



Environment,
Climate Change
& Water



**New South Wales Natural Resources
Monitoring, Evaluation and Reporting Strategy
2010–2015**



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Published by:

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ISBN 978 1 74293 028 2

DECCW 2010/977

December 2010

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Introduction

Purpose

The NSW Government invests in natural resource management (NRM) to ‘improve biodiversity and native vegetation, sensitive riverine and coastal ecosystems, soil condition and socio-economic well-being’ (NSW Government 2010a). The success of NRM in NSW depends on having appropriate information available to support decision-making at each stage of the adaptive management cycle. Monitoring, evaluation and reporting (MER) are therefore integral components of NRM delivery.

The NSW Natural Resources Monitoring, Evaluation and Reporting Strategy 2010–2015 (MER Strategy) guides the monitoring, evaluation and reporting efforts of natural resources over the next 5 years to:

- support continuous improvement of NRM and investment decisions
- inform evaluation and reporting on progress towards the state-wide NRM targets at the State and catchment scales
- improve knowledge of the condition of natural resources and the pressures on them, as well as on trends in the condition of our natural resources
- improve capacity to report on achievements of investments in NRM programs
- improve data management and sharing arrangements among MER partners
- enhance collaborative partnerships with key NRM players to strengthen the MER effort.

Audience

The MER Strategy has two key audiences:

- the NSW Government and other investors – Evaluation and reporting on progress towards targets and achievements of NRM investment will provide greater levels of transparency and accountability in relation to public expenditure, and will help the government to set policies and prioritise investment.
- natural resource and land managers, whether public or private – Monitoring and evaluation information will support them to adaptively manage natural resources and prioritise investments.

External relationships

The MER Strategy was developed in accordance with the state-wide NRM targets (Appendix 1) and is consistent with the *Standard for Quality Natural Resource Management* (NRC 2005).

The approach to MER adopted in the MER Strategy is aligned with the Evaluation Framework for CMA Natural Resource Management (DECC 2009) and the Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework (AG NRM MERI Framework) (Australian Government 2009).

The MER Strategy supports regional delivery of NRM in NSW and informs the review, revision and ongoing implementation of Catchment Action Plans (CAPs). The MER Strategy was developed with the key drivers for MER in mind and supports policy and planning

initiatives such as the draft NSW Biodiversity Strategy 2010–2015 (NSW Government 2010b).

Internal relationships

The MER Strategy is a high-level strategic document that was developed by the Natural Resource and Environment Chief Executive Officers Cluster (the ‘Cluster’) with help from the NRM Senior Officers’ Group (SOG) and the MER Strategy Working Group. Appendix 2 provides details of these groups. It builds on the achievements and experience gained in implementing the 2006 *NSW Natural Resources Monitoring, Evaluation and Reporting Strategy* (DNR 2006).

Comprehensive details on implementation actions of the key inter-agency MER programs are outlined in the internal working document prepared by the NRM Senior Officers’ Group. This internal working document is referred to as the MER Implementation Plan and is a ‘living’ document rather than a static plan. To underpin the MER Implementation Plan, an inter-agency data agreement and related schedules will be brokered to commit each MER partner to acquiring, managing and sharing MER data. Figure 1 outlines the relationships between the documents.

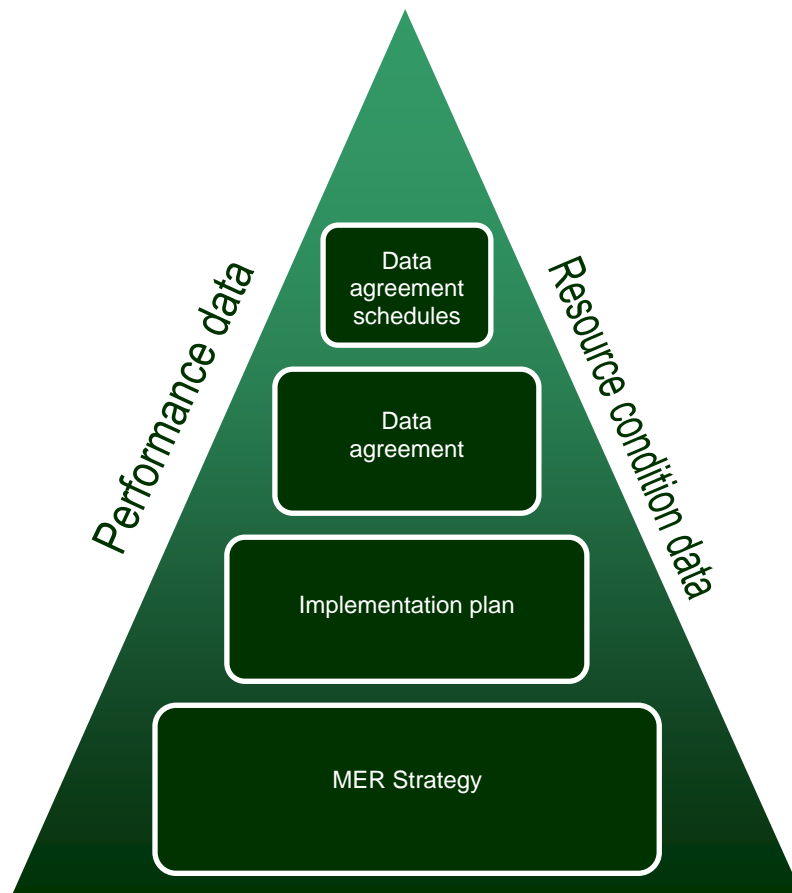


Figure 1: Relationship between the MER Strategy and supporting documents

Principles

The 10 key principles underpinning the MER Strategy are as follows.

Principle 1

It is recognised that interventions have impacts at different temporal, spatial and institutional scales. Logic-based approaches will guide MER activities.

Principle 2

As far as resources and organisational capabilities allow, the outputs and outcomes of public investment in NRM on public and private land will be captured.

Principle 3

Establishment and maintenance of strong collaborative partnerships with all partners in NRM are essential to the delivery of MER.

Principle 4

Investment in MER activities should be efficient, giving priority to addressing critical information needs and outcomes; making best use of existing data; clearly identifying roles, tasks and timelines for delivery; and avoiding duplication.

Principle 5

Datasets and indicators should be developed in order to aggregate and disaggregate source data for use at a range of spatial scales where possible.

Principle 6

MER of NRM should be consistent with best practice. Data collection, management and sharing protocols should meet established standards and be consistent with community expectations.

Principle 7

Data collection standards should be specified by the data custodians to facilitate exchange and multiple uses of data.

Principle 8

All data collected, collated or derived under the MER Strategy should be freely available and exchanged across all levels of MER (except where data access is restricted) by way of data-sharing frameworks and standards defined by the NSW Common Spatial Information Initiative (CS2i) (see www.cs2i.nsw.gov.au/).

Principle 9

Data management, storage, sharing and dissemination standards and systems are the responsibility of the respective organisation carrying out the monitoring activity.

Principle 10

Feedback loops from evaluations to policy-makers, natural resource managers and the community are essential if evaluation lessons are to be learned and NRM policies, programs and projects improved.

Focus and priorities

The long-term vision for NRM MER is for a seamless link between local, regional, State and Australian Government NRM data that truly informs and guides the whole community on how we care for the natural resources of the State. This vision will be achieved by progressively developing collaborative partnerships across the NRM sector and building robust mechanisms that facilitate the acquisition, management and sharing of NRM data.

The vision for NRM MER will take many years to achieve. The MER Strategy 2010–2015 builds on the achievements and experience gained in implementing the 2006 *NSW Natural Resources Monitoring, Evaluation and Reporting Strategy* (DNR 2006). The 2006 MER Strategy focused on making best use of existing resource condition monitoring to inform NRM policy and investment decisions and develop monitoring programs to address areas where no resource condition monitoring existed. The first state-wide analysis of the monitoring data was produced for the 2009 NSW State of the Environment (SoE) Report (DECCW 2009) and for an initial set of State of the Catchment (SoC) reports in 2010 (see www.environment.nsw.gov.au/publications/reporting.htm).

A key challenge for NRM MER is that the condition of natural resources is often slow to respond to management actions, taking many years to improve or reverse negative trends. Natural systems are also very complex and highly variable. In addition, NRM interventions operate at different spatial, temporal and institutional scales, with numerous parties contributing to the NRM effort in NSW. These challenges, combined with the limited nature of the resources and organisational capacity available to undertake MER, mean that a staged approach to implementation is required.

