Monitoring, Evaluation and Reporting Strategy

for the

Goulburn Broken Catchment

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action
Salinity & Water
A U S T R A L I A

Acronyms

CMA	Catchment Management Authority
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
EMS	Environmental Management System
EPA	Environmental Protection Agency
GB	Goulburn Broken
GBCMA	Goulburn Broken Catchment Management Authority
GVW	Goulburn Valley Water
G-MW	Goulburn-Murray Water
IC	Implementation Committee
ISIA	Institute of Sustainable Irrigated Agriculture (Tatura)
KPI	Key Performance Indicator
MER	Monitoring, Evaluation and Reporting
MGBIC	Mid Goulburn Broken Implementation Committee
NAP	National Action Plan
NHT	Natural Heritage Trust
NLWRA	National Land and Water Resources Audit
NRM	Natural Resource Management
NVMS	(Goulburn Broken) Native Vegetation Management Strategy
RCS	Regional Catchment Strategy
RHWQC	River Health and Water Quality Committee
SIR	Shepparton Irrigation Region
SIRCIS	Shepparton Irrigation Region Catchment Implementation Strategy
SIRIC	Shepparton Irrigation Region Implementation Committee
SIRTEC	Shepparton Irrigation Region Technical Support Committee
UGIC	Upper Goulburn Implementation Committee

Executive summary

The Monitoring, Evaluation and Reporting (MER) Strategy for the Goulburn Broken (GB) Catchment encompasses all activities impacting on natural resource management (NRM). The GB Regional Catchment Strategy (which lists principles, policies, targets and actions) provides context for all MER actions.

Integrated catchment management involves decisions based on information from different disciplines, such as salinity, biodiversity and sociology. Presenting information from these disciplines so that multiple benefits and trade-offs are well understood optimises decision making and helps build greater trust between the community, agencies and government investors.

MER plays a critical role in information management and a consistently structured approach to MER across all disciplines is needed. National frameworks for monitoring and evaluation and for target setting are used as the basis from which we are developing this consistency.

The quality of MER varies with the maturity and approach of different disciplines and improving the information and developing consistency will be ongoing for many years.

MER mission statement, objectives and actions

GBCMA's MER mission statement is:

> Natural resource management in the Goulburn Broken will be monitored and evaluated comprehensively, efficiently and cost-effectively. Information on natural resources and their management will be readily available to ensure that the community is well informed and decisions are based on the best available environmental, economic and social data.

Objectives, actions and targets have been collated under five sub-headings:

1. Participative decision-making
    - To support communities to develop MER processes that are responsive to their unique social structures.
    - To provide a readily identified common Goulburn Broken Catchment context for all NRM MER activities within the Catchment.
    - To provide direction on the chain of information flow for NRM MER, including forums and timing.

2. Community and industry MER activities
    - To nurture the abundant good-will from volunteers in NRM MER activities.
    - To promote the environmental ethic of industry via NRM MER.
    - To measure the contribution of volunteers to NRM.

3. Data knowledge and quality – environment, economic, social and institutional
    - To improve understanding and demonstration of the link between cause and effect in a complex integrated system.
    - To consolidate baseline monitoring efforts.
    - To improve the link between technical experts, community decision-makers and investors.
    - To provide direction on how to show assumptions that underpin decisions including the link between outputs and intended (and unintended) outcomes

and how to show progress via monitoring, evaluating and reporting against identified outcomes and milestones.

4. Project and issue management
   - To improve issue and project management by improving MER.
   - To ensure the Regional Catchment Strategy is current.

5. Database management and information exchange
   - To develop a database management approach that enables information to be accessed, easily, efficiently, and effectively.

Developing a consistent structured approach

Monitoring is the systematic collecting of data to enable evaluation and reporting. Evaluation involves assessing against a stated goal, objective or value and determines the efficiency, effectiveness and appropriateness of a NRM program. 'Reporting' has been added to 'monitoring and evaluation' terminology in recent years to increase emphasis on, and usefulness of, information for decision making.

The management cycle includes several steps, with different stakeholders having different information requirements at each step. Documenting these requirements for key issues will be critical in achieving the objectives of this Strategy. An example of this documentation has been included in the appendix, based on the cycle in the following flow chart.

Generalised management cycle showing monitoring, evaluation and reporting steps.
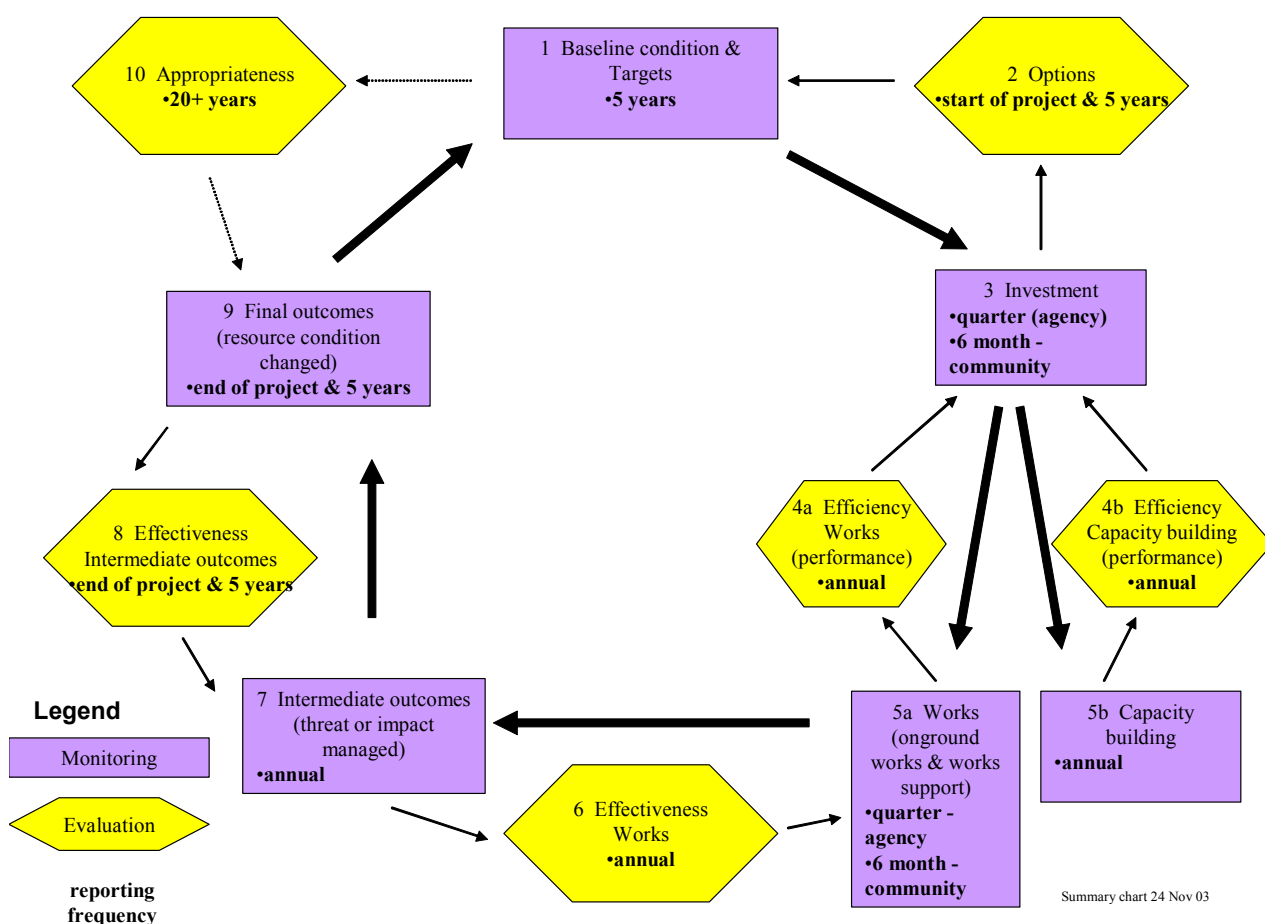
1 Introduction

1.1 Background

1.1.1 MER Strategy development process

The Goulburn Broken CMA has received funding through the National Action Plan for Salinity and Water Quality (NAP) to develop a Monitoring, Evaluation and Reporting (MER) Strategy. A series of Background Papers (see References) were produced to help inform the development of this Goulburn Broken MER Strategy.

