Framework for Catchment Condition and Management Reporting in Victoria

Indicators and Data

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1. Introduction

The Victorian Auditor General's Office (VAGO) Report recommended that Department of Environment, Land, Water and Planning (DELWP) and Catchment Management Authorities (CMAs) improve catchment management monitoring and reporting by developing and implementing a consistent approach to monitoring and publicly reporting on catchment condition, regional catchment strategy delivery and related investment outcomes, including:

- the finalisation of consistent catchment condition indicators for use at both state and regional levels;
- addressing deficiencies in catchment condition data to support monitoring and reporting against the consistent indicators; and
- the development of indicators to measure the outcome of investments associated with regional catchment strategy implementation.

Progress in this area has been seemingly slow for some years due to the limitations of individual policy areas and agencies working in isolation. However, this project offers a new opportunity for agencies to work together to help solve some of these long standing challenges.

Purpose of this document

The purpose of this document is to outline a collaborative approach to consistent catchment condition and management reporting to ensure that:

- the development of catchment condition and management indicators occurs within a framework that easily allows reporting on the condition and management of catchments;
- there is a clear basis for developing an agreement on the supply of data and information to support future reporting by Catchment Management Authorities (CMA);
- early planning occurs early in the process for the development of the next catchment condition report by DELWP and the Victorian Catchment Management Council (VCMC); and
- there is a commonly agreed language to inform discussion between a range of agencies, including Parks Victoria (PV), the Commissioner for Environmental Sustainability (CfES) and Trust for Nature (TfN).

2. Catchment condition and management reporting

The current arrangements for catchment condition and management reporting in Victoria, described in Table 1, are based on the following state-wide and regional reporting requirements:

- Five yearly State of Environment (SOE) reporting (CfES);
- Five yearly state-wide catchment condition reporting (VCMC);
- Reporting on progress with plans and strategies (including Regional Catchment Strategies (RCS)) developed by DELWP, PV and CMAs;
- Annual reporting by CMAs on the condition and management of land and water resources; and
- Annual reporting on activity and outcomes from investment programs (DELWP, PV, CMAs and TfN).

State-wide environmental condition reporting considers the quality of key state-wide environmental assets and the status of threats to those assets.

Management reporting considers the progress with, and achievements of, key plans and strategies.

Output reporting provides information on the activities and achievements of management programs conducted by government agencies and the community.

State of Environment (SoE) reporting covers a broader range of interests than catchment condition reporting. The SoE also reports on issues and aspects of environmental management that are traditionally outside the scope of catchment management; including human settlements and air quality.

Table 1 also shows that environmental accounts may be prepared to further communicate the value of the environment, and benefits of management activity, for specific audiences and purposes.

Table 1 Current arrangements for collaborative state-wide catchment condition and management reporting.

<table>
<tr><th rowspan="2">State of the Environment Reporting (CfES)</th><th colspan="3">Reporting logic</th><th colspan="2">Indicators</th><th rowspan="2">Environmental Accounts can be reported at each level; including contribution to ecosystem services.</th></tr>
<tr><th rowspan="3">Catchment Condition and Management Reporting (VCMC)</th><th rowspan="2">State-wide Environmental Condition Reporting</th><th></th><th>Quality</th><td>Indicators that show the state and change in quality of environmental assets within Victoria.</td></tr>
<tr><th></th><th>Threats</th><td>Indicators that show the state and trajectory of key threats to environmental assets.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><th>Reporting on State and regional policy and strategies, including RCS</th><th>Management Reporting</th><th>Progress with plans and strategies</th><td>Indicators of progress towards policies and strategies.
e.g. RCS, Victorian Waterway Management Strategy, Coastal Strategy etc.</td><td></td></tr>
<tr><td colspan="3" rowspan="2">Annual output reporting and investment acquittal (CMAs, DELWP, TfN, PV)</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Output Reporting</td><td>Outputs from investment activities</td><td>Outputs and achievements from investment programs (recorded and reported by CMAs using the DELWP output data standard).
May also include descriptive reporting on successes and the release of new information.</td><td></td></tr>
</table>

Collaboration

The key to developing agreement on indicators and measures is collaboration across agencies and policy areas. There is no clear agency responsible for setting standards, approaches or language for monitoring, evaluation or reporting across Victoria's environmental agencies, so collaboration is essential to solving some long standing challenges. The key benefits of a collaborative approach include improvements in agencies capacity to:

- account for the use of community resources;
- communicate challenges and outcomes to the community; and between and within agencies; and
- provide relevant information to support adaptive and integrated management.

