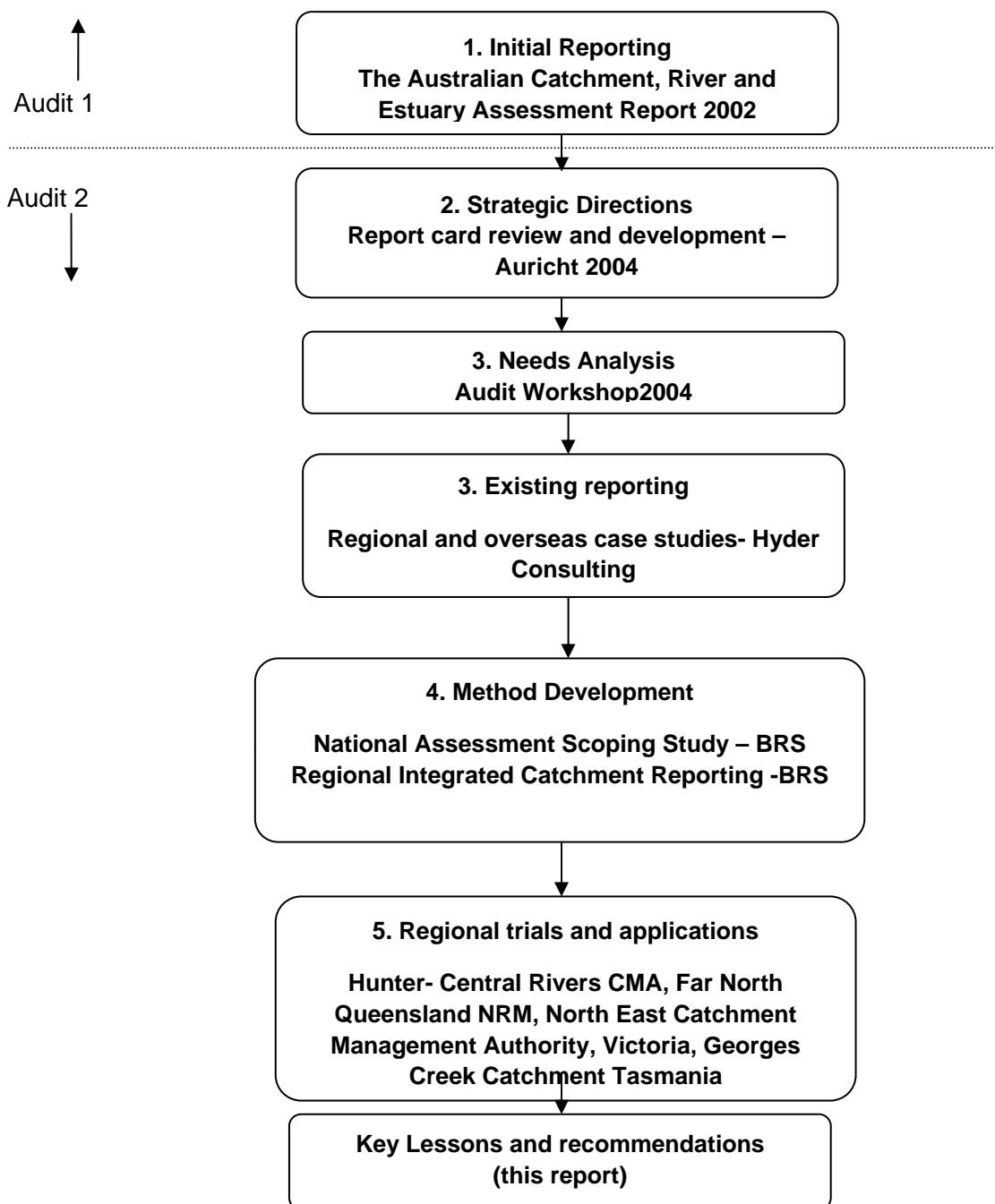


Figure 2-1 Evolution of Audit projects on catchment condition reporting

### 3 Review of individual catchment reporting initiatives

The individual reports reviewed as part of this synthesis report are presented in Table 3-1 below. showing details, timelines, and relationship to Audit 1 and Audit 2.

Table 3-1 Timeline and categorisation of the Audit catchment reporting projects

Concept	Specific Purpose	Title of Report	Lead Author/s and organisation
<i>Audit 1:</i>			
<i>Initial reporting</i>	Initial report on the state of the catchments in the intensive land use zones	Australian catchment, river and estuary assessment 2002	Audit, State and Commonwealth agencies and CRC's
<i>Audit 2</i>			
<i>Reviews</i>	Setting Audit direction for catchment/regional reporting	Report card review and concept development	C. Auricht, Information Systems Consultant, 2004
	Case studies of Current Regional/Catchments Integrated Assessments	Case studies of current regional/catchment integrated assessments	Hyder Consulting 2005 - 2006
<i>Needs</i>	Workshop with participants representing variety of NRM and research organisations and government	Integrated catchment (or regional) assessment – needs assessment and options for the Audit	Report on workshop by Thorman, R., Audit , 2005
<i>Method development</i>	Determine methods of catchment/regional reporting and use of data and indicators	National assessment of catchment condition – scoping study	Chesson, J., Kingham, R., Bureau of Rural Resources, 2005
		Signposts for Australian Agriculture: a framework for developing economic and social indicators	Ashton, D., Goesch, T., Australian Bureau of Agricultural Economics, 2005
<i>Regional trials</i>	Application of catchment /regional reporting methods to selected case study NRM regional organisations	Regional integrated catchment condition reporting – catchments to the coast	Kingham, R., Chesson, J., Georgeson, L., Grant M. Bureau of Rural Sciences, 2007
		Triple bottom line indicators for a Victorian catchment management authority	L.Tiller, P. Fitzsimmons Department of Primary Industries Victoria, 2007
		Tasmanian integrated catchment reporting (Georges Catchment)	RMCG Consultants, Melbourne, 2007

## 3.1 Initial reporting

### 3.1.1 The national assessment of Australia's intensively managed catchments

The Audit published its first report on catchment condition in 2002 as part of Audit 1. The *Australian Catchment, River and Estuary Assessment 2002 Vol 1 and 2* is based on the linkages between catchment condition and river condition through to estuary condition. Catchments based on river basins were chosen as the principle coordinating feature because they are natural systems where the links between system components can be readily identified. For example, the role of factors such as soil erosion, and vegetation cover in the upper catchment, has a demonstrable impact on rivers and estuaries.

A clear intention of the report is to integrate biophysical data sets at a catchment scale to facilitate comparisons between catchments. It became the first systematic and comprehensive study on the condition of Australian catchments, rivers and estuaries. A major contribution was the development of a method for collecting and analysing data for catchment condition reporting. The main goals of the report were:

- 1 Develop a system using biophysical data to define catchment condition
- 2 To apply the classification system to provide an Australia-wide assessment
- 3 To develop a data base that can be applied and extended across a range of scales
- 4 To provide information for decision-makers to address management needs, identify information gaps and further research.

The basic units for developing the method was to identify the biophysical elements and processes that determine change in catchment condition. These are defined as *condition drivers*. Examples of how these condition drivers emerge and interact are given as conceptual models for three different types of river basins:

- Coastal basins with lower intensity use
- Coastal basins with higher intensity use
- Inland basins.

