FINAL REPORT

Improving water markets in the lower Fitzroy

Mobilising strong water governance arrangements
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Research for **sustainable** and **inclusive** development in **northern Australia**.







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Executive Summary

This research project is focused on how further development of water resources and the agricultural sector in the lower Fitzroy may be dependent on establishing well-designed governance, regulatory, and operational arrangements.

Up to recent times the water resource management system for the lower Fitzroy has been sufficient for various needs, with two supplemented schemes in the river system and a robust regulatory and administrative framework provided under the *Water Plan (Fitzroy Basin) 2011*. However the system is rapidly becoming more complex, with additional demands emerging for urban, industry and agricultural needs, and the new Rookwood weir now completed.

The complexity of managing three supplemented schemes in the lower Fitzroy, and the issues in differing responsibilities for water quality are identified as **governance** challenges. There are two major options for adjusting governance systems to address the current atomisation of responsibilities and water markets in the region.

- create a new **water utility** to manage all water resources in the lower Fitzroy on behalf of the current water owners and operators, similar to Seqwater in south-east Queensland; and
- creating a **single operator for agricultural water systems** in the lower Fitzroy through some transfer of responsibility for agricultural water from the Fitzroy Barrage to Sunwater.

Any consideration of these potential governance changes needs to be evaluated in terms of two key criteria, whether it helps to make the necessary operational changes, and whether the benefits of change outweigh the costs. Currently the relatively small size of the water assets in the lower Fitzroy limits the benefits of pooling water assets into single management systems through governance changes.

- **Recommendation**: Explore and evaluate options to pooling water assets into single management systems such as a **new water utility** or a **single operator for agricultural water systems**, taking account of the benefits and costs involved relative to continuing with the current arrangements.

An additional governance consideration is ensuring the future involvement of Traditional Owners in water markets in the lower Fitzroy. Currently there are Indigenous Land Use Agreements (ILUAs) between the Queensland Government and the Gaangalu Nation People, and between Sunwater, the Queensland Government and the Darumbal People Aboriginal Corporation, with the latter including a 500 megalitre water allocation from Rookwood Weir to the Darumbal People. At present, it is not clear how the Darumbal water allocation will be used or how Traditional Owners can play a role in water governance in the Lower Fitzroy region.

- **Recommendation**: Explore options and instruments for Traditional Owners to be involved in water markets and generate longer term benefits.

In terms of **operational management**, suggestions were to improve communication about the operating rules, zone caps, and management of priority water with the introduction of Rookwood supplies, and accounting for variations in environmental conditions when irrigators have supplies from multiple sources.

For water trading the most relevant rules are those outlined in the *Fitzroy Basin Water Management Protocol* released by DRDMW (2023), which specifies the rules for transferring water between the five zones in the lower Fitzroy under the three supplemented schemes, as well as caps for water allocations, conversion between medium and high security water, and changes in nominal allocations when water is transferred in or out of zone E (the Rookwood weir pool). The industry currently has a limited understanding of the system,

which is understandable given the atomised nature of the three supplemented water schemes, the number of recent changes, and the difficulty of finding relevant information on relevant websites.

- **Recommendation**: Improve information about the water system and rules for trading in the lower Fitzroy through one or more of the following strategies:
  - Develop a summary of the water supply system and rules relevant to water transfer and trading
  - Provide briefing sessions to local industry
  - Provide briefing sessions and training to local water agents and extension officers
  - Publish regular updates about the system in direct mailing or newsletters to local irrigators.

The second operational issue that may impact on the potential for water trading are variations in environmental compliance requirements between the supplemented schemes. In line with the conditions of development of Rookwood Weir under the Australian *Environment Protection and Biodiversity Conservation Act 1999*, purchasers of water for agricultural purposes from Rookwood Weir are required to develop and maintain detailed Land Use Management Plans. This may be a major impediment to market operations, if only irrigators with approved Land Use Management Plans are eligible to purchase water from Rookwood, even for temporary transfers.

- **Recommendation:** Consider extending the requirement for Land Use Management Plans to all holders of agricultural water in the lower Fitzroy, to generate greater commonalities in the system and increase the flexibility for water trading.

There is no common water trading platform to support the **water market**, even though the addition of the Rookwood weir supplies is creating enough volume in the system to support a more robust market. New entrants who need to find and purchase a large water entitlement in order to secure their operation currently face a barrier to entry that could be resolved with a more efficient water market. There appears to be a missing market in particular around long term water lease options, particularly as new enterprises in the lower Fitzroy get bedded down. At present there does not appear to be any robust market tools (i.e. trading platforms) that to facilitate these types of transactions.

- **Recommendation:** Explore options for water lease instruments to express an unrealised market for medium term water arrangements in the lower Fitzroy; identify water trading platforms or other exchange mechanisms to bring potential buyers and sellers together; and recommend options to register or contract lease arrangements.