The Strategy has undergone significant consultation with key stakeholders (Table 1).

Table 1. GB MER Consultation Steps.

*A full list of agencies and individuals is included in Appendix 1.

Revision	Status	Date	Reviewer(s)*
-	Background papers	June – July 2003	• GN Partnership Team • SIRIC SIRTEC (multi-agency technical group) • Dryland Support Team (multi-agency technical group for MGBIC and UGIC)
-	Draft	June 2003	• GB Partnership Team • GB Implementation Committees • SIRIC SIRTEC • GB Dryland Support Team • Australian Government and Victorian NAP/NHT monitoring, evaluation and reporting staff
1	Revised draft	Jan 2004	• Australian Government and Victorian NAP/NHT monitoring, evaluation and reporting staff
2	Revised draft	Feb 2004	• GB Partnership Team • GB Implementation Committees via IC Executive Officers
3	Revised draft	Feb 2004	• GB Board
4	Final (working document)	Apr 2004	• n.a.

It is not appropriate for this document to be 'perfect' – subsequent updates will contain improved information (see Figure 1).

Figure 1. Document quality indicator.
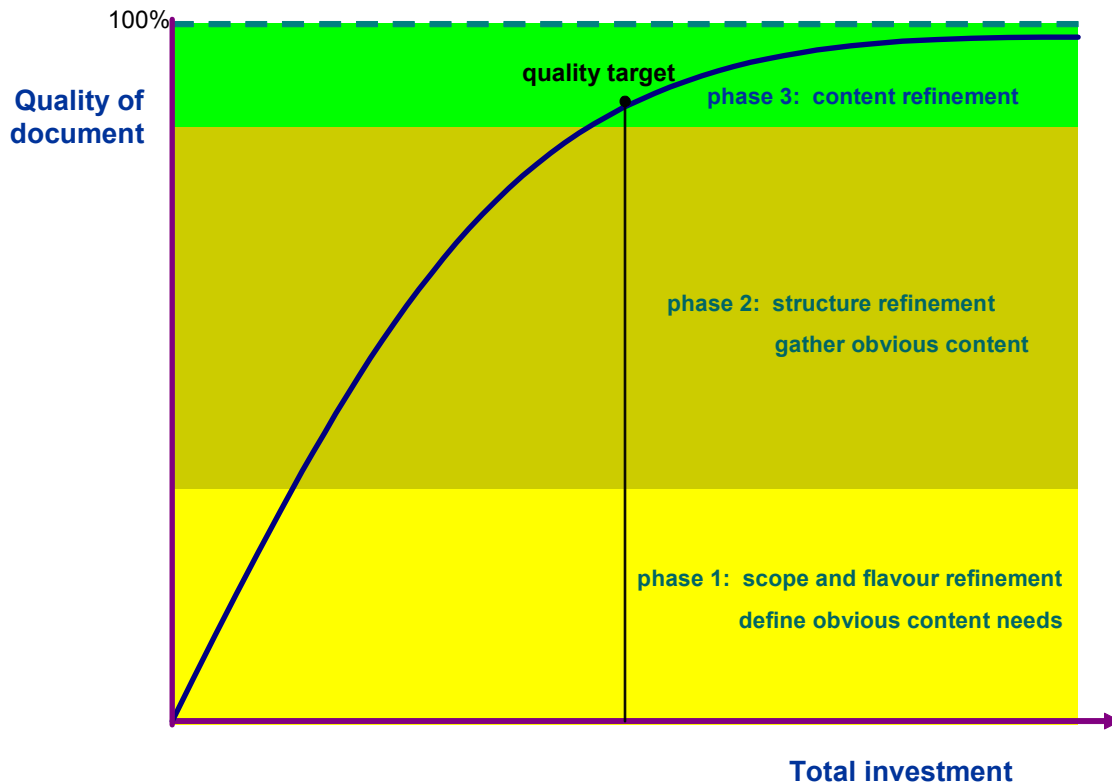
1.1.2 MER Strategy scope

This MER Strategy:

- encompasses all activities and not just those pertaining to NAP/NHT. Due to the highly interconnected nature of NRM activities, it is not appropriate to develop a strategy that ignores significant activities that are not funded by NAP/NHT. The most appropriate reference point for MER activities are the objectives of, and the practices, policies and activities undertaken under, the Goulburn Broken Regional Catchment Strategy (RCS).

- is at the strategic level – it does not provide detail on all issues.

- draws together the threads of MER processes that often have dramatically different levels of maturity. This means that a very general direction is all that is appropriate or possible now for many MER issues.

- includes natural resource monitoring beyond the scope of the GBCMA.

Figure 2. Generalised hierarchy of Goulburn Broken MER strategies and plans.

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┌─────────────────────────────────┐
│  •  National NRM Monitoring and │
│     Evaluation Framework         │
│  •  National Standards and       │
│     Targets Framework            │
└─────────────────────────────────┘
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┌─────────────────────────────────┐
│  Victorian NAP/NHT MER Strategy  │
│          (in prep.)              │
└─────────────────────────────────┘
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┌─────────────────────────────────┐
│          MER Strategy            │
│           for the                │
│   Goulburn Broken Catchment      │
└─────────────────────────────────┘
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┌──────────────────────────────────────────────────────────────────────┐
│  GB strategies, plans and processes that have an MER Component, for     │
│  example                                                                │
│  •  Regional Catchment Strategy                                         │
│  •  Sub-strategies                                                      │
│  •  Single biophysical issues eg irrigation salinity, native           │
│     vegetation, water quality                                           │
│  •  Implementation Committees                                           │
│  •  Implementation Committee technical groups                           │
│  •  GBCMA Board                                                         │
│  •  Landcare                                                            │
└──────────────────────────────────────────────────────────────────────┘
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1.2   GB MER Strategy mission, outcomes and objectives

1.2.1   MER mission statement

MER activities at Catchment-scale have been performed in the Goulburn Broken since the inception of co-ordinated salinity management in the late 1980s. Single-issue management evolved into integrated catchment management through the 1990s. Measuring progress in a complex, integrated environment is very challenging and we are in our infancy of understanding and communicating progress.

The breaking down of government single-issue 'silo' structures to create more integrated service and program delivery is not unique to natural resource management[1]. If integrated catchment management is to be successful, regional communities must be empowered and this will only occur if there is trust between government funders, individual funders (especially landholders), and community decision-makers. MER must be improved to enable this trust to be built. This involves improving the ability of community to demonstrate progress toward outcomes.

Ten catchment management authorities have been established in Victoria under the *Catchment and Land Protection 1994* and these potentially provide the major decision-making interface between government funds and the community for delivery of integrated services and programs.

Many organisations based inside and outside the Catchment are already conducting monitoring and evaluation exercises within the Catchment. This Strategy is an opportunity to document and refine these exercises which should result in efficiency gains.

Generally, implementing the Strategy will result in improved appropriateness, efficiency and effectiveness. Specific benefits include:
• availability of NRM data to planners, researchers and the community.
• knowledge by decision-makers of Catchment issues;
• adaptive management and a culture of integrated catchment management across the Catchment;
• confidence among investors that their efforts will produce expected outcomes;
• targeting and coordination of investments and on-ground actions;
• revision framework for natural resource management plans, strategies and programs; and,
• accountability to the community and government.