State-wide Environmental Condition

The term environmental condition is used here to refer to an evaluation of the quality of land and water resources, and the impact of threats to those resources, at a statewide scale. In this context the term 'land' is used as it is referred to in the *Catchment and Land Protection Act* (1994) (CaLP Act) and includes soil, native vegetation and native animals.

Environmental condition can be influenced by a range of factors, of which, management activity is only one. These factors may also include elements outside the control of government policy and actions, such as bushfire and climate change.

Changes in environmental condition at the state-wide scale are mostly only measureable in the longer term (20+ years). However, in specific circumstances indicators may give reasonable evidence of the direction of change in shorter timeframes.

Threats to condition include a range of factors that may in the past, present or future, result in a degradation of environmental value.

Management reporting

Both the efficiency and effectiveness of management interventions can be reported at site, landscape, regional or state-wide scales. However, management reporting aims to demonstrate progress towards program outcomes documented within plans and strategies. These outcomes may be long-term (20+ years) or short term (e.g. 1-5 years).

Reporting on management progress should refer to specific measures documented in plans and strategy. These measures may address physical change in the landscape, progress toward implementing activities, changes to land management, community support or improvements in strategic planning.

It is important to note that reporting on management progress should be anticipated and documented as part of a project logic during program development.

Output reporting

Outputs are completed activities that are funded through agency programs. Each output represents a discrete item that, in turn, contributes to the delivery of a project, the project helps deliver on a plan and, at the broader scale, the plan helps deliver on government policy.

A consistent approach to information management and standards for investment outputs helps to ensure easy acquittal against investment agreements.

The delivery of investment outputs should be the basis for describing the deliverable of short term funding agreements for the delivery of projects.

DELWP have worked with catchment agencies to develop the Output Data Standard to help guide reporting on investments. Recently, CMAs have published an annual 'Achievements' report that details the scope and scale of activities that are conducted within their catchments.

Environmental accounts

Environmental-economic accounting (EEA) is a framework for describing environmental assets and how they change over time, along with the linkages and interactions with the economy. There is an international standard that defines this framework known as the System of Environmental-Economic Accounting (SEEA).

SEEA includes reporting and accounting guidelines on how to define and characterise ecosystem assets, assess the services they provide to society, and link transactions and investment on the environment to changes in ecosystem assets. It enables linking management actions to changes in the quantity and quality of these assets and understanding how these changes generate value in terms of social and economic benefits to people.

SEEA provides an important basis for the consistent development and integrated reporting of indicators. For instance, the development of indicators needs to consider a range of criteria, including the use of established measures of assets, the ability to measure change, scalability and the use of scientifically robust data and methods. SEEA adds value by providing a framework to organise and reconcile basic statistics using accounting concepts and structures to obtain a time series of consistent, comparable and coherent statistics and indicators and by facilitating the linkages with official economic and social statistics.

Further when there are multiple indicators that are designed to measure different aspects of a common environmental asset, it is important that data collection and collation for all indicators include:

- Agreement on the units data is collected for;
- Common classification of the assets and how they change over time; and
- A structured approach for integration of relevant datasets to inform proposed indicators but having sufficient flexibility to produce new indicators in the future.

The role of accounts in supporting indicator development and reporting is to ensure indicators are consistent and integrated because their component data are derived using a common framework. This will further help to streamline consistent collection of environmental data. An overview is presented in the figure below with a focus on environmental assets*.

