



Victorian Waterwatch Program Monitoring, evaluation and reporting plan

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Riverness Pty Ltd

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Document History

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- Victorian Waterway Management Strategy (DEPI, 2013), and
- Department of Sustainability and Environment Monitoring, Evaluation and Reporting Framework - Land, water and environment (DSE, 2012).

The authors also acknowledge that the document has been adapted from the Australian Government Caring for our Country Monitoring, Evaluation, Reporting and Improvement Plan - MER Plan Template (DEWHA and DAFF, 2012).

Acronyms

CMA – Catchment Management Authority

DEPI – Department of Environment and Primary Industries

DELWP - Department of Environment, Land, Water and Planning (formerly DEPI)

MER – Monitoring Evaluation and Reporting

RWS – Regional Waterway Strategy

VWMS – Victorian Waterway Management Strategy

RRHS – Regional River Health Strategy

EEMSS – Estuary Entrance Management Support System

LSRR – Large Scale River Restoration

KEQ – Key Evaluation Questions

1 Introduction

For more than 20 years, the Victorian Waterwatch Program has been connecting local communities with river and wetland health and sustainable water management issues. Through the Waterwatch Program, groups and individuals are supported and encouraged to become actively involved in local waterway monitoring, onground activities and awareness raising.

Over the last five years, the program has focused on improving the quality, accessibility and relevance of waterway monitoring data. Volunteer monitors have expanded their monitoring capacity beyond water-quality testing, carrying out a range of onground activities of state and national importance.

The Plan for Waterwatch Victoria (the Plan) provides the directions for the Victorian Waterwatch Program (the Waterwatch Program) over the next eight years. The Plan will support implementation of the *Victorian Waterway Management Strategy* (VWMS). The VWMS outlines the framework for government, in partnership with the community to manage rivers, estuaries and wetlands so that they can support environmental, social, cultural and economic values now and into the future.

The overall purpose of the Plan is to clarify the state policies and actions relating to state Waterwatch coordination; and define the framework that will:

- inform regional implementation delivered in partnership with the community
- ensure statewide consistency in program delivery to gain efficiencies
- support regional autonomy to ensure the Waterwatch Program remains relevant and effective in delivering regional outcomes
- complement monitoring, evaluation and reporting processes to demonstrate successes and inform continuous improvement.

2 MER Plan Purpose

The management of rivers, estuaries and wetlands in the region is conducted within an adaptive management framework. At the core of adaptive management is the ability to learn from previous experience and update management approaches to reflect the knowledge gained during implementation. Figure 1 presents the eight-year adaptive management cycle of the Victorian Waterway Management Program and Regional Waterway Strategies. The cycle includes (DEPI, 2013):

- **Strategy and Planning** – state policy framework and targets, planning for waterway management through regional waterway strategies with priorities and regional targets
- **Implementation and Monitoring**- Government and other investment in regional priorities, implementation of priority management activities, intervention monitoring and long-term resource condition assessment
- **Evaluation and reporting**- management reporting, intervention monitoring reporting, resource condition reporting, program evaluation and improvement

Community participation and research and innovation occur across all parts of the program. This knowledge and information is crucial for ensuring effective adaptive management and informing associated MER processes.



Figure 1. The eight-year adaptive management cycle of the Victorian Waterway Management Program and Regional Waterway Strategies (Source: DEPI, 2013)

This MER plan has been developed to support the state and regional Waterwatch Programs monitor, evaluate and report on the successes of the program and inform continuous improvement. Implementation of the MER plan is critical to ensure the Waterwatch Program remains sustainable into the future. Clearly defining the MER standards and processes and leading its implementation through the state coordination role will ensure that MER is delivered in the most effective and efficient manner.

The MER plan:

- presents the program logic underpinning the Waterwatch Program.
- clarifies the assumptions associated with the program logic and identifies strategies to manage potential risks.
- identifies the key questions for evaluation and establishes processes to monitor progress within the framework of the statewide monitoring program.
- clarifies the communication and reporting needs and identifies the processes required to support these needs.
- enables lessons learned from monitoring and evaluation to be gathered and inform improvement.

Monitoring and assessment of the program against the key evaluation questions will support reporting processes to demonstrate Waterwatch achievements to a range of target audiences including State Government and regional investors and waterway managers. Importantly, the process will support the sharing of knowledge across the regions from volunteers to the state and regional coordinators. The combination of reporting and knowledge sharing will ensure a sustained Waterwatch Program into the future.

3 MER stages and timeframe

MER requires a three-phase cycle of planning, implementation and review.

- **Planning** — development of the program logic and using it to develop the MER Plan.
- **Implementation** — of the MER Plan includes ongoing monitoring, periodic evaluation and reporting of achievements and impacts including progress towards the targets.
- **Review** — of the MER Plan will be ongoing and occur annually as a minimum. This will enable assumptions to be reviewed and updated where necessary; activities to be documented and areas for improvement or modification identified.

This three-phase cycle will be coordinated by the state Waterwatch coordinator and supported by regional implementation. This Plan should be considered a live document and updated with new and relevant standards, methods and processes as required.

4 Program logic

Program logic is an approach to planning that uses a diagram to demonstrate the rationale for a program and express how change is expected to occur.

The program logic provides the rationale for how the Victorian Waterwatch Program will contribute to the vision for Victoria’s waterways, which is defined in the *Victorian Waterway Management Strategy*:

Vision for Victoria’s waterways - “Victoria’s rivers, estuaries and wetlands are valued, healthy and well-managed; supporting environmental, social, cultural and economic values that are able to be enjoyed by all communities” (DEPI, 2013b)

The simplified program logic for the Victorian Waterway Management Program that implements the *Victorian Waterway Management Strategy* is illustrated in Figure 2. It describes how each year, specific management activities and outputs are delivered by regional agencies in order to achieve particular management outcomes. Over the eight-year planning period, these outputs and outcomes collectively contribute to either maintaining or improving the environmental condition of waterways. In the long-term, this will ensure that Victoria’s waterways can continue to support environmental, social, cultural and economic values.