An analysis of market requirements to address thin market problems identifies that scale is important in well functioning markets. Market conditions in the lower Fitzroy are sub-optimal compared to many other water regions in Australia. While the region is the fourth largest water supply region in the state, once urban and industrial supplies are excluded it falls to sixth place with only about 55,000ML available for agriculture. The market structure is also very concentrated, with two corporations holding about 55% of agricultural water allocations. This may limit the potential for ongoing market activity.

One of the challenges in developing water markets in the lower Fitzroy is that potential users are not familiar with market platforms and agents, and do not have access to good market information. Two major water trading platforms can be identified in Australia, **Waterfind** (www.waterfind.com.au) and **Water Exchange**. There are a larger number of water brokers, including two national organisations (RuralCo and

Elders) and a number of more regionally or state-based organisations (Appendix 3). Concerns about market conduct in the Murray-Darling Basin water markets mean that recommendations about water market platforms and agents need to be impartial.

- **Recommendation:** Provide the local industry with information about water trading platforms and agents, and also identify the platform and agent that are the preferred supplier for Sunwater in Queensland.

Another aspect of market transparency is that farmers and water users have limited access to clear information about the sector and water prices. The lack of timely access to market information is an issue in many water markets in Australia (ACCC 2021). While the Queensland Government provides summaries of water market data[1], the data is typically lagged and only provides price averages. Additional analysis that provided trends and highlighted differences in prices and volumes would be useful.

- **Recommendation:** Explore options for providing relevant and timely water market data for local industry, including drawing on the water trading data and water sales data published through Business Queensland.

- **Recommendation:** Recommend that Sunwater and Fitzroy River Water use their website to direct interest from industry in the lower Fitzroy to one or more water brokers.

The atomised nature of water supply schemes in the lower Fitzroy catchment is reflected in the water trading platforms where the Water Supply Schemes are listed separately, which may limit ease of access for participants. Even if the schemes have to be listed separately as different markets, options to report buy and sell opportunities as well as completed trades and market prices for the consolidated region would be helpful.

- **Recommendation:** Explore options for the major water trading platforms to report buy and sell opportunities as well as completed trades and market prices for the consolidated lower Fitzroy region.

[1] Monthly reports are available at https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/market-information

1. INTRODUCTION

Thisresearch project is focused on how further development of water resources and the agricultural sector in the lower Fitzroy may be dependent on establishing well-designed governance, regulatory, and operational arrangements. Up to recent times the water resource management system for the lower Fitzroy has been sufficient for various needs, with two supplemented schemes in the river system and a robust regulatory and administrative framework provided under the *Water Plan (Fitzroy Basin) 2011* (State of Queensland 2022). However, the system is rapidly becoming more complex, with additional demands emerging for urban, industry, and agricultural needs, and the new Rookwood weir is now completed.

The Lower Fitzroy has about 21% of the available water supply allocations in the Fitzroy Basin, as compared to 17% in the Dawson catchment, 52% in the Nogoa Mackenzie (including the Comet and Theresa/Retreat basins), and 10% in the Callide, which includes approximately 32.2 GL of groundwater. The supplemented schemes currently operating in the Lower Fitzroy include the Eden Bann Weir operated by Sunwater (with 25,520ML of high and 3,101ML of medium priority water with 43 allocations) and the Fitzroy Barrage operated by Fitzroy River water (50,473 ML of high and 11,630 ML of medium priority water with 298 allocations). In addition to those supplemented supplies, there are also 125 unsupplemented allocations managed by DRDMW, for a total of 45,508ML (DNRME 2018).

The new Rookwood Weir, operated by Sunwater, was completed in late 2023 and creates at least an additional 72,000ML of medium priority supplemented supplies in the lower Fitzroy. At least 50% of this water is to be allocated to agriculture, with 2,000ML allocated to urban use (Livingstone Shire Council) and 30,000ML allocated for industrial use (Gladstone Area Water Board). The water for urban and industrial uses will be released from Rookwood weir down to the Fitzroy Barrage to access the offtake pipelines. The yield at full supply levels is now estimated to be 86,000ML of medium priority water[2], higher than the initial levels approved, and the final allocations to urban, industry and agriculture uses are not identified at this point. Assuming that the medium priority water from the supplemented schemes is available to agricultural and rural uses and that 40,000ML of medium security water is available to agriculture from Rookwood Weir, the current availability of water to agriculture in the Lower Fitzroy is approximately 54,731ML of supplemented water and 45,508ML of unsupplemented water. While this is a small basin compared to the Murray-Darling system, it is comparable to many other irrigation districts in Queensland (Figure 1).