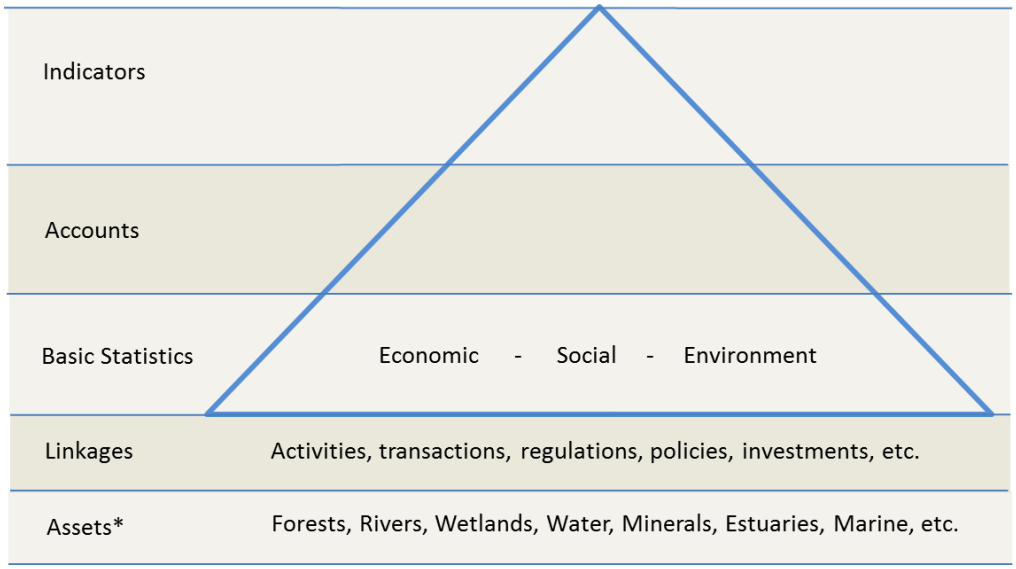

Figure 1 Linking indicators to environmental-economic accounting – the information pyramid[1]

[1] This figure is based on SEEA Briefing notes (http://unstats.un.org/unsd/envaccounting/seeanews.asp)

For the purpose of reporting, accounts are used to track changes in environmental assets over time and identify key linkages or connections to activities or management actions led by government, businesses and households. Table 2-1 shows that accounts may be prepared at a range of scales for different purposes. For example:

- At a State-wide level – accounts can be used to measure the overall contribution of the environment to the economy and community, informing measures of progress and assessing the impacts of environmental degradation.
- At a regional level – accounts can be used to inform priority setting and resource allocation by enabling tracking of the condition of natural assets and ecosystem services, and unpacking changes in condition and services resulting from government investment or other external influences (e.g. natural events) over time.
- At a program management level – accounts can be used for accountability and analysis to improve program settings over time by enabling consistent reporting on changes in asset condition, ecosystem services, and return on investments.

Roles and responsibilities in environmental condition and management reporting

The Commissioner for Environmental Sustainability – State of Environment reporting

The Commissioner for Environmental Sustainability is appointed under the *Commissioner for Environmental Sustainability* (CES) Act 2003. The Commissioner's role includes the publication of a State of the Environment (SoE) report every five years.

The scope of the SoE report is broader than the CCM Report and previous reports have included data and indicators associated with air quality, climate change mitigation and human settlements.

Under the CES Act, the Commissioner is an independent office. The SoE report must be tabled in Parliament within ten sitting days of being presented to the Minister. However, the Minister does approve the Framework that sets the strategy and approach for the report. As the Framework is also tabled in Parliament, it has the potential to provide an authorising environment for monitoring and reporting reform.

VCMC – Catchment condition reporting

The CaLP Act directs the VCMC to prepare a Catchment Condition and Management Report at five yearly intervals. This includes an assessment of the condition and management of land and water resources within catchments.

DELWP – State-wide strategies, investment and monitoring

DELWP develops environmental policy, strategy and programs and, invests in the management of the environment through its regional partners such as the CMAs. DELWP also undertakes state-wide monitoring (e.g. the Victorian Forest Monitoring Program - a comprehensive state-wide public forest monitoring program, which informs the 5-yearly State of the Forests Report) and provides information and data to the VCMC, CMAs and the Office of the Commissioner for Environmental Sustainability to assist with the production of their reports.