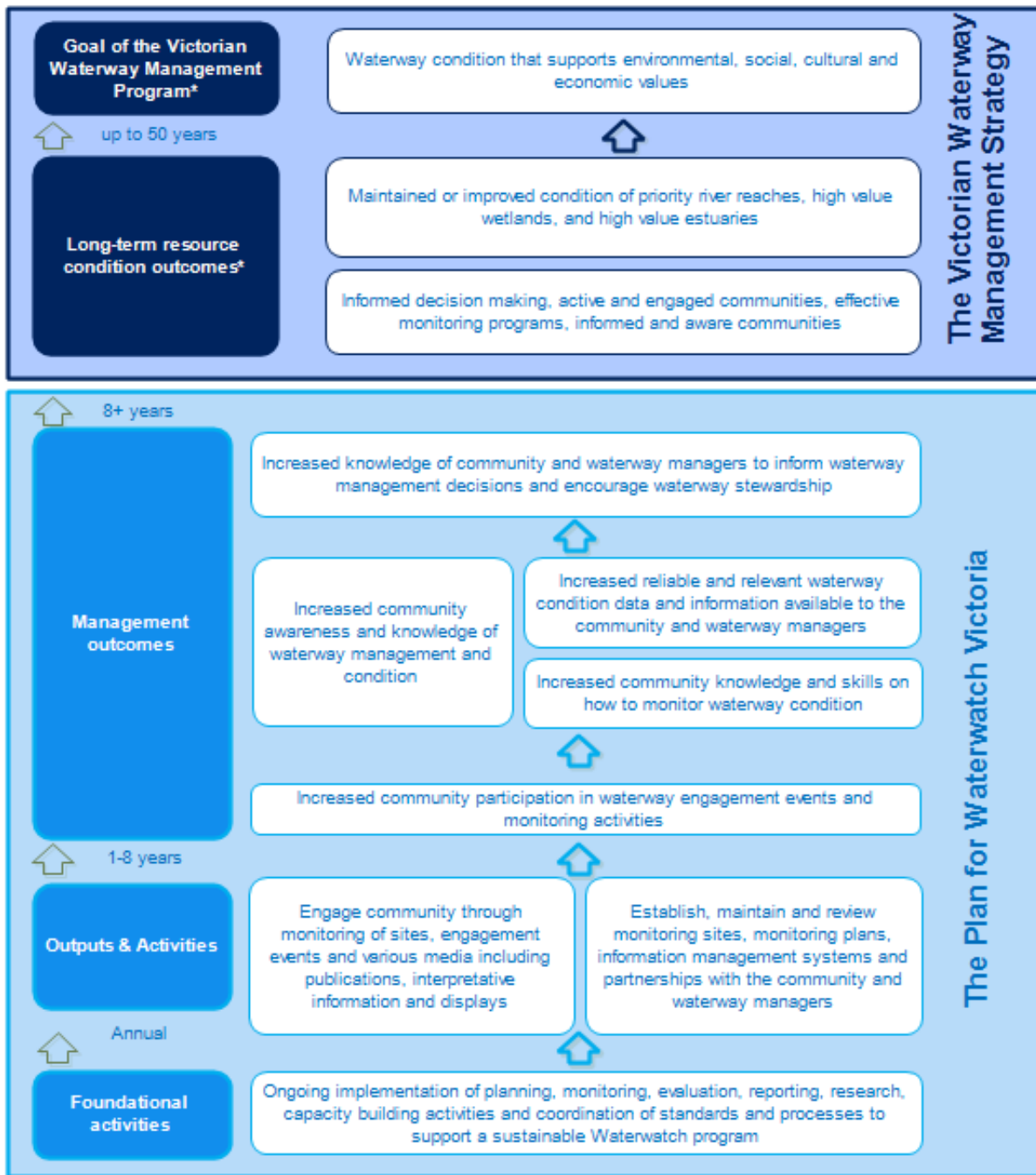
Figure 2. Simplified program logic for the Victorian Waterway Management Program (Source: DEPI, 2013b)

The long term resource condition outcome level aligns with the management objective for Victoria’s waterways which is *“To maintain or improve the environmental condition of waterways to support key environmental, social, cultural and economic values.”* (DEPI, 2013)

The management outcome, output and activity levels focus primarily on the levels within the program logic that are measurable over the eight year implementation period.

A more detailed version of this program logic and additional explanatory information is provided Appendix 1.

The program logic for the Victorian Waterwatch Program is illustrated in Figure 3. The logic demonstrates how the Waterwatch Program contributes to the goal and long-term resource condition outcomes for the Victorian Waterway Management Program.



* The 'Goal of the Victorian Waterway Management Program' and the 'Long-term resource condition outcomes' have been sourced directly from the Victorian Waterway Management Strategy

Figure 3. Program logic for the Victorian Waterwatch Program

4.1 Program logic assumptions

The program logic (see Figure 3) articulates the series of events that are expected to occur over the life of the Waterwatch Program and beyond. However, within each of the levels of the logic there are a range of assumptions. Table 1 provides a list of the key assumptions associated with the program logic and identifies strategies for managing the assumptions. The table is based on the analysis presented in Appendix 1 where all of the assumptions associated with the program are identified and assessed for the level of management required depending on the likelihood and consequence of the assumption being wrong. The assumptions beyond the management outcome level are documented and managed through the Victorian Waterway Management Program. Therefore, Table 1 only considers those assumptions for which the Victorian Waterwatch Program can influence and manage over the eight year cycle.

