

SUBMISSION

Consultation Draft — Fitzroy–Derby Water Resources Management Plan

A Systems Approach to Water Security in the Martuwarra (Fitzroy) Catchment

Submitted to

Department of Water and Environmental Regulation

Government of Western Australia

Prepared by

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Acknowledgement

Rock2Reef Pty Ltd acknowledges the Traditional Owners of the Martuwarra (Fitzroy) River and its catchment, and the deep and continuous knowledge they hold of these living waters, developed and cared for over many thousands of years. We recognise the central role of Traditional Owners in the governance, planning and long-term stewardship of the river, and we offer this submission in support of, and with respect for, that role. We pay our respects to Elders past and present.

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Executive Summary

The Martuwarra (Fitzroy) River is one of Australia’s great river systems. It supports internationally significant environmental values, sustains cultural traditions extending back many thousands of years, underpins pastoral and other enterprises across the Kimberley, and contributes to the ecological health of the floodplains, wetlands, estuaries and marine environments that depend upon it.

Rock2Reef Pty Ltd welcomes the opportunity to make a submission to the Consultation draft — Fitzroy–Derby Water Resources Management Plan. As the first water plan for the Fitzroy River catchment and its related groundwater resources, this process represents an important opportunity not only to determine how water should be allocated, but also to consider how the landscape itself can be helped to retain, store and gradually release a greater proportion of the rainfall it already receives.

This submission proposes that future water management integrate two complementary objectives. The first is the responsible allocation of existing water resources, which must remain central to the management of the river. The second is the improvement of catchment function, so that a greater proportion of rainfall remains within the landscape through increased infiltration, healthier floodplains, improved groundwater recharge and more resilient vegetation. These objectives are not in competition. They strengthen one another.

This submission does not seek to replace existing hydrological science, engineering or water allocation frameworks. Rather, it proposes an additional layer of landscape-scale thinking, grounded in practical field observation gathered over more than twenty years of landscape restoration in Western Australia. Where the submission extends beyond established scientific understanding, it does so by recommending collaborative research and monitored demonstration projects, rather than by presenting hypotheses as settled fact.

The central proposition is straightforward and is offered as a question worthy of investigation:

Can healthier landscapes increase the proportion of rainfall that remains within a catchment, thereby strengthening long-term water security for communities, culture, agriculture and the environment?

If the answer proves to be even partly yes, then landscape restoration deserves recognition as an important component of future water policy. Healthy landscapes should be understood not only as an environmental asset, but as a form of distributed natural water infrastructure that complements the engineered infrastructure on which water security has traditionally depended.

The submission recommends that the Plan recognise the catchment as one connected hydrological system; that landscape restoration be considered as complementary water infrastructure; that long-term demonstration catchments be established; that Traditional Owner knowledge be integrated throughout planning and monitoring; and that monitoring be expanded beyond river flow to include infiltration, groundwater recharge, floodplain condition and ecological resilience. A full set of recommendations is provided in Part Three.

Finally, the submission proposes that the enduring product of this work should be knowledge. It invites the Plan to establish the Fitzroy (Martuwarra) as a nationally significant “learning catchment,” in which physical works and the generation of understanding operate together

over decades, knowledge is shared openly, and learning becomes a permanent function of water planning. This learning framework is set out in Part Four.

PART ONE

The Questions Before the Answers

1. Introduction: Every River Begins Somewhere

Water planning has traditionally concentrated on the management of rivers, aquifers and water licences. These are essential responsibilities, and they should remain central to the management of the Fitzroy River. They are not the whole of the story, however, because rivers are products of landscapes.

Every river has a source. Hydrologically, that source may be a spring, a tributary or the accumulation of countless rainfall events across a catchment. Functionally, however, the river begins much earlier. It begins where rainfall first meets the landscape. Before water reaches a creek line, it encounters leaves, grasses, litter, soil, roots, rock, floodplains and groundwater. Every one of these interactions influences what happens next. Some water infiltrates. Some evaporates. Some is stored temporarily within the soil. Some moves slowly through the landscape. Some becomes runoff and eventually enters the river.

By the time water reaches the main channel, it has already completed a long journey. The river is therefore not the beginning of the water story; it is the result of everything the landscape has already done. Every drop of water entering the Fitzroy first interacts with soils, vegetation, geology and floodplains before reaching the main river channel. It follows that improving the function of the wider catchment may improve the long-term resilience of the river itself.