The next step was to list the biophysical attributes that impact on catchment condition. No less than 128 attributes were identified and presented within the following broad categories:

- **Geographic drivers** of ecosystem condition with the various drivers classed under Climate and Rainfall, Topography, Soil Properties, Vegetation Type

- **Land use-associated drivers** of ecosystem condition with the various drivers classed under Nature Conservation, Other Protected Areas and Indigenous Use, Minimal Use, Forestry, Livestock Grazing, Dryland Agriculture, Irrigated Agriculture, Built Environment, Water Bodies
- **Resource use and degradation** drivers of ecosystem condition with the various drivers classed under Native Vegetation Extent and Condition, Fire Regime, Soil Erosion, Soil Degradation, Landscape Water Balance/Catchment Hydrology, Dryland Salinity, Water Quality, Surface and Ground Water Use, Nutrient Loading, Exotic Biota.

These 128 biophysical attributes were reduced to 110 that had potential for use as indicators for catchment condition assessment. An assessment criterion was developed to screen them for factors such as applicability and nationally available data. This revealed only 14 indicators that could be used with current resources and data. These 14 indicators were then used to calculate the composite catchment condition index and subindices. The indicators were spatially referenced and then viewed, weighted, reclassified and combined to form composite indices within a geographic information system. A five-point condition scale ranking from better to poorer was used to rank and map relative catchment condition for the intensively used catchments in Australia

The catchments were based on the 246 river basins defined by the Australian Water Resources Council. All the river basins in the intensive land use zones of Australia were assessed with the addition of selected river basins in the Northern Territory and the western division of the Murray-Darling Basin. This resulted in 197 river basins falling within the assessment area, amounting to 3 million km<sup>2</sup> or 40 percent of the continent. Each river basin was then assessed on three scales – a 5.5 km<sup>2</sup> grid, a 500km<sup>2</sup> catchment, and the total river basin.

The main results were:

- Five percent are in the lowest condition
- Fifteen percent are in the lower condition
- Fifty percent are in the mid range
- Thirty percent are in the highest condition
- A significant proportion (15-20%) of those in the cleared, agronomically marginal rainfall areas, with soils of lower fertility and structure are likely to continue to decline
- The 30% in the highest condition shows where a strategic investment may provide the greatest benefit.

The usefulness of using each indicator separately to predict condition is examined and presented. Combining only a few key indicators to assess particular issues such as water quality is also undertaken. Completion of the entire assessment process revealed the following limitations:

- Only biophysical data and indicators were used
- Results can be distorted because data sets are internally linked e.g. vegetation, soils and land use
- Only readily available data was used
- Time constraints resulted in the project being completed just before new data became available
- Thresholds of condition were not included.

Notwithstanding these limitations, the report addresses the various ways the assessment of catchment condition can be used in decision-making in NRM. For example, different management actions and financial decisions will be made in those catchments in poorest condition compared to those in good condition. The essential characteristics that define the different condition scores are also a valuable resource for decision making and priority-setting at a national scale. The following recommendations were made:

#### 1 Refinement of methods

- Include spatially referenced land-use practice data to better interpret land use impacts
- Developed regional environmental thresholds and indicators for improved comparative analysis
- Incorporate other functional landscape units such as bioregions
- Design decision support tools for evaluating land use change options

#### 2 Data sets

- Make all Audit data sets available
- Make other data sets such as climate variability, soil condition available
- Include social and economic data

#### 3 Improve relevance to regional catchment management authorities

- Develop minimum and agreed indicator sets, reference condition(s) and threshold values that quantify biophysical catchment condition
- Maintain an inventory and quantitative definitions of the catchment management issues across Australia
- Establish agreed regional and catchment management boundaries as a basis for setting priorities, monitoring activities and reporting progress

- 4 Improved scenario development
  - Link social and economic options with biophysical condition to test the likely outcomes of various management actions
  - Identify and apply the different data sets for defining catchment condition so that regional groups can select those most appropriate to their community goals and expectations.

## 3.2 Setting direction

### 3.2.1 Setting Audit direction for catchment/regional reporting

The Audit commissioned a report by the CSIRO titled *Catchments to Coast*. This unpublished report discusses how integrated catchment condition reporting could be applied in Australia. This opened a discussion on regional reporting and established the complexity of the task.

### 3.2.2 Report card review and concept development

The next report was by Auricht (2004) on *Report Card Review and Concept Development*. This is a review of various resource condition reporting methods and applications in Australia and overseas. Auricht examines the following international reporting methods:

- World Resources 2001-2002 and the PAGE study – United Nations and World Resources Institute
- Millennium Ecosystem Assessment – developed by United Nations to help assess a number of international conventions
- Earth Trends: The Environmental Information Portal – World Resources Institute database
- Global Terrestrial Observation System - Global Observing Systems Information Centre
- International Institute for Sustainable Development – website database
- Dashboard for Sustainability – Consultative Group on Sustainable Indicators

The Australian reporting systems reviewed by Auricht were:

- Gippsland Report Cards - Gippsland Integrated Natural Resources Forum
- Ecosystem Health Monitoring – Moreton Bay Waterways and Catchments Partnership
- Australian Natural Resource Management – Regional Report Cards – Australian Government Joint Team, Department of Environment and Heritage and Department of Agriculture Fisheries and Forestry.

- Australian Catchment Condition Assessment – Audit
- Landscape Health in Australian – Audit
- State of the Catchment 2002: Performance Assessment Reporting System – South Australian Murray-Darling Basin
- Health of our Catchments – Victorian Catchment Management Council
- Know Your Catchments – Assessment of Catchment Condition – Department of Sustainability and Environment, Victoria
- National Carbon Accounting System – Australian Greenhouse Office
- Sustainability Initiatives:
  - Signposts for Agriculture – Bureau of Rural Sciences
  - Landmark Project – Murray-Darling Basin Commission.

Following this extensive review it is not surprising that the main finding was that there is a great variety of reporting methods. The challenge for the Audit was to help develop a system that incorporates the best features of all the current systems into “a robust, easy to use system that enables results to be comparable over time and between jurisdictions”. Auricht concludes that such a report card system would facilitate establishment of priorities at local, regional, state and national level and provide a base for the investment of NRM funds. Auricht makes the following observations and recommendations:

- 1 A consistent framework for the collection and recording of resource condition information is critical
- 2 Regular reporting is required to enable impacts to be monitored
- 3 The value of information and the effectiveness of the decision-making and planning processes are closely related to the quality of information and its availability
- 4 One of the strengths of the proposed Report Card is that it will draw much of its material from the same organisations and groups that are involved in the collection and collation of data
- 5 It is important that social and economic aspects are included
- 6 Mechanisms are required to identify gaps in data and information
- 7 The report Card must convey meaningful and usable information that is simple to understand by a variety of stakeholders, from NRM managers to the public
- 8 Mechanisms for collecting non-peer reviewed sources of data such as local and traditional knowledge are important
- 9 Successful resource condition and trend assessment reporting have a strong capacity building and education component
- 10 The NWLRA could take a leadership role by providing a common basis for reporting

- 11 One of the major benefits of the Report Card concept is its intention to provide an inter-linked multi-scale assessment of resource condition.