Table 1. Summary of the key assumptions of the Waterwatch Program that require management or where management should be considered and associated management strategies

Assumptions	Management strategy
Assumptions that require management	
The data collected is accurate and collected at the appropriate frequency to inform management	<ul style="list-style-type: none"> • Ensure standards and training are available, current and appropriate, and volunteers have the required knowledge and skills • Undertake QA/QC testing to determine whether outputs are delivered to standard. • Regular review of appropriateness of standards • Review of data collection frequency at sites located on priority waterways
The parameters measured are relevant to management decisions	<ul style="list-style-type: none"> • Review current parameters • Regions to discuss need and opportunities for monitoring of other parameters
Waterway managers are willing to utilise and value the monitoring data and information	<ul style="list-style-type: none"> • Share information on data quality and potential uses of Waterwatch data to waterway managers. • Regional coordinators to discuss options for ensuring data is valued by management
Monitoring data and information is stored in a manner that can be accessed now and into the future	<ul style="list-style-type: none"> • Investigate options to integrate Waterwatch data with the Water Management Information System (WMIS)
Waterwatch coordinators can effectively engage with waterway managers to promote Waterwatch and determine management priorities	<ul style="list-style-type: none"> • Coordinators to share knowledge on the best ways/methods to engage with waterway managers to identify/discuss priorities.
Resources are appropriate to implement the program at state and regional level resourcing	<ul style="list-style-type: none"> • Communicate to waterway managers the resources required to deliver the program • Adopt adaptive management approach to planning and delivery • Secure funding through demonstration of outcomes by ensuring processes are in place to demonstrate management outcomes and the importance of the program to government and community e.g. reporting and engagement processes
Monitoring program is effective at providing accurate and timely information to inform reporting, planning and decision making	<ul style="list-style-type: none"> • Ensure database is up to date and waterway managers are aware of data available • Discuss with waterway managers when data needs to be available for decision making processes

Assumptions	Management Strategy
Assumptions where active management should be considered	
Program MER standards are appropriate, accessible and implemented to standard	<ul style="list-style-type: none"> • Undertake annual review of MER plan to ensure the standards are appropriate and it is being implemented as required
Engagement methods (e.g. events, displays and media) appeal to the community and waterway managers and they participate	<ul style="list-style-type: none"> • Undertake evaluation of engagement methods to identify most effective methods of engagement • Training of coordinators in engagement methods
The training of volunteers is relevant, effective, accessible and user friendly	<ul style="list-style-type: none"> • Ensure standards/guidelines to support training are up to date and relevant
Monitoring sites are able to be targeted to waterway priorities	<ul style="list-style-type: none"> • Ensure regional coordinators and volunteers have a clear understanding of waterway priorities
Increased participation in waterway engagement activities will increase awareness and knowledge of waterway management and condition	<ul style="list-style-type: none"> • Evaluate effectiveness of engagement events and share knowledge across regions
Knowledge gained from implementation will inform future activities	<ul style="list-style-type: none"> • Ensure appropriate training of coordinators • State coordinator to support processes to share knowledge at network meetings and Waterwatch conference.

5 Monitoring and evaluation

5.1 Monitoring

Monitoring activities are targeted to collect data and information to inform evaluation and reporting of program implementation. Monitoring activities can also include the collection of information relating to foundational influences and externalities that impact on program implementation. Foundational influences include factors such as climatic variability, drought, flood, bushfire and potential impacts of climate change; and externalities include factors such as land use change, population growth, government support, economic conditions, community expectations and landholder attitudes.

Monitoring activities will be consistent with the statewide monitoring processes coordinated through the Victorian Waterway Management Program. Table 2 presents the options for monitoring the implementation of the Waterwatch Program.

Table 2. Options for monitoring data and methods to inform evaluation and reporting

Monitoring focus and number	What will be measured/measures	Frequency	Responsibilities
1. Output statistics			
1.1	Monitoring sites (various options for analysis of sites using the same base data): <ol style="list-style-type: none"> 1. Number of active monitoring sites – Sites from the database where assessments have been undertaken within the previous 6 months 2. Number and proportion of active monitoring sites on priority waterways – Sites from the database where assessments have been undertaken within the previous 6 months and overlay on priority waterways map using GIS and apply filter 3. Number and proportion of active monitoring sites on reaches with no other equivalent monitoring sites i.e. filling data gaps - Sites from the database where assessments have been undertaken within the previous 6 months and overlay on map of known monitoring sites using GIS and apply filter 4. Number of active monitoring sites where monitoring has occurred at required frequency (need to determine 'required frequency' this will be dependent on what is monitored and what the end use is expected to be) - Sites from the database where assessments have been undertaken within the previous 6 months and apply frequency filter 5. Number of site assessments – Number of assessments undertaken within the previous 6 months 	6 monthly aligned with DELWP investment reporting	Regional coordinators to ensure all data has been uploaded in the database by end July and end December of each year. State coordinator to extract data and undertake analysis
1.2	Number of engagement events and participants – Provided through 6 monthly regional reports provided by coordinators. Utilise the DELWP Output Standard (4.4 Engagement Event)	As previous	Regional coordinators to provide state coordinator with regional report State coordinator to collate data from regional reports