CMAs - Annual reporting and investment acquittal, RCS reporting

CMAs are established under the CaLP Act and deliver functions responsibilities under both the CaLP Act and the Water Act 1989.

CMAs report annually in response to these requirements on the condition and management of land and water resources in their regions, and the carrying out of their functions. These functions also include their responsibilities to develop Regional Catchment Strategies. Reporting on management of land and water resources includes reporting on the broader range of on-ground activities delivered through government investment.

Parks Victoria – annual reporting and investment acquittal

Parks Victoria is a statutory authority, created under the *Parks Victoria Act* 1998 and reports to the Minister for Environment, Climate Change and Water. Parks Victoria delivers on a range of activities across Victoria's parks network to protect and enhance park values. Management responsibilities and activities are reported in its annual report.

3. Adaptive management

While reporting is a key driver for monitoring, evaluation and reporting, the priority for agencies like DELWP is the need for data ensure the cost – effectiveness of investment and management actions.

Adaptive management is a process that formalises information flows between strategy and planning and evaluation, to ensure that we can learn from what we do (see Figure 2). Consistency of underlying data and information is critical to the implementation of an adaptive management approach.

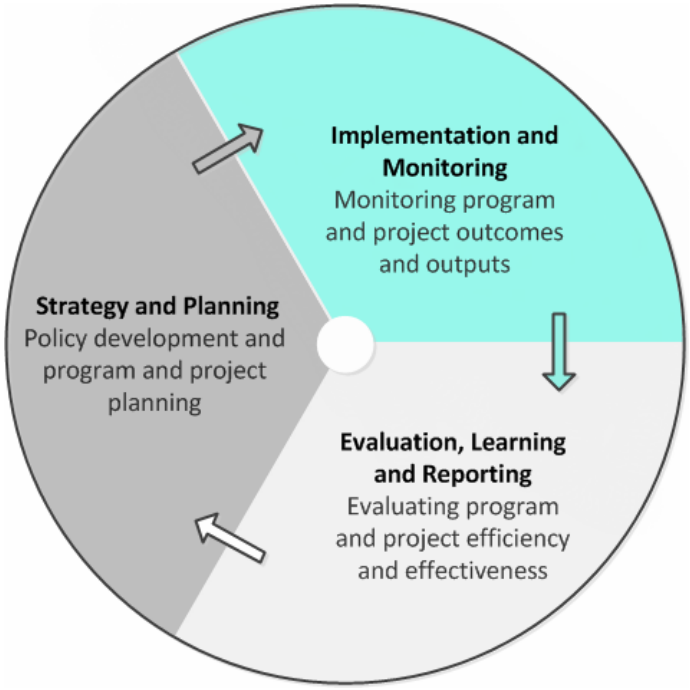

Figure 2 Key elements of the adaptive management cycle; ensuring we can learn from what we do.

4. Indicator framework

The following indicator framework is designed to provide the basis for a cross agency agreement on indicators and measures for catchment condition and management. The framework consists of a thematic structure, a set of principles; and a structure for evaluation questions based on assets, threats and the requirement for ongoing adaptive management.

Thematic structure

The indicator framework described in Table 2**Error! Reference source not found.** is built on five key themes. These themes describe key areas of catchment condition and management and include; Biodiversity (native habitat and native species), Waterways, Coasts (marine and coastal environments), Land (land management) and Community (community contribution to, and benefits from, environment programs).

The thematic structure above distinguishes between the condition of key assets and key areas of management. Changes to the condition of Victoria's environment are often slow moving and hard to detect. Key themes of Land and Community provide the potential for powerful stories about the more dynamic aspects of environmental management where landholders and community groups engage in significant works for the broader community benefit.

Table 2 Thematic structure.

Key themes	
The condition of key assets	
Biodiversity	The condition of native habitat
	The health of native species
Waterways	The condition of waterways (rivers, wetlands, lakes and estuaries)
Coasts	The condition of marine and coastal environments
Environmental management and community benefit	
Land	The management of land – private and public
Community	The benefits that flow from community participation

Principles for indicator development

The development of appropriate indicators can be complex and require consideration of the validity, integrity and the cost effectiveness of underlying data. The following principles are designed to assist the development of appropriate catchment condition and management indicators:

Meaningful and easy to understand

1. Indicators should provide consistent information in an easy to understand form and be appropriate for their audience.
2. Indicators should be based on a common framework and enable easy communication of the condition of assets (e.g. good, moderate, poor, unknown).