This submission therefore proposes that water planning extend beyond the river channel and consider the entire landscape as part of the water resource.

2. Why Ask a Different Question?

Australia has invested decades in improving the science of water management. We measure rainfall, river flow, groundwater, water quality and environmental water requirements with increasing precision. These systems are fundamental to modern water planning and remain essential to the responsible management of our rivers. This submission does not challenge that foundation.

Instead, it asks whether another question deserves greater attention. Rather than asking only how water should be allocated once it reaches a river system, should we also ask how effectively the landscape retains, stores and regulates the rainfall that creates that river in the first place? This is not a question about replacing current approaches. It is a question about broadening them.

This question should not be interpreted as suggesting that rainfall can be created. Rather, it recognises that landscapes differ greatly in their ability to retain rainfall. Some landscapes shed water rapidly; others slow it. Some recharge groundwater effectively; others generate immediate runoff. The condition of the landscape strongly influences these outcomes. As pressures on Australia's water resources continue to increase, understanding the role of landscape function may become increasingly important to long-term resilience.

3. Observation Before Intervention

This submission did not begin with a research project. It began with observation. Over many years, landscapes that appeared remarkably similar were found to respond very differently to the same rainfall events. Some remained productive long after rain had ceased; others dried rapidly. Some drainage lines became increasingly stable; others continued to erode. Some areas regenerated naturally; others struggled despite similar management. These differences suggested that something more than rainfall alone was influencing the way water behaved.

Rather than immediately searching for solutions, the work began by asking why. That question became the foundation of more than two decades of observation across Western Australian landscapes. The objective was not to confirm a theory; it was to understand recurring patterns. Observation came first. Intervention came later. Learning continues today.

In many fields, observation is recognised as the first step towards understanding. Doctors observe symptoms before prescribing treatment. Engineers investigate ground conditions before constructing infrastructure. Ecologists study ecosystems before attempting restoration. Landscape management should follow the same principle. The approach described throughout this submission has consistently followed five stages:

- Observe — watch how the landscape and its water behave over time, across seasons and across different positions in the catchment.
- Understand — seek to explain why those behaviours occur before acting.
- Intervene — apply a measured, locally appropriate response.
- Monitor — record what changes, and what does not.
- Learn — allow each result to inform the next decision.

This sequence is intentionally slow. Healthy landscapes develop over decades, and understanding them requires similar patience. The greatest lesson emerging from this work is that natural systems often continue responding long after human intervention has ceased. Time becomes an active participant in restoration.

4. Defining Landscape Function

The term landscape function is used throughout this submission. For the purposes of this discussion, it refers to the capacity of a catchment to perform the natural processes that regulate water, sustain biological activity and support ecological resilience.

These processes include capturing rainfall, slowing runoff, increasing infiltration, storing water within soils and groundwater, reconnecting floodplains where appropriate, supporting healthy vegetation, and progressively releasing stored water back into rivers, wetlands and surrounding ecosystems.

Healthy landscape function does not create rainfall. It influences what happens after rainfall arrives. This distinction is central to the submission. The objective is not to generate more water; it is to understand whether healthier landscapes retain and regulate existing rainfall more effectively than degraded landscapes do.

5. Landscape Function Creates Water Function

Hydrology has long recognised that rivers are influenced by processes occurring throughout their catchments. This submission extends that principle through a simple organising idea:

Landscape function creates water function.

Where landscapes function well, water may move differently. Runoff may slow. Infiltration may increase. Floodplains may reconnect more frequently. Groundwater processes may be strengthened where conditions allow. Vegetation may remain active for longer periods following rainfall.

The precise relationship between these processes will vary between landscapes. That is to be expected, because no two catchments are identical. The proposition is not that every landscape behaves in the same way; it is that the condition of the landscape influences the behaviour of water. Understanding the strength of that relationship in the Fitzroy catchment deserves further investigation, and is well suited to the demonstration and monitoring approach recommended later in this submission.

6. From Infrastructure to Function

Australia's water future will continue to depend upon engineered infrastructure. Dams, pipelines, levees and storage systems remain essential, and this submission does not question their importance. It asks whether healthy landscapes should also be recognised as infrastructure in their own right.