## 3.3 Establishing needs

### 3.3.1 The Audit workshop

The next step was for the Audit to conduct a workshop attended by 40 participants representing Commonwealth and state agencies, Cooperative Research Centers, other research institutions and catchment management authorities. This was held to build upon the work in Audit 1 and the unpublished CSIRO report. The main aims of the workshop were to:

- Identify national, state and regional reporting needs
- Determine the extent to which the CSIRO unpublished report titled *Catchments to Coast* would meet those needs
- Identify where partnerships could be developed, leading to co-investments for agreed outcomes.

Participants were asked to complete a questionnaire on their organisation or jurisdiction's reporting needs. The survey showed that some regional reporting on biophysical aspects is taking place but there is a continuing difficulty with social and economic aspects. Most participants indicated a willingness to continue to be engaged with the process and the workshop resulted in the following recommendations:

- 1 Develop nationally consistent but regionally based resource condition methods and assessments
- 2 Establish an on-line 'knowledge centre' or toolbox to assist regions
- 3 Develop a pilot framework for integrating and linking the social and economic aspects of catchments. Include key indicators and the information required to support them. Align those indicators to the National M&E Framework then trial in selected areas
- 4 Develop partnerships with other groups involved in capacity building and knowledge enhancement projects to develop regional tools.

## 3.4 Review of current reporting

### 3.4.1 Case studies on how regional delivery organisations were reporting

Early in 2005 and as part of Audit 2 the Audit commissioned Hyder Consulting to select a set of case studies and review their reporting requirements and methods. The purpose of the project was to document case studies of integrated reporting to facilitate transfer of information and

building capacity by collating and presenting current practices. The focus was to identify successful projects as well as finding gaps that needed addressing.

The Australian case studies selected by the consultants in consultation with the Audit were:

- Gippsland Integrated Natural Resource Forum, Victoria
- Hunter Councils, New South Wales
- Moreton Bay Waterways & Catchment Partnership, South East Queensland
- Fitzroy Basin Association, Queensland; Blackwood Basin Group, Western Australia
- South Australian Murray Darling Basin Natural Resource Management Board

The two overseas case studies were of the Fraser Basin, British Columbia, Canada and Auckland Regional Council, New Zealand.

The case studies showed that there was a great variety of responses to reporting taking place throughout other jurisdictions and NRM organisations throughout Australia. The case studies give a sobering view of this great variety and the lack of a cohesive response to the need for reporting and accountability. Table 3-2 illustrates this variety.

Table 3-2 Summary results of the case studies in catchment condition reporting

Organisation and its role	Type of reporting used	Internal use	External reporting	Integration with State & National requirements
<b>Gippsland Integrated Natural Resource Forum (GINRF). Based in Gippsland Victoria to facilitate cooperation and coordination between with existing NRM organisations in the region</b>	An annual report. A descriptive report card system based on the main natural assets of the region. It is presented as a scorecard. Members of the GINRF collate information and provide it to the GINRF secretariat. Data are assessed by an agreed process and ratings are prepared and delivered by the independent Chair. At the annual review, conditions and stewardship ratings can be used to assess the environment and the regional NRM performance.	The report card was used for the development of the East and West Gippsland CMA RCIPs. It has also been influential in development of the Gippsland Lakes Rescue Package.	The aim of the report card was to act as a communication tool and reporting tool although it is currently only recognised as a communication tool.  The report card reflects for the first time an outward communication tool reflecting a whole of catchment approach.	It is aligned to the National Matters for Target but is not directly related to its reporting requirements.
<b>Blackwood Basin, Western Australia. Formed as a peak body to coordinate NRM across the 2.35million ha of this WA wheatbelt catchment</b>	Intends an annual report. A report card system is not used. They used an internal process of integrated MER and NRM planning which guided investment decision making	Zone Action Plans were based on defining the environmental issues and needs for each of the nine zones. The process involved a five step framework: identify issues within the zone; research and collate data on the environmental pressures; identify the option available; benefit / cost analysis; development of incentives.	This group is particularly experienced and accepting of environmental reporting. The Blackwood region is a large proportion of south west Western Australia covering about 42% of the South West region. Region to sub-region relationships have been difficult in the past but relationships are somewhat improved. Changes as a result of the NAP and the establishment of the south west Western Australia region & changes within the MER have also added to the history of environmental management for this area	No apparent program that aligns to State or National targets

Organisation and its role	Type of reporting used	Internal use	External reporting	Integration with State & National requirements
<p><b>Fitzroy Basin, Queensland. One of the 13 regional NRM organisations in Queensland</b></p>	<p>Reports as required to Commonwealth Government. Although a report card system has not been used, to date, indicators supporting reporting have been associated with: economic profiling of properties across the region; sediment modelling; grazing utilisation through proposed ground cover assessment from trialling remote land cover imagery; and biodiversity including regional ecosystem status and distribution, rare and threatened species listings.</p>	<p>Reporting is linked to the Regional Investment Strategy. Current focus is on output reporting to meet State and National requirements.</p>	<p>The FBA is working with the Queensland Department of Natural Resources and Mines to trial State of Region reporting as a basis to assess resource sustainability performance. State of Region reporting is seen as a link between evaluation of monitoring data and the next cycle of planning.</p>	<p>The National Monitoring and Evaluation Framework and the National Standards and Targets are being addressed through Queensland reporting frameworks</p>
<p><b>Hunter Councils Incorporated, New South Wales. An incorporated body comprising 14 local government areas</b></p>	<p>No specific reporting timeframe and on an as-needs basis. Hunter Central Regional Environmental Management Strategy (HCCREMS), which aims to integrate government planning and environmental management at the regional level. It also assists with State of Environment Reporting. A report card system is not used.</p>	<p>The HCCREMS has initiated a wide range of research projects to address key challenges facing local government in achieving ESD to ecosystem management and urban design</p> <p>The HCCREMS aims to focus on supporting councils but support is provided to community groups via advice and data/information.</p>	<p>HCCREMS provides: a regional data collection service for councils annually for their SoE reports; training and capacity building for SoE report writers in sustainability reporting; and facilitation of a regional SoE report writers' network to support adoption of the indicators.</p> <p>HCCREMS has proven very useful for focusing &amp; applying research &amp; development on specific regional NRM issues. The HCCREMS has initiated a wide range of research projects to address key challenges facing local government achieve ESD to ecosystem management &amp; urban design</p>	<p>The focus is towards local and regional issues.</p>

