

Developing a MERI Plan for Murray River wetlands receiving water for the environment in the Mallee

Jaclyne Scally¹, Trent Wallis¹, Stephanie McNulty² and Meg Arney³

¹ RM Consulting Group (RMCG) Pty Ltd, Torquay, Victoria, 3228. Email: jaclynes@rmcg.com.au

² RM Consulting Group (RMCG) Pty Ltd, Hawthorn, Victoria, 3122. Email: stephaniem@rmcg.com.au

³ Mallee Catchment Management Authority, Mildura, Victoria, 3502. Email: meg.arney@malleecma.com.au

Key points

- Monitoring of environmental watering of wetlands along the Murray in the Mallee had been extensive but would benefit from a more integrated, prioritised and cost-effective approach.
- Environmental watering is critical to counteract altered flow regimes and maintain the ecological health of Murray River wetlands.
- A regional, value-based Monitoring, Evaluation, Reporting and Improvement (MERI) framework enables consistent monitoring across multiple wetlands by focusing on shared ecological, social and cultural objectives.
- Prioritised monitoring and structured evaluation support adaptive management, improved decision-making and can demonstrate long-term outcomes.

Abstract

Many wetlands along the Murray River in the Mallee rely on water for the environment to restore more natural flow regimes and support ecological health. While there has been a long history of monitoring efforts directed at watered wetlands in the region, a review of this work has identified the need for a more systematic approach to monitoring and evaluation that is more integrated, prioritised, and cost-effective.

In response, a MERI plan for lower Murray wetlands was developed, with a focus on Specific, Measurable, Achievable, Relevant and Time-bound (SMART) objectives and targets that enable the monitoring and evaluation of the ecological, social and cultural response to watering. A key feature of the plan was a robust and agreed program logic aligned with regional goals and objectives. We also detailed data collection methods and Key Evaluation Questions (KEQs) aligned to best practice evaluation themes: Effectiveness, Appropriateness, Efficiency, Impact and Legacy.

With around 30 wetlands receiving water each year, monitoring every location is neither feasible nor necessary, particularly as sites can vary annually, making it difficult to consistently collect data and track change over time. As a result, a decision-support framework was developed as part of the MERI plan to direct monitoring efforts to sites where the lessons, insights and assumptions can be used to tell a broader regional story, such as sites with broad geographic coverage, existing data and/or good representation of ecological, social and cultural values.

This project highlighted that a more targeted and prioritised monitoring approach generates more consistent and robust long-term data. This ensures the data can be used to demonstrate achievement of outcomes and support investment.

Keywords

Water for the environment, MERI framework, SMART objectives, wetlands, adaptive management, Murray River, monitoring and evaluation

Introduction

Wetlands along the Lower Murray River floodplain in the Mallee region represent important ecological, cultural and socio-economic assets. The region contains approximately 900 wetlands covering around 50,000 hectares, including riverine systems, saline lakes, marshes and floodplain depressions (Mallee CMA, 2022).

Historically, these wetlands experienced highly variable hydrological regimes driven by flooding, rainfall and groundwater processes. However, river regulation and a drying climate have significantly altered these natural flow patterns. Reduced frequency, duration, and extent of inundation have led to declining ecological condition across many wetland systems (MDBA, 2012). Environmental watering now plays a critical role in mitigating these changes by reinstating key aspects of natural flow regimes and supporting ecosystem resilience.

Although environmental watering programs have been implemented for decades, associated monitoring efforts have often been fragmented, inconsistently applied, and resource intensive. This has limited the ability to demonstrate outcomes, support adaptive management, and justify ongoing investment. These challenges are consistent with broader MERI practice, which recognises clear program logic, outcome-focused monitoring and targeted evaluation as critical to supporting adaptive management and demonstrating impact.

MERI can become disconnected from project delivery and perceived as a reporting requirement, rather than a tool for learning and adaptation (Wallis et al., 2020). At the same time, clear objectives, program logic and outcome-focused monitoring improve the ability to demonstrate impact and communicate value.

This paper presents the development of a regional scale MERI framework designed to provide a coordinated, efficient and outcome-focused approach to monitoring and evaluating environmental watering across the Lower Murray wetlands.

The study area

The MERI plan focuses on wetlands along the Murray River between Swan Hill and the South Australian border (Figure 1). These Lower Murray wetlands include anabranch channels, freshwater and saline lakes, swamps and floodplain systems that rely on surface water inundation.