Monitoring focus and number	What will be measured/measures	Frequency	Responsibilities
1.3	Number of publications – Provided through 6 monthly regional reports provided by coordinators. Utilise the DEPI Output Data Standard (4.7 Publication)	As previous	As previous
1.4	Number of active volunteers - Provided through 6 monthly regional reports provided by coordinators. Utilise the DEPI Output Data Standards (4.5 Partnership/Mixed)	As previous	As previous
1.5	Number of volunteer hours	As previous	As previous
1.6	Value of in-kind contributions	As previous	As previous
1.7	Database statistics e.g. number of times site accessed, number of data downloads. Potential to request users to specify from list their reasons for data download e.g. use to inform decisions or request them to specify their role e.g. volunteer, waterway manager.	Annual	State coordinator to query database to collect statistics
2. Survey/Interview data			
2.1	<p>Surveys of regional coordinators to assess:</p> <ul style="list-style-type: none"> • appropriateness, effectiveness and efficiency of state coordination • regional coordinator views on regional capacity <p>Consider evaluation questions.</p>	Annual	<p>State coordinator to prepare, distribute and analyse survey data</p> <p>Regional coordinators to complete survey</p>
2.2	<p>Surveys of regional volunteers to assess:</p> <ul style="list-style-type: none"> • Satisfaction with regional support • Volunteer capacity to monitor • Awareness, knowledge and/or behaviour change <p>Focus on short, simple surveys completed by the volunteer at events/meetings or online. Focus on developing generic surveys and data analysis/collation processes that can be used across regions to make process efficient. Consider evaluation questions. Capture “stories of change” through interviews.</p>	Annual volunteer survey	<p>State coordinators to support regions in development of surveys.</p> <p>Regions to undertake surveys and provide collated data to state coordinator as a component of regional reports</p>
2.3	<p>Surveys of event participants to assess increase in awareness, knowledge and/or behaviour change</p> <p>A standard framework for surveys should be developed. Focus on short, simple surveys completed by the volunteer at events/meetings or online. Focus on developing generic surveys and data analysis/collation processes that can be used across regions to make process efficient. Consider evaluation questions.</p>	Event surveys dependant on time of event	<p>State coordinators to support regions in development of surveys.</p> <p>Regions to undertake surveys and provide collated data to state coordinator as a component of regional reports</p>

Monitoring focus and number	What will be measured/measures	Frequency	Responsibilities
2.4	<p>Surveys of waterway managers to assess:</p> <ul style="list-style-type: none"> Opinions of the value of monitoring data for a) contribution to decision making b) contribution to broader data, information and knowledge of waterway condition Opinions on the value of the program for community engagement and awareness raising <p>Focus on short, simple surveys completed in discussion with waterway managers. Focus on developing generic surveys and data analysis/collation processes that can be used across regions to make process efficient. Consider evaluation questions.</p>	Annual waterway manager	<p>State coordinators to support regions in development of surveys.</p> <p>Regions to undertake surveys and provide collated data to state coordinator as a component of regional reports</p>
3. Case studies/ Most significant change stories	<p>Case studies and ‘most significant change stories’ to document significant achievements/events</p> <p>Case studies (200-300 words plus 1 or 2 photos) by regional coordinators demonstrate:</p> <ul style="list-style-type: none"> Use of community data by CMA or other management agency Improvements in community capacity through presentations and training <p>The case studies are an opportunity to showcase the program and recognise monitors.</p>	6 monthly aligned with DELWP investment reporting	<p>State coordinators to support regions by defining template/processes to collect case studies and most significant change stories.</p> <p>Regions to document case studies and most significant change stories and provide state coordinator as a component of regional reports</p>
4. QA/QC results	<p>State coordinators to assess level of participation in QA/QC by volunteers</p>	6 monthly aligned with DELWP investment reporting	<p>State coordinators to maintain associated standards</p> <p>State coordinators to undertake assessments of volunteers and provide data to regional coordinator</p>

5.2 Evaluation

The strategy and planning phase of the adaptive management cycle (Figure 1) includes the development of pre-determined key evaluation questions by which to assess the program and gain new knowledge and information. Evaluation questions provide the basis for evaluation design and associated monitoring processes.

Evaluation of the Waterwatch Program will include an assessment of the extent to which the outcomes have been achieved at each level of the program logic underpinning the program. It also address the assumptions in the program logic and provides direction and improved knowledge for subsequent planning cycles.

The evaluation questions developed for the Waterwatch Program address the following five categories (DSE, 2012):

- **Impact** - changes to resource condition, management activities or institutions
- **Appropriateness** - addressing the needs of beneficiaries and against best practice
- **Effectiveness** - achievement of desired management outputs and resource condition objectives
- **Efficiency** - value or return from investment
- **Legacy** - after the activity/program end

Table 3 lists the key evaluation questions and the monitoring processes used to support evaluation of these questions. These are overarching questions that should be considered in evaluation, and additional questions can be developed to breakdown the specific elements. The questions focus on 'what happened' during implementation of the program. When responding to these questions the opportunities for improvement should also be reviewed and documented.

Annual reviews of the Waterwatch Program will focus on assessment of progress towards the planned management activities, outputs and management outcomes. These reviews will consider any new knowledge and information that may require changes to planned management activities and outputs. The annual review will be undertaken by the state coordinator and supported by regional coordinators. It will align with regional investment processes to gain efficiencies in data collection and reporting by regions.

The findings from these annual reviews will inform broader state and regional evaluation processes for the VWMS (to be undertaken in 2016 and 2020) and the RWSs (to be undertaken in 2017 and 2021). They will ensure the Waterwatch Program can readily contribute to the broader state and regional processes to demonstrate the Waterwatch Program's successes.

Table 3. Evaluation questions and methods for monitoring

Evaluation focus	Evaluation questions	What will be measured/measures (Refer to details on monitoring methods from Table2)	Frequency	Responsibility
Impact	1. To what extent has the program achieved its management outcomes?			
	1.a) Increased knowledge of community and waterway managers to inform waterway management decisions	1. Statistics (1.1) 2. Surveys (2.2-4) 3. Case studies/ Most significant change stories	Annual and aligned with evaluation processes of the Victorian Waterway Management Program and RWSs	State coordinator with support from regional coordinators for state evaluation. Regional coordinator with support from state coordinator for regional evaluation.
	1.b) Increased community awareness and knowledge of waterway management and condition	2. Surveys (2.2, 2.3, 2.4) 3. Case studies/ Most significant change stories	Refer to previous	Refer to previous
	1.c) Increased community knowledge and skills on how to monitor waterway condition	1. Statistics (1.2 (Engagement events for training volunteers, 1.3 (Publications relating to manuals/guidelines), 1.4) 2. Surveys (2.2) 3. QA/QC processes	Refer to previous	Refer to previous
	1.d) Increased waterway condition data and information available to the community and waterway managers	1. Statistics (1.1, 1.5) 2. Surveys (2.3, 2.4) 3. QA/QC processes	Refer to previous	Refer to previous
	1.e) Increased community participation in waterway engagement events and site monitoring activities	1. Statistics (1.1, 1.2, 1.4)	Refer to previous	Refer to previous
	2. Were there any unintended outcomes, either positive or negative?	2. Surveys (2.1, 2.2)	Refer to previous	Refer to previous
Appropriateness	3. To what extent are the delivered activities\outputs aligned with state and regional waterway priorities?	1. Statistics (1.1) 2. Surveys (2.2, 2.3, 2.4) 3. Case studies/ Most significant change stories	Refer to previous	Refer to previous