Organisation and its role	Type of reporting used	Internal use	External reporting	Integration with State & National requirements
<p>Moreton Bay, Queensland. A partnership of 19 local governments, State Government agencies, academic and research organisations and Commonwealth Government. Now known as South East Queensland NRM.</p>	<p>Report cards and technical reports are used as a decision support tool, community education and engagement.</p> <p>Ecosystem health report cards per catchment.</p> <p>Management response report card.</p> <p>Annual report to partners.</p>	<p>Ecosystem health monitoring program technical report.</p> <p>Business plan.</p> <p>Financial reporting business plan.</p> <p>Quarterly financial reports to the Partnership's Board.</p> <p>Half yearly status reports of projects and expenditure against business plan. Freshwater, estuarine and marine ecosystem health report cards per catchment published annually from information obtained through the Environmental Health Monitoring Program (EHMP).</p> <p>Management response report card annually reporting on management interventions and outcomes.</p>	<p>Reporting has supported planning and policy development at a range of levels, such as decision support tools used by the Queensland Environmental Protection Agency and by industry to negotiate pollution loads for licences under legislation. It has also supported water resource planning for SEQ future growth management planning. This area has experienced significant growth and this has helped generate support.</p> <p>Breadth of partners involved.</p> <p>The decision support tool for monitoring and report cards has helped develop NRM Regional Investment Strategies and to define assets of high ecological value in planning. This provides a considerable focus for the Partnership.</p> <p>A foundation for technically based condition and trend analysis to guide management recommendations has been gained.</p>	<p>Unclear although there are areas of common interest.</p>
<p>South Australian Murray Darling</p>	<p>It was intended to introduce a report card</p>	<p>The intention of the new system</p>	<p>To be used for internal planning and</p>	<p>The intention was to align the</p>

Organisation and its role	Type of reporting used	Internal use	External reporting	Integration with State & National requirements
<b>Basin Resource Management Board. One of the eight regional NRM organisations in SA.</b>	system known as the Performance Assessment and Reporting System (PARS). It was designed to measure the overall catchment health of the SA MDB. The indicators cover the river, the irrigated areas, the dryland farming areas, threatened species, pests, native vegetation and revegetation, ongoing education and priority setting. The PARS has been disbanded and by the end of 2005 to favour a new catchment condition report based on 26 Resource Condition Targets (RCT).	(PARS) was to assist with priority setting.	decision-making.	new system with both State and National guidelines and requirements.
<b>Fraser Basin Council, British Columbia, Canada. An NGO with membership comprising community groups, business and four levels of Canadian Government</b>	A report card system has been adopted in the form of the "Snapshot Report". The report is produced biannually and provides sustainable performance indicators. It is a broadsheet distributed throughout the region to report on a suite of 20 triple bottom line indicators.  They cover a broad range of social, environmental and economic issues.	The Fraser Basin Council (FBC) was established to ensure that the "decisions that were being made about how we live, work and play in the Fraser Basin will protect and advance its social, economic and environmental sustainability." Goals were to increase public awareness and understanding about sustainability; identify critical issues and responses to improve progress; and inform and influence decisions and actions to advance sustainability.	The Snapshot provides a report card monitoring structure that effectively integrates socio-economic information; provides valuable information for ongoing longitudinal studies; effectively engages the community; and provides information that influences planning and public and private investment.	The FBC feeds into Canada's SoE reporting on freshwater ecosystems. Evidence of perceived 'usefulness' can be found in its funding from the private sector, NGOs and three levels of government. Indirectly FBC influences many decisions by many agencies, based on consensus and influence rather than regulatory controls. It also helps inform via education and research.
<b>Auckland Regional Council. One of</b>	A report card was not used.	The Regional Monitoring Authority,	The ARC has developed a Statutory	Aligns with the NZ Regional

Organisation and its role	Type of reporting used	Internal use	External reporting	Integration with State & National requirements
<p>15 regional councils established under the Regional Management Authority</p>	<p>However, aspects of the SoE monitoring program include: ambient air quality; surface freshwater quality and quantity; freshwater ecology; groundwater quality and quantity; geothermal water quality and quantity; saline water quality; saline ecology; terrestrial ecosystems; geological features; natural hazards; land use patterns; analysis of social and economic trends (population, GDP); whether issues and concerns are being recognised.</p> <p>Reports annually to public various committees and every five years for SoE reports.</p>	<p>35 councils are required to collect and keep representative data on natural resources and the environment for their region. Different regional councils interpret this in diverse ways, and this was accommodated to provide for difference. The ARC commission research and development on natural systems to refine the data collection and interpretation</p>	<p>Policy Effectiveness Monitoring Program (SPEMP) to evaluate the effectiveness of operative statutory RMA policy documents. This involves a 5 step process: setting monitoring objectives; identifying what to monitor; developing indicators; collecting, analysing and presenting data; subsequent review of the statutory document. The program is based on data gathered through SoE reporting. The program will be used to evaluate the effectiveness of the policies and methods contained in this plan in achieving the anticipated environmental results.</p>	<p>Monitoring Authority framework so that there are direct linkages to national policies and plans.</p>

The main findings from the case studies are:

- 1 There is a great variety of reporting styles throughout the jurisdictions and NRM organisations. Very few of them are presented in a systematic way that provides an accurate assessment of progress within the region and there are very few opportunities for cross-regional comparisons
- 2 There is a wide variation in capacity for systematic reporting within the organisations and very little evidence to show that there are strong drivers for them to increase that capacity
- 3 There is a very strong basis for reporting because all the formal NRM regions have had to develop regional catchment strategies that have Resource Condition Targets and Management Action Targets. These plans are also supported by a Regional Investment Strategy
- 4 Consistency with state and national reporting standards was not strongly addressed in the organisations reviewed in the case studies
- 5 Simple score cards that use simple language, visual icons and maps are a powerful tool for reporting to the community on how and why NRM investment is made
- 6 There remains a strong focus on the use of biophysical indicators at the expense of socio-economic indicators or the integration of both
- 7 All the case studies demonstrated that internal reporting for decision making was addressed. The problem was more in developing a consistent and repeatable approach that could be used across jurisdictions and NRM organisations
- 8 There remains the need to develop a set of indicators that can be used by jurisdictions and NRM organisations with confidence, both in their capacity to use them and also that once they are used they will find acceptance in the state and national agencies that might evaluate progress against targets.

## 3.5 Method development

### 3.5.1 The National Assessment of Catchment Condition Scoping Study

Chesson and Kingham (2005) propose a method for the national scale assessment of catchment condition for the intensive land use zone of Australia building on the previous work of the Audit. They also examine the potential of incorporating better data and more sophisticated scenario assessment including socio and economic data into the previous work of the Audit. A second aim was to assess the use of the Matters for Target and associated indicators that were at the time being developed under the National NRM Monitoring and Evaluation Framework.

The result is a method designed to determine catchment condition for the two main classes of assets – biophysical and human. It is based on the

component tree framework developed under *Signposts for Agriculture*. It is a hierarchical component tree that begins with the two main asset classes and subdivides them into sub-components with appropriate indicators according to the level of complexity required. The component tree divides at the first stage between Condition of Human Assets and Condition of Biophysical Assets.

The condition of Biophysical Assets is assessed by the capacity to provide ecosystem services such as food, fuel and fibre. The capacity to adopt improved management practices is the primary condition used to assess Human Assets. The subdivision of asset classes under each heading can be as short or as detailed as required. Desired outcomes can be set and measured. The method is flexible and can be refined by drilling down to either more assets or finer detail within assets as capacity within the organisation develops and/or the need arises. This method allows the addition of asset classes and indicators that are developed at a later date as might occur with the National NRM Matters for Target.