The MER Strategy will focus over the next 5 years on the following priorities:

1. **Review and prioritise the MER of resource condition** – In the first year of the MER Strategy, the current frequencies, methods and indicators of the existing resource condition MER program will be reviewed, and gaps in the program will be identified, so that the essential level of data required to report on the status of, and trends in, the condition of natural resources can be identified. This review will help to prioritise the MER effort and build a business case for identifying an appropriate level of funding to support the program.
2. **Develop a new program performance strand** – The resource condition MER program provides information on the status of, and trends in, the condition of natural resources, as well as long-term change information. Given the slow rate at which the condition of natural resources changes, it has become apparent that we need a new MER program in order to give natural resource managers, government and investors information on those short- to medium-term outputs and outcomes of NRM activity that are understood to contribute to our long-term resource condition outcomes. This program will be developed and implemented in a staged manner over the life of the MER Strategy.
3. **Develop and enhance collaboration with MER partners** – The MER Strategy requires the collaboration and support of a range of NRM players if it is to succeed. Resources and organisational capacity are limited, and therefore engagement with different stakeholders will be prioritised. The engagement priorities are:
 - i. **Enhancing the collaborative partnerships with key MER partners and clarifying roles and responsibilities** – Key MER partners include the Department of Environment, Climate Change and Water (DECCW, including the NSW Office of Water (NOW)), Industry & Investment NSW (I&I NSW), Catchment Management Authorities (CMAs), the Natural Resources Commission (NRC) and the Land and Property Management Authority (LPMA). The list of MER partners is not static. As the MER Strategy is implemented, additional bodies may become MER Partners.
 - ii. **Engaging local government, which plays a major role in managing natural resources and land and has responsibility for preparing SoE Reports every 4 years** – The Division of Local Government has developed an Integrated Planning and Reporting framework to improve the integration of various statutory planning and reporting processes undertaken by councils, including reporting on the environment. Engagement with local government has begun initially with the Division of Local Government and the Local Government and Shires Associations to investigate opportunities to better align MER activities at local, regional and State levels.

- iii. Progressively involving Federal Government and other State bodies that manage natural resources and/or contribute to the collection of NRM data – These include the Australian Government (e.g. the Caring for our Country program), Bureau of Meteorology, Australian Bureau of Statistics, the Sydney Catchment Authority and water authorities. In particular, national links are required to facilitate better flow of MER data and information up from the regional and State levels, as well as down from the national level.
 - iv. Informing and consulting with the Natural Resources Advisory Council of NSW (NRAC) as a high-level forum to provide key stakeholder advice to the NSW Government on NRM and land-use planning issues – Other industry and community groups that contribute to NRM and potentially to MER efforts will also be informed and consulted through existing forums in which key MER partners participate.
4. **Improve data acquisition, management and sharing** arrangements – Data and information management are crucial to the success of the MER Strategy. A priority is to develop robust mechanisms to improve data acquisition, management and sharing arrangements with key MER partners. Developing and brokering an inter-agency data agreement that commits each organisation to the acquisition, management and sharing of the NRM data is a central plank of the MER Strategy. This will be done in the first 6 months of the MER Strategy.

The MER approach

Continuous learning and adaptive management

MER provides decision-makers with timely information that they can use to learn from successes and failures. They can also use this information to continuously respond and adapt to, or replace, policies, strategies, programs and actions so that goals are realistic and NRM outcomes are continuously improved (Figure 2).

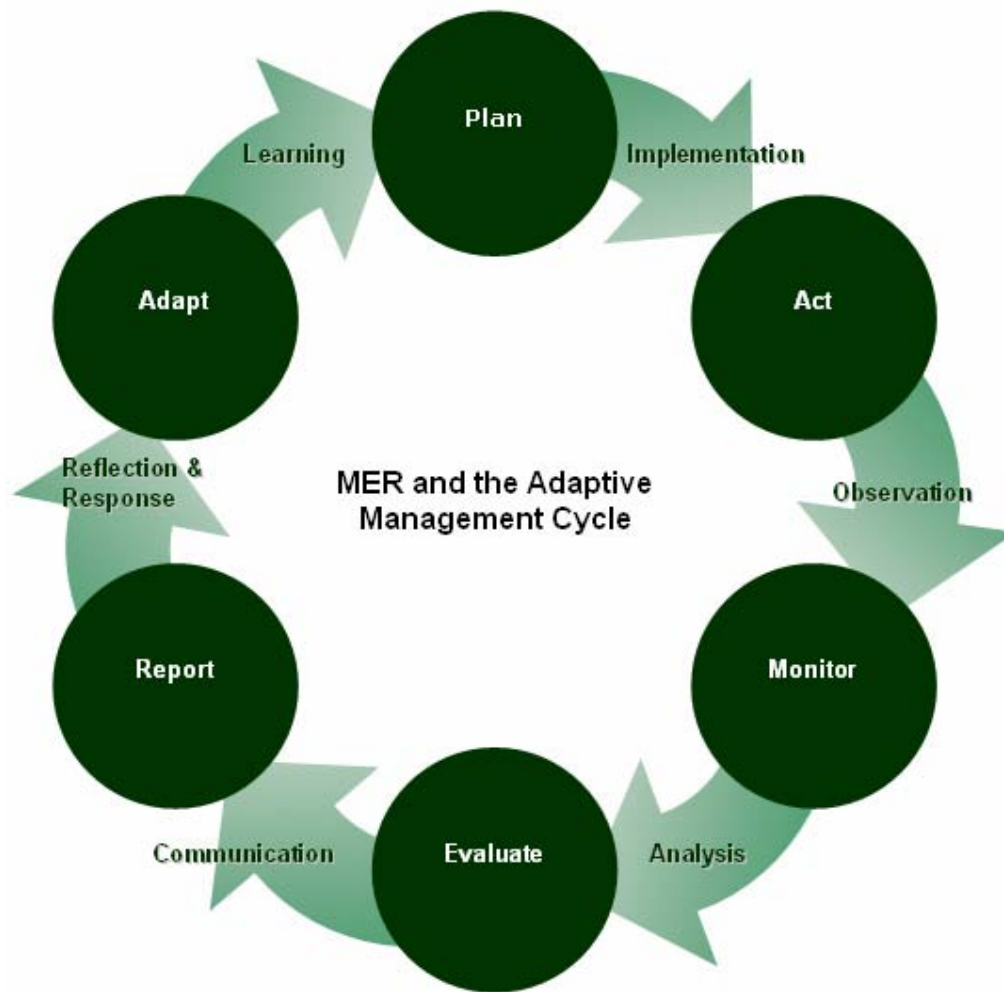


Figure 2: MER and the adaptive management cycle

The adaptive management approach is effective in NRM, because most NRM planning and investment decisions involve a high degree of complexity and uncertainty.

Adaptive management is a way of testing assumptions and progressively reducing uncertainty without delaying action. Because it is iterative, the adaptive management cycle can be used by policy-makers, decision-makers and MER practitioners to adjust methods or change priorities as circumstances change, new data become available, and knowledge about system function improves. All natural resource MER partners are encouraged to adopt adaptive management as an integral part of their business cycles.

Program logic and conceptual models

The MER Strategy is informed by a logic framework. Conceptual models and program logic are key components.

Conceptual models depict or represent the most current scientific understanding of the components, processes and interactions occurring in a landscape, natural resource asset or ecosystem. Conceptual models are useful tools that researchers can use to inform their research and share their research findings with natural resource managers and the community. They highlight knowledge gaps, establish priorities, clarify and synthesise thinking, and inform monitoring programs. For more information about conceptual models, see www.epa.qld.gov.au/wetlandinfo/site/ScienceAndResearch/ConceptualModels.html.

Conceptual models have been developed for each of the natural resource assets under the MER Strategy. Conceptual models should be updated and revised as scientific understanding of natural systems improves.

Program logic is a framework that describes the change expected following the implementation of a program or initiative. It is a systematic and visual way of representing a program, with its underlying assumptions and theoretical frameworks. (For more information see DECC 2009). Program logic describes the rationale behind a program and provides a representation of why and how it is believed the program will work. It identifies high-level outcomes and the steps to achieving them. That is, investment will provide management activities that produce outputs and then ‘outcomes’ at progressively higher levels that contribute to meeting the state-wide NRM targets. Program logic builds on the understanding gained from the conceptual models. The models identify assumptions and factors of success of the NRM program or initiative and help in program planning and design. In this way, they inform MER activities, including target-setting, defining key questions to guide actions, and developing appropriate indicators and performance measures at each of the logic levels. Like conceptual models, program logic models provide a useful communication tool and highlight knowledge gaps.

Program logics should be developed for all major NRM programs and initiatives undertaken by agencies. CMAs should review and update their program logics when they review and update their CAPs.

At the NRM sector level, the term ‘program logic’ refers to NRM outcomes generally, rather than specific programs. Table 1 uses a program logic hierarchy to show the different levels of outcomes expected over time for NRM investment. It reflects the reality that changes to resource condition occur over many years. The logic that underpins this table acknowledges that NRM operates at a range of scales and over different time frames.