3. Indicators should provide information to support good decision-making within an adaptive management framework.

Linked to policy objectives and demonstrate accountability

4. Indicators should be relevant to policy objectives and show progress against strategic directions.
5. Policy owners must be responsible for the development of indicators that fall within their areas of accountability.

Comprehensive and acknowledge a range of scales and timelines

6. Environmental indicators should cover:
    a. The condition of environmental assets.
    b. Threats to the condition of those assets.

Program logic

7. Indicators should be considered within a logic framework that links management activities with the outcomes of plans and strategies and the condition of the environment.

Achievable

8. Indicators need to be cost-effective and repeatable.
9. Related indicators should aim to be consistent in their design.
10. Indicators should provide useful information to meet reporting requirements for state-wide environmental reporting as well as Regional Catchment Strategy review.
11. Continuity in how indicators are structured is important to detect changes over time. However, these structures need to be robust to account for changes in underlying data that often occur due to technical or budgetary variation.
12. While the method and technology that supports the development of indicators can change and improve over time, it is important that, if possible, translation of past assessments is carried out to enable consistent reporting.

Assets, threats and management

The assessment of environmental condition and management involves the consideration of key environmental assets, the threats to those assets and the management response to the threats. Table 3 shows high level key evaluation questions to guide the assessment.

Table 3 High level key evaluation questions used to guide the assessment of environmental condition and the management

Condition	**Asset Quality**	What is the state and change in condition of key environmental assets?
	Threats/Pressures	What is the state and change in key threats to our environmental assets?
		What is the level of impact of threats on key assets?
Management		How are government and community responding to threats? What is the evidence for the appropriateness of this response? Are we doing the right things? And are we doing them right? Is there any evidence of physical environmental change attributable to management actions? How are we progressing with plans and strategies?

5. Headline indicators

Headline indicators are designed to tell a high level story about the condition and management of Victoria's catchments. Other indicators may provide finer information on progress toward objectives or the status of threats and are essential to telling a comprehensive story (see Table 4).

Table 4 Thematic structure including proposed Headline Indicators.

Themes		Headline Indicators	Other important indicators
Catchment Condition			
Biodiversity	**Native habitat**	**Extent and quality of native vegetation** (Evidence of major changes in the extent of native vegetation)	
	Native Species	**Health of threatened species populations**	
Waterways		**Index of Stream Condition** (benchmark conducted every eight years) **Index of Wetland Condition** (benchmark conducted every eight years)	**Index of Estuarine Condition**
Coasts		**Levels of protection for coastal and marine areas** (Extent of coast and marine areas protected by parks and reserves)	**Water quality in coastal lakes and bays** (Compliance with State Environment Protection Policy objectives)
Management			
Land		**Land managed for conservation – active stewardship** (Area of land protected by agreements, covenants, management plans and parks and reserves)	**Changes in the extent of intensive land use** **Ground cover change**
Community		**Community Participation** (Level of participation in Landcare and community groups) **Community use of parks** (Level of participation in recreational use of parks)	**Community Capacity** (Support from government programs (e.g. funding, education) that enable participation.) **Community use of Coasts**