The GBCMA has adopted the following Mission Statement with respect to MER:

> Natural resource management in the Goulburn Broken will be monitored and evaluated comprehensively, efficiently and cost-effectively. Information on natural resources and their management will be readily available to ensure that the community is well informed and decisions are based on the best available environmental, economic and social data.

1.2.2 MER Strategy outcomes

Historically monitoring and evaluation have been considered separately from reporting processes. The 'R' in MER is relatively new and it emphasises the importance of communicating.

The success of this MER Strategy will therefore be determined not only by the quality of information generated (considers timeliness, relevance and presentability for the intended audience), but also by how well the information is communicated and understood.

The outcomes sought by the MER Strategy are to increase stakeholder knowledge and understanding of:

1. resource condition trends,

2. effectiveness of best practices (impact of actions on resource condition targets),

3. adoption rates of best practices (including rates attributed to fund sources such as NAP and NHT),

4. community capacity required to adopt best practices (including institutional arrangements).

Objectives and targets for action have also been collated under five sub-headings (see Figure 3 and Section 3).

Figure 3. MER Strategy objectives hierarchy.
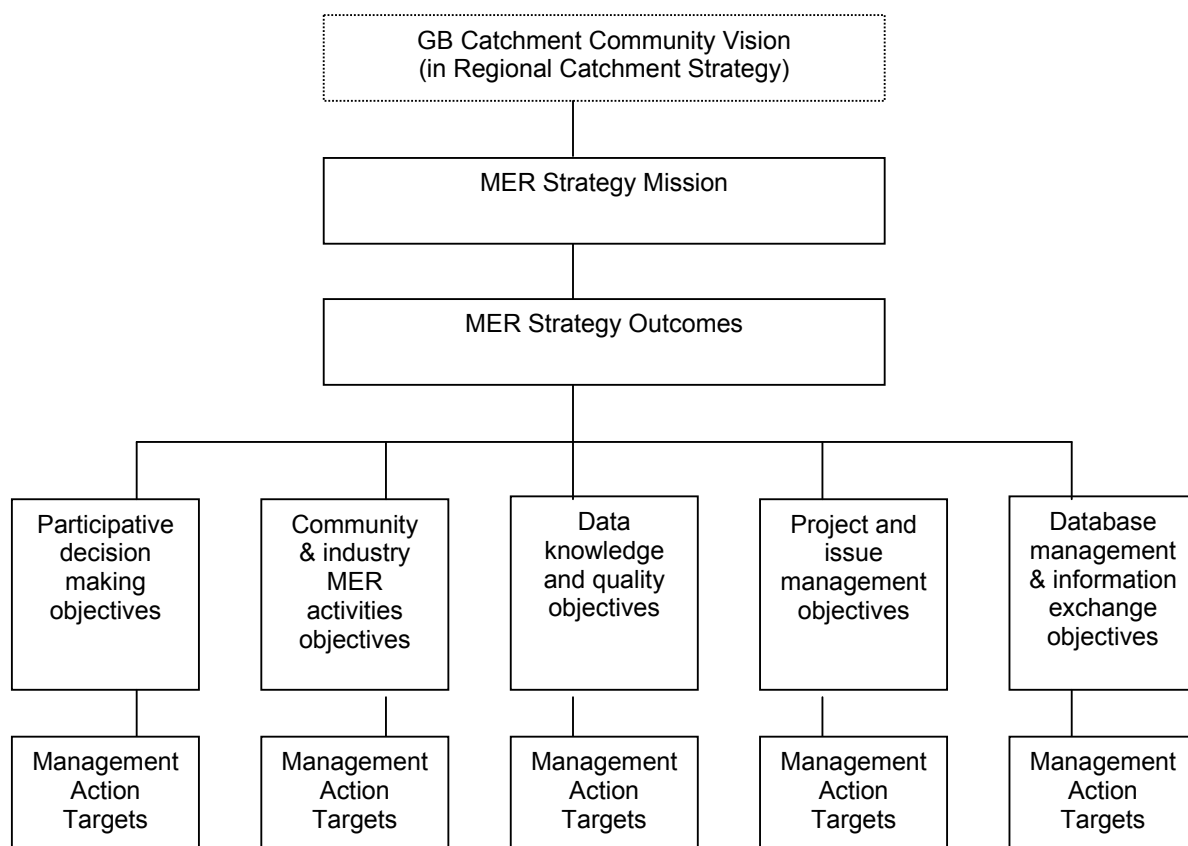
1.3   National and State policy directions

1.3.1   National NRM monitoring and evaluation framework

The *National NRM Monitoring and Evaluation Framework*[2] (2002) that the Australian and State governments, via the Natural Resource Management (NRM) Ministerial Council, have developed provides a blueprint for monitoring and evaluation frameworks for programs, strategies and policies within the scope of the Council.

Accompanying this Framework is a *National Standards and Targets Framework*[3] (2002) that specifies outcomes that investment in natural resource management (through programs such as the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust) should work to achieve.

Appendix 4 shows how Goulburn Broken target-setting links to these frameworks.

1.3.2   National Action Plan for Salinity and Water Quality

The 2002 National Action Plan for Salinity and Water Quality (NAP) agreement between the Australian Government and Victoria[4] requires both parties to jointly develop a State monitoring evaluation and reporting strategy. *Catchment Management Authority NAP-NHT MER Draft Strategy Guidelines* (November 2003) define

expectations of each CMA, and the Goulburn Broken approach is to adapt to the Guidelines as they evolve.

1.3.3   National Audit

The National Land and Water Resources Audit[5] is a program of the Natural Heritage Trust. It was set up in 1997 to improve land, water and vegetation management by providing better information to resource managers.

The Audit covers seven topics: agriculture; coasts; land; people; rangelands; terrestrial biodiversity; and water.

1.3.4   Catchment Condition Reporting under Catchment and Land Protection Act

Implementation of this MER Strategy will help the Board fulfil its obligation under the *Catchment and Land Protection Act* (1994)[6]. The Board of the GBCMA must "…submit to the Minister and the Council on or before 31 August in each year a report on the condition and management of land and water resources in its region and the carrying out of its functions.' The framework for this obligation is being developed by the CMAs and the State. Meanwhile, the GBCMA prepares a comprehensive annual report.

1.4   Principles

Principles advanced in the *National NRM Monitoring and Evaluation Framework* (2002) are adopted by the GB MER Strategy. MER needs to:

1   be useful for all partners

2   be simple, cost-effective, affordable and practical:
   - avoids duplication of effort,
   - uses data for multiple purposes,
   - ensures that users can obtain the data, and,
   - ensures that users can easily find out whether suitable data already exist.

3   recognise NRM interventions encompass a range of time-scales

4   allow meaningful interpretation of data over time

5   specify the assumptions within the strategies

The GBCMA is also striving for all MER activities to abide by ethical principles implied in Australasian Evaluation Society's Guidelines[7].

The Catchment Community reinforces several important points stemming from these principles for all MER activities:

   - Information-gathering exercises are appropriate for the scale of decision-making that the information influences. There needs to be a clear reason why information is being gathered. In most cases these reasons will relate specifically to decision-making, although exercises such as some baseline monitoring are often necessary because we simply don't know today what might be important for decision-making in future, and that requires an understanding of change over time.

- All stakeholders have ownership rights. Each stakeholder has unique needs that must be recognised. MER protocols need to have sufficient flexibility to ensure that the exercise remains relevant to the stakeholders.

- A demonstration of adequate process can substitute for outcomes where outcomes are very long-term or difficult to measure.

- Natural resource programs are focused on high-level outcomes to be delivered many years out and it is generally impossible to assess their overall effectiveness with any accuracy within their funded life. While intermediate outcomes will provide some guide to likely effectiveness, most management action targets set within the first five years will represent only the earliest stages of progress towards remedying the key problems identified in regional plans.