Table 1: Program logic hierarchy for NRM

Outcome hierarchy	Outcome description	Associated targets
Vision/goals	<p>Statement of the vision or goal for the long-term</p> <p>'Improve biodiversity and native vegetation, sensitive riverine and coastal ecosystems, soil condition and socio-economic well-being' (NSW Government 2010)</p>	No targets at this level
Long-term outcomes	<p>Change in condition and extent of natural resource assets in the long term</p> <p>Includes the maintenance of condition and extent, or prevention of decline, as well as improvement of condition and extent.</p> <p>These long-term outcomes are the result of the cumulative effect on natural resource assets of human activity, climate change and natural variability of those assets. This includes, but is not restricted to, the effects of NRM intervention.</p>	<p>Longer-term targets at a broad geographical level (e.g. there is an improvement in the condition of riverine ecosystems in 10 to 20 years)</p> <p>State-wide NRM targets</p> <p>Some CAP catchment targets</p>
Intermediate outcomes	<p>Aggregate change, in the medium term, in how natural resource assets are managed and how management has affected on-ground results, including behaviour and practice change</p> <p>Includes:</p> <ul style="list-style-type: none"> • change in the extent and condition of the natural resource that occurs in the short to medium term (e.g. extent of native vegetation, water quality) • changes in attitudes, skills, knowledge, behaviour and management practices • a reduction in pressures on, and threats to, the asset. <p>Intermediate outcomes provide an indication of progress towards the long-term outcomes.</p>	<p>Intermediate targets</p> <p>(e.g. percentage of land managed in a certain way over 5 to 10 years)</p> <p>CAP catchment targets</p>
Outputs	<p>Immediate products or services that are produced by a program or project</p> <p>Includes biophysical (e.g. hectares of vegetation enhanced) or non-biophysical (e.g. number of participants in training workshops).</p> <p>These outputs are directly attributable to the investment or program.</p>	<p>Output targets</p> <p>(e.g. hectares of land revegetated, number of participants in training workshops in 1 to 2 years)</p> <p>CAP management targets</p> <p>Agency key performance indicators</p>
Foundational activities and inputs	<p>The resources and foundational activities used to produce outputs</p> <p>Inputs include resources (e.g. funds, staff hours) and foundational activities (e.g. developing plans, policies and strategies, and baseline data-gathering and research).</p> <p>These inputs are directly attributable to the investor or proponent.</p>	<p>Input targets</p> <p>(e.g. funds invested in NRM on-ground activities, number of plans implemented in 6 to 12 months)</p> <p>Targets identified in program/project plans</p>

Key MER questions

Key questions that the MER Strategy seeks to address at each level of the logic hierarchy are outlined in Table 2. They provide the focus for the MER activities that will be undertaken under the MER Strategy.

Table 2: Key MER questions and broad information needs

Outcome hierarchy	Key evaluation questions	Information required to answer evaluation question
Vision/goals		Aspirational (success is inferred)
Longer-term outcomes	<p>How are we progressing towards our NRM targets?</p> <p>What is the status of, and trend in, the condition (or extent) of natural resource assets?</p> <p>How effective are the cumulative management actions in achieving the desired long-term outcomes?</p>	<p>Resource condition data</p> <p>Resource condition data on status and trends, including information on pressures on the asset and trends in those pressures</p> <p>Resource condition data, point-of-investment case studies and aggregated output data</p>
Intermediate outcomes	<p>What is the preliminary change in the extent and condition of the asset arising from management actions?</p> <p>What is the aggregated change in how assets are managed? To what extent have land managers adopted practices that contribute to meeting our NRM targets?</p>	<p>Resource condition data on status and trends (including information on pressures on the asset and trends in those pressures and case studies)</p> <p>Aggregated output data</p> <p>Behavioural and practice change data</p>
Outputs	What products and services have been produced from NRM investment?	Output and input data

Monitoring, evaluation and reporting

MER activities operate at each level of the logic hierarchy (i.e. inputs and foundational activities, outputs, intermediate outcomes and longer-term outcomes).

The MER processes for the MER Strategy are outlined in the following section and summarised in Table 3.

Table 3: Key MER activities

	Monitoring	Evaluation	Reporting
Vision/ goals		Inferred from lower-level findings	No formal reporting (implied achievement)
Long-term outcomes	<p>State-wide monitoring of resource condition</p> <p>Resource condition monitoring at site of management activity</p>	<p>Multiple lines of evidence to evaluate:</p> <p>‘How are we progressing towards our state-wide NRM targets?’</p> <p>‘What is the change in status and trends of natural resource assets?’</p> <p>‘How effective are the cumulative management actions in achieving the desired goals?’</p> <p><i>Informs:</i></p> <ul style="list-style-type: none"> – <i>prioritisation of NRM investment</i> – <i>policy and program development</i> 	<p>Progress against state-wide NRM targets</p> <p>SoE Report</p> <p>SoC Reports</p>
Intermediate outcomes	<p>Medium-term changes in resource condition (e.g. extent of native vegetation and water quality)</p> <p>Aggregated change in management of asset (aggregated outputs)</p> <p>Land manager attitude and data on change in practices</p>	<p>Multiple lines of evidence to evaluate:</p> <p>‘What is the preliminary change in the extent and condition of asset?’</p> <p>‘What is the aggregated change in how asset are managed?’</p> <p>‘To what extent have land and natural resource managers adopted practices that contribute to meeting our NRM targets?’</p> <p><i>Informs:</i></p> <ul style="list-style-type: none"> – <i>investment strategies of CMAs and agencies</i> – <i>policy and program development</i> 	<p>Progress against state-wide NRM targets</p> <p>SoE Report</p> <p>SoC Reports</p>
Outputs	<p>Output information (e.g. area protected, number of people attending training)</p> <p>Case studies on performance</p>	<p>Evaluate:</p> <p>‘What products and services have been produced from NRM investment?’</p> <p><i>Informs:</i></p> <ul style="list-style-type: none"> – <i>programs and project planning</i> – <i>management and implementation of resources and on-ground activities</i> 	<p>Aggregated data to inform reporting against NRM targets at State and catchment scales</p> <p>CMA reporting against CAP targets</p> <p>Program/project reporting</p>
Foundational activities and inputs	<p>Inputs such as investment, staff costs, equipment, volunteer hours</p> <p>Foundational activities (e.g. plans implementation)</p>	<p>Assess:</p> <p>Inputs and foundational activities against plans</p> <p><i>Informs:</i></p> <ul style="list-style-type: none"> – <i>staff of the performance of the methods used</i> – <i>management and Board of on-ground performance</i> 	<p>Agency and CMA financial reporting</p> <p>Program/project reporting</p>

Monitoring

Monitoring addresses the evaluation questions and describes what is occurring over the monitoring period. Data gathered may be a mix of qualitative and quantitative and generated from formal or informal collection processes (DECCW 2009).

Types of monitoring

To understand the changes in resource condition and the outcomes of NRM investment, two strands of monitoring are required:

1. Monitoring of the condition of natural resource assets or the 'resource condition' strand is required to provide an assessment of changes in the state of, and trends in the condition of, natural resource assets in the longer term.
2. Monitoring of natural resource program performance, or the 'program performance' strand, assesses the foundational activities, outputs and intermediate outcomes achieved from investment in NRM programs in the short and medium term.

Monitoring data and information collected by both strands will be brought together through evaluation processes to inform reporting of progress toward state-wide NRM targets.

Monitoring data and information developed or collated for the MER Strategy will be available for use by partner organisations. Analysed data and information will be made available to the community. Data Custodianship principles (www.nrims.nsw.gov.au/glossary.html) that clarify roles and responsibilities will underpin all data management activities. Data access arrangements will be aligned with CS2i.

Monitoring is a collaborative effort across multiple natural resource and land management agencies, including CMAs. For the MER Strategy to be successful, all MER partners must meet their obligations as formally agreed under the MER Strategy and Implementation Plan and as specified in the data agreements. Failure to provide monitoring data as agreed will affect the quality of the evaluations and lead to incomplete reporting on progress towards the state-wide NRM targets.

Further details on the resource condition and program performance monitoring strands are outlined below.

Monitoring at different scales

There are two primary sources of information on resource condition:

1. **state-wide monitoring** by the natural resource agencies DECCW, NOW and I&I NSW. The monitoring programs are designed to provide unbiased, quality-assured data that are spatially and temporally representative of the cumulative effects of all management activity, climate change and natural variability. This may be supplemented by similar programs conducted by, for example, CMAs or local government. Where quality and consistency permit, these data will be combined with state-wide datasets.
2. **point-of-investment monitoring** by CMAs and/or agencies to evaluate the success of intervention at the point of investment. Results from such programs are difficult to aggregate to provide resource condition assessments at larger scales but, where indicators and methods are common to the state-wide MER program, efforts will be made to use those monitoring results in state-wide resource condition assessments.