Appendix 1. Glossary of common MER terminology

Planning term	Preferred definition
Activity/Action	The process of using labour and materials to produce outputs. In particular outputs related to planned outcomes.
Adaptive Management	Adaptive management is a systematic approach for improving resource management by learning from management outcomes.
Catchment	An area which, through run-off or percolation, contributes to the water in a stream or stream system (*Catchment and Land Protection Act, 1994*).
Catchment management	The co-ordinated management of land and water resources, using catchments as a basis (*CaLP Act*).
Condition/Quality/Health	The qualitative state of something described using specific criteria. In the program logic in this Framework the word 'condition' describes the qualitative endpoint for environmental policy. These condition outcomes may also include social and economic criteria.
Effectiveness	Achievement of desired management outputs and resource condition. Where efficiency refers to value of the process, effectiveness refers the quality of the result.
Efficiency	Value of return from effort and investment
Environment	The natural world, as a whole or in a particular geographical area, especially as affected by human activity. (Oxford Dictionaries http://oxforddictionaries.com/definition/environment).
Foundational	Used as a conditional statement to identify activity that supports the capacity to deliver outcomes, but is not attributed to specific outputs.
Goal/Objective	A qualitative description of what is desired in the long term. Goal and Objective are synonyms.
Immediate outcome	The impact of planned outputs measured during the timeframe described by a specific plan or strategy at 1-3 years. Short term is a synonym for immediate.
Indicator	A quantitative or qualitative factor or variable that provides a simple and reliable basis for assessing achievement, change or performance. It is a unit of information measured over time that can help show changes in a specific condition. A given goal or objective can have multiple indicators.
Input	Effort, materials, equipment and funds put into natural resource management to deliver outputs and, in the longer term, achieve management outcomes and resource condition change.

Planning term	Preferred definition
Intermediate outcome	The impact of planned outputs measured at a midpoint between immediate outcomes and longer term outcomes (usually 5+ years). A specific timeframe may be proposed e.g. at the end of a 5 year strategy. In this Framework this role is filled by management outcomes.
Intervention monitoring	Systematic tactical observation of natural resources which seeks to identify the impact of specific policy, programs and activities.
Land	Soil, water, vegetation and fauna on land (excludes a mineral within the meaning of the Mineral Resources (Sustainable Development) Act 1990 and petroleum) (CaLP Act). This term is also variously used to refer to everything that is not water, an agricultural area or, simply, ground. The Planning and Environment Act (1987) refers to land as buildings and other structures permanently fixed to land and land covered with water as well as any estate, interest, easement, servitude, privilege or right in or over land. Due to this complexity, use the term with care and always clarify the meaning.
Land water & biodiversity	A subset of the environment that refers to land, water in the environment, and plants and animals. A synonym for land and water resources and a synonym for Natural Resources.
Long term	A period of time – usually 5 to 20+ years.
Longer term outcome	The proposed impact of planned outputs in the long term; beyond that measureable within the timeframe for activities related to a specific plan or strategy (see long term).
Management	Activities conducted as part of specific plans or strategies.
Management effectiveness	The degree to which natural resource activities and outputs contribute to management outcomes and objectives.
Management progress	Management progress refers to the measureable progress with strategies and plans that can be reported at the end of a specific timeframe (typically 1-5 years). Reporting on management progress may include material change attributable to implementation of a strategy or plan, however, measureable change may also include changes to land management, community support or improved strategic planning.
Natural resource/s	A subset of the environment that describes soil, water in the environment, plants and animals. “A synonym for land, water and biodiversity” and ‘land and water resources’ (in the sense used here, it excludes a mineral within the meaning of the Mineral Resources (Sustainable Development) Act 1990 and petroleum) (CaLP Act).
Natural resource condition	The qualitative state of a natural resource at a particular time covering a defined spatial area and described using specific criteria.

Planning term	Preferred definition
Natural resources management	Any activity relating to the management, use, development or conservation of natural resources.
Output	The measureable result (good or service) of activity over a fixed period of time delivered to a standard.
Performance	A quantitative or qualitative description of progress toward defined outcomes.
Performance measure	Quantifiable units of measurement that can be used to determine and assess progress toward outcomes.
Program logic	A conceptual model that shows the rationale behind a program/ project or strategy - what are understood to be the cause-and-effect relationships between activities, outputs, management outcomes, long-term outcomes and resource condition change.
Standard Output	A standard output is an output that is part of an agreed list of outputs that form the basis for investment and planning purposes. Reporting requirements for standard outputs are defined in the DELWP Output Data Standard.
Surveillance monitoring	Systematic strategic observation of natural resources which seeks to identify changes in condition and threatening processes. These are often outside the direct influence of natural resource management, but can help provide important contextual information. Also referred to as condition monitoring.
Target	Quantitative description of desired outcome over a defined period.
Water resources	The quality, quantity, or rate of flow, of water (CaLP Act).

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