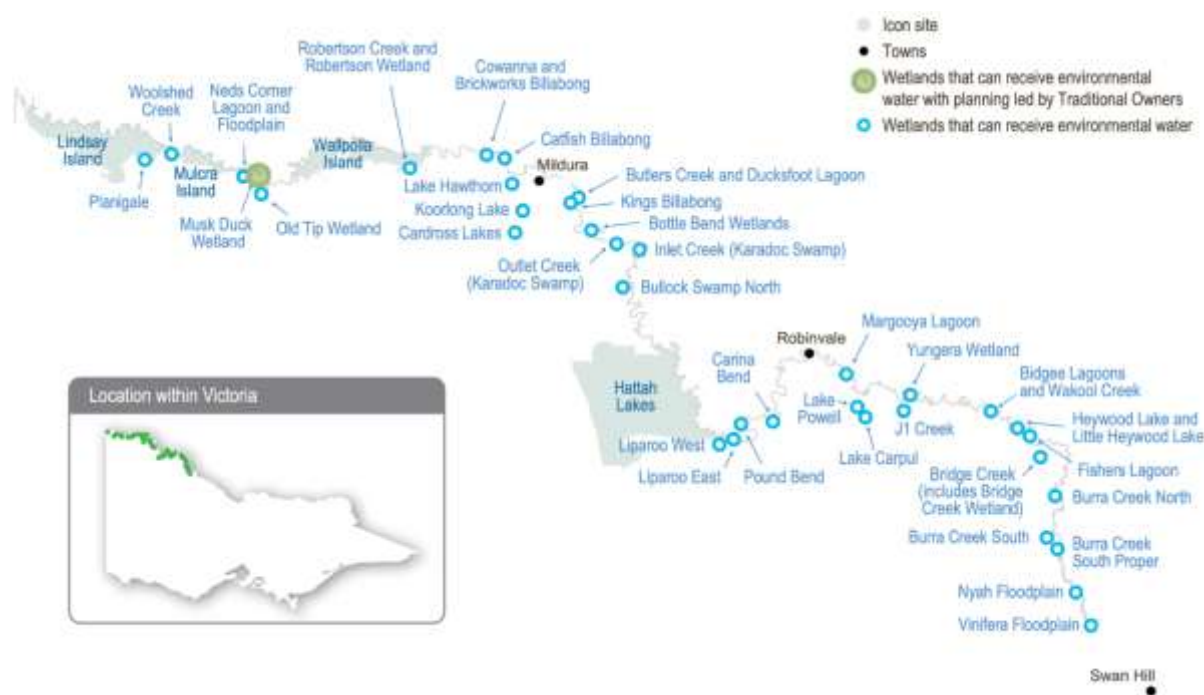


Figure 1 Location of wetlands along the Lower Murray

Approximately 84% of these wetlands occur on public land, although private land wetlands are increasingly managed for conservation outcomes. These systems support key ecological values including River Red Gum (*Eucalyptus camaldulensis*), Black Box (*Eucalyptus largiflorens*), and aquatic vegetation communities, as well as threatened fauna such as Murray Cod, Murray Hardyhead and Growling Grass Frog.

Environmental watering in the region is guided by multiple strategic frameworks, including Environmental Water Management Plans (EWMPs), the Mallee Regional Catchment Strategy, the Victorian Waterway Management Strategy, and the Murray-Darling Basin Plan. Annual watering actions are determined through Seasonal Watering Plans and Proposals. The MERI plan aligns with these frameworks, providing a mechanism to evaluate outcomes and support decision-making.

Method

Desktop review and objective synthesis

The development of the MERI plan commenced with a comprehensive desktop review of existing environmental watering documentation. This included over 30 EWMPs, strategic plans, and operational documents such as Seasonal Watering Plans and Proposals.

A key methodological decision was to synthesise objectives across wetlands by thematic ecological values rather than site-specific outcomes. This approach recognised the consistency of objectives across plans and enabled the development of a scalable, region-wide monitoring framework.

Common ecological values identified included:

- Waterbirds (feeding, breeding, refugia)
- Vegetation (aquatic plants, lignum, River Red Gum, Black Box)
- Threatened species
- Native fish and frogs
- Invasive species
- Ecosystem diversity
- Carbon and nutrient cycling.

In addition, socio-economic, cultural and recreational objectives were incorporated, including First Nations cultural values, recreation, education, and economic benefits.

Field assessment and stakeholder engagement

A field trip to representative wetlands (Figure 2) provided practical insights into current monitoring approaches and constraints. Observations highlighted logistical and resource challenges associated with comprehensive monitoring across a large and dynamic wetland network.

Two stakeholder workshops were conducted with Mallee CMA staff and a representative from the Department of Energy, Environment and Climate Action (DEECA). These workshops refined the monitoring framework, tested assumptions, and validated prioritisation criteria. This participatory approach ensured the MERI plan was robust, practical to implement, and aligned with stakeholder needs.

Program logic development

A central component of the MERI plan was the development of a robust program logic framework linking inputs, activities, outputs and outcomes. The program logic aligned the environmental watering actions with short-, medium- and long-term outcomes across the ecological, social and cultural domains.

Key assumptions underpinning the program logic include:

- Environmental water delivery can mimic critical aspects of natural flow regimes
- Ecological responses are measurable and attributable to watering actions

- Monitoring data can inform adaptive management decisions.

Monitoring and evaluation framework

A monitoring framework was also developed and structured around SMART objectives and key evaluation questions (KEQs). Evaluation themes include:

- Effectiveness
- Appropriateness
- Efficiency
- Impact
- Legacy.