- It will be desirable at some time in the future for the broader purposes of public policy to have an objective review of how well these approaches performed in achieving their primary outcomes. Unfortunately, because the original programs will have long since been discontinued by the time it becomes possible to do this, and no government is likely to commit the resources that far ahead, it may be that the best the implementation plans and state MER strategies can do is draw attention to the unmet need and collect baseline data before or early in programs as a reference point.

1.5   What is monitoring, evaluation and reporting?

1.5.1   Monitoring

Monitoring in the context of natural resource management is the systematic collecting and storing of data to enable activities, projects, programs, plans and strategies to be evaluated and reported. Monitoring includes measurement of the level of activity (output) and change (outcome). Change may or may not come directly from an activity – the link (assumption) is tested at the evaluation of program stage.

Data include:
- basic such as weather (including rainfall, sunshine and temperate), stream flow, and water quality in rivers and streams;
- resource condition such as extent of vegetation;
- project such as the number of specific activities undertaken/completed;
- works such as amount/volume undertaken;
- compliance such as EPA licence conditions;
- financial such as costs;
- social such as population size, growth, attitudes, age structure, skills, knowledge; and,
- economic data such a farm incomes, regional production

Baseline monitoring provides data on environmental, social and economic condition ('triple bottom line) independent of causes and is critical in providing context when evaluating and reporting.

A major feature of monitoring is the storage of data in a documented manner that allows simple retrieval and easy exchange of data to other users.

1.5.2   Evaluation

Evaluation generally involves assessing, for example, an outcome or activity against a stated goal, objective or value. It therefore involves assessing whether the level of change is appropriate or adequate and the strength of the link between the activity and the change. Evaluation is the 'systematic investigation of the worth or merit of an object (eg a program, project, or instructional material)'.[8] In summary, evaluations are conducted to assess the efficiency, effectiveness and appropriateness.

The need for before and after information is a major requirement for many evaluations as the major measure being assessed is change or trend.

Other evaluations will assess project participants' reactions, changes in knowledge, attitude, skills, and behavioural change. This type of evaluation requires different data sets than those used for biophysical evaluations and often includes qualitative measures.

Data used to inform evaluation varies depending on the level of decision making. MER is costly and time consuming and therefore should be undertaken to generate meaningful useful information.

Principles developed through a Land and Water Australia project[9] provide useful guidance for evaluation activities in the Goulburn Broken:
1   Evaluation of any given project or program needs to be set within the context of the entire NRM outcomes framework.
2   At different levels (national, state, local) it will be important to assess the combined impact of a mix of strategies as well as the impact of individual strategies.
3   Because NRM is multi-faceted, there will be a need to identify a very wide range of evaluation methods coming from many disciplines (many different social sciences and physical sciences).
4   Because the NRM context is highly dynamic, evaluation methodologies should not be too tightly tied to assessing performance in terms of pre-ordinately specified objectives.

1.5.3   Reporting

There have long been calls for increasing the emphasis of catchment management programs on monitoring and evaluation. In the last couple of years, this call has broadened to include reporting. This is a healthy addition because it implies that data gathered in monitoring and evaluation exercises must feed into a decision-making process. This narrows the focus of investment, simultaneously reducing wastage and increasing efficacy.

Reporting is the documenting of results of monitoring and evaluation and presenting to the appropriate forum (or audience) at specified times.

While it is reasonable to expect reports on outputs delivered from a given investment regularly, perhaps even quarterly, it is administratively costly and largely useless to compile reports on outcomes within this same timeframe.

A comment on costs and expectations of highly detailed decision-support systems
Costs involved in making decisions and reporting progress have escalated in recent years while the quality of decisions has declined. More data is expected to be included in decision-making by government investors without the merit of the data having been scrutinised. There needs to be greater respect for judgments that use the collective wisdom of experienced and skilled stakeholders, especially in the absence of quantitative information that can be aggregated. It is quite reasonable to make assumptions: the challenge is to document and communicate those that really matter.
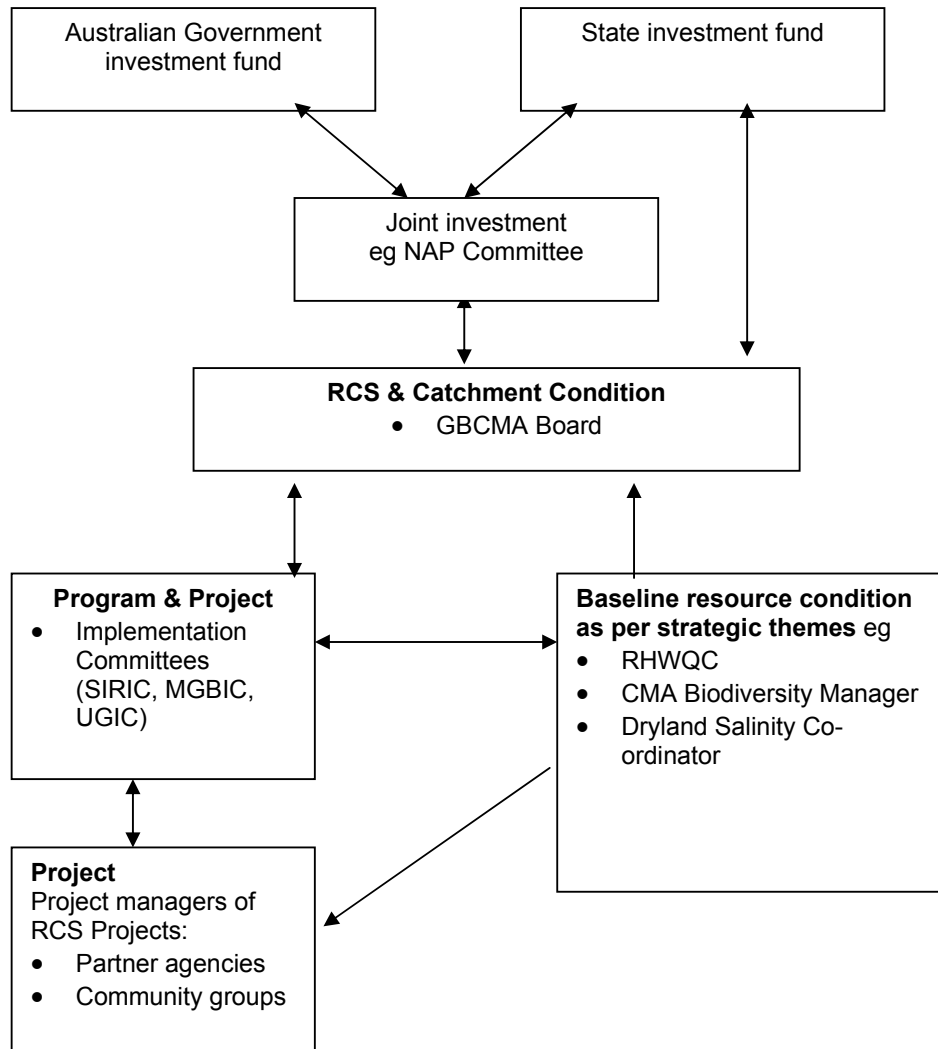
1.5.4   Challenges of MER in an integrated environment

While MER has been conducted successfully over many years for several NRM issues in the Goulburn Broken, the major challenge today is to refine MER in an integrated environment: being able to measure and understand the multiple-benefits and trade-offs of single actions is critical in decision making. Understanding the impacts of competing factors such as drought is also critical.

Land and water issues were the early focus for decision-making and in recent years biodiversity has been integrated. Emerging issues such as acid soils, greenhouse gases and climate change will be integrated into decision making and MER as they become better understood.

MER happens at all levels, from global to national to state to regional to local to farm to site. MER activities also vary enormously in scope, from highly complex, integrated issues to single issues. Overlap between MER activities is an unavoidable fact of life. The challenges are to reduce duplication of activities by fostering linkages between

them and enabling aggregation of data at various levels. To achieve this we need to maximise consistency between NRM plans by using similar language and hierarchies of information. Figure 5 breaks down the management cycle into a sequence that helps to develop this consistency. Examples of recent types of MER plans are included in Table 2.