Evaluation focus	Evaluation questions	What will be measured/measures (Refer to details on monitoring methods from Table2)	Frequency	Responsibility
	4. To what extent were the monitoring activities undertaken to standard?	1. Surveys (2.1, 2.2) 2. QA/QC processes	Refer to previous	Refer to previous
	5. What approaches to communication, engagement of stakeholders were successful?	2. Surveys (2.1, 2.2, 2.3, 2.4)	Refer to previous	Refer to previous
	6. To what extent did they lead to the establishment and maintenance of successful partnerships?	2. Surveys (2.1, 2.2, 2.3, 2.4)	Refer to previous	Refer to previous
Effectiveness	7. To what extent has the program delivered its outputs?	1. Statistics (1.1, 1.2, 1.3, 1.4, 1.5)	Refer to previous	Refer to previous
	8. To what extent did the state coordination role meet the needs of regional coordinators	2. Surveys (2.1)	Refer to previous	Refer to previous
	9. To what extent did the regional coordination role meet the needs of volunteers	2. Surveys (2.2)	Refer to previous	Refer to previous
	10. To what extent are the systems and processes that support the program effective at supporting program implementation	2. Surveys (2.1, 2.2, 2.3)	Refer to previous	Refer to previous
Efficiency	11. To what extent did the program attain the best value out of available resources e.g. based on benchmarking against past performance, relative to other equivalent programs and/or performance over the life of the plan?	1. Statistics (1.1, 1.2, 1.3, 1.4, 1.5) relative to past performance for these statistics and change over the life of the plan	Refer to previous	Refer to previous
Legacy	12. How sustaining and enduring are the outcomes of the program expected to be?	1. Surveys (2.2-4) 2. Case studies/ Most significant change stories	Refer to previous	Refer to previous

6 Reporting

Reporting is an important tool to ensure accountability for the investment of government funds into waterway management activities. Over the long-term, consistent and effective reporting provides evidence to evaluate and communicate the effectiveness of the Waterwatch Program and supports continuous improvement through the collection and sharing of information.

Table 4 identifies the key stakeholders at organisational, community, regional, and state levels that should be kept informed on the progress of the Waterwatch Program or would benefit from Waterwatch Program information. It also identifies what they need to know and how it will be communicated.

Table 4. Reporting and communication processes associated with the Victorian Waterwatch Program

Who needs access to information about this Strategy?	Type of information and format required?	Why is this information needed?	Methods of providing information	Dates /frequency
Victorian Waterway Management Program through DELWP management	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements outlining key program statistics (including progress to state targets) and case studies demonstrating outcomes for each region. Case studies to focus on demonstrating use of data to inform decision-making Progress against evaluation questions 	<ul style="list-style-type: none"> Accountability Demonstrating program achievements and value Supporting state MER processes for the Victorian Waterway Management Program 	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements report detailing key program statistics (including progress to state targets) and case studies for each region Seek opportunities to present the data at existing DELWP meetings Attendance/contribution to evaluation processes for VWMS 	<ul style="list-style-type: none"> Annual (February) As opportunities arise 2016 and 2020 (Timeframe for VWMS evaluation/review)
CMA's and Water Authorities				
Board and management	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements outlining key program statistics (including progress to state targets) and case studies demonstrating outcomes for each region. Case studies to focus on demonstrating use of data to inform decision-making. 	<ul style="list-style-type: none"> Demonstrating program achievements and value Supporting regional MER processes for the Victorian Waterway Management Program 	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements report detailing key program statistics (including progress to state targets) and case studies for each region Seek opportunities to present the information at existing Board and management meetings Attendance/contribution to evaluation processes for RWSs 	<ul style="list-style-type: none"> Annual (February - data based on previous financial year) As opportunities arise 2017 and 2021 (Timeframe for RWS evaluation/review)
Waterway managers	<ul style="list-style-type: none"> As above and specific regional information regarding alignment of Waterwatch sites with regional priorities and provision of data 	As above	As above and seek opportunities to present information at state and regional waterway manager meetings	<ul style="list-style-type: none"> As opportunities arise
Regional Waterwatch	<ul style="list-style-type: none"> Annual Victorian Waterwatch 	<ul style="list-style-type: none"> Accountability 	<ul style="list-style-type: none"> Annual Victorian Waterwatch 	<ul style="list-style-type: none"> Annual (February)

Who needs access to information about this Strategy?	Type of information and format required?	Why is this information needed?	Methods of providing information	Dates /frequency
Coordinators	achievements outlining key program statistics (including progress to state targets) and case studies demonstrating outcomes for each region. Case studies to focus on demonstrating use of data to inform decision-making <ul style="list-style-type: none"> Progress against evaluation questions 	<ul style="list-style-type: none"> Demonstrating program achievements and value Supporting state MER processes for the Victorian Waterway Management Program and RWSs Sharing key learnings 	achievements report detailing key program statistics (including progress to state targets) and case studies for each region <ul style="list-style-type: none"> Presentations/discussions at network meetings and Waterwatch conferences Attendance/contribution to evaluation processes for RWSs 	<ul style="list-style-type: none"> Aligned with network meetings and Waterwatch conferences 2017 and 2021 (Timeframe for RWS evaluation/review)
Waterwatch volunteers	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements outlining key program statistics (including progress to state targets) and case studies demonstrating outcomes for each region. Case studies to focus on demonstrating use of data to inform decision-making. 	<ul style="list-style-type: none"> Demonstrating program achievements and value 	<ul style="list-style-type: none"> Annual Victorian Waterwatch achievements report detailing key program statistics (including progress to state targets) and case studies for each region 	<ul style="list-style-type: none"> Annual (February)

7 Knowledge Gaps and Research

The process of developing the program logic and evaluation questions demonstrates the areas where critical knowledge gaps exist. Table 5 identifies the key knowledge gaps identified through this process, and also identifies the strategies for addressing them. These strategies may involve collating existing information or proposing areas for further research programs. The Victorian Waterway Management Program has indicated it will support research that:

- provides essential knowledge to address critical short-term and/or strategic long-term knowledge gaps. The resulting research findings will be incorporated into policy and management.
- targets knowledge gaps or low confidence in the relationships between outputs, management outcomes and long-term resource condition outcomes (if significant for waterway management and investment) (DEPI, 2013).