A third potential source of resource condition information is the monitoring of progress towards CAP catchment targets by CMAs. Where available, data from those monitoring activities will contribute to the assessment of resource condition at the regional scale. They will contribute to state-wide assessments of resource condition only if there is a high degree of consistency in the CAP targets across many CMA regions.

Differences between the two sources of information are given in Table 4.

Table 4: Comparison of state-wide and point-of-investment monitoring

Parameter	State-wide monitoring	Point-of-investment monitoring
Indicators monitored	Focused on resource condition: representative of ecosystem composition, structure and function Responsive to human impact	Focused on evaluating management objectives
Selection of sampling sites	Randomised spatially within strata (e.g. type, disturbance) throughout the State	Targeted to management activity area
Sampling frequency	Sufficient to detect trend change over long time frames (e.g. by 2015)	Sufficient to report against program objectives (not usually sampled after program completion)
Sampling period	Long term (10+ years) for trend analysis	Short term (1 to 2 years), depending on investor needs
Reference state	Defined reference condition; often best available or pre-European, undisturbed condition	Target state or state in absence of management
Capacity to infer causes	On a broad scale yes, but depends on management hypotheses being tested and stratification	Yes

Evaluation

Evaluation is a systematic and evidence-based review of the appropriateness, efficiency and/or effectiveness of programs or projects (Department of Finance 1994). It attempts to explain why a particular outcome has occurred, how well a program or activity was undertaken, whether it was a good thing to do, and what should be done in the future in light of the evaluation findings (DECC 2009).

Types of evaluation

There are three key types of evaluation that could be used to evaluate public investment in NRM (DECC 2009; Department of Finance 1994). These are:

- Appropriateness evaluations help in deciding the need for, or nature of, a new program, or the relevance of an existing program.
- Efficiency evaluations evaluate the inputs and processes used to produce the outputs of the program and can be used to determine if, or how, resources could be used more efficiently
- Effectiveness evaluations examine the extent to which program objectives or desired outcomes have been achieved.

The type of evaluation to be used is based on the evaluation questions being answered. Evaluation information from each type of evaluation can be used to inform other types of evaluation. The MER Strategy seeks to use monitoring information at all scales to fulfil multiple evaluations.

The type of evaluation method to be used depends on the purpose of the evaluation, what evaluation question is being addressed, and at what scale the evaluation is being conducted.

The diversity of management actions and complexity associated with NRM produce many different kinds of evidence that need to be assessed to determine the status and trends of natural resource condition and inform progress toward NRM targets. The use of multiple lines of evidence (both qualitative and quantitative) allows this range of evidence to be considered and the contribution of NRM investment to be determined in the context of environmental pressures.

Use of experts or expert panels may also be helpful to review, weigh and evaluate these lines of evidence and develop findings to inform the reporting of progress toward the NRM targets.

Refer to the *Evaluation Framework for CMA Natural Resource Management* (DECC 2009) for further information on undertaking evaluations.

Evaluation at different scales

There are three main levels of evaluation for the MER Strategy: State, CMA regional, and program and project scale.

At the **State scale** there are three main types of evaluation. They are undertaken for:

- NRC reports to the Premier on progress towards the state-wide targets and effectiveness of implementation of CAPs
- the DECCW SoE report
- reports to Cabinet relating to the NSW State Plan (NSW Government 2006).

Although there is some overlap, these reports have discrete purposes that mean that the evaluation may need to occur in different ways. Evaluations that end up in one reporting process may feed back into the evaluation of another process. For example, State Plan reporting materials may feed into SoE reports, and SoE material may feed into NRC evaluations.

The NRC is required under the *Natural Resources Commission Act 2003* to report annually on progress in achieving compliance with state-wide standards and targets adopted by the Government.

The NRC uses multiple lines of evidence collated from State agencies (including DECCW, I&I NSW and CMAs) and Federal agencies to evaluate the progress being made towards the state-wide targets. Evidence collated from these agencies, including resource condition data, performance information, point-of-investment data and information from the SoE reports, will be used where available and appropriate. The collated information is then analysed and verified by an independent expert panel.

DECCW has responsibility for producing a SoE report every 3 years. The report provides an overview of the condition of the NSW environment and ‘aims to provide credible, scientifically based, state-wide environmental information to assist those involved in environmental policy and decision-making and managing the State’s natural resources’ (DECCW 2009).

The SoE reports are prepared in accordance with the Pressure – State [or Condition] – Response framework, which is based on the relationship between humans and ecosystems. The framework identifies our understanding of the pressure that humans place on natural resources, the desired state of those resources and the resulting condition or methods we use to manage our impact. The SoE reports also use multiple lines of evidence in their evaluation approach. Specialist input external to the government is provided by independent experts, as well as by members of the NSW State of the Environment Advisory Council.

NRM agencies are required to undertake evaluations of NRM and other matters and to report their progress to Cabinet against the Priorities and Measures under the NSW State Plan. This material is also used to produce annual State Plan updates.

At the **CMA regional scale**, the NRC also evaluates catchment-scale progress towards state-wide NRM targets. It uses multiple lines of evidence, including available MER resource condition data, performance reporting, point-of-investment data, program logic, results of NRC audits, expert panel data, and other scientific knowledge gathered from CMAs, agencies and other stakeholders.

CMAs already have in place Monitoring, Evaluation, Reporting and Improvement Plans, developed as part of their Caring for our Country project funding requirements, and processes for adaptive management. CMAs will continue to evaluate their own performance

as part of the adaptive management cycle and report to their communities and stakeholders to ensure that the feedback loop is closed. The type of evaluations to be undertaken will need to be relevant to the questions the CMA seeks to address in its evaluation and could include effectiveness, efficiency and appropriateness evaluations. In most cases the method of evaluation will involve multiple lines of evidence.

At the **program or project scale**, evaluation is done to assess how well program or project objectives are being achieved. Program- or project-scale evaluation is required for internal reporting purposes and to facilitate adaptive management. The timing of these evaluations will depend on the program and type of evaluation being conducted. Evaluations at the program and project level are the responsibility of the CMA or agency implementing the program or project.

The *Evaluation Framework for CMA Natural Resource Management* (DECC 2009) has further information about how to undertake program and project evaluations.

Reporting

Reporting is the communication and sharing of information gained from evaluation to guide NRM decision-making and improve knowledge.

Types of reporting

The key reporting mechanisms of NRM MER include:

- NSW State Plan and SoE and SoC reports
- reporting to meet the requirements of other investors, such as the Australian Government agencies' and CMAs' internal reports to boards and committees and external reports to stakeholders, including the general public.

Although there is some overlap, each of these reporting mechanisms packages NRM monitoring and evaluation information in different ways to suit the required purpose.

Over the life of the MER Strategy, better collaborative arrangements will be developed among local government, CMAs, State agencies and the Australian Government to facilitate more comprehensive and (where possible) better aggregation of, reporting on NRM. An aspirational goal would be to have more streamlined regional reporting for NRM so that local government reporting could better inform SoC reporting, and vice versa.

Under the new planning and reporting requirements for local governments, an SoE report is prepared as part of the Annual Report in a year in which an ordinary election of councillors is to be held (every 4 years from September 2008). The SoE report will report against environmental issues that may be relevant to the environmental objectives established by the Community Strategic Plan. An SoE report for a local government area may be prepared as part of, and for the purposes of, an SoE report for a larger area (such as a region or a catchment management area).

Reporting at different scales

There are three main levels of reporting: State, CMA regional, and program and project scales.

At the **State scale**, key reporting under the MER Strategy is achieved through the following documents:

- NRC reports on progress towards NRM targets
- the NSW SoE report
- the NSW State Plan.

Each year, the NRC reports on progress towards the state-wide NRM targets and effective implementation of CAPs. In 2008, this progress report focused on the results of audits of CMAs at the state scale; in 2009 it was a technical report against the native vegetation target. In 2010 there will be a report on progress towards the targets and the key drivers of landscape health at a macro-regional scale. The NRC will also continue to produce technical reports against individual targets; these reports are based on MER data and expert assessments.

As the regional model matures and proceeds through an adaptive management cycle of planning, implementation, audit and response, the NRC's progress reports will focus on the key issues at the relevant stage of the cycle and on the key questions to which government is seeking answers at that time.

The NSW SoE report is produced every 3 years as a requirement of the *Protection of the Environment and Administration Act 1991*. MER of the condition of resources relating to the state-wide NRM targets informs both the 'condition' and 'pressure' components of the SoE report.

At the same time, MER of NRM activities and outputs can inform the 'response' component of the SoE report where appropriate and at the State scale. However, the SoE report reports on issues that are broader than the state-wide NRM targets and relies on a wide range of information.

During the life of this MER Strategy (2010–2015), the SoE will be produced in 2012 and 2015.

Quarterly progress reports for the NSW State Plan are required. DECCW has responsibility for coordinating these reports. Provision of monitoring and evaluation information will be provided by MER partners as available and appropriate.