The first report for this project (Rolfe et al. 2023) reviewed the administration of water resources in the Lower Fitzroy, and summarised the governance challenges into four groups. One of these groups related to the potential for water markets to operate more efficiently. The development of Rookwood Weir has exposed substantial demand for water supplies, as well as interest in a wide variety of agricultural options. However there is very limited use of water trading in the region, and poor rates of utilisation for some schemes. A review process was recommended to identify what the market rules should be given the complexity of the system and the different types of demands and enterprises involved.

The second report for this project (Rolfe et al. 2024) summarised the issues in the basin into four groups:

- Governance
- Operational management
- Water markets
- Involving irrigators in governance.

[2] https://www.sunwater.com.au/projects/rookwood-weir-project/

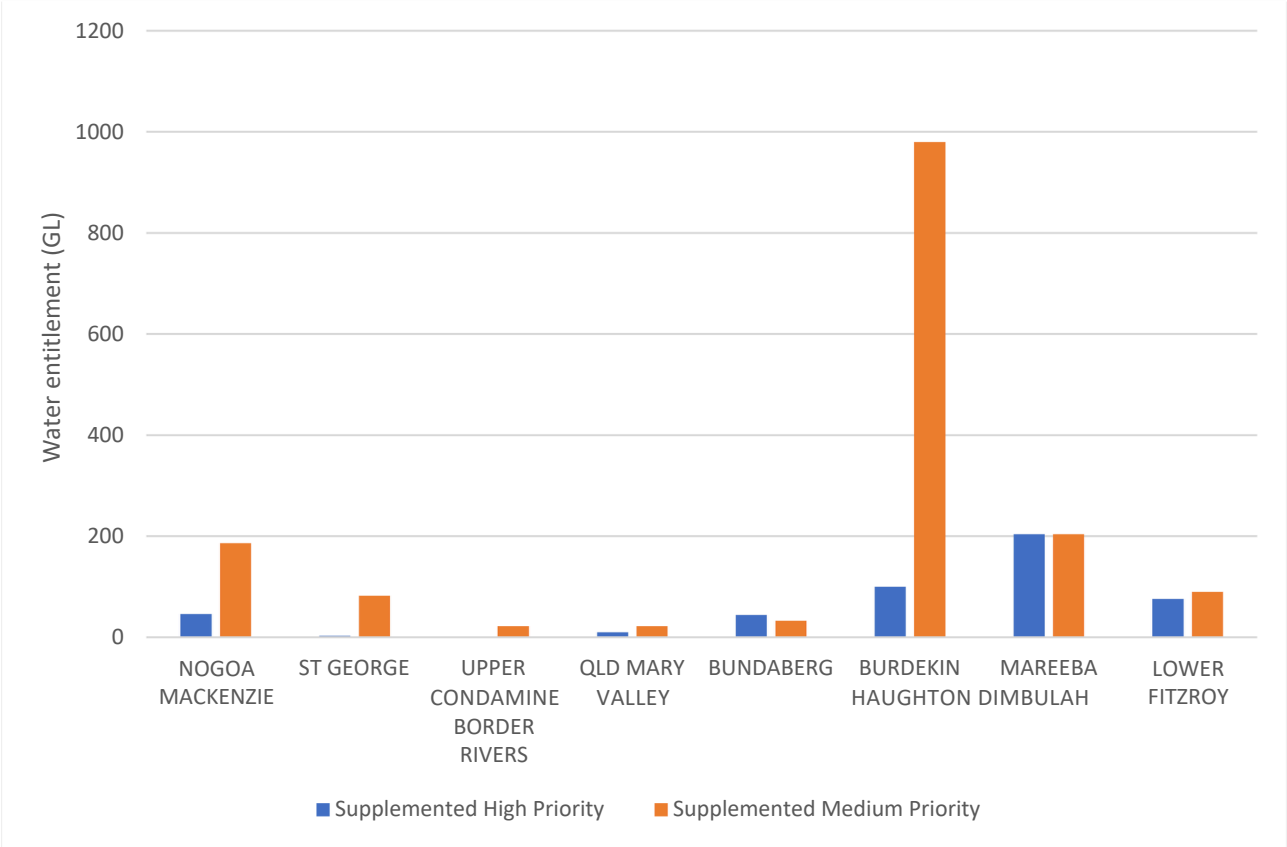


Figure 1: Supplemented water supplies by irrigation district in Queensland (Data provided in Appendix 1)

The complexity of managing three supplemented schemes in the lower Fitzroy, and the issues in differing responsibilities for water quality were identified as **governance** challenges, noting that ownership structures were unlikely to change in the short term and that no major complaints about governance were identified.

In terms of **operational management**, suggestions were to improve communication about the operating rules, zone caps, and management of priority water with the introduction of Rookwood supplies, and accounting for variations in environmental conditions when irrigators have supplies from multiple sources.