Unlike engineered assets, landscapes perform their work continuously and across entire catchments. They intercept rainfall, store water, filter sediment, support vegetation, moderate erosion, and recharge groundwater where conditions allow. These services occur simultaneously, and often without any direct human management. This submission describes these processes collectively as distributed natural water infrastructure.

The term is intended to stimulate discussion rather than to establish a fixed new category of infrastructure. Whether the concept proves useful in practice should be determined through evidence gathered across multiple landscapes. The value of naming it is that it invites water planners to weigh the condition of the catchment alongside the engineered assets that have traditionally dominated water planning.

PART TWO

A Systems Approach in Practice

7. From Silos to Systems

Modern land and water management often separates water into categories: surface water, groundwater, floodplains, wetlands, vegetation, agriculture and marine ecosystems. In reality these systems remain physically connected. Groundwater influences rivers. Floodplains influence groundwater. Vegetation influences infiltration. River flows influence estuaries. Freshwater influences coastal ecosystems.

Managing each component separately risks overlooking the relationships between them. The river is the product of its catchment, and water planning should recognise the catchment as one connected system rather than a collection of separate assets. This submission therefore recommends adopting a systems perspective, in which water is managed across the entire catchment rather than only within river channels. This approach complements existing hydrology and water allocation frameworks; it does not replace them.

8. Walking the River Together

Perhaps the most valuable recommendation in this submission has little to do with engineering. Before major decisions are made about the future of the Fitzroy River, Rock2Reef proposes a collaborative journey along the river itself.

Beginning in the upper catchment and continuing to the river mouth, representatives from Traditional Owner groups and Elders, government agencies, hydrologists, ecologists, pastoralists, researchers and local communities could walk sections of the river together. The purpose would not be consultation alone. The purpose would be shared learning.

Traditional Owners hold detailed knowledge accumulated through many thousands of years of continuous relationship with the river. Scientists contribute hydrology, ecology, geomorphology and environmental monitoring. Landholders contribute observations gained through decades of practical management. Government contributes planning, policy and long-term stewardship. Each perspective reveals different aspects of the same river. Bringing these perspectives together, on Country and in sequence from headwaters to coast, creates an opportunity to develop a genuinely integrated understanding of the Fitzroy catchment, and to combine cultural knowledge, practical observation and scientific understanding into a shared picture of how the river functions.

The river has always connected people. Its future should be shaped in the same spirit.

9. Evidence from Two Decades of Restoration

Over approximately twenty years, the author has undertaken practical landscape restoration on a property in Western Australia. The objective was not to maximise water storage through large infrastructure. Instead, the work focused on improving landscape function. Interventions sought to slow runoff, increase infiltration, reconnect water with vegetation, reduce erosion, encourage natural regeneration, and improve opportunities for groundwater recharge.

Over time, the landscape responded. Vegetation density increased. Water persisted for longer following rainfall. Ground cover improved. Natural regeneration became increasingly common. These observations do not, by themselves, prove cause and effect. They do, however, provide practical evidence that landscape function deserves further scientific investigation through monitored demonstration projects. They should be interpreted not as proof, but as a sound basis for structured, independently monitored field trials.

It is precisely because field observation cannot, on its own, establish cause and effect that this submission consistently recommends collaborative research and demonstration rather than asserting conclusions. The contribution offered here is two decades of patient observation and a practical method for testing it.

10. The Rock2Reef Hydrological Pattern System

One outcome of this work has been the gradual development of more than twenty repeatable landscape patterns. While many restoration programs rely primarily on a small number of techniques, such as leaky weirs or whoa-boys, practical experience suggests that no single intervention is suitable for every landscape. Different landscape positions require different responses.

The Rock2Reef Hydrological Pattern System therefore focuses on function before structure. Each pattern is selected according to what the landscape needs to achieve. Examples include slowing water, reconnecting floodplains, reducing flow energy, encouraging infiltration, trapping sediment, stabilising erosion and improving groundwater recharge. The intention is not to prescribe fixed designs, but to develop a practical library of landscape responses that can continue to evolve through research and experience. The framework should continue to be refined through scientific testing and practical application, and is offered to the Plan as a starting point for collaborative trials rather than as a finished prescription.

11. Groundwater and Floodplains

Groundwater represents one of Australia's most valuable but least visible water resources, and it is of particular importance in the Fitzroy catchment, where groundwater sustains critical ecosystems through the dry season. Increasing recharge opportunities, and protecting the natural processes that support recharge, should therefore be regarded as an important long-term objective.