At the **CMA regional scale**, the NRC will provide the Premier with SoC reports based on its evaluation of catchment-scale progress towards state-wide targets. For each CMA catchment, there will be two types of reports:

- a 'technical' report summarising all the data and indices and aimed primarily at a scientific audience
- an 'evaluation' report providing 'plain English' descriptions of what the technical reports are telling us.

The NRC will publish the next round of SoC reports in 2013, and these reports will be publicly available.

Reporting of monitoring and evaluation information at the **program or project scale** will be the responsibility of each agency and CMA.

Priority 1: Review and prioritise resource condition MER activities

Resource condition monitoring of natural resource assets at a State scale helps document the cumulative effects of human activity, climate change and natural variability on natural resources. Because management intervention is inevitably targeted at priority areas, broad-scale resource condition assessments are needed to evaluate whether the condition of the resources overall is improving.

Information on the status of, and trends in, natural resource condition serves to:

- document the current condition of the resource asset in question and how it has changed over time – This includes, where possible, projections of future condition based on analyses of baseline data, past trends, and the outcomes expected from management activities
- help decision-makers in the future management of natural resources at a range of scales
- help define targets on the basis of an understanding of historic trends and drivers and the mapping out of future changes that can be achieved given community values and available resources – This does not preclude setting ‘aspirational’ targets that may go beyond what is currently considered ‘realistically achievable’.
- provide a basis for evaluation and learning from monitoring results, as well as input to the development of future management activities.

This Strategy improves on resource condition monitoring under the 2006 MER Strategy by:

- reviewing and improving the indicators measured
- improving access to the full range of original data, including metadata
- better incorporation of regional datasets from regional bodies such as CMAs and local government
- improving interaction with regional bodies in interpreting MER data
- developing and testing rules for integrating indicators into indices of resource condition that are responsive to pressures on ecosystems
- integrating analyses and reporting across themes to present a better picture of overall landscape health – For example, condition in one theme can become a pressure in another, such as the effect of vegetation extent on river, wetland and estuary water quality.
- increasing the focus on quantifying pressure indicators to help decision-makers using MER program outputs
- linking the scoring systems for condition and pressure indicators more directly to triggers for different types of management action.

Indicator monitoring programs

Each of the 11 natural resource asset classes (Targets 1 to 11) will have indicators reported at varying intervals as appropriate and consistent with resources available. The indicators to be measured under each natural resource asset class and the frequency of monitoring and reporting are covered in the MER Implementation Plan. However, a key priority for the MER

Strategy is to review the indicators. The MER Implementation Plan will define a minimum level of monitoring and will also indicate where monitoring activity will be enhanced should additional resources become available.

Target 12 (economic sustainability and social wellbeing) and Target 13 (capacity of natural resource managers) require significant support from CMAs for the monitoring of regional communities. MER against these targets will be a collaborative effort involving both CMAs and agencies.

Modelling frameworks will be developed for a range of asset classes. This will allow scenarios of change to be modelled on the basis of defined management interventions and will provide for the future states of the resource classes. Monitoring will then be targeted to verify the modelled trajectories, allowing timely management interaction if there is a deviation from predicted trajectories. The modelling frameworks will allow much better implementation of adaptive management and will allow reporting of condition and trends on the basis of modelling results, including for assets where there is a large lag between action and outcome.

Managing data

Data will need to be collected, collated or derived to support each theme of the resource condition MER program. It is essential that these data are stored in existing corporate systems or new systems identified and designed for this specific purpose.

All data, including metadata, must be captured and stored consistently with naming conventions and data storage protocols. These protocols must be documented. All metadata must be published in the relevant agencies' metadata portals and made available to the *NSW Metadata Portal* hosted by the LPMA.

Transforming data

To ensure the transparency and repeatability of data transformation used for the MER program, theme teams are responsible for documenting and publishing all processing steps applied to the data, including any indices or calibration constants used.

Priority 2: Develop a new Program Performance MER strand

The Program Performance strand is a new component of NRM MER. It addresses the intermediate outcome, output and input (where appropriate) levels of the program logic outcomes hierarchy for NRM. Data and information requirements will access existing data collection, where available, for each of these outcome levels and will inform SoC and SoE reporting.

Intermediate outcome data and information

Intermediate outcome data and information will include preliminary changes in the extent and condition of assets, changes in how assets are managed, and changes in practices and attitudes. These outcomes can be measured in the medium term and provide an indication of progress towards the longer-term outcomes. Data and information to identify intermediate outcomes will include:

- performance case studies that give details of the local outcomes of NRM investment projects – This information may include local resource condition change, outputs and photo points and will provide information that contributes to knowledge of the link between management actions and medium- to longer-term outcomes.
- aggregated changes in asset management – These will be derived by aggregating output data according to carefully designed management change statements. Aggregation will be undertaken to the CMA regional and state scales to show whether any medium-term change has occurred in the ways in which natural resources and land are managed.
- changes in the behaviour and practices of natural resource and land managers – Significant improvement in NRM outcomes relies heavily on the adoption of natural resource and land management practices that support the improvement of our natural resource assets. Existing behaviour and practice change monitoring programs will be reviewed to identify gaps and opportunities for developing a joint proposal with NRM partners to address this information requirement.

Output data and information

Outputs are the products and services produced by a program. They are the readily measured results of investment. Achievement of outputs contributes to the production of a desired outcome. The Program Performance strand will use output data and information to identify achievements from NRM investment and how this investment contributes to state-wide targets in the short term. The output monitoring program includes:

- establishment of output indicators – This will be done through identification of currently collected data and information, consideration of the state-wide NRM targets, and identification of the outputs that contribute to meeting those targets and their relevance for reporting at regional and State scales through simple statements of aggregated NRM management change.
- monitoring of identified outputs – Monitoring will continue to be done by agency and CMA partners at time frames appropriate for agency and CMA purposes, such as for continuous improvement and reporting to funding bodies and government. This data and information will be collated and used by DECCW's program performance team to inform reporting at the State and catchment scales.

- support for the use of existing spatial data management systems (e.g. DECCW Land Management Database) – The output monitoring program is focused largely on the delivery of ‘on-ground’ management. Support for the use of spatial data management will therefore be provided to enable spatial location of investment and aggregation of outputs at a range of scales for evaluating intermediate outcomes.

Foundational activities and inputs

Foundational activities are the basic building blocks for implementing NRM. They are the resources, activities and tools used to deliver outputs and outcomes. They include plans, strategies, funding, expenditure, models, maps and other information and tools. Inputs, such as financial data, are generally monitored, recorded and reported for financial accountability purposes, so limited input information will be used for informing MER. However, some foundational activities and input information may be aggregated to inform intermediate outcomes and may include some relevant financial information, such as leveraged funds, and other supporting information such as services that support implementation.

Development and implementation of the Program Performance strand

The Program Performance strand is a new program, and it will be developed and implemented in a staged manner. The phases include:

1. Negotiate and agree on output indicators, data collection and reporting arrangements and document in the data agreement and schedules.
2. Develop and agree on protocols for monitoring, data management, information provision and reporting with MER partner agencies and organisations.
3. Develop and adopt processes and systems for spatial data capture and management within each partner agency/organisation.
4. Trial Program Performance MER to demonstrate processes and systems and improve their effectiveness and efficiency.
5. Review and adapt the Program Performance MER processes and systems and support implementation by partner agencies and organisations.
6. Provide agreed data and information and develop reporting products for DECCW and NRC for SoE and SoC reporting (manual data handling initially, with progressive change to automated data entry and reporting).
7. Review land manager behaviour and practice change monitoring programs to identify gaps and investigate opportunities for developing a joint funding proposal with NRM partners to address this information requirement.
8. Review the execution of the Program Performance MER strand and adapt as required.
9. Continue ongoing support of MER partners in the capture and delivery of spatial data and information.

Priority 3: Develop and enhance collaboration with MER partners

Successful implementation of the MER Strategy will require collaboration with MER partners, consultation with stakeholders, involvement of other agencies and NRM investors, and dissemination of information to the wider community.

Existing forums and reporting instruments will be used, where possible, to provide the necessary opportunities for collaboration and engagement with MER partners and stakeholder groups.

The primary method for collaboration with MER partners will be the MER Management Teams, comprising a Resource Condition Management Team and its 13 resource condition MER theme teams, a Program Performance Management Team, and a MER Data Management Team. High-level collaboration will continue to occur through the Cluster and the SOG. Further detail of governance arrangements for the MER Strategy is given in the 'Governance' section of this document.

Collaboration and consultation with CMAs will occur at the various levels of the CMA hierarchy, including by CMA chairs, general managers, and monitoring and evaluation officers. This will include:

- representation on the SOG
- representation to be sought from CMAs on the MER Management Teams that will have responsibility for implementing the three main MER programs
- regular consultation and updates through the CMA chairs and general managers meetings and the MER forums
- direct liaison by MER Management Teams (including the 13 resource condition theme teams) with individual CMAs in the development and implementation of their programs, as well as by the NRC with CMAs in the development of the SoC reporting program.