There is no common water trading platform to support the **water market**, even though the addition of the Rookwood weir supplies is creating enough volume in the system to support a more robust market. New entrants who need to find and purchase a large water entitlement in order to secure their operation currently face a barrier to entry that could be resolved with a more efficient water market. There appears to be a missing market in particular around long-term water lease options, particularly as new enterprises in the lower Fitzroy get bedded down. At present there does not appear to be any robust market tools (i.e. trading platforms) that to facilitate these types of transactions.

Gaps around information and market signals were identified as major gaps, and it was recommended that these issues be addressed before trying to **involve irrigators in governance**.

This report summarises the issues and recommendations for the first three topics (Governance, Operational Management and Water Markets). Recommendations regarding irrigators will be developed in a separate report later in 2024.

2. GOVERNANCE ISSUES

Goodgovernanceiskey to the establishment of accepted regulatory and administration systems and the efficient management of water and water markets. There has been a comprehensive development of water management systems in Australia over the past 30 years, as successive governments have implemented more sustainable management of water resources as well as searching for more efficient ways of allocating resources to productive uses. Among the major stepping stones was The Council of Australian Governments' Water Reform Framework announced in 1994, followed by the Intergovernmental Agreement on a National Water Initiative in 2004 (National Water Commission, 2011). These agreements underpinned substantial reform at the state levels to establish water plans, set limits to water extraction, set up property rights, and establish structures for water markets to operate.

In the Fitzroy Basin in central Queensland there is a robust regulatory and administrative framework provided under the *Water Plan (Fitzroy Basin) 2011*. Water plans are part of water management systems and processes established in Queensland under the *Water Act 2000* and administered by the Queensland Department of Regional Development, Manufacturing and Water (DRDMW). There is increasing recognition that attention needs to be paid to the 'soft' institutional systems as well as the 'hard' institutional systems that underpin governance, and so consultation mechanisms are used to help review systems, including the review of the Fitzroy Basin Water Plan by 2025.

Following the Queensland *Water Act 2000*, the *Water Plan* (*Fitzroy Basin*) *2011* provides the legal framework to develop and use surface and groundwater resources across the Fitzroy Basin. The Plan provides all details of resource availability, allocation, management, environmental flow, and relevant applications. Allocated and unallocated water is clearly defined. Under the Plan, the basin is broken into nine subcatchment areas, including the Fitzroy (above the barrage) and downstream of the Fitzroy Barrage. Water resources are grouped into groundwater, regulated water, and unregulated water. For management purposes, the Basin is further divided into Water Management Areas, which are then further classified into zones, with the Fitzroy water management area comprising five zones. There are environmental goals and conditions to be met in managing the water resources in the Basin, with conditions often specific to the various zones within the Basin.

Although the framework is well established, governance is complex in the lower Fitzroy system, with three supplemented schemes in the river system plus unsupplemented water. Because of variations in water ownership and operation, there are a number of overlapping roles and processes to govern the system.

- DRDMW is responsible for system regulation and carriage of the Fitzroy Basin Water Plan.
- DRDMW, Sunwater and Rockhampton Regional Council are responsible for water in the Rookwood Weir, Eden Bann Weir and Fitzroy Barrage impoundments, respectively.
- Sunwater manages water from the Rookwood and Eden Bann weirs, and Fitzroy River Water (a subsidiary of the Rockhampton Regional Council) manages water from the Barrage.
- Most of the water from the Barrage, and smaller quantities from Eden Bann and Rookwood weir, are allocated to urban use including drinking water.
- Stanwell Power Corporation and Gladstone Area Water Board are the major holders of industrial allocations, while there is a large range of entitlements for medium security water for agriculture.
- Rockhampton Regional Council, Sunwater and the Queensland Government have interests in future development processes, including the potential to increase water storages.

Akey challenge in the lower Fitzroy is to stimulate water markets to be more effective, given that the underlying systems for water trading and water markets are in place. Water entitlements are established under the *Water Plan* (*Fitzroy Basin*) *2011,* and DRDMW manages the entitlements, registering changes in ownership. However, there is limited market trading in the lower Fitzroy at present, even though there are private industry agents that operate in this space, and trading platforms such as Water Exchange and Waterfind.

There are three major reasons for fostering water markets to become more active in the lower Fitzroy.

- Markets should underpin gains in efficiency from transferring water from lower value or no use to higher value uses, helping to create economic returns in the region;
- Water markets will make it easier for new enterprises to source water supplies and establish in the region which will capitalise on higher demand from investors; and
- Water markets will improve water utilisation from the current low rates, which is a prerequisite for planning for additional water supplies in the region, such as from raising the Fitzroy Barrage or Eden Bann Weir.