Floodplains also deserve renewed attention. Healthy floodplains slow water, deposit sediment, recharge groundwater and support extensive ecological communities. Where practical, restoring or protecting floodplain function may improve both environmental and productive outcomes. A systems approach treats groundwater and floodplains not as separate categories to be managed in isolation, but as connected components of the same hydrological system.

12. From Catchment to Coast

This submission recognises that river systems do not end at the coastline. Freshwater influences estuaries; estuaries influence coastal ecosystems. A systems approach therefore considers the entire pathway from rainfall to the coast.

Established science already recognises the importance of estuarine condition, freshwater inflows, wetlands and seagrass habitats for many aquatic species. Improved landscape

function may, over long timeframes, alter the timing and quality of freshwater reaching downstream environments, creating opportunities for better ecological outcomes. Based on field observation and broader hydrological reasoning, Rock2Reef proposes that future research investigate whether landscape-scale improvements in infiltration and groundwater recharge influence downstream freshwater delivery and the resilience of estuarine and coastal ecosystems.

These propositions are presented as research priorities rather than as established conclusions, and they should be tested through collaborative scientific investigation. Regardless of the outcome, improved understanding of the catchment-to-coast pathway will strengthen future water planning.

PART THREE

A Pathway Forward

13. Demonstration Catchments

The strongest and most practical pathway forward is to establish demonstration catchments, in which Traditional Owners, researchers, government agencies and landholders work together. These sites would provide the controlled, long-term setting in which the questions raised in this submission can be tested honestly.

Each demonstration site should include long-term monitoring of rainfall, infiltration, groundwater, vegetation, floodplain condition and ecological response. The objective is to learn what works under different conditions, and to build a transparent evidence base for future policy. Demonstration catchments would also create an enduring framework for adaptive management, in which new information continually improves future decisions.

14. Phased Implementation and Adaptive Management

Implementation should begin with a small number of carefully chosen pilot projects rather than with catchment-wide change. This staged approach manages risk, respects the time that natural systems require to respond, and allows methods to be refined before they are applied more broadly.

These pilots should be independently monitored, openly reported and refined over time. Adaptive management will allow new information to improve future decisions while maintaining scientific integrity. Guidance for landscape restoration should be developed on the basis of demonstrated outcomes rather than assumptions, and should remain open to revision as evidence accumulates.

15. Recommendations

Rock2Reef Pty Ltd respectfully recommends that the Fitzroy–Derby Water Resources Management Plan consider the following:

1. Manage the Fitzroy catchment as one connected hydrological system, rather than as a collection of separately managed assets.
2. Recognise landscape restoration and healthy catchment function as complementary, distributed natural water infrastructure that works alongside engineered assets.
3. Integrate Traditional Owner knowledge throughout planning, decision-making and monitoring, consistent with the central role of Traditional Owners in the stewardship of the Martuwarra.
4. Undertake a collaborative “walking the river” process from headwaters to coast, bringing Traditional Owners, scientists, landholders and government together to build a shared understanding of the system.
5. Establish long-term demonstration catchments in which government, Traditional Owners, researchers and landholders collaborate and monitor outcomes.

6. Expand monitoring beyond river flow to include infiltration, groundwater recharge, floodplain condition and ecological resilience.
7. Support collaborative research into catchment-to-coast hydrological processes, including the relationship between landscape function and downstream freshwater, estuarine and coastal ecosystems.
8. Encourage practical field trials supported by independent scientific evaluation, beginning with a small number of pilots.
9. Develop practical guidance for landscape restoration based on demonstrated and independently monitored outcomes, and apply adaptive management so that guidance improves as evidence accumulates.
10. Establish the Fitzroy (Martuwarra) as a nationally significant “learning catchment,” in which physical works and the generation of knowledge operate together over the long term, so that learning becomes a permanent function of water planning.
11. Share knowledge openly through accessible reporting, scientific publication, field days, university collaboration, Traditional Owner-led knowledge exchange and community engagement, reporting both successful and unsuccessful outcomes, and allow the approach to inform a wider network of learning catchments over time.