Figure 5. Generalised management cycle showing monitoring, evaluation and reporting steps.
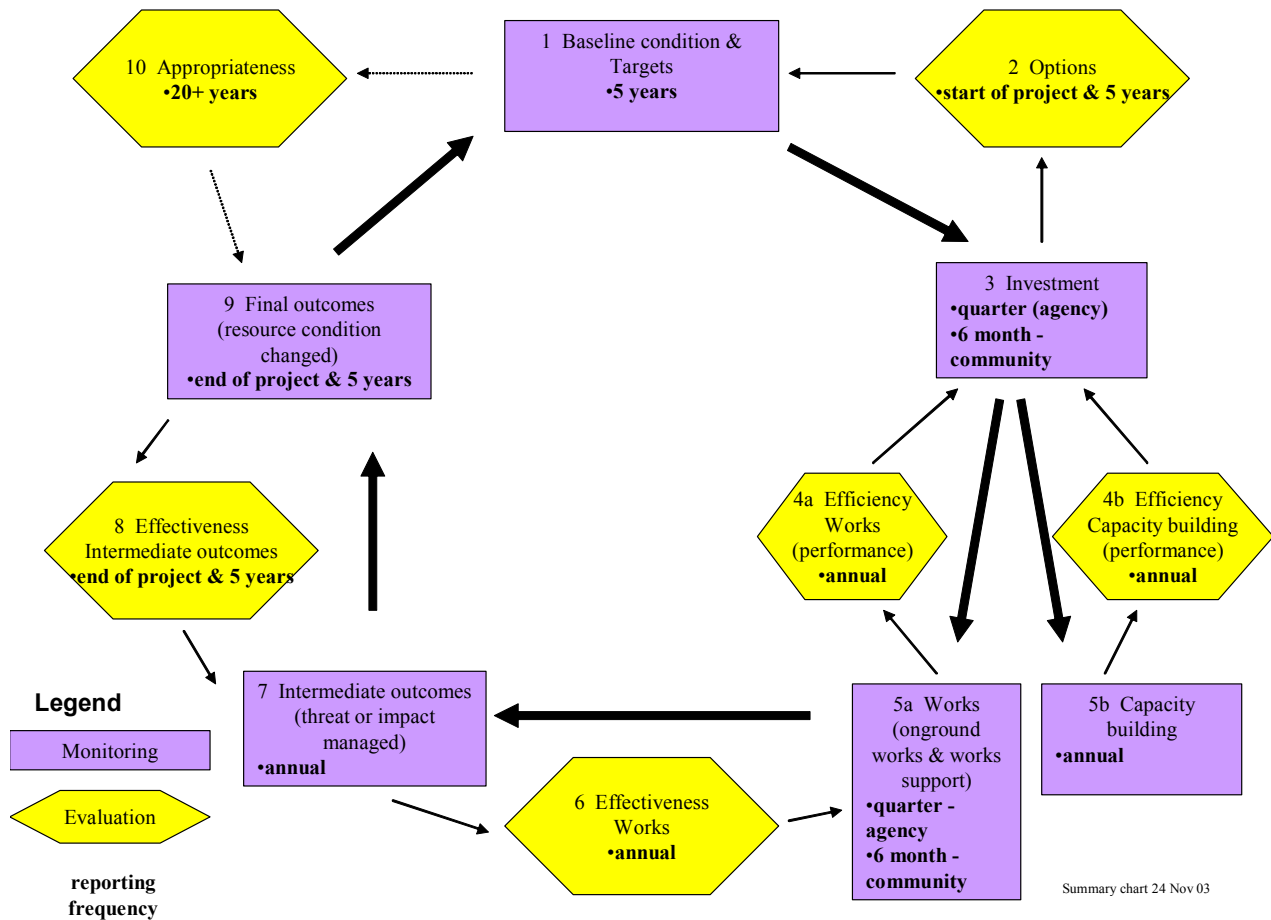
Table 2: Examples of different types of MER.

MER Plan type	Example	Integration Level	Emphasis	Assumptions certainty	Reports to			
					Cwlth State investors	Board	IC	Sub-IC
Sub-catchment	South west Goulburn	VH	Multiple actions Multiple outcomes	L	N	N	Y	Y
Specific project	Heartlands	H	Multiple actions Multiple outcomes	M	Y	N	Y	Y
Funded project	Bushcare project	M	Compliance: Few actions Efficiency (actions/$) Effectiveness (intermediate outcomes)	H	Y	N	Y	Y
Single action (large scale)	Sub-surface drainage	M	Single action (groundwater management)	H	Y	N	Y	N
Single action – small scale	Individual staff works program	VH	Efficiency (actions/$)	n.a.	N	N	N	?
Strategic theme	Irrigation salinity	H	Well-understood multiple resource condition targets (river and land salinity)	H	Y	Y	Y	N
Strategic theme	Native vegetation	VH	Resource condition targets reasonably well understood Management action targets Uptake of actions by partners	H	Y	Y	Y	N
Implementation Committee (integrated)	Annual report	VH	Multiple actions Multiple outcomes	L-VH	Y	Y	Y	N
Single issue, multiple investment	Key project: Vegetation management	H	Efficiency (actions/$) Effectiveness (intermediate outcomes/$)	M	Y	Y	Y	Y

2   What is being done?

Management of different natural resource issues have very different histories and not surprisingly, different processes for MER have evolved. This MER Strategy is the first attempt to collate the issues and begin updating MER processes using a consistent framework.

Key documents for reporting monitoring and evaluation activities are listed in Table 3. Strategies and subsequent reviews report and evaluate achievements to date and list monitoring and evaluation requirements over the next review period. Annual reports, particularly of Implementation Committees, provide monitored outputs achieved over the previous year. Appendix 3 provides an example summary of MER activities under a national matter for target[3]: 'native vegetation communities' integrity'.

New evaluation needs are readily identified and implemented via the rigorous decision-making processes in the Catchment (see Section 3). These needs might arise for many reasons, including extreme climate conditions, commodity price shifts, or political imperatives.

Appendix 4 lists all resource condition targets used in GBRCS implementation planning and shows which matter for targets (specified in the National Framework[3]) are addressed.

Table 3. Examples of key documents for reporting strategic-level monitoring and evaluation activities.

Strategic planning theme	Relevant Matter(s) for Target	High-level document recording results of MER	Responsibility	Last update	Next update
General	Several	Catchment condition report	GBCMA	nil (no guidelines yet)	every 5 years
General	Most	RCS	GBCMA	2003	2007
General	Most plus financial	Annual reports	GBCMA UGIC MGBIC SIRIC	2003	2004
Biodiversity	Several	Biodiversity Integration Strategy	GBCMA	2004 (in prep.)	2007
Native vegetation	Native vegetation communities' integrity	Native Vegetation Management Strategy (NVMS)	GBCMA	2000	2005
		Assumptions list	Biodiversity Manager	2003	2004
		Audit of all parameters (Background Papers to NVMS)	Biodiversity Manager	1998	2005
		NLWRA (baseline condition)	DSE Melbourne	2002	2007
Irrigation salinity	Land salinity, Surface water salinity in freshwater	Shepparton Irrigation Region Catchment Implementation Strategy (SIRCIS)	SIRIC	1990, 1995	2004