Local government will be engaged initially through representatives of the Division of Local Government and the Local Government and Shires Associations. A sub-group of the three MER Management Teams will continue to work with the Division of Local Government and the Local Government and Shires Associations to investigate opportunities for achieving better alignment of MER activities at local, regional and State levels.

Progressive involvement of the Australian Government and other NSW Government bodies will occur through a parallel process of meetings and reference groups as the MER Strategy evolves.

Engagement with other stakeholders, including peak bodies and industry groups, will occur through meetings and *ad hoc* representation at their forums, such as meetings of the NRAC.

Routine MER-related reporting will continue to occur through existing reporting products, including the State Plan, SoE and SoC, and through progress and technical reports prepared by MER teams. In addition, information products for other audiences, such as the general community, will be developed by CMAs and agencies as required.

The Senior Officers' Group will develop, as an internal working document, a MER Strategy Communication and Engagement Plan to guide the communication and engagement activities required for the MER Strategy. The MER Management Teams will also provide details of their engagement and communication activities as part of their individual delivery plans.

Priority 4: Improve data acquisition, management and sharing arrangements

Data and information management are crucial for the success of this Strategy. Without adequate provision for data management, warehousing and accessibility, the aims of this Strategy cannot be achieved. Agencies engaged in MER activities need to ensure that adequate facilities and resources are available to manage MER data and information.

The MER Data and Information Management strand provides coordination and support for NRM data and information management and sharing arrangements among the MER partners. This strand builds on the experiences from implementing the 2006 MER Strategy. A number of obvious areas for improvement have been identified. These include:

- inadequate or missing documentation (particularly metadata)
- ongoing delays in the supply of data sets
- problematic data discovery and access
- inadequate security of theme project files and data products
- the need to identify synergies and potential efficiencies between agencies and programs, in relation to data needs, collation, management and outputs.

MER teams will be empowered to implement more effective data management through the provision of support, training and access to data management tools. Where appropriate, MER data management support will be developed in a form that is applicable to a range of corporate programs, including non-MER projects.

The principles governing data and information management under this Strategy are:

- Agencies engaged in MER activities ensure that adequate resources and facilities are available for managing MER data.
- Each MER team is accountable for all MER data required for, or used by, its theme, ensuring that the respective data custodians effectively manage MER data.
- Data collected, collated or derived for the MER Strategy will be managed to maximise their usefulness to both current and future users.
- All data collected, collated or derived under the MER Strategy (including Primary, Derived and Ratings data) should be publicly accessible (except where access is restricted by the custodian or owner). Data will be freely available by way of data-sharing frameworks and standards defined by CS2i.
- Enduring and best-practice data management systems are to be established by data custodians or owners to ensure the effective collection, collation, storage, access to, and dissemination of, MER data and information.
- Effective data management needs to be addressed at all levels: inter-agency, intra-agency and within MER teams.
- Data management, storage, sharing and dissemination standards and systems are the responsibility of the respective data custodians or owners within the agencies.
- MER teams are accountable for ensuring that metadata are created and publicly accessible for all MER data.

- MER teams need to actively identify synergies between themes and other data programs to ensure that MER data is logically consistent with the data from these other programs and opportunities for potential efficiencies in data collection and management are investigated.
- Where possible datasets and indicators should be developed so that the source data can be aggregated and disaggregated for use at a range of spatial scales.
- All data and information collected should conform to standards specified by the data custodians or owners, to facilitate exchange and multiple uses of data.

The mutual rights and responsibilities of each MER partner in relation to ongoing collection and management of, and access to, MER data under the MER Strategy will be negotiated and agreed on through the governance hierarchy and documented in the Inter-agency Data Acquisition and Sharing Agreement for the NSW Natural Resources Monitoring Evaluation and Reporting Strategy.

The administration of this data agreement and the schedules will be the responsibility of the MER Data Sharing Agreement Administrator, as nominated by the SOG. Each party to the agreement must nominate a MER Data Sharing Coordinator, and all information quality issues, requests for help, and all other notices must be directed to the MER Data Sharing Coordinator of each party.

The data agreement and schedules will be reviewed by the SOG annually (at a minimum) and be initiated by the MER Data Sharing Agreement Administrator. Any substantive changes to the schedules, including removal of data collected or data and information products supplied, will be reported to the SOG and the Cluster.

The MER Data Management Team will monitor and coordinate data and information management activities. The MER Data Management Team will help and guide the data custodians or owners to ensure, for example, that metadata statements, as published by the data custodians or owners, are available for all datasets and that data are ultimately available and accessible to stakeholders, including all MER partners.

Managing the MER Strategy

Governance

Implementation of the MER Strategy requires involvement of all NRM sector organisations, and the governance arrangements reflect this.

The governance structure for the delivery of the MER Strategy is hierarchical (Figure 3) and includes the Cluster, the SOG and the MER Management Teams. The composition of these groups is outlined in Appendix 2.

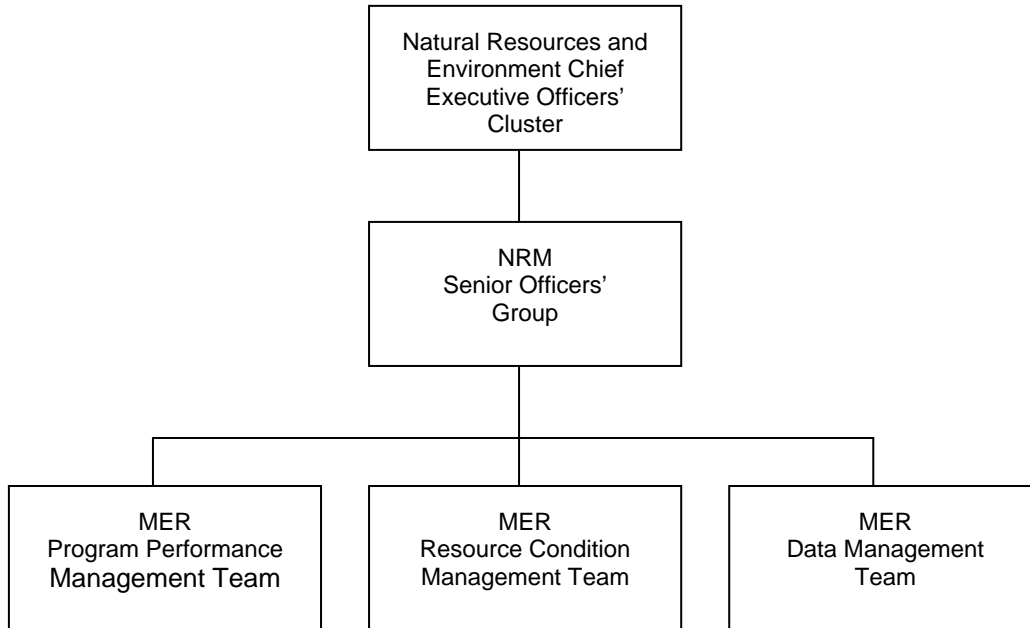


Figure 3: Governance structure

The Cluster has ultimate responsibility for overseeing the implementation of the MER Strategy, including overseeing the formal agreements on agencies' contributions under the MER Strategy and Implementation Plan, and the data agreement. The Cluster is composed of representatives of NRM sector agencies and organisations. NRC and CMA involvement and commitment under the MER Strategy and Implementation Plan, including the details in the data agreement, will be resolved through the SOG.

The SOG was established by the Cluster to oversee and negotiate organisational arrangements and provide advice to the Cluster on implementation of the MER Strategy. Within this context the SOG will:

- through brokering and review of the data agreement and schedules, negotiate the roles and responsibilities of MER partner agencies and organisations in providing data and information
- ensure that implementation of the MER Strategy provides for accurate, robust and meaningful natural resource and environmental MER
- provide strategic direction to ensure that implementation of the MER Strategy meets reporting, evaluation and budget requirements
- provide updates, comment and advice to the Cluster as requested

- provide an annual report to the Cluster on the implementation of the MER Strategy and data agreement to ensure that CEOs have early warnings of emerging gaps in data and that MER partners are meeting their agreed obligations
- lead a review of the MER Strategy in 2014 to inform the development of the next MER Strategy and the review of state-wide NRM targets
- maintain relationships with other relevant bodies concerned with natural resources and environmental MER to ensure consistency where appropriate
- ensure that data for all MER programs, including inter-agency arrangements, are managed effectively under the MER Strategy.

MER Management Teams oversee the day-to-day management of the three overarching inter-agency MER strands: the resource condition MER program, performance MER and MER data management. Representation on these Management Teams will be drawn from DECCW, I&I NSW, LPMA and CMAs. Operational coordination among the Management Teams will be delivered by having the chair of each Management Team on other teams.