Indicators, data collection methods and reporting approaches were also defined for each objective. The framework ensures consistency while allowing flexibility for site-specific considerations.

Results: what has changed

Development of a prioritised monitoring framework

Given that approximately 30 wetlands receive environmental water in any given year, comprehensive monitoring across all sites is impractical. Variability in site selection further complicates long-term data collection. Previous MERI work has demonstrated that attempting to monitor all activities reduces effectiveness and limits the ability to generate meaningful insights.

To address this, a decision-support framework was developed to prioritise monitoring efforts. Key criteria include:

- Geographic representation
- Existing data availability
- Ecological, social and cultural significance
- Ability to inform regional understanding.

This approach ensures that monitoring investment is directed towards sites that provide the greatest learning value, enabling robust demonstration of outcomes and supporting the development of a defensible regional evidence base.

Integration of data and reporting tools

An accompanying Excel-based tool was developed to support operational use of the MERI framework. This resource enables:

- Tracking of monitoring sites and outcomes
- Alignment with intermediate outcomes (to 2035)
- Updating of data and priorities over time.

The MERI plan is designed as a living document, allowing ongoing refinement as new data and insights emerge.

Structured evaluation approach

The establishment of KEQs linked to evaluation themes enables systematic assessment of environmental watering outcomes. This structure supports both periodic (annual, multi-year) and triggered evaluations (event-based), ensuring timely feedback into management. An annual decision process was established which included the:

- Identification of sites receiving environmental water
- Collection of baseline data where required
- Application of prioritisation criteria
- Allocation of monitoring effort.

This structured process enables monitoring priorities to be reviewed and updated annually, ensuring effort remains aligned with management objectives and emerging knowledge gaps.

This outcome-focused approach reflects broader improvements in MERI practice for environmental watering, where a clearer focus on outcomes can strengthen reporting and communication of future watering decisions.

Discussion: lessons from the transition

Improving monitoring efficiency and effectiveness

The MERI plan demonstrates the importance of strategic prioritisation in large-scale environmental programs. By focusing on representative sites and key knowledge gaps, the framework reduces duplication of effort and improves cost-effectiveness.

The shift from site-based to value-based monitoring represents a significant advancement. It enables aggregation of data across sites, facilitating stronger regional insights and more robust evaluation of program outcomes.

Supporting adaptive management

The MERI cycle, monitoring, evaluation, reporting and improvement provide a structured mechanism for adaptive management. Continuous feedback allows managers to refine watering strategies, monitoring approaches and investment decisions.

This is particularly important in the context of climate variability and uncertainty, where flexible and responsive management is essential.

Integration of social and cultural values

A notable feature of the MERI plan is the inclusion of socio-economic and cultural objectives alongside ecological outcomes. This reflects a broader understanding of environmental water benefits, including cultural connections, recreation and regional development.

The inclusion of First Nations values is particularly important, supporting partnerships and ensuring cultural considerations are embedded in water management.

Broader applicability

The approach developed in the Mallee has potential application in other regions managing multiple environmental watering sites. Key transferable elements include:

- Program logic frameworks
- Thematic objective grouping
- Prioritised monitoring approaches
- Decision-support tools.

These elements can support more efficient and effective monitoring across diverse environmental programs.

Conclusions

This paper presents a regional MERI framework for Lower Murray wetlands that addresses a critical gap in the monitoring and evaluation of environmental watering programs and strengthens the linkage between environmental water delivery, monitoring and evaluation. By providing a coordinated, prioritised and adaptive approach, the framework improves the ability to demonstrate outcomes, inform decision-making and maximise the benefits of environmental water.

The framework shows that outcome-focused monitoring is essential to demonstrate impact, while prioritised monitoring enables efficient use of limited resources. Structured evaluation further supports adaptive management by linking monitoring evidence to decision-making.

Importantly, the framework reinforces the role of MERI as a core component of environmental water management rather than a reporting requirement. The integration of ecological, social and cultural objectives, supported by program logic and decision-support tools, provides a practical and scalable approach to monitoring complex wetland systems. As a living framework, it will continue to evolve, supporting the long-term resilience of Lower Murray wetlands.



Figure 2 Field inspection of watering site (T. Wallis, RMCG, 2026)

Acknowledgements

The authors acknowledge the Mallee Catchment Management Authority, DEECA, and Victorian Environmental Water Holder involved in the workshops, field assessments and report review. Their contributions were critical to the development of the MERI framework. We also acknowledge the Traditional Owners of the lands and waters on which these programs operate, and their ongoing connection to Country.

References

- RMCG (2026). *MERI Plan for Lower Murray wetlands in the Mallee*. RM Consulting Group Pty Ltd, Torquay, Victoria.
- Wallis, T., Feniuk, C., Gardner, T., & Annett, S. (2020). *Building monitoring, evaluation and reporting capacity for more effective waterway management*. Proceedings of the 10th Australian Stream Management Conference.
- Mallee Catchment Management Authority (2022). *Mallee Regional Catchment Strategy 2022–2028*.
- Murray–Darling Basin Authority (2012). *Basin Plan*.