Research will be directed to investigating those relationships where there is little scientific evidence, or the confidence in the evidence is low. This targeted approach to research also provides an increased focus on prediction and testing of these predictions, rather than more general, descriptive research. It is also vital that research is targeted to better understanding the effectiveness of management activities in which there is significant Victorian Government investment (DEPI, 2013).

The VWMS also outlines the following policy statement:

Policy 5.5 – The Victorian Government will support social research to inform development of waterway policy and improve the Government’s understanding of the drivers and barriers to positive waterway behaviour by communities. The Victorian Government will repeat the statewide My Victorian Waterway survey to:

- provide an improved understanding of community uses, expectations, attitudes and behaviours towards waterways;
- provide information for the regional planning of waterway work programs;
- help guide community engagement activities;
- assess and evaluate effectiveness of waterway health community education and engagement activities; and
- Waterway managers will consider the findings from social research to help inform development and implementation of regional waterway management programs.

Table 5. Key knowledge gaps associated with the Waterwatch Program and strategies for addressing them

Knowledge gap	Alignment with research priorities for the Victorian Waterway Management Program	Priority (High, Medium, Low)	Strategy for addressing knowledge gap	Responsibility
Understanding of the drivers and barriers to positive waterway behaviour by communities	Aligns with policy 5.5	High	State coordinator to ensure that regions have access to reports from the My Victorian Waterway survey	State coordinator
Extent of alignment of active Waterwatch sites to priority waterways and gaps in the Victorian Water Quality Monitoring Network that may be able to be addresses through Waterwatch	Provides essential knowledge to address critical short-term and/or strategic long-term knowledge gaps. The resulting research findings will be incorporated into policy and management.	High	Undertake GIS analysis to determine alignment and share information with regional coordinators	State coordinator
Understanding of the Water Management Information System (WMIS) and methods to best integrate Waterwatch data	Provides essential knowledge to address critical short-term and/or strategic long-term knowledge gaps. The resulting research findings will be incorporated into policy and management.	High	State coordinator to investigate WMIS and seek opportunities for integration	State coordinator

8 Adaptive Management

Adaptive management is a systematic process for improving management by ‘learning from doing’. The approach uses real-life actions (such as projects, activities or policy) to test and improve understanding of how these actions contribute to achieving desired outcomes or objectives. The knowledge gained then provides the basis for continuing with, or adapting, actions in response to what has been learnt. Adaptive management is commonly practiced by implementing and then reviewing policy, or by predicting the outcomes of management activities and then strategically monitoring the actual outcomes to gather information to improve future management (DEPI, 2013).

Table 6 lists the state level targets for the Waterwatch Program and the evaluation questions listed in Table 3. It provides an opportunity to document the progress made and, most importantly, to document the lessons learnt. Documenting the lessons learned is critical to the adaptive management cycle presented previously in Figure 1. Learning occurs at all stages and knowledge is used to improve subsequent cycles (every eight years) (DEPI, 2013).

This table should be reviewed at minimum on an annual basis to ensure lessons learned are incorporated in annual planning cycles.

Table 6. Documentation of results achieved and lessons learned to support adaptive management

Expected results	Summary of actual results to date	Evidence to support summary	Issues / comments about delivering the activity	Lessons learned and actions taken to improve delivery (if applicable)
CONTRIBUTION TO STATE TARGETS				
Number of sites with improved waterway knowledge (Refer to trajectory graph in the Plan for Waterwatch) Current monitoring sites (2014) – 1066 Expected: <ul style="list-style-type: none"> • 2016 - 1208 • 2020 - 1486 				
Number of community members with increased capacity (Refer to trajectory graph in the Plan for Waterwatch) Current monitors (2014) – 4000 Expected: <ul style="list-style-type: none"> • 2016 - 4410 • 2020 - 5360 				

Expected results	Summary of actual results to date	Evidence to support summary	Issues / comments about delivering the activity	Lessons learned and actions taken to improve delivery (if applicable)
KEY EVALUATION QUESTIONS				
Impact				
1. To what extent has the program achieved its management outcomes?				
1.a) Increased knowledge of community and waterway managers to inform waterway management decisions				
1.b) Increased community awareness and knowledge of waterway management and condition				
1.c) Increased community knowledge and skills on how to monitor waterway condition				
1.d) Increased waterway condition data and information available to the community and waterway managers				
1.e) Increased community participation in waterway engagement events and monitoring activities				
2. Were there any unintended outcomes, either positive or negative?				
Appropriateness				
3. To what extent were the delivered activities\outputs aligned with state and regional waterway priorities?				
4. To what extent were the monitoring activities undertaken to standard?				
5. To what extent were the approaches to communication and engagement of stakeholders successful?				

Expected results	Summary of actual results to date	Evidence to support summary	Issues / comments about delivering the activity	Lessons learned and actions taken to improve delivery (if applicable)
Effectiveness				
6. To what extent has the program delivered its outputs?				
7. To what extent did the state coordination role meet the needs of regional coordinators				
8. To what extent did the regional coordination role meet the needs of volunteers				
9. To what extent are the systems and processes that support the program effective at supporting program implementation				
Efficiency				
10. To what extent did the program attain the best value out of available resources e.g. based on benchmarking against past performance, relative to other equivalent programs and/or performance over the life of the plan?				
Legacy				
11. How sustaining and enduring are the outcomes of the program expected to be?				