The NSW Spatial Council has been established to coordinate policy and the strategic direction of spatial information in NSW by way of the CS2i framework, as endorsed by the NSW Cabinet. The NSW Spatial Council will therefore provide advice and guidance on the information management aspects of the MER Program, including the provision of whole-of-government standards for data licensing, access and sharing; endorsement of relevant data and information standards developed by the MER Program; and facilitation of links to relevant stakeholder forums (e.g. local government forums).

Regular reporting on the implementation of the MER Strategy will be as follows:

- SOG will report to the Cluster on implementation of the MER Strategy at least every 12 months.
- SOG will review, at a minimum every 12 months, the data agreement and schedules and provide a report to the Cluster.
- MER Management Teams will provide regular progress reports to the SOG.
- Regular updates on implementation of the MER Strategy will be provided to CMA general managers' meetings and the MER forum.
- The NSW Spatial Council will be reported to as required.

Roles and responsibilities

The commitment of each of the key MER agencies and organisations is critical to successful implementation of the MER Strategy. Each MER partner agency and organisation will:

- nominate an MER Strategy Manager, who is accountable for ensuring that the organisation meets its commitments as described in the MER Strategy and Implementation Plan and in the data agreement and schedules – This senior officer will also be responsible for managing the risks associated with the implementation of MER for that organisation.
- nominate an MER Data Sharing Coordinator, who will work with the MER Data Sharing Agreement Administrator in relation to administering the data agreement and schedules
- meet the funding requirements of their contribution to the MER Strategy implementation program through recurrent funding, or seek external funding as available

- undertake organisational reporting to, for example, funding bodies and government, as required of the organisation.

The broad roles and responsibilities of each MER partner in implementing the MER Strategy are described in Table 5.

Table 5: Key MER partners’ roles and responsibilities for the NSW MER Strategy

Agency	Monitoring	Evaluation	Reporting
<p>DECCW</p> <ul style="list-style-type: none"> • Scientific Services • Climate Change, Policy and Programs • Parks and Wildlife • Culture and Heritage 	<p>Coordinate and lead NRM resource condition MER program Lead monitoring of state-wide resource condition relating to following NRM targets: native vegetation, fauna, threatened species, estuaries, wetlands, resource condition, soils, land capability, natural resources manager capacity.</p> <p>Receive and manage resource condition information, local or regional input and output information</p> <p>Collate NRM inputs, outputs and other performance indicators</p> <p>Land manager behaviour and practice-change review and proposal</p> <p>Acquire, manage and share MER data, including metadata, as agreed to in data agreement and schedules</p> <p>Broker and administer data agreement and schedules under auspices of the SOG</p> <p>Undertake a secretariat role to support governance structure</p>	<p>Analyse and evaluate specified resource condition monitoring data to inform reporting at State and catchment scales</p> <p>Analyse and evaluate performance output monitoring data collated from across sectors to inform reporting at State and catchment scales</p>	<p>SoE reporting</p> <p>Provide NRC and DECCW with analysis of resource condition monitoring and performance monitoring to inform reporting</p> <p>Provide progress reports to State Plan on state-wide NRM targets.</p> <p>Internal reporting as required</p> <p>Reporting as required to other agencies and jurisdictions</p>
<p>DECCW</p> <ul style="list-style-type: none"> – NSW Office of Water 	<p>Lead monitoring of state-wide resource condition relating to the following NRM targets: riverine ecosystems and groundwater systems</p> <p>Monitor and record inputs and appropriate standard outputs</p> <p>Acquire, manage and share MER data, including metadata, as agreed to in data agreement and schedules</p>	<p>Analyse and evaluate specified resource condition monitoring data to inform reporting at State and catchment scales</p> <p>Provide performance output data to DECCW for NRM sector compilation, analysis and reporting</p>	<p>Provide NRC and DECCW with analysis of resource condition monitoring and performance monitoring data to inform reporting</p> <p>Internal reporting as required</p> <p>Report as required to other agencies and jurisdictions</p>

Agency	Monitoring	Evaluation	Reporting
I&I NSW	<p>Lead monitoring of state-wide resource condition relating to the following NRM targets: invasive species, marine and economic sustainability and social wellbeing</p> <p>Monitor and record inputs and appropriate standard outputs</p> <p>Acquire, manage and share MER data, including metadata, as agreed to in data agreement and schedules</p>	<p>Analyse and evaluate specified resource condition monitoring data to inform reporting at State and catchment scales</p> <p>Provide performance output data to DECCW for NRM sector compilation, analysis and reporting</p>	<p>Provide NRC and DECCW with analysis of resource condition monitoring and performance monitoring data to inform reporting</p> <p>Internal reporting as required</p> <p>Reporting as required to other agencies and jurisdictions</p>
LPMA	<p>Monitor and record inputs and appropriate standard outputs</p> <p>Acquire, manage and share MER data, including metadata, as agreed to in data agreement and schedules</p> <p>Manage data sharing frameworks and standards defined by CS2i</p>	<p>Provide performance output data to DECCW for NRM sector compilation, analysis and reporting</p>	<p>Provide NRC and DECCW with performance monitoring data to inform reporting</p> <p>Internal reporting as required</p> <p>Reporting as required to other agencies and jurisdictions</p>
CMAs	<p>Monitor and record inputs and appropriate standard outputs</p> <p>Monitor site of investment resource condition as required for assumptions testing</p> <p>Acquire, manage and share MER data, including metadata, as agreed to in data agreement and schedules</p>	<p>Provide performance output data to DECCW for NRM sector compilation, analysis and reporting</p>	<p>Provide NRC and DECCW with available MER data to inform reporting</p> <p>Internal reporting as required</p> <p>Reporting as required to other agencies and jurisdictions</p>
NRC	<p>Meet obligations for data management and sharing as agreed to in data agreement and schedules</p> <p>Collate data as specified in data agreement and schedules for evaluation and reporting functions</p> <p>Manage and share MER data, including metadata, as agreed to in data agreement and schedules</p>	<p>Evaluate progress made towards the state-wide NRM targets at State and catchment scales</p> <p>Audit implementation of CAPs in terms of progress in achieving compliance with the State's Standard for Quality NRM and meeting the state-wide targets</p>	<p>Annual progress reporting on progress towards state-wide NRM targets</p> <p>Reporting and publishing of SoC reports on progress towards state-wide targets at catchment scale</p> <p>Reporting on effectiveness of CAP implementation</p>

Risk management

Various factors may jeopardise the successful implementation of the MER Strategy. A Risk Management Plan has been developed as part of the Implementation Plan. It includes:

- Risk Identification and Assessment, which describes and assesses the potential risks and the likelihood of occurrence of potential risks to implementation of the strategy
- a Risk Management Strategy to identify management activities to address each identified risk
- a Risk Management Plan Review and Evaluation to ensure that the Risk Management Plan is informed by implementation experience and remains current.

Individual agencies and CMAs should develop their own risk management plans for implementing MER. The MER Strategy Manager nominated by these agencies and organisations will be responsible for ensuring that risks to the implementation of MER are managed to successfully achieve the objectives of the MER Strategy.

Review of the MER Strategy

Evaluating and reporting on the outcomes of NRM investment, and assessing change in the condition of natural assets, is complex. These steps are substantially affected by external physical influences and processes, which can confound the findings. Moreover, MER is being undertaken in an evolving policy environment. It is therefore intended that the MER Strategy will also evolve as understanding of the natural assets and MER processes is expanded through experience. To address these issues, the MER Strategy should be reviewed:

- in 2014, after the 2012 SoE and 2013 SoC reports have been completed and before the end of the MER Strategy. This review will be done by an independent body to inform the development of the next MER Strategy and the review of state-wide NRM targets.
- following any significant institutional or policy change.

The review of the MER Strategy needs to include consideration of the resources available for implementation; institutional change; MER capacity; and other influencing factors. To improve future delivery, the review should also take an opportunity to draw on new techniques and experiences gained from application of the MER Strategy.

In addition to these reviews, regular updates will be provided to the Cluster and SOG on implementation of the MER Strategy and its programs, and adjustments can be made throughout the life of the MER Strategy.

Abbreviations and acronyms

CAP	Catchment Action Plan
Cluster	Natural Resources and Environment Chief Executive Officers' Cluster
CMA	Catchment Management Authority
CS2i	NSW Common Spatial Information Initiative
DECCW	Department of Environment, Climate Change and Water
GIS	Geographical Information System
I&I NSW	Industry & Investment NSW
LPMA	Land and Property Management Authority
MER	Monitoring, evaluation and reporting
MERI	Monitoring, evaluation, reporting and improvement
MER Strategy	NSW Natural Resources Monitoring, Evaluation and Reporting Strategy 2010–2015
NOW	NSW Office of Water
NRAC	Natural Resources Advisory Council of NSW
NRC	Natural Resources Commission
NRM	Natural resources management
SoC	State of the Catchment
SoE	State of the Environment
SOG	Senior Officers' Group

Glossary

For the purposes of the MER Strategy, the following definitions have been used (adapted from the *Evaluation Framework for CMA Natural Resource Management*, DECC 2009).