Low utilisation rates[3] for water entitlements suggest that the use of water entitlements in the Lower Fitzroy is not being optimised. Market mechanisms, where water can be traded to highest value use, are often viewed as a solution to these inefficiencies. It is already possible to trade water within the Lower Fitzroy, on either a temporary or permanent basis, but volumes of permanent water trades between 2012/13 and 2017/18 of supplemented water were very limited (DNRME 2018). The only exception was 2016/17 when 1,600ML of water changed hands in the Lower Fitzroy system. This reflects the small amounts of supplemented water available outside of urban and industrial allocations (3,100ML from Eden Bann and 10,700ML from the Fitzroy Barrage).

2.1. Governance options to manage the lower Fitzroy

One limitation to the current system is that while water trading is possible, the system is being treated as four separate markets (three supplemented schemes and the unsupplemented water), with no common platform available. Within some supplemented schemes there is information provision to help link potential buyers and sellers, but these are largely informal with limited (or too much) information. Developing a single entry point or portal for potential buyers and sellers will be useful to encourage more market development. These are issues that could be potentially addressed through governance changes. There are two major options for addressing the current atomisation of responsibilities and water markets in the region.

[3]As described in Rolfe et al. (2023) unutilised volumes are up to 27% in the Lower Fitzroy (Eden Bann), and 53% in the Rockhampton Barrage system. Between the years 2013/14 and 2017/18, average utilisation of water was 68.2% from the Lower Fitzroy system (Eden Bann) (28.6 GL of water entitlements), 40.8% from the Fitzroy Barrage system (62.1 GL of water entitlements), and 6.8% from unsupplemented water licenses (58.9 GL of water entitlements) (Minister's Performance Assessment Report DNRME, 2018). However, most of the underutilisation in the supplemented systems is because holders of industrial water in Eden Bann and urban water in the Fitzroy Barrage are maintaining those reserves as an insurance against future needs.

The first option is to create a new **water utility** to manage all water resources in the lower Fitzroy on behalf of the current water owners and operators. The role model for this type of utility is the Queensland Bulk Water Supply Authority (trading as Seqwater), which provides bulk water services in south-east Queensland. Seqwater is responsible for all bulk water supplies in the region, including for urban, agricultural and industry uses, as well as for managing flood mitigation and recreational services. Under this option a **Lower Fitzroy Water Supply Authority** could be formed to manage all water supplies and assets in the lower Fitzroy system, essentially pooling the three supplemented systems into a single operational unit.

The second option is for Sunwater, as a statutory Queensland Government-owned corporation, to become the **single operator for agricultural water systems** in the lower Fitzroy. This would involve some transfer of responsibility for agricultural water from the Fitzroy Barrage to Sunwater through a long-term lease or other arrangement with Fitzroy River Water. This would then locate all agricultural customers within Sunwater and provide opportunities for more seamless water trading and conditions. This is a much simpler option than a single water utility, as it would maintain current ownership and institutional arrangements, and would concentrate reform on the agricultural water sector.

Any consideration of these potential governance changes needs to be evaluated in terms of two key criteria: whether it helps to make the necessary operational changes, and whether the benefits of change outweigh the costs.

The first criterion relates to the fact that governance changes by themselves will not automatically address the operational and market function improvements that need to be made (these are discussed in the following sections of this report). The advantage of a single ownership or management system is that it is often easier to make those changes in an efficient way. However, if there are barriers to some of those operational changes, then this will limit the case for governance changes.

The second criterion takes account of the costs of making the governance and institutional changes. These can be substantial, particularly if a new water utility is created. The case for governance changes will typically depend on the benefits created being larger than the costs incurred. The benefits can include lower operational costs, more efficient resource management and better optimisation of strategic resource development. Currently, the relatively small size of the water assets in the lower Fitzroy limits the benefits of pooling water assets into single management systems through governance changes.

Recommendation: Explore and evaluate options to pooling water assets into single management systems such as a **new water authority** or a **single operator for agricultural water systems**, taking account of the benefits and costs involved relative to continuing with the current arrangements.

2.2. Managing Traditional Owner interests

There is some allocation of water resources to Traditional Owner groups in the Fitzroy Basin, including a 500ML water allocation from Rookwood Weir to the Darumbal People Aboriginal Corporation (DPAC). Water is of significant cultural value to Traditional Owners and flow is key to belief systems around Songlines (DPAC Director Malcolm Mann, comment reported by NITV News, 2022)[4].

[4] https://www.sbs.com.au/nitv/article/darumbal-people-to-oversee-qlds-largest-water-infrastructure-project/9gdt195lx Accessed June 2024.

In 2022, Sunwater and DRDMW entered an Indigenous Land Use Agreement (ILUA) with DPAC for the Rookwood Weir Project, facilitating collaboration. The Darumbal ILUA included the water allocation and other benefits such as the co-naming of the new weir with a Traditional language name in addition to the English name. The weir's name in Darumbal language is Mangibei Gamu, meaning 'keeping – saving' water (DRDMW, 2024)[5]. This ILUA is the first to provide a water allocation in perpetuity, providing a potential income stream to support programs of the Darumbal People (State of Queensland 2023).