9 References

Department of the Environment, Water, Heritage and the Arts and the Department of Agriculture, Fisheries and Forestry (2012) Australian Government Caring for our Country Monitoring, Evaluation, Reporting and Improvement Plan - MERI Plan Template v0.2. Commonwealth of Australia

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Department of Sustainability and Environment (2011) My Victorian Waterway – Personal connections with rivers, estuaries and wetlands in Victoria. Victorian Government Department of Sustainability and Environment, Melbourne

Waterwatch Victoria (2015) The Plan for Waterwatch Victoria. Report produced by Waterwatch Victoria

Appendix 1. List of assumptions associated with the program logic and strategies for managing assumptions as required. Note – Assumptions highlighted in bold are those documented in the VWMS (DEPI, 2013)

Rating table for likelihood and consequence rankings

Assumption Risk Matrix *				
		Consequence if assumption is wrong		
		Minor	Moderate	Severe
Likelihood of assumption being wrong	Unlikely	No management	No management	Consider management
	Likely	No management	Consider management	Yes – requires management
	Highly likely	Consider management	Yes – requires management	Yes – requires management

Assumption	Assumption factors	Likelihood assumption is wrong	Consequence if assumption is wrong	Management required?	Management strategy
The data collected is accurate and collected at the appropriate frequency to inform management	<ul style="list-style-type: none"> Relies on: <ul style="list-style-type: none"> standards being available and appropriate volunteers having the appropriate skills and knowledge and applying the skills as required volunteers having time to monitor at required frequency 	Unlikely – Highly likely (Dependant on aspects such as service delivery method used and funding constraints)	Moderate	Yes- requires management	<ul style="list-style-type: none"> Ensure standards and training are available, current and appropriate, and volunteers have the required knowledge and skills Undertake QA/QC testing to determine whether outputs are delivered to standard. Regular review of appropriateness of standards Review of data collection frequency at sites located on priority waterways
The parameters measured are relevant to	<ul style="list-style-type: none"> Water quality data previously used for ISC2 and 3 Requires understanding of potential end 	Unlikely-Likely	Severe	Yes – requires management	<ul style="list-style-type: none"> Review current parameters Regions to discuss need and opportunities for monitoring of

Assumption	Assumption factors	Likelihood assumption is wrong	Consequence if assumption is wrong	Management required?	Management strategy
management decisions	use				other parameters
Waterway managers are willing to utilise and value the monitoring data and information	<ul style="list-style-type: none"> The regional Waterwatch coordinator survey (2014) identified there is significant variation across regions and waterway managers on the confidence in Waterwatch data 	Unlikely-highly likely (Dependant on individual waterway managers views)	Moderate	Yes – requires management	<ul style="list-style-type: none"> Share information on data quality and potential uses of Waterwatch data to waterway managers. Regional coordinators to discuss options for ensuring data is valued by management
Engagement methods (e.g. events, displays and media) appeal to the community and waterway managers and they participate	<ul style="list-style-type: none"> 20 years of experience in delivering engagement Demonstrated success of the program in appealing to community My Victorian Waterway Survey (DSE, 2009) supports assumption 	Unlikely	Severe	Consider management	<ul style="list-style-type: none"> Undertake evaluation of engagement methods to identify most effective methods of engagement Training of coordinators in engagement methods
The training of volunteers is relevant, effective, accessible and user friendly	<ul style="list-style-type: none"> 20 years of experience in delivering training Standards to support training exist and are accessible to volunteers 	Unlikely	Severe	Consider management	<ul style="list-style-type: none"> Ensure standards/guidelines to support training are up to date and relevant
Community awareness of waterway management and condition will encourage them to participate in monitoring	<ul style="list-style-type: none"> My Victorian Waterway Survey (DSE, 2009) supports assumption 	Unlikely	Moderate	No management	
Monitoring data and information is stored in a manner that can be accessed now and into the future	<ul style="list-style-type: none"> Online Waterwatch database available Some feedback from the regional Waterwatch coordinator survey (2014) commented that the database was clunky VVMS supports improved data management for Waterwatch and to ensure the data is available through the Water Management Information System (WMIS) 	Likely	Severe	Yes – requires management	<ul style="list-style-type: none"> Investigate options to integrate Waterwatch data with the Water Management Information System (WMIS)
Monitoring sites are able to be targeted to waterway priorities	<ul style="list-style-type: none"> The regional Waterwatch coordinator survey (2014) identified a high level of capacity of volunteers to target priority waterways 	Unlikely	Severe	Consider management	<ul style="list-style-type: none"> Ensure regional coordinators and volunteers have a clear understanding of waterway priorities