An eight-stage workplan is developed that helps identify indicators and potential sources of data and ways of aligning them to other state and National initiatives. Methods of setting standards, acquiring and managing data and presenting the results are provided and ways of aggregating it through the multi-criteria analysis system developed by the BRS are discussed. Using this assessment process it will be possible to identify the relative condition of catchments to each other and the capacity of land managers in them to bring about change. Assessments over time will be able to measure that change.

The scope of the assets of significance is defined as well as a summary of content, products, examples and costs for the three options are provided:

- Option 1 uses the simplest conceptual model with minimal data requirements. It uses only the minimum amount of information to provide a measure for each component in the framework. It can be and presented online together with map products and written summary reports.
- Options 2 and 3 rely on more detailed information and link to other NRM initiatives through resource condition indicators. They both rely on more complex web-based analysis for use of the multi-criteria analysis shell (MCAS) developed by BRS. A greater number of indicators for each asset. This can be presented on line in a way that is interactive and allows users to navigate through data and aggregate and integrate data sets.
- Option 3 includes a method for including scenario-based modelling to support investment decisions.

Chesson and Kingham provide a method for national assessment of catchment condition to assist in NRM priority-setting and decision making. They point out that some of the impediments encountered by the Audit in its first assessment of the intensively managed catchments still remain, namely, lack of data collection and inadequate data quality.

### 3.5.2 Signposts for Australian Agriculture: A Framework for Developing Economic and Social Indicators

This report discusses the issues surrounding the identification of indicators for the 'Signposts for Australian Agriculture' project. The concept of 'Ecologically Sustainable Development' (ESD) was used as a philosophical basis to develop economic and social indicators. A set of criteria was established to select the economic and social indicators that can be derived from available data sources. Data for the following economic indicators can be obtained from the ABARE farm surveys that include all agricultural industries with the exception of cotton, sugar and horticulture:

- Total factor productivity - this is a relative measure of total farm output to input use
- Farm business profit - the measures can be used for this indicator include *Net value of production* (can be used to measure national production) and *farm business profit* (which is more appropriate to monitoring change over time using farm data)
- Farm land value -this provides a financial measure of the natural resource base of agricultural production.

The authors discuss the difficulty of defining the relevant social outcomes in NRM and then selecting indicators that can be supported by available data. This is made more difficult because of the impediments to clearly identifying the contribution of agriculture to human and social capital. The following three indicators were selected:

- Number of farm accidents - this is the number of farm accidents reported as OH&S incidents sourced through the National Occupational Health and Safety Commission
- Level of education and training - this is a measure of the education level attained by people employed in a defined industry or geographic area sourced through the ABARE farm surveys
- Employment - this is a measure of the number of people that are employed in a defined industry or region sourced through the Australian Bureau of Statistics

It is concluded that it is not possible to get a single measure of the contribution of agriculture to ESD. Identifying the contribution of agriculture to each of the biophysical, economic and social components of ESD is achievable. This depends on selecting indicators clearly related to identifiable agricultural policies and actions. Following this principle also reduces the number of potential indicators. The authors point out that indicators are not a substitute for the detailed analysis of costs and benefits and the policies that underpin them.

## 3.6 Regional implementation

### 3.6.1 Regional Integrated Catchment Condition Reporting – Catchments to the Coast

The aim of this project was to develop the tools and process for reporting regional catchment condition. It uses the conceptual framework developed by Chesson and Kingham (2005) described above. It was also aimed to develop a consistent NRM reporting approach particularly for addressing social, economic and environmental outcomes.

The reporting framework was based on the Signposts for Agriculture component tree but modified to meet the case study regional needs. The main components highlighted were:

- Value of human assets
- Value of natural resources (natural capital)
- Effect of the region on bio-physical systems beyond the region

These major asset classes can be expanded into as many specific indicator classes as required such as addressing a specific target with a performance measure for which data exists. The process of customising the component framework to meet individual regional requirements is shown.

A set of criteria was used to select two case study regions that included a capacity to implement MCAS. These were Hunter-Central Rivers Catchment Management Authority (HCR CMA) and Far North Queensland Natural Resource Management Limited (FNQ NRM). Sample report cards were developed but the authors note that no real data was used and these were trials to determine whether the method could deal with different ways regional organisations defined their assets.

The project resulted in examples of what the report cards would look like if they were fully developed for each of the case study regions. They were placed on a website to demonstrate how the material could be accessed online. A list of data sets was compiled that aligned to the FNQ NRM customised framework.

The main findings were:

- 1** There is a need to identify roles and responsibilities for monitoring, evaluation and reporting of catchment condition (specifically between state governments and regions)
- 2** There is a tension between having the flexibility to create report cards based on local priorities, versus national standard indicators
- 3** Current data and data collection activities are insufficient, and will result in significant gaps in catchment condition reporting at the regional and national levels

- 4 There is a tension between a simple, succinct report on catchment condition and NRM reporting that is transparent and supported by scientifically credible information that covers the range of relevant considerations

These findings resulted in the following recommendations:

- 1 The Audit, drawing on the resources available to it through the Audit Advisory Council, should engage with national, state, and regional agencies involved in monitoring, evaluation and reporting to increase awareness and understanding of how their roles and responsibilities interact. (It was noted that the reporting framework developed could be used to identify priorities for NRM reporting, and assign responsibility for collecting the information)
- 2 A particular effort is required to articulate to the regions the importance and role of indicators required for national and state level monitoring, evaluation and reporting
- 3 Long-term data collection and monitoring programs using consistent methods need to be established. This will enable time series reporting of resource condition which can inform the effectiveness of NRM investment strategies
- 4 A simple report card supported by a detailed web-based information system is recommended as an effective way of reporting on catchment condition.

### 3.6.2 Triple Bottom Line Indicators for a Victorian Catchment Management Authority

Tiller and Fitzsimmons (2007) apply the Millennium Ecosystem Assessment (MA Framework) to developing the Triple Bottom Line (TBL) social, economic and environmental indicators for Victorian Catchment Management Authorities. The MA Framework was developed by the United Nations to assess the consequences of ecosystem change for human wellbeing and establish a scientific basis to improve the conservation and sustainable use of ecosystems. It is based on the interdependencies between ecosystem services, drivers of change, and human activity. Having applied the MA Framework to Victorian landscapes the authors then use the North East Catchment Management Authority (NECMA) as a case study region for applying the MA Framework.

Tiller and Fitzsimmons also review the Generic Framework methodology developed by the BRS and applied in the Wet Tropics in North Queensland and the Hunter-Central Rivers. They interrogated both the BRS method and the MA Framework with the following questions:

- Did it build capacity of stakeholders to track progress towards sustainability?
- Was it applicable at multiple scales?
- Was there integration of the components?

- Did it enable consistency of reporting across scales – national, state, regional?
- Did it add value to take a human wellbeing perspective rather than land assets?
- Do the two frameworks contradict or complement each other?

Tiller and Fitzsimmons regard the BRS methodology as an asset-based approach. They acknowledge that it includes both biophysical and human assets and has the flexibility to accommodate variety in the way jurisdictions and organisations define their assets. However, these authors argue that the wide variety of asset descriptions and definitions used in the BRS method makes it difficult to include social and economic data. They believe that the MA Framework imposes a more consistent approach in integrating socio-economic and environmental aspects to guide decision-making. According to them, the MA Framework is also more successful in showing the interdependencies between human wellbeing and resource condition.