A second ILUA between the Gaangalu Nation People and the Queensland Government is also in place, for an area upstream of the weir on Gaangalu Country (State of Queensland 2023).

At present, it is not clear how the Darumbal water allocation will be used or how Traditional Owners can play a role in water governance in the Lower Fitzroy region. In relation to the water allocation, it is expected that any transfer of water would only be temporary so that ownership would be retained by DPAC. Mechanisms for water leases in the Lower Fitzroy need to be clarified to secure the ability of DPAC to generate income from the water allocation while retaining ownership and appropriate levels of control.

Recommendation: Explore options and instruments for Traditional Owners to be involved in water markets and generate longer term benefits.

[5] https://www.rdmw.qld.gov.au/water/consultations-initiatives/rookwood-weir. Accessed June 2024.

3. OPERATIONAL MANAGEMENT ISSUES

3.1 Introduction

Another area of focus for developing irrigated agriculture in the lower Fitzroy is to focus on operational management issues. Currently there are three water owners and two water managers for supplemented schemes as well as the unsupplemented water. One way of stimulating better allocation of water resources
is to improve the alignment of operating systems and rules so that it is more seamless for water users to hold water from different systems. Transparent and systemic rules around water allocations and water operations are normally a prerequisite for markets to work efficiently.

The most relevant issues for the lower Fitzroy appear to be limited information and communication about the rules for the system and the challenges of meeting different environmental regulations with different water entitlements. These are addressed in the following sections.

3.2 Understanding the rules in the Lower Fitzroy

Queensland's water market is a structured system aimed at promoting the efficient and sustainable use of water resources through various trading mechanisms. Three main markets are currently operating in Queensland: water allocation, seasonal water assignment, and relocatable water licences. The water allocation market involves the trading of registered water allocation titles, which are separate from land titles and can be traded similarly to real estate. Currently, surface water allocations can be permanently transferred in Queensland, and markets are also being opened to allow for the permanent transfer of underground water allocations.

All water trades and allocations are regulated and recorded in the Water Allocations Register (WAR), ensuring transparency, accountability, and security of water resources in Queensland. Requests to move water allocations to a different location must be pre-approved by DRDMW. Seasonal water assignments, also known as temporary trades, allow the short-term reassignment of water allocations within a water year to meet immediate needs. These assignments can be made multiple times within a year and reassigned if unused. Governed by Water Plans, management protocols, operations manuals, and the *Water Regulation 2016*, both supplemented and unsupplemented water can be assigned through different processes. Assignments require the completion of specific forms and confirmation of available water, with consent needed from resource operations licence (ROL) holders for supplemented water. Supplemented water allocation holders need the ROL holder's consent for seasonal water assignments, and if a distribution operations licence (DOL) holder is involved, their consent is required as specified in the operations manual, with no involvement from the DRDMW.

The Queensland Government publishes daily updates on unsupplemented seasonal water assignments for market monitoring. The relocatable water licence market facilitates the transfer of water licences from one parcel of land to another, subject to specific rules to ensure no adverse impacts on other water users or the environment. To change a water allocation, such as through changes, subdivisions, or amalgamations, the allocation holder must obtain a water allocation dealing certificate from the department and register it on the Water Allocations Register (WAR) before it expires, using Form 14, with additional registration requirements possibly applying based on the type of supply and mortgage status. Leases or transfers of water allocations that do not affect a water allocation's resource-related attributes (but may affect its proprietary or tenancy interests) do not require approval from the department. However, notices may have to be given and all relevant documents must be registered on the WAR.

The management of water systems is facilitated by zoning rivers and waterways into discrete areas over which specific rules can be applied. The lower Fitzroy River system is broken into five zones for water management, as depicted in Figure 2.