Strategic planning theme	Relevant Matter(s) for Target	High-level document recording results of MER	Responsibility	Last update	Next update
	aquatic environments	Managing Victoria's Growing Salinity Problem	Victorian Auditor General's Office	2002	to be determined
		Background Papers to SIRCIS:			
		Surface Water Management Review	SIRIC	2002	to be determined
		Sub-surface Water Management Review	SIRIC	2002	to be determined
		Farm Program Review	SIRIC	2002	to be determined
		Environment Program Review	SIRIC	2002	n.a.
		Development of KPIs for the Public Salinity Control Pump Program	SIRIC	Nov-01	as needed
		KPIs for the Public Salinity Control Pump Program	SIRIC	Jun-03	Annual
		SIRCIS Annual Report	SIRCIS	2003	2004
Dryland Salinity	Land salinity, Surface water salinity in freshwater aquatic environments	Dryland Salinity Management Plan	MGBIC and UGIC	1990 1995	to be determined
		Managing Victoria's Growing Salinity Problem	Victorian Auditor General's Office	2002	to be determined
River health	Inland aquatic ecosystem's integrity (rivers and other wetlands)	River Health Strategy	RHWQC	-	2004 (in prep.)
		Index of Stream condition reports	Riverine Strategies Manager	-	2004 (then 2009)
Soil	Soil Condition	Background papers for GBRCS	MGBIC Executive Officer	2002	to be determined
Water quality	Nutrients in aquatic environments	Water Quality Strategy	RHWQC	1996	2004
		Annual Reports	GVW G-MW Waterwatch	2003	2004
	Turbidity/suspended particulate matter in aquatic environments	*Further work required.*	RHWQC		to be determined
Wetlands	Inland aquatic ecosystem's integrity (rivers and other wetlands)	Wetlands Strategy	RHWQC	2004 (in prep.)	2007
Threatened species	Significant native species and ecological	Background paper for RCS: Threatened Flora and Fauna Species and Non-threatened	Biodiversity Committee (now defunct)	2002	to be determined

Strategic planning theme	Relevant Matter(s) for Target	High-level document recording results of MER	Responsibility	Last update	Next update
	communities	Vertebrate Fauna in the GB Catchment			
		NLWRA	DSE Melbourne	2002	to be determined
Pest plants	Ecologically significant invasive species	GB Region Weed Action Plan 2001-05	DPI Pest Manager	2001	to be determined
Pest animals	Ecologically significant invasive species	Rabbit Action Plan	DPI Pest Manager	2001	to be determined
		Rabbit busters - by landholders involved in program	DPI Pest Manager (part of statewide review)		to be determined
Community capacity	nil	Reports on sub program evaluations. Generally have not been at strategic level.	SIRIC, MGBIC and UGIC	2003	2004
Various	Several	Triennial review, NRM Program, Institute of Sustainable Irrigated Agriculture (ISIA)	DPI staff, ISIA	2000-01	2003-04

3   MER objectives and management actions

This Section describes how MER Strategy outcomes listed in Section 1.2 will be achieved. Objectives and Management Actions are listed under five sub-headings (for ease of reading the information only):

1   Participative decision-making

2   Community and industry MER activities[a]

3   Data knowledge and quality – science, economic, environment and institutional

4   Project and issue management

5   Database management and information exchange

Appendix 2 provides timeframes, responsibilities and costs for implementing management actions listed in this Section.

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[a] 'Management Actions' listed are equivalent to those defined under the National Framework[2]. MER 'activities' are at a lower level, such as aggregating the area of native vegetation fenced off, evaluating whether a project has been cost-effective, or presenting to a forum. A MER 'process' includes the whole cycle of MER for a particular issue and includes several activities.

3.1 Participative decision-making

Implementing solutions is a long process of difficult dealings with a great variety of individuals, groups and institutions. Objectives and indicators of success therefore need to promote participation as well as accountability and so the emphasis must shift from specific programs or agencies to the 'social problem as a whole and the multiple lines of attack on it'[10].

MER activities must be relevant to stakeholders so they will participate in them.

Goulburn Broken Implementation Committees have developed MER processes[a] to a very high level over more than a decade which has enabled the community to participate in decisions that affect how much public funding government agencies and voluntary groups receive and where these funds are spent.

The Catchment's key decision-making forums actively involve Australian Government and State investors so there is a shared understanding of the Catchment's unique circumstances, including decision-making processes and information requirements. This has become even more important under the employment conditions of recent years where individuals change positions continually.

The next section deals with community implementation of decision making.

3.1.1 Objectives

- To support communities to develop MER processes that are responsive to their unique social structures.
- To provide a readily identified common Goulburn Broken Catchment context for all NRM MER activities within the Catchment.
- To provide direction on the chain of information flow for NRM MER, including forums and timing.

3.1.2 Management actions

1. Continue support of the existing MER processes, such as those including Implementation Committees, that promote participative decision-making.
2. Map existing participative decision-making processes within the Catchment to help communicate to all stakeholders the rigour of existing MER processes. ('Rigour' includes regularity, transparency and opportunity for all stakeholders to be involved.)
3. Develop MER protocol that ensures all stakeholder needs of MER and possible contributions to MER are considered. This includes including social and economic evaluation in annual program and sub-program level reports.
4. Conduct gap-analysis to identify stakeholders who might be alienated from current MER processes.

3.2   Community and industry MER activities

Many community groups are actively involved with NRM MER in the Catchment, both voluntarily and as a condition of receiving external funding. Many groups supplement external funder requirements with additional MER that are more relevant to them. These groups include Waterwatch, the Grey-crowned Babbler and Superb Parrot Groups.

Some groups and group collectives have also established local area plans[11] that are structured according to missions, resource condition targets and priorities of the Goulburn Broken Regional Catchment Strategy. An *Evaluation Plan for Local Area Plans of the Shepparton Irrigation Region*[12] has been drafted and is expected to be finalised before implementation during 2004. Producing this Plan involves extensive consultation so that on-ground works can be reported against broad Catchment goals.

Several DPI staff supporting the Shepparton Irrigation Region Implementation Committee have undergone significant MER training recently and will be facilitating agency partners and community groups and individuals to enhance MER processes.

Several industries also demonstrate environmental and social responsibility. For example, Murray Dairy, the dairy industry's peak research body throughout northern Victoria and southern New South Wales, includes regional catchment strategy priorities as major drivers in its direction[13]. The Dairy Research and Development Corporation actively promotes responsible management of natural resources, and several large dairy processing companies such as Tatura Milk Industries have a quality control system that includes NRM outcomes as part of its accreditation of farms.[14]

The Victorian government in partnership with the Victorian Farmer's Federation has recognised the need to strengthen the link between the farm and Catchment scales through Environmental Management Systems (EMS)[15]. There are several EMS projects underway in the Catchment and these need to be supported to ensure RCS priorities are included.

It is critical that the link between the local and catchment scales is fostered through close attention (from significant investment) in the detail of MER processes, especially in those groups that have initiated this approach. (Note that this link will only be strong if there are subsequent links in both directions – down to the landholder and site scales, and up to the State and National scales.)
Many MER activities undertaken by the community are not linked to funding but nevertheless play an important role in building the knowledge base of the Catchment. For example, many groups and individuals monitor birds for Birds Australia's *Atlas of Australian Birds*[16].

Landcare and other community groups often have different demands from multiple investors. Community groups usually have little experience in evaluating projects. There is a huge challenge to relieve the administrative burden that this creates for volunteers.

Universities outside the Catchment and within are involved with many Goulburn Broken NRM projects. The links between these projects and the RCS rely on individual interests and need to be supported.

MER activities need to be relevant to stakeholders to ensure ongoing participation – not just in MER, but in NRM in general. Providing information (or reporting) back to stakeholders in a way that is relevant to them will encourage their ongoing contribution.

3.2.1   Objectives

- To nurture the abundant good-will from volunteers in NRM MER activities.
- To promote the environmental ethic of industry via NRM MER.
- To measure the contribution of volunteers to NRM.

3.2.2   Management actions

5. Build two-way loop into MER protocols, ensuring that contributors must receive information back in a form that is relevant to them.
6. Document existing information that is provided to land managers at local area scale and identify possibilities for enhancing it.
7. Develop and implement MER training program for agency staff and the community.
8. Continue developing MER system that links the Goulburn Broken Regional Catchment Strategy with community group MER activities, including via local area plans.
9. Continue developing MER system that links Goulburn Broken Regional Catchment Strategy with private industry MER activities, including via Environmental Management System approaches.
10. Develop links between university MER activities and the Goulburn Broken Regional Catchment Strategy.