PART FOUR

Building a Learning Framework

16. A Different Kind of Investment

Every generation invests in its future. Some investments are visible — dams, pipelines, roads and monitoring stations. Others are less visible but equally important, and chief among them is knowledge. This submission suggests that the next opportunity in Australian water planning is to deepen our understanding of how landscapes create, regulate and sustain water. It does not seek to replace existing science or policy; it invites their continued evolution through broader observation and evidence.

Understanding grows when recurring patterns and relationships are recognised over time. Future water planning should therefore be designed not only to manage water effectively, but to continually improve our understanding of the landscapes that generate it. When understanding improves, management naturally improves with it.

17. Learning Catchments and the Fitzroy Opportunity

A learning catchment is a landscape where observation, scientific monitoring, Traditional Owner knowledge, practical land management and adaptive learning operate together over decades. Physical works remain important, but the enduring product is knowledge. Every intervention becomes an opportunity to learn, refine and improve future decisions.

The Fitzroy (Martuwarra) is uniquely placed to become a nationally significant learning catchment. Its environmental importance, cultural significance and scale provide an exceptional opportunity to investigate landscape function through respectful collaboration rather than predetermined conclusions. The objective is not to prove a theory, but to reduce uncertainty through evidence.

18. Partnership, Adaptive Learning and Shared Knowledge

Enduring partnerships are themselves a form of infrastructure. Traditional Owners, scientists, landholders, universities and government each contribute different observations and strengths. No single participant holds complete knowledge of a living catchment. Together they build a richer and more resilient understanding.

Adaptive management is strengthened by adaptive learning. Observation leads to evidence; evidence improves understanding; understanding refines management. Every flood, drought and restoration effort becomes another opportunity to test ideas and strengthen future decision-making. Learning should become a permanent function of water planning rather than an occasional by-product of it.

Knowledge has greatest value when it is shared openly. Learning catchments should produce accessible reports, scientific publications, field days, university collaborations, Traditional Owner-led knowledge exchange and community engagement. Sharing both successful and unsuccessful outcomes accelerates collective learning and builds trust between partners.

19. Towards a National Learning Network

If this approach proves valuable in the Fitzroy, it can gradually expand into a national network of learning catchments. Different regions will reveal different processes, but together they can build a cumulative understanding of how Australian landscapes influence water security.

Twenty years from now, Australia could possess a generation of practitioners drawing upon decades of shared observation, rigorous science, Traditional Owner knowledge and practical experience. Policy would increasingly be informed by evidence gathered through long-term learning rather than isolated projects. Uncertainty would not disappear, but it would steadily diminish.

20. Conclusion and Closing Reflection

The Martuwarra (Fitzroy) River represents one of Australia's great natural systems. Its future should be guided by sound science, practical experience, Traditional Owner knowledge and long-term collaboration.

Australia has developed strong systems for measuring and allocating water. The next opportunity is to investigate how healthy landscapes can improve long-term water security by retaining, storing and gradually releasing more of the rainfall they already receive. This submission does not claim to provide every answer. Instead, it proposes an additional question worthy of investigation:

Can healthier landscapes increase the proportion of rainfall that remains within a catchment, thereby strengthening long-term water security?

If the answer is even partly yes, then landscape restoration deserves recognition as an important component of future water policy. The opportunity before Western Australia is not simply to allocate water wisely; it is to better understand how healthy catchments create resilient rivers.

This submission began with a simple proposition: the river is not the beginning of the water story; it is the result of everything the landscape has already done. If that idea encourages Australia to broaden its approach to water planning, then its greatest legacy will not be a single project or policy. It will be a stronger national capacity to observe carefully, recognise recurring patterns, test ideas honestly and continue learning from the landscapes that sustain us.

Rock2Reef Pty Ltd respectfully submits these observations in the hope that they contribute to a constructive discussion about the future management of the Martuwarra (Fitzroy) River. We invite collaboration between Traditional Owners, government, scientists, landholders and the wider community, and we would welcome the opportunity to discuss any aspect of this submission further. In that spirit, this submission closes with a simple invitation:

*Walk together.
Observe carefully.
Measure patiently.
Question respectfully.
Share openly.
Allow evidence to guide understanding.
Allow understanding to guide management.*

Allow that management to leave healthier rivers and healthier landscapes for the generations that follow.

The river has always connected landscapes and people. It can also connect knowledge, helping us build a stronger future together.

Respectfully submitted,

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