Tiller and Fitzsimmons held a workshop with the North East CMA to select 12 indicators from a list of 63 indicators developed as part of another project funded by the Victorian Government titled *Triple Bottom Line Indicators for Victorian Landscapes*. Indicator selection criteria were established and used to select the 12 indicators.

The indicators selected were based on their alignment with the key determinants of the MA Framework as well as the State wide targets and National M&E Framework. Selection criteria was established and this used in workshop with NECMA to select the following 12 indicators. The MA Framework determinants are; Ecosystem services, Drivers of change, and Human well-being. The 12 indicators selected to represent these determinants were:

- 1 Social value of rivers
- 2 Index of stream condition
- 3 Condition of fresh water – presence of contaminants
- 4 Extent and condition of native vegetation
- 5 Conservation status of native vegetation types
- 6 Distribution of regionally prohibited pest plants
- 7 Distribution of pest animals
- 8 Soil structure and decline
- 9 Diversity of land use types
- 10 Change in land cover between 2006 and 2030
- 11 Number of farms implementing whole farm plans/EMS
- 12 Soil water erosion risk.

In using these indicators, Tiller and Fitzsimmons found that the MA Framework helped in working through CMA program logic. They also found

that the triple bottom line indicators could be incorporated in the process of understanding the relationship between, activities, causes, impacts and influences. A set of evaluation questions were developed to ensure that the indicators fit the NECMA and whether they are relevant to both regional and state scales. They note that this process can not take place without significant local knowledge and expertise so that regional reporting is accurate and can then be aggregated at different scales with confidence.

They make the following observations on the key issues they identified:

- Greater consistency and reliability of data across the different scales is required and this could be achieved by coordination across the different scales of regional, state and national reporting requirements
- The capacity to monitor performance is limited without clearly defined objectives
- The capacity to acquire, organise, query and present information from different data sets needs strengthening
- There needs to be an on-going capacity for TBL indicator development and repeatable reporting in a particular timeframe that is cost effective.
- There needs to be benchmarking and testing assumptions on impact of activities
- Data collection and availability remains an impediment.
- The adoption of appropriate monitoring and evaluation programs based on TBL indicators

They advocate the next steps as:

- Development of an information support system for regional planning
- Better knowledge management both for reporting and data custodianship
- Ensuring that indicator products and maps are accessible at the Victorian Resources Online website.

### 3.6.3 Tasmanian Integrated Catchment Reporting (Georges Catchment)

The aim of this project was to review catchment reporting processes and requirements and develop a method for reporting on the Georges Catchment. The catchment is regarded as priority catchment in the Northern Tasmania region. The method and indicators selected were based on addressing the principles in the National M&E Framework and align with *Northern Tasmania Natural Resource Management Strategy* as well as the assets addressed in the Georges Catchment strategy the *Break O'Day Natural Resource Management Strategy*. It was also designed to meet the Tasmanian Monitoring and Evaluation Strategy, the National Action Plan for Salinity and Water Quality (NAP) and the Natural Heritage Trust Extension.

The review of reporting methods resulted in the selection of a modified version of the BRS *Catchments to Coast* framework. It is an asset-based approach but with the incorporation of the concept of ecosystem services. Seven asset classes are used: land, water, biodiversity, estuaries, atmosphere, communities, cultural heritage. The Georges Catchment is used as a sub-regional case study area for testing the method.

A spreadsheet monitoring tool was developed for each asset to manage data for the selected resource condition and management targets as well as scoring condition and trend. A large list of potential indicators was scanned based on a set of criteria. They were then refined on the basis of availability and suitability to the targets. Two or three indicators were chosen for each target.

The information package chosen to convey condition messages for the Georges Catchment was a scorecard for each asset. A standard format was used to create consistency and ease of interpretation. The standard format includes a map and/or photos and diagrams to visually represent the condition, supporting written information, a case study on management activities and a panel that shows the asset condition and trend. Condition of indicators was assessed using a standard scoring system – excellent, good, marginal, and poor. A management rating was also given based on assessment of four criteria – planning, capacity building, onground works, and monitoring.

The project focussed on an individual catchment – the Georges. However, it was determined that ultimately a nested approach, with two scales of reporting, would work well in the region. The scales are as follows:

- Whole of region – where a ‘watching brief’ occurs by collecting information on the full suite of assets/indicators covered by the framework. This would provide comparison between all areas in the catchment.
- Priority catchments – defined as those catchments having high values, threatening processes and management activities occurring (e.g. Georges Catchment). More detailed information and data would be collected and analysed for these areas. The focus could also be on priority issues/assets, with potentially only a portion of the framework considered in any one catchment.

An approach focussed on regional reporting was considered to be more cost-effective, enable comparison between catchments and ensure NRM North’s reporting obligations are met.

Towards the conclusion of the project a brief evaluation was undertaken focused on project quality and impact. This included a telephone survey of key project stakeholders. The key evaluation outcomes were:

- The trial was a valuable learning and capacity building exercise. It has created a strong foundation for further development of integrated catchment reporting.
- There is a consistent view from participants involved in the trial that the project has had a greater impact on their understanding of reporting than on their understanding of catchment condition. To paraphrase some respondents, it was more about the experience than the outputs.
- It is clear that this project needs to be considered the first step in a process to create better reports on catchment condition. Continued work would reinforce the partnerships formed, capitalise on increased participant capacity to report, and ultimately lead to a higher quality and usefulness of catchment condition reporting in NRM North and other regions.

A summary of the catchment condition reporting processes reviewed in this report are provided in Table 3-3.

Table 3-3 Summary of regional implementation

Region where report card used	Report and authors	Type of report card used	Indicator selection	Alignment with state and national requirements	Comments
Hunter – Central RivCMA)	Kingham, R., Chesson, J., Georgeson, I., Grant, M. (2007). Regional Integrated Catchment Condition Reporting – Catchments to the Coast. Final Report BRR 42. Audit 2007	Used generic framework, or component tree, designed for Signposts for Agriculture as basic framework to develop pathways between asset condition, targets and management actions.	The intention was to customise the generic framework to align with the HRCMA priorities. However, HRCMA already used NSW Natural Resources Commission State-wide Standards. HRCMA saw developing methods of measuring changes in catchment condition as a State responsibility.	Indicators could more easily be aligned to National M&E Framework because based on NSW NRC Standard.	Main emphasis for HRCMA was to use the opportunity to focus on tools to set targets and then management actions.
Far North Queensland NRM	As above	Uses the existing Wet Tropics regional assets then analyses each using Signposts for Agriculture component tree to reveal different layers and then select indicators. Used to develop spatial analysis of assets shown on map together with level of investment shown. Catchment condition was also shown with kite diagrams to show score for each subcatchment. Envisages on line reporting at various levels of complexity according to regional organisation needs and stakeholder needs.	Selection was difficult because: <ol style="list-style-type: none"> <li>1. Lack of reliable data</li> <li>2. Insufficient knowledge of how any chose indicators would relate to asset condition</li> </ol>	There was tension between selecting indicators that would suit the region as well as align with national National M&E Framework.	<p>Main emphasis was on using a reporting framework to align management actions and resource condition targets</p> <p>Indicators proposed by region differed from National M&amp;E Framework.</p> <p>Process viewed by region as assisting ME&amp;R.</p> <p>The result was a conceptual model and did not use real data.</p>