Term	Definition
Adaptive management	An approach that involves learning from management actions and using that learning to improve the next stage of management.
Appropriateness evaluation	An evaluation that will help in deciding the need for, and nature of, a proposed new program. May be applied not only at the planning stage but also over the life of a longer-term program, particularly if the political, economic, environmental or social context changes.
Attributes	The data layers or components that will inform a performance indicator against its target or basis for comparison
Catchment Action Plan (CAP)	The regional planning tool developed by CMAs with their regional communities and NRM and land management agencies to identify and give details of planned investment to address the key natural resource management issues facing their catchments.
Compliance audit	An examination of procedures, systems, program documentation and controls that have been implemented, i.e. considers how the actual inputs, processes and outputs comply with those that were intended.
Conceptual models	Models (textual or diagrammatic) that describe the components, processes and interactions occurring in a landscape, asset or ecosystem.
Effectiveness evaluation	Examines the extent to which program objectives or desired outcomes have been achieved. Will also measure factors that affect achievement and relationships between program implementation and measured outcomes. These evaluations are usually conducted when a program is well established.
Efficiency evaluation	Evaluates the inputs and processes used to produce the outputs of the program. Will be done throughout the life cycle of the program.
Evaluation	A systematic and objective assessment of a program's appropriateness, efficiency or effectiveness (or a combination of these). Evaluation findings are used to manage a program adaptively.
Externalities	Those factors or risks that are outside the control of a program or organisation, but that may still affect the delivery of that program.
Foundational activities and inputs	The inputs, tools and activities that support a program to deliver outcomes; can include funds, human resources, legislation, strategies, policies and planning tools.
Geographic Information System (GIS)	Software used to store, manipulate and display spatial data.
Inputs	Resources (e.g. human or other) used to produce program outputs.
Management change statements	Simple statements of aggregated outputs achieved from investment to enable short- to medium-term reporting of management change.

Term	Definition
Multiple lines of evidence	An evaluation method that can be used to infer relationships by using various sources of information (existing or new) based on an assessment against criteria.
Natural resource management (NRM)	The management of land, water, soil, native vegetation and biodiversity, with a particular focus on how management affects the quality of life for both present and future generations. NRM is congruent with the concept of sustainable development and recognises that people are an integral part of the cultivated landscape and that natural resource managers are key local stakeholders in the delivery of landscape-scale change through their use and management of these resources.
Natural resource and land management agencies	NSW State agencies tasked with contributing to the management of natural resources. They include, but are not limited to, the DECCW, I&I NSW and LPMA.
NSW Common Spatial Information Initiative (CS2i)	A whole-of-government initiative that provides a framework where government, business and the community can access spatial and related information and services.
Objectives	Concise, realistic outcome-styled statements about what a program is aiming to achieve.
Outcome or results hierarchy	The arrangement of the results (measured or desired) of a program in an ordered sequence from lowest to highest. Usually represents the relationship between the results of inputs, outputs and outcomes.
Outcomes	All the consequences of a program beyond its outputs. Outcomes are usually intermediate of longer term and may be intended or unintended.
Outputs	The products or services that are produced by a program. Often more tangible and measurable than outcomes.
Performance information	Qualitative or quantitative evidence that is collected and used to address the evaluation questions.
Program logic	A model of change. Program logic identifies the thinking behind management decision and the links among inputs, outputs, intermediate outcomes and expected longer-term outcomes.
Qualitative	Descriptive form of performance information. May be collected through surveys or observations.
Quantitative	Numerical form of performance information.
Unanticipated outcomes	Outcomes not predicted to be caused by a program. They may be positive or negative outcomes in terms of the program. These types of outcomes should be considered during the logical framework approach.

Appendix 1: NSW state-wide targets for NRM

1. By 2015 there is an increase in native vegetation extent and an improvement in native vegetation condition.
2. By 2015 there is an increase in the number of sustainable populations of a range of native fauna species.
3. By 2015 there is an increase in the recovery of threatened species, populations and ecological communities.
4. By 2015 there is a reduction in the impact of invasive species.
5. By 2015 there is an improvement in the condition of riverine ecosystems.
6. By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.
7. By 2015 there is no decline in the condition of marine waters and ecosystems.
8. By 2015 there is an improvement in the condition of important wetlands, and the extent of those wetlands is maintained.
9. By 2015 there is an improvement in the condition of estuaries and coastal lake ecosystems.
10. By 2015 there is an improvement in soil condition.
11. By 2015 there is an increase in the area of land that is managed within its capability.
12. Natural resource decisions contribute to improving or maintaining economic sustainability and social wellbeing.
13. There is an increase in the capacity of natural resources managers to contribute to regionally relevant natural resource management.

Source: NRC 2007

Appendix 2: MER Strategy development and governance groups

The following provides details of representatives of the MER Strategy development and governance groups. The lists are not static, and representation may change as the MER Strategy evolves.

The **Natural Resources and Environment Chief Executive Officers' Cluster Group** (the Cluster) is composed of the Chief Executive Officers of NRM sector agencies and organisations, including:

- Department of Environment, Climate Change and Water (Chair) including the NSW Office of Water
- Industry & Investment NSW
- Department of Planning
- Department of Premier and Cabinet
- NSW Treasury
- Land and Property Management Authority
- Aboriginal Affairs NSW.

The **NRM Senior Officers' Group** (SOG) includes representatives of:

- Department of Environment, Climate Change and Water (Chair), including the NSW Office of Water
- Department of Premier and Cabinet
- Aboriginal Affairs NSW
- Catchment Management Authorities
- Department of Planning
- Industry & Investment NSW
- Land and Property Management Authority
- Natural Resources Commission
- NSW Treasury.

The **MER Strategy Working Group** includes representatives of:

- Department of Environment, Climate Change and Water (Chair)
 - NSW Office of Water
 - Scientific Services
 - Information Management
 - Natural Resource Management Investment
 - Parks and Wildlife
 - State of the Environment

- Country Culture and Heritage
- Landscapes and Ecosystems Conservation
- Catchment Management Authorities
 - one general manager
 - two monitoring and evaluation officers
 - Secretariat to CMA Chairs Council
- Industry & Investment NSW
 - Resource Planning and Development
 - State Forests
- Land and Property Management Authority
- Natural Resources Commission
- Executive Officer of the Cluster and SOG
- Local Government and Shires Associations.

The **MER Program Performance Management Team** includes representatives of:

- Department of Environment, Climate Change and Water (Chair)
- NSW Office of Water
- Catchment Management Authorities
- Industry & Investment NSW
- Land and Property Management Authority.

The **MER Resource Condition Management Team** includes representatives of:

- Department of Environment, Climate Change and Water (Chair)
- NSW Office of Water
- Catchment Management Authorities
- Industry & Investment NSW.

The **MER Data Management Team** includes representatives of:

- Department of Environment, Climate Change and Water (Chair)
- NSW Office of Water
- Catchment Management Authorities
- Industry & Investment NSW
- Land and Property Management Authority

References

- Australian Government 2009, *Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework*, available at www.nrm.gov.au/publications
- DECC 2009, *Evaluation Framework for CMA Natural Resource Management*, Department of Environment and Climate Change, Sydney, available at www.environment.nsw.gov.au/4cmas/evalframework.htm
- DECCW 2009, *NSW State of the Environment 2009*, Department of Environment, Climate Change and Water, Sydney, available at www.environment.nsw.gov.au/soe
- Department of Finance 1994, *Doing Evaluations: A practical guide*, Australian Government, Canberra
- DNR 2006, *NSW Natural Resources Monitoring, Evaluation and Reporting Strategy*, NSW Natural Resources and Environment CEO Cluster Group, Department of Natural Resources, Sydney
- NRC 2005, *Standard for Quality Natural Resource Management*, Natural Resources Commission, Sydney, available at www.nrc.nsw.gov.au
- NRC 2007, *State-wide Targets for Natural Resource Management Fact Sheet*, Natural Resources Commission, Sydney, available at www.nrc.nsw.gov.au/content/documents/Fact%20sheet%20-%20State-wide%20targets%20for%20NRM.pdf
- NSW Government 2006, *NSW State Plan: A New Direction for NSW*, Sydney
- NSW Government 2010a, *NSW State Plan: Investing in a Better Future*, Sydney, available at www.nsw.gov.au/stateplan
- NSW Government 2010b, *Draft NSW Biodiversity Strategy*, prepared by the Department of Environment, Climate Change and Water and Industry & Investment NSW, Sydney, available at www.environment.nsw.gov.au/biodiversity/nswbiostrategy.htm