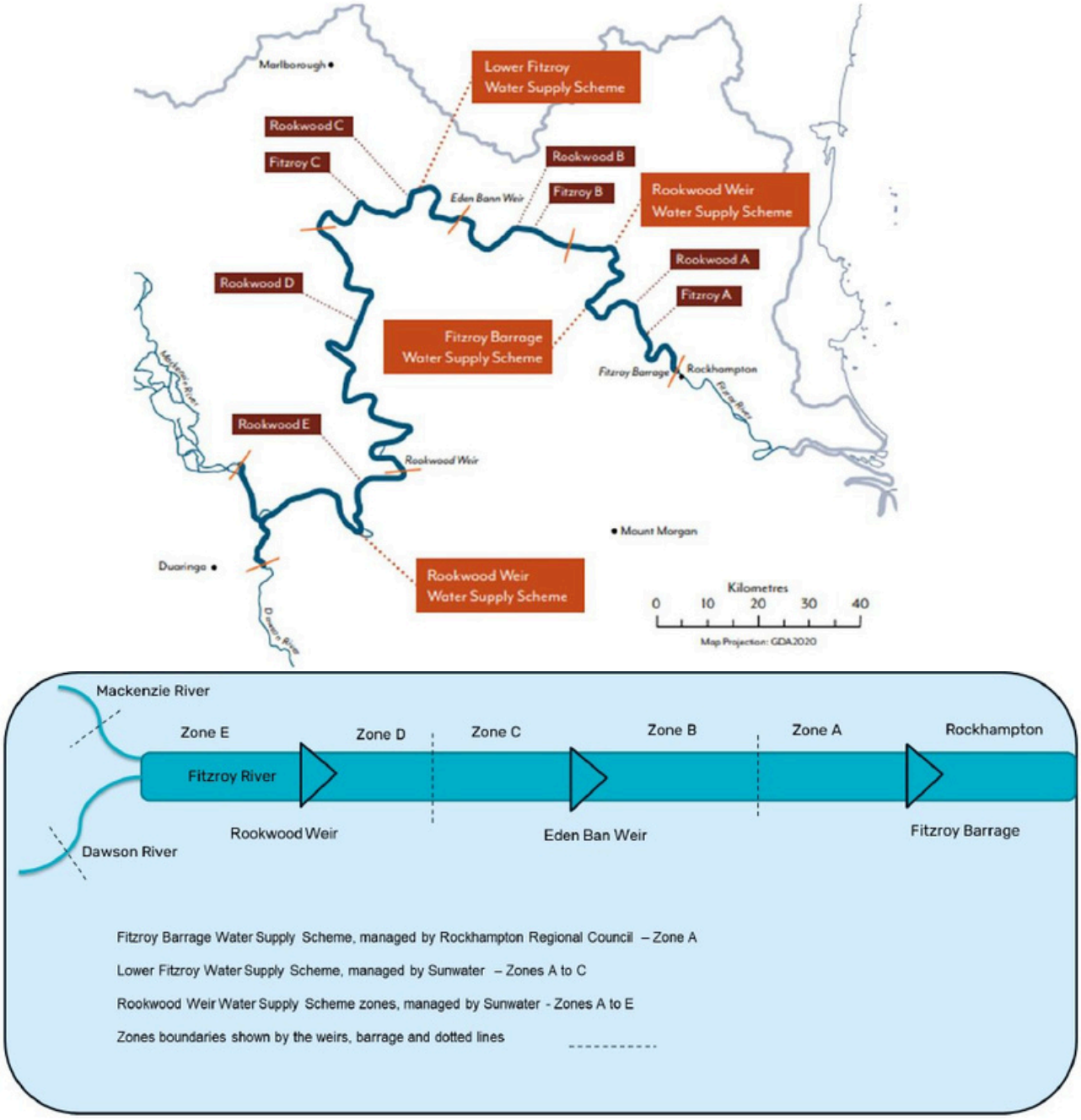


Figure 2: General map of lower Fitzroy River system and water schemes. Source: Sunwater (2022)[6].

[6] https://www.sunwater.com.au/wp-content/uploads/Home/Projects/Rookwood/Rookwood_Weir_Scheme_Overview_Fact_Sheet.pdf

The development of Rookwood Weir meant that the rules for water allocation and distribution in the Fitzroy Basin needed to be adjusted. The Resource Operations Licence for Rookwood Weir was issued under the *Water Act 2000* to take effect on the 31st March 2021, and sets out conditions for operations, environment management and monitoring among other conditions. In 2022, the *Water Plan (Fitzroy Basin) 2011* (water plan) was formally amended to account for future water allocations from Rookwood Weir, along with the Fitzroy Basin Water Management Protocol (Fitzroy WMP). This was followed in 2023 by Sunwater adjusting the rules for operation of the system (Sunwater 2023). Adjustments to the rules for water extraction and delivery were aimed at preserving the entitlements of pre-existing asset holders as much as possible.

For water trading the most relevant rules are those outlined in the *Fitzroy Basin Water Management Protocol* released by DRDMW (2023). Under the rules water trading is permitted between Fitzroy zones A, B and C for the Lower Fitzroy Water Supply Scheme (Eden Bann) and between Fitzroy zones A, B, C, D and E for the Rookwood Weir Water Supply Scheme (Figure 2). By implication, water from the Fitzroy Barrage Water Supply Scheme can only be traded within Fitzroy zone A. The Water Management Protocol (DRDMW 2023) also sets out the rules for nominal allocations for Rookwood Weir water to be adjusted if water is transferred downstream of zone E (a 10% reduction is applied) or upstream to zone E (the 10% reduction is reversed). Conversions of water from medium security to high security are allowed for all schemes (subject to zone caps) at the rate of 1.5:1 and vice versa. Caps are set for water holding by zone (Figure 3).