Region where report card used	Report and authors	Type of report card used	Indicator selection	Alignment with state and national requirements	Comments
North East Catchment Management Authority, Victoria (NECMA)	Tiller, L., Fitzsimmons, P (2007). Triple bottom line indicators for a Victorian catchment management authority. Department of Primary Industries Victoria. Audit 2007	Used the Millennium Ecosystem Assessment (MA) Framework developed by United Nations. Particular interest was in applying the TBL.  Presented as maps, graphs, tables together with explanation of indicators, relevance and regional and State trend analysis. Proposed on-line visualisation for stakeholder engagement.	Held a workshop to select indicators based on MA Framework that would align to a range of State and National requirements as well as the NECMA Regional Catchment Strategy. Selected 12 indicators.	Set out to develop indicators that aligned with State and national requirements as well as SoE reporting.	The main aim of this project was to trial a method where indicators were used that could be disentangled to show social, economic and environmental outcomes.  This was also a trial and not fully implemented.
Georges Catchment, NRM North. Northern Tasmania	RMCG (2007). Tasmanian Integrated Catchment Reporting (Georges Catchment) Draft Catchment Condition Report. RMCG Consultants, Melb. 2007	Data was collected from discussions with key staff and two or three were chosen for each asset class. Analysed to demonstrate current condition, trends and progress towards targets. Worksheets for the development of a score card were prepared. A printed score card was developed for presentation in two forms:  1 A one-page glossy for the general public  2 A two-page score card for NRM managers with additional information on data source, reliability and management implications.	Indicators were selected for each asset and the resource condition targets.	Georges Catchment is a priority subcatchment of NRM North so reporting was aligned to overall Northern Tasmania NRM Strategy. Authors state that the latter is aligned to National M&E Framework.	This was a conceptual model and has yet to be fully implemented.

## 4 Results of the survey of NRM regional delivery organisations

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### 4.1 Background

Telephone interviews were conducted with regional NRM organisations in April 08 to determine their reporting methods. The main purpose was to determine whether a report card based on indicators was used for reporting catchment condition. Respondents were also asked whether their reports were placed on the web.

### 4.2 Results

A total of 57 regional NRM organisations across Australia were identified as relevant to this survey. All of them maintained websites. It was possible to conduct telephone interviews with the appropriate member of staff with 49 of the 57 organisations, providing an 86 % sample. The results are shown in Table 4-4.

Table 4-4 Results of the survey of regional NRM organisations

Number of regional NRM organisations contacted	Number with websites	Number of NRM regional organisation that were interviewed	Number of respondents involved in reporting –eg reports to governments, annual reporting, SoE reporting	Number with reporting links on their website	Number involved in catchment condition reporting	Number that currently use a report card based on indicators	Number that do not currently use a report card but intend to do so
57	57	49	49	9	10	4	5

This is presented graphically in Figure 4-2.

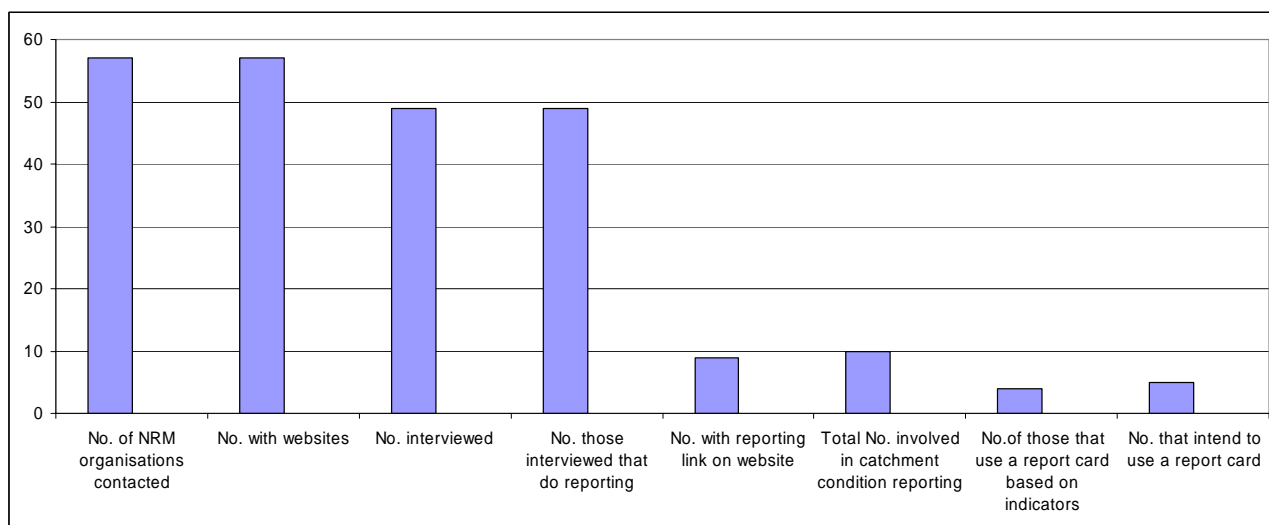


Figure 4-2 Graphical representation of phone survey

## 4.3 Conclusions

The main conclusions that can be drawn from the survey are:

- A variety of staff are responsible for reporting and this is reflected in their position title. Only 16 out of the 49 staff contacted of the regional organisations described themselves as the monitoring and evaluation officer, or very similar title
- All 57 organisations had an active website
- All of the organisations interviewed stated that they had reporting obligations for boards, governments, annual reports and SoE reporting
- Notwithstanding these reporting obligations, only 10 respondents stated that they specifically addressed catchment condition reporting and only four of those used a report card based on indicators made available to the public on the website
- The intention to use report cards is not high with only five organisations stating that they intend to use them.

## 5 The main findings

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### 5.1 The need for catchment reporting

#### 5.1.1 A clear need for a consistent system of catchment/regional reporting

All the reports reviewed for this synthesis report highlight the need for a consistent method of catchment/regional reporting that allows comparisons between catchments/regions and can be aggregated at state and national levels. There is a wide variety of reporting methods being used both within states and nationally. It is clear that some states have addressed the need for consistency with wider requirements more than others. Notwithstanding, this move towards consistency, the appropriate method has not yet been established. Consequently, there is a wide variety in reporting timelines, methods used such as written reports or web-based score cards and the underlying indicators selected for reporting.

### 5.2 The methods used for catchment reporting

#### 5.2.1 Need for a commonly agreed approach to selecting indicators for reporting

Along with a consistent method of reporting is the need for as much consistency as possible in the selection of indicators. A number of the reports listed a preferred criteria for selecting indicators. The following is a composite list of all the criteria listed and recommended in each of the reports:

- 1 They should be relevant to planning, management, policies and regulations and regional priorities.
- 2 The indicators need to be able to be disentangled from other issues so that they clearly relate to the resources and/or assets that are being reported.
- 3 Are they aligned to Resource Condition Targets and Management Action Targets and in a way that can be used for monitoring and evaluation?
- 4 Are they aligned with State policies and requirements, SoE and National M&E Framework?
- 5 They should be sensitive to system change by showing trends in condition.
- 6 Does the indicator demonstrate a response in condition relative to management action?