3.3 Data knowledge and quality – environment, economic, social and institutional

Huge improvements have been made in understanding the causes and effects of many of our actions in the past 20 years, such as the impact of salt disposal on agricultural and riverine systems. However, the momentum towards integrated catchment management over the past decade highlights the inadequacy of our understanding of how our actions affect the three elements of the triple bottom line – environmental, economic and social.

We are in our infancy of understanding these complex relationships – in fact, we are only at the stage of developing an accepted process that documents these relationships. Put simply,

$$Outcomes = Outputs \times Assumptions^{17}$$

where:
- Outputs are the extent of actions undertaken.
- Assumptions are the assumed effectiveness of the action and how the action impacts on resource condition.[b]
- Outcomes are what results from the actions – including unintended and unanticipated, resource condition changes, and economic and social changes.

The confidence held in different assumptions varies from certainty to very unsure: assumptions always need to be accompanied by a confidence rating or statement so that we have a sense of surety about outcomes expected. Several models using relatively simple computer software are emerging (such as through *The Living Murray*[18] project) that enable confidence levels to be included. Perhaps 'assumptions' is no longer an appropriate word because it implies a lack of certainty or rigour when this might not be the case.

When targets are set, assumptions are also made about the expected rate of adoption of actions. Progress is well underway in documenting the 'assumption-links' between outputs and outcomes can be documented.

Given the relative infancy of integrated catchment management, the following quote from a report of a national forum is not surprising:
'Standards of monitoring and evaluation for natural resource management programs over the past decade have, in general, been extremely inadequate. There is relatively little accumulated information sufficiently robust to make a clear evaluation of outcomes and of the efficacy of program investment by governments or communities.'[19]

A major challenge with improving technical information is to ensure technical experts and decision-makers (especially investors) understand each other's needs. An appreciation of the time it takes to facilitate this understanding is sorely needed so that expectations of investors are appropriate.

While there is common agreement between investors, community decision-makers and technical experts that data needs to be standardised and systematic so that it can be readily recorded, aggregated and reported, there is varied expectation of what information can be delivered and by when. Many local databases have been used for

over a decade and large investment would be needed to translate the data to new databases with different data protocols.

In recent years, investors at the State scale (ie Australian Government and State investors) have been faced with the challenge of comparing the ten Catchments across Victoria, often with little information. Unfortunately, the information sought by investors often did not exist at the level of detail required or were of such high uncertainty that the 'information' generated resulted in poorly justified decisions.[20]

A step-wise approach to improving information needs to be mutually understood.

Progress against resource condition targets occurs as opportunities arise and is appropriate about every five years for most issues. Funds received by the Catchment through the Regional Management Plan[c] (RMP) contribute to, and generally leverage, a much larger overall investment which means that RMP outputs contribute only part of the resource condition change. The GBCMA's Annual Report lists progress against management action and resource condition targets.

Different 'silo managers' (Australian Government and State investors responsible for single NRM issue investment) have different project data requirements which create extra administration.

There are three areas that need to be included:
- Baseline monitoring – considers resource condition, environmental and social trends.
- Project MER – considers relative impact of specific project actions on outcomes.
- Program monitoring – considers whole of program impacts.

3.3.1 Objective

- To improve understanding and demonstration of the link between cause and effect in a complex integrated system.
- To consolidate baseline monitoring efforts.
- To improve the link between technical experts, community decision-makers and investors.
- To provide direction on how to show assumptions that underpin decisions including the link between outputs and intended (and unintended) outcomes and how to show progress via monitoring, evaluating and reporting against identified outcomes and milestones.

3.3.2 Management actions

11. Refine core logic (process of documenting assumptions (with certainty levels) that link outputs to outcomes).
12. 'Map' core logic for all programs, expanding on the example in this Strategy's Background Paper on SIR salinity.
13. Prepare standardised project evaluation and reporting processes with investors, including access to reports.
14. Prepare gap and data needs analysis from 'assumption maps' (see previous) so that understanding can be improved.
15. Prepare detailed 'MER Action Plan for Improving Investment' which highlights sequential approach to improving MER processes.
16. Continue baseline monitoring of the triple bottom line, especially resource condition trends, where possible using agreed standards.

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[c] The Regional Catchment Investment Plan is the proposal for investment and the RMP defines the accountabilities. The process for agreement between investors and proposers on the contents of these documents is subject to ongoing refinement.

3.4   Project and issue management

The Catchment Community has developed rigorous project and issue management processes over many years. These processes include strong MER components.

Baseline monitoring programs in the Catchment have enabled the Catchment Community to be relatively pro-active in most NRM issues. Pilot strategies for Australia were developed in the Goulburn Broken for salinity, nutrient and native vegetation management during the 1980s and 1990s.

Demands by different investors, often for the same projects, have created huge administrative burdens in many cases, especially on volunteer community groups. There is potential to streamline administrative demands by matching parameters (outputs and outcomes) used in project proposals with those used in reports.

Figure 5 (page 16) shows long-term (outcome oriented) and short-term (output or action oriented) loops for MER. It is critical to keep these loops separate so that stakeholders are focused on the same information – and information that is relevant. Timeframes and audiences used for output and outcome reporting need to be separated.

The RCS and most sub-strategies are presently evaluated every five years (refer to Section 2). This includes an evaluation of whether we are on track to achieving long-term outcomes. It is appropriate to see whether the long-term outcomes originally sought are still appropriate, perhaps after 20 years or earlier if improved information becomes available.

The purpose of an evaluation should be clearly stated. This will help determine whether the evaluation should be conducted in-house or independently.

Outputs and outcomes need to be standardised. Significant progress has been made on this with the development of standard outputs for vegetation management in CAMS and 'Resource Condition Targets' and 'Management Action Targets' in the RCS which align with the National Framework.[3]

3.4.1   Objective

- To improve issue and project management by improving MER.
- To ensure the Regional Catchment Strategy is current.

3.4.2   Management actions

17. Continue baseline-monitoring projects such as water tables, stream salinity, native vegetation, and water quality using where possible agreed statewide data protocols.
18. Work with investors to align project proposals and project reporting.
19. Develop checklist of MER to be included in reviews of each RCS sub-strategy or Action Plan, including a schedule of evaluations as they are undertaken, the purpose of the evaluation, and whether it is appropriate to have the evaluation conducted in-house or independently.
20. Include MER needs in each project proposal.
21. Continue standardising outputs and outcomes for each stakeholder and build into databases.
22. Evaluate and update the Regional Catchment Strategy every 5 years, in accordance with the *Catchment and Land Protection Act* (1994).

23. Evaluate and update programs and sub-strategies of the Regional Catchment Strategy as required (generally every 5 years).
24. Include support processes in evaluations at the strategy level: generally at the 5 year interval.
25. Review appropriateness of long-term outcomes sought in Regional Catchment Strategy and sub-strategies, perhaps at 20 year intervals.
26. Build variation evaluation into reporting by including upper and lower limits on proposed outputs that would initiate an evaluation of a project or sub-strategy.
27. Review programs at the intermediate outcome level (where projects become integrated) annually (includes evaluation information to feed into longer term Strategy review).
28. Review projects half-yearly (includes monitoring and evaluation information to feed into annual program review) and on completion.
29. Review this MER Strategy annually and conduct major review every 5 years, using the Outcomes, Objectives, Management Actions, Timeframes and Responsibilities as the basis for the review.

3.5 Database management and information exchange

The number of databases has grown exponentially over the last decade in parallel with data demands from different investors and improvements in information technology. This has created a mountain of data with many and varied databases being managed by many organisations. There is likely to be data gathering that is duplicated, missing and obsolete.