Assumption	Assumption factors	Likelihood assumption is wrong	Consequence if assumption is wrong	Management required?	Management strategy
Volunteers can access sites or coordinators are available to fill gaps	<ul style="list-style-type: none"> Reduced coordinator FTE indicates there is less capacity of coordinators to fill gaps 	Likely	Low	No management	
Waterwatch coordinators can effectively engage with waterway managers to promote Waterwatch and determine management priorities	<ul style="list-style-type: none"> The regional Waterwatch coordinator survey (2014) identified that there were opportunities to link with waterway managers beyond host organisations RWSs and work plans should clearly demonstrate regional management priorities. 	Unlikely-Likely (Dependant on individual waterway managers)	Severe	Yes – requires management	<ul style="list-style-type: none"> Coordinators to share knowledge on the best ways/methods to engage with waterway managers to identify/discuss priorities.
Program MER standards are appropriate, accessible and implemented to standard	<ul style="list-style-type: none"> MER Plan will support development and implementation of standards 	Unlikely	Severe	Consider management	<ul style="list-style-type: none"> Undertake annual review of MER plan to ensure the standards are appropriate and it is being implemented as required
Increased participation in waterway engagement activities will increase awareness and knowledge of waterway management and condition	<ul style="list-style-type: none"> My Victorian Waterway Survey (DSE, 2009) supports assumption Review of RRHSs Review of previous funding projects including review of the LSRR projects 	Likely	Moderate	Consider management	<ul style="list-style-type: none"> Evaluate effectiveness of engagement events and share knowledge across regions
Resources are appropriate to implement the program at state and regional level resourcing	<ul style="list-style-type: none"> Community capacity and government funding can fluctuate depending on externalities such economic conditions 	Highly likely	Moderate	Yes – requires management	<ul style="list-style-type: none"> Adopt adaptive management approach to planning and delivery Secure funding through demonstration of outcomes by ensuring processes are in place to demonstrate management outcomes and the importance of the program to government and community e.g. reporting and engagement processes
Monitoring program is effective at providing accurate and timely information to inform reporting, planning and decision making	<ul style="list-style-type: none"> State led monitoring processes are defined in the VWMS (DEPI, 2013) Requires data to be made available at appropriate times for managers 	Likely	Severe	Yes – Requires management	<ul style="list-style-type: none"> Ensure database is up to date and waterway managers are aware of data available Discuss with waterway managers when data needs to be available for decision making processes

Assumption	Assumption factors	Likelihood assumption is wrong	Consequence if assumption is wrong	Management required?	Management strategy
Knowledge gained from implementation will inform future activities	<ul style="list-style-type: none"> Strong network of coordinators supported through state coordinator and are linked through network meetings, Waterwatch conference. 	Likely	Moderate	Consider management	<ul style="list-style-type: none"> Ensure appropriate training of coordinators State coordinator to support processes to share knowledge at network meetings and Waterwatch conference.
Regional delivery model most effective method to deliver waterway outcomes	<ul style="list-style-type: none"> Catchment Management Authorities and partners have >10 years of experience in delivering waterway outcomes in the region and have demonstrated outcomes Review of RRHSs Review of previous funding projects including review of the LSRR projects 	Unlikely	Moderate	No management	
Partnerships between government, community and industry lead to most effective management	<ul style="list-style-type: none"> Supported by the VWMS (DEPI, 2013) 	Unlikely	Moderate	No management	
Priority setting ensures investment targeted to greatest gain	<ul style="list-style-type: none"> Supported by the VWMS (DEPI, 2013) 	Unlikely	Moderate	No management	

Appendix 2. DEPI Output data standards recommended for the Waterwatch MER.

NRMS Standard Output title	Output type	Unit of Measure	Terminology from DEPI standard outputs	Example
1.8 Monitoring Structure	Measuring point	Number	Measuring station: a place set up for recording, observing, or measuring information, data, or phenomena in the local environment or from a particular vantage point. The information may come from natural or man-made sources.	Active Waterwatch monitoring site <small>Error! Bookmark not defined.</small>
4.3 Assessment	Water	Number	Assessment: site-specific assessment of condition, outcomes or management issues present. This information is used to inform future decision-making and activity at that site.	Number of Waterwatch assessments.
4.4 Engagement Event	Conference	Number of participants	Conference: Large gathering of individuals or members of one or several organisations, for discussing matters of common interest.*	<i>Climates, Catchments and Communities Conference 2004, North Central CMA. Communities Caring for Catchments: Volunteers Protecting our Waterways Conference 2006, West Gippsland CMA.</i>
4.4 Engagement Event	Field day	Number of participants	Field day: an event devoted to a particular location(s) to discuss a particular topic (s).	<i>World Wetlands Day – Wetlands Tour Along Gunbower Creek 2014, North Central CMA. Highlands and Strathbogie Wetland Field Day 2010, Goulbourn Broken CMA. Also includes stalls and displays at festival and expos.</i>

*Terminology was not provided in the DEPI Output Standard. State Coordinators chose a definition most relevant to both programs.

NRMS Standard Output title	Output type	Unit of Measure	Terminology from DEPI standard outputs	Example
4.4 Engagement Event	Presentation	Number of participants	Presentation: is the process of presenting a topic to an audience. It is typically a demonstration, lecture, or speech and is usually a one way exchange of information to a larger number of participants.*	Estuaries Unmasked Night Seminar. Also includes incursions and excursions with schools groups.
4.4 Engagement Event	Training	Number of participants	Training: structured activities designed to improve or refresh existing skills or develop new ones.	Volunteer induction or refresher training (QA/QC). First Aid Training.
4.4 Engagement Event	Workshop	Number of participants	Workshop: an educational event or series of meetings emphasising interaction and exchange of information among a usually small number of participants.	Shorebird ID workshop, Frogtober: Build a fabulous frog habitat workshop, EEMSS workshop.
4.5 Partnership	Agencies/corporate	Number	Partnership: an association of two or more organisations and/or individuals that is established, maintained or modified.	Water Authorities, Local Government and Catchment Management Authorities.
4.5 Partnership	Community groups	Number	Partnership: an association of two or more organisations and/or individuals that is established, maintained or modified.	Friends of Groups, Landcare groups, EstuaryWatch Groups.
4.5 Partnership	Mixed	Number	Partnership: an association of two or more organisations and/or individuals that is established, maintained or modified.	Number of active Waterwatch volunteers ^{Error! Bookmark not defined.}
4.7 Publication	Online/Printed	Number	Publication: the preparation and issuing of a material or other work for public consumption.	<i>Interpreting Estuary Health Data</i> , EstuaryWatch Victoria, <i>A beginners guide to frog identification</i> , Melbourne Water, Annual EstuaryWatch data summary brochure.
4.8 Information Management System	Database	Number	Database: a comprehensive collection of related data organised for convenient access, generally a computer.*	EstuaryWatch Online Database, Waterwatch Data Management System.

*Terminology was not provided in the DEPI Output Standard. State Coordinators chose a definition most relevant to both programs.