- 7 Are the data available at the scale of intended use?
- 8 Are there cost limitations in acquiring and processing the data?
- 9 Are the methods of data collection and sources of error well-documented?
- 10 Is the variability of the data large enough to affect the interpretation of the attribute at the scale of intended use?
- 11 Has the attribute been validated to have meaning relative to the assessment question and the scale of intended use?
- 12 Is the indicator widely understood and regarded as useful by users?
- 13 Is there expertise in the catchment/region to analyse and use the data?

## 5.2.2 There are different approaches

Although one 'agreed' process for reporting was not identified there has been significant progress in scoping and developing reporting frameworks and indicator selection. For example, the component tree framework developed for the *Signposts for Agriculture* project is outlined by Kingham *et al* (2007). It presents a systematic way of ensuring all assets are incorporated and indicators are chosen for them. It is used as organising tool for examining assets and drilling down to their components.

Tiller and Fitzsimmons (2007) used the MA Framework for showing interdependencies between human wellbeing and resource condition. For them, the MA Framework addresses interdependencies and from a human context rather than a more biophysical asset based approach.

The 'next step' in developing an agreed reporting process has been hampered by a number of issues including:

- Different NRM organisations define assets differently
- There is difficulty in getting agreement on the indicators to be used
- The same data sets are not available across all jurisdictions.

Realistically, it may not be practical for an agreed process to be implemented across all jurisdictions. However, there is now enough information and background work to enable successful report card processes to implement.

## 5.2.3 Integration with State and National requirements

The case studies undertaken by Hyder Consulting in 2005 show that most of the Australian NRM organisations they reviewed had responded to local and regional reporting requirements rather than address the National M&E Framework. They note that alignment with some of the National M&E Framework is readily achievable but the indicators need to be complimentary to regional needs.

Chesson and Kingham (2005) found that there were practical limitations to using the National M&E Framework such as identifying the indicators and data availability. They note that the National M&E Framework was still being developed and there was not complete agreement on the components of each asset and the indicator for that component. Consequently, Chesson and Kingham recommend that:

- 1 Desired outcomes should be specified. This way they can be linked to targets and are also transparent so that they can be agreed upon
- 2 Align indicators with others being used such as National M&E Framework, State of Environment, ANZECC
- 3 Performance measures for each component need to be specified
- 4 Assessment of catchment condition arising from analysis of the above steps should be linked to the regional NRM strategy and investments.

In a later project, Kingham and Chesson (2007) found closer alignment in NSW than in Queensland. In NSW targets and indicators were coordinated at State level whereas there was more variety of approaches in Queensland. Different jurisdictions have different interpretations of reporting requirements and there remains a lack of data collection and inadequate data quality. The report by Tiller and Fitzsimmons (1970) who applied the MA Framework methodology made their selection of indicators consistent with Victorian Government policy and reporting requirements as well as the National M&E Framework.

## 5.2.4 Addressing the triple bottom line

The importance of incorporating social and economic indicators and analysis in reporting is well-recognised in all the reports. What has not been successfully resolved is how best to achieve this result and what indicators are the most suitable for doing so. At least two of those reports, Tiller and Fitzsimmons (2007) and Ashton and Goesch (2005) focus on the issue. Their reports highlight the difficulty NRM organisations face in selecting social and economic indicators at a catchment/regional level with current resources. The standard indicators and data available from broad surveys such as the farm surveys by ABARE and the census data from the ABS are difficult to disentangle from the wide variety of local and regional influences that shape NRM.

## 5.3 The application of catchment condition reporting

### 5.3.1 Data availability

A common theme across the reports reviewed is the lack of data available to inform the report card process. For example, Tiller and Fitzsimmons state at the catchment scale, the North East CMA had little or no spatial information to contribute to the TBL indicators. There is also a lack of sound monitoring information to accurately report on resource condition and trend.

Kingham *et al* 2007 state that “Data availability remains a serious impediment to comprehensive assessment of catchment condition”. This lack of data within and across jurisdictions inhibits the ability to develop report cards that are comparable across different regions; however, it would not stop most NRM organisations from developing a report card for their own area.

### 5.3.2 The capacity of the NRM organisations

Developing report cards is not a simple process. They require considerable effort to:

- Define assets
- Define indicators for assets
- Source and organise data
- Agree on benchmarks and methods to assess condition.

This requires discipline and to provide value, must be repeated at regular intervals. Repeatability is therefore important. Given that the report card process could be at yearly, two-yearly, or five-yearly intervals, and that staff are likely to have moved on during these periods, it is important that the method is well documented and easily followed.

The reporting process could be stream-lined with the development of agreed processes and supporting tools. For example, among the recommendations made by Tiller and Fitzsimmons (2007) is that an on-line database combined with visual spatial outputs would increase capacity to make informed land management decisions.

## 6 Conclusion

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Report cards are a powerful tool and there is a clear need for consistent reporting on catchment condition throughout Australia. Governments continue to invest large amounts of money on a variety of activities carried out by regional NRM organisations. The use of report cards based on agreed indicators would enhance catchment condition reporting and allow comparisons between regions, particularly if they are aligned with the National M&E Framework.

Impediments to the use of report cards remain that need be addressed. Unresolved issues such as indicator selection, the availability of data and the way it is processed and presented ensure that more work needs to be done. The difficulty of incorporating social and economic data has not been resolved. Although not commonly referred to in the reports previously undertaken, the capacity of NRM organisations to undertake a report card process may be the most important limiting factor for adoption and implementation.

### 6.1 Recommendations

#### 1 Develop a common set of core indicators with quality data

There is a need to reinforce a core set of national indicators with reliable data sources attached to them. There needs to be a clear role and responsibility for data collection and resources allocated to developing partnerships to undertake that role. It is easy to list numerous potential indicators. It is very difficult to narrow them down to the assets and targets of each CMA and then attach data sources to them. This is a priority project.

#### 2 The need to scale indicators from the regional through to national and state level

The core indicators that are identified need to align with regional reporting but they also need to allow comparisons at state and national level.

#### 3 There is an urgent need to identify social and economic indicators at the regional level

Many of the indicators that are labelled as biophysical do encapsulate a large amount of social and economic data. For example, any measure of water quality or extent of vegetation cover is also a measure of social and economic history of the region as well as current impact. Regions need a great deal of assistance in disentangling indicators. Broad statistics such as population growth, employment and gross regional product are very difficult to use for NRM.

## 4 Capacity building in report card development and use

Some of the methods of report card development and presentation require a high level of skills and resources. Some regional organisations will require training and capacity building in the appropriate techniques such as data storage and manipulation through techniques such as multi-criteria analysis.

## 5 A Commonwealth Government requirement attached to funding

There are good reasons for catchment condition reporting using the report card that is transparent and used to measure investment outcomes. One reason why some NRM organisations are not undertaking this reporting is because it has not been a necessary condition of funding.

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