Data warehouses such as www.vicwaterdata.net and through www.nre.gov.au have been established to amalgamate data and provide a one-stop shop for checking the existence and contents of datasets. Data gathered in the Catchment must be included in these warehouses.

While it is appropriate that databases continue to be managed by different organisations, an understanding of these databases is needed.

Access to information is often more difficult than it needs to be, especially where information has been generated using public funds.

While Victoria's *Freedom of Information Act* (1982)[21] made access to government information easier, the *Victorian Information Privacy Act* (2000)[22] has the opposite effect.

3.5.1 Objective

- To develop a database management approach that enables information to be accessed, easily, efficiently, and effectively.

3.5.2 Management actions

30. Compile and maintain a single catchment inventory of all NRM MER activities. This means identifying for quick reference the MER project (or groups of like projects such as 'Landcare projects'), where the details can be found, and who is responsible for the database. It does not mean including all of the details of all databases.
31. Develop a simple access system to databases relating to the Catchment's NRM MER activities. This includes constructing a database management protocol that ensures databases developed in the Catchment are included in appropriate database warehouses.
32. Develop data access protocols that allow decision-makers and the community to access publicly funded data and other natural resource data if possible. This includes consideration of the *Freedom of Information Act 1982* and the *Privacy Act 2000*.

4   MER timelines and responsibilities

As discussed in Section 1.5.4 and Section 2, many stakeholders operating at different levels are undertaking MER.

Most programs, projects and sub-strategies have detailed MER requirements embedded within them while others have MER identified as requiring special emphasis and are dealt with in separate, but highly connected, MER action plans, such as for biodiversity and the sub-surface program in the SIR.

Appendix 2 provides a costing and lists responsibilities for implementing the high-level, catchment-wide management actions for MER listed in Section 2.

Appendices

Appendix 1. MER Strategy Consultation

Listed below are members of various organisations who have been consulted during production of this Strategy (see Table 1 page 7).

GBCMA Partnership Team

Bill O'Kane	GBCMA	CEO
Russell Wealands	GBCMA	Executive Officer UGIC
Phil Stevenson	GBCMA	Executive Officer MGBIC
Ken Sampson	GBCMA	Executive Officer SIRIC
Kate Bell	GBCMA	Biodiversity and Bushcare Manager
Guy Tierney	GBCMA	Floodplain Manager
Stan Gibney	GBCMA	Business Manager
Wayne Tennant	GBCMA	Riverine Strategy Manager
Justin Sheed	GBCMA	Waterways Manager
Rick Felton	DPI	
Bruce Cumming	DPI	
Terry Hunter	G-MW	
Megan McFarlane	GBCMA	Business Development Manager

SIRIC SIRTEC

Ken Sampson	Co-ordinator
Allen Canobie	Community
Greg Smith	G-MW
Peter Dickinson	G-MW
Steve Harding	SKM
Heinz Kleindienst	SKM
Stan Cornish	NVFGA
Peter Gibson	Community
John Tunn	Aboriginal Affairs Victoria
Laurie Gleeson	Goulburn Valley Water
Chief Executive Officer	North Central CMA
Bill O'Kane	GBCMA
Justin Sheed	Goulburn Broken Waterways
Chris Linehan	DPI
Peter Howard	GBCMA
Pam Collins	DPI
Melva Ryan	A/g MCC
Elita Briggs	EPA
Bruce Cumming	DPI
Rachael Spokes	DPI
David Lawler	DPI
Geoff Lodge	DPI
Mike Morris	DPI
Terry Batey	DPI
Steve Lottkowitz	DPI
Ross Plunkett	G-MW
Pat Feehan	G-MW
Russell Pell	Community
Gordon O'Brien	GBCMA
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GB Dryland Support Team

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Mark Cotter	DPI
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Alan Dobson	DPI
Dave Smith	DPI
Greg Pell	DPI
Justin Sheed	GBCMA
Kate Bell	GBCMA
Phil Stevenson	GBCMA
Russell Wealands	GBCMA
Russell Purcell	DPI
Stephen Feiss	G-MW
Sudath Herath	G-MW
Tom O'Dwyer	GBCMA

Upper Goulburn Implementation Committee

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Mike Dalmau	Community
Robert Dare	Community
Chris Doyle (Chairman)	Community
Margaret Hatton (Deputy Chair)	Community
Peter Howarth	Community
David Ritchie	Community
John Thompson	Community
Nigel Waterhouse	DPI
Greg Smith	G-MW

Mid Goulburn Broken Implementation Committee

Jill Breadon	Community
Geoffrey Campbell	Community
Dougal Gilmour	Community
Menon Parameswaran	Community
Sally Simson (Deputy Chair)	Community
Peter Robinson (Chairman)	Community
Alan Sutherland	Community
Ken Whan	Community
Dave Smith	DPI
Stephen Feiss	G-MW

Shepparton Irrigation Region Implementation Committee

Allen Canobie	Community
Steve Farrell	Community
Peter Gibson (Deputy Chair)	Community
Peter McCamish	Community
Athol McDonald	Community
Russell Pell (Chair)	Community
Ann Roberts	Community
Nick Roberts	Community
Bruce Cumming	DPI
Pat Feehan	G-MW

Goulburn Broken Board

Stephen Mills	Community
Ailsa Fox	Community
Catherine Scott	Community
Craig Madden	Community
Yvonne Davies	Community
Graeme (Mick) Williams	Community
Don Cummins	Community
Lyn Gunter	Community
Charles Jones	Community
Stephen Junghenn	Community
John Pettigrew	Community
Kevin Ritchie	DSE
Chris Norman	DPI

Australian Government and State NAP/NHT Staff

Megan Hawke	Evaluation Manager, Victoria
Dugal Wallace	Targets and Standards Manager, Victoria
Peter Forbes	Program Development Manager, Victoria
Ian Gaze	Monitoring and Evaluation Manager, Australian Government

Appendix 2: GB MER Strategy Action Plan

Refer to attached document.

Appendix 3: Summary of a matter for target: native vegetation communities' integrity

Refer to attached document.

Appendix 4: Approval status of GB resource condition targets and alignment against national matters for targets

Refer to attached document.

Appendix 5. Major government directions – further background information

National Land and Water Resources Audit

How is the Audit helping natural resource managers?
The Audit is

(i) providing a clear understanding of the status of, and changes in, the nation's land, vegetation and water resources and implications for their sustainable use;
(ii) interpreting the costs and benefits (economic, environmental, and social) of land and water resource change and any remedial actions;
(iii) developing a national information system of compatible and readily accessible land and water data;
(iv) producing national land and water (surface and groundwater) assessments;
(v) integrating and collaborating with other relevant initiatives; and
(vi) providing a framework for on-going monitoring of Australia's land and water resources

What are the Audit outputs?

(i) *Scientific assessments:* The status, and where possible, recent changes in land, vegetation and water resources. These assessments will help decision-makers and provide a benchmark for future work;
(ii) *Reports* - The economic, environmental and social dimensions of land, and water resource change, including land cover and remedial actions;
(iii) *Integrated, nationally-compatible data sets*;
(iv) *National water resources assessment* - The extent of the surface and groundwater resources, quality, supply, capacity and use.
(v) *Defined and agreed reporting links* - between the Audit and the State of the Environment reporting process, the Indicators for Sustainable Agriculture and other relevant activities at the State and Australian Government level;
(vi) *Framework* - To assess and monitor the health and management of Australia's land and water resources to meet the needs of all major stakeholders.

References and further reading

GB MER Strategy background papers (2003)

- Analysis of issues concerning monitoring and evaluating integrated catchment management.
- In-depth analysis of how a natural resource management issue is monitored including development of Evaluation Plan for the SIRCS Salinity Program.
- Alignment of monitoring and reporting databases such as CAMS with sub-strategy Evaluation Plans.

Referenced documents

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[14] Stuart Brown pers. Com.

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Further reading

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