Table 4 – Limits of total nominal volume (ML) for high priority water allocations in a zone

Water supply scheme	Nominal volume	Zone				
		Fitzroy A & Rookwood A	Fitzroy B & Rookwood B	Fitzroy C & Rookwood C	Rookwood D	Rookwood E
Lower Fitzroy	Maximum	25 800	0	5	—	
	Minimum	25 200	0	0	—	
Fitzroy Barrage	Maximum	51 200	—	—	—	
	Minimum	48 800	—	—	—	
Rookwood Weir	Maximum	22 100	0	0	450	1000
	Minimum	20 850	0	0	0	0

Table 4A – Limits of total nominal volume (ML) for medium priority water allocations in a zone

Water supply scheme	Nominal volume	Zone				
		Rookwood A	Rookwood B	Rookwood C	Rookwood D	Rookwood E
Rookwood Weir	Maximum	21 560	12 000	12 000	17 500	28 550
	Minimum	7560	0	0	0	15 000

Figure 3: Caps on water holdings by zone in the lower Fitzroy River system. Source: DRDMW (2023) p.15, Tables 4 and 4A.

Other notable aspects of the rules set out for the lower Fitzroy system are that trading outside of the system (i.e. into the upstream Dawson or the Nogoa-Mackenzie systems is prohibited), but that it is possible to change the purpose of having a water allocation between 'agriculture' and 'any'. This essentially separates the water market in the lower Fitzroy system from the rest of the river basin, but allows water to be traded between different uses such as agriculture, urban and industrial.

Two issues have been identified with the current water management system in the lower Fitzroy. The first is that the rules for engaging with the system appear to be poorly understood by irrigators, which is likely to be because of the atomised nature of the supplemented water supply schemes and the number of recent changes. The second issue is that the caps on water allocations within zones may create uncertainty about the potential for water transfers. These are information issues that may limit potential water trades, so some method of providing summary information is required.

Some information is already accessible. The Department of Regional Development, Manufacturing, and Water provides overviews of water systems in Queensland[7] while Business Queensland provides information about water markets, trading and investment[8]. However, these are very general and act as a resource base rather than as a direct guide to recent changes. The one exception is specific information on the locations of water allocations by scheme and zone that are provided by Business Queensland[9], noting that information about Rookwood Weir allocations is yet to be set up on the site.

There are different options for addressing these information gaps. One option is to develop a summary of the water supply system in the lower Fitzroy and information that may be relevant to those who may be interested in purchasing or selling water. Other options are to provide briefing sessions to local industry, to brief local water agents and extension officers about the system, or to publish regular updates about the system in direct mailing or newsletters to local irrigators. Different combinations of these information strategies may be required.

Recommendation: Improve information about the water system and rules for trading in the lower Fitzroy through one or more of the following strategies:

- Develop a summary of the water supply system and rules relevant to water transfer and trading
- Provide briefing sessions to local industry
- Provide briefing sessions and training to local water agents and extension officers
- Publish regular updates about the system in direct mailing or newsletters to local irrigators.

[7] https://www.rdmw.qld.gov.au/water – accessed 30th June 2024.
[8] https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets – accessed 30th June 2024.
[9] https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/current-locations/lower-fitzroy – accessed 30th June 2024.

3.3. Variations in environmental compliance requirements

Another operational issue that may impact on the potential for water trading is variations in environmental compliance requirements between the supplemented schemes. In line with the conditions of development of Rookwood Weir under the Australian *Environment Protection and Biodiversity Conservation Act 1999*, purchasers of water for agricultural purposes from Rookwood Weir are required to develop and maintain detailed Land Use Management Plans[10]. The plans aim to ensure the requirements of the Queensland and Australian governments in relation to Great Barrier Reef water quality targets, will be met. Where irrigators have entitlements from more than one water supply in the Lower Fitzroy, there is potential for variations in requirements depending on the source of the water. This may be a major impediment to market operations, if only irrigators with approved Land Use Management Plans are eligible to purchase water from Rookwood, even for temporary transfers.

Potential issues in water distribution systems

There is an administrative obligation on Rookwood water purchasers of the Land Management Code of Practice (Sunwater 2024), including annual notifications of compliance with the code as it applies to land management practices on their property (see Appendix 2). The Code applies to each purchaser of the water from Rookwood Weir who proposes to use water for irrigated agriculture, including both new and existing irrigators. It applies "to the irrigated agriculture on a property irrespective of the availability of other sources of water or the proportion of total water supply afforded by the water purchased from Rookwood Weir on that property" (Sunwater 2024). An advantage of this requirement is that it avoids the need for irrigators with multiple entitlements from different schemes to account for varying environmental standards, and hence reduces the need for sophisticated water traceability and accounting systems.

There is no such requirement for irrigators who only hold water from the Fitzroy Barrage or Eden Bann Weir. The Code does not apply to existing water users in the Lower Fitzroy if they are not purchasing additional water, or to farming operations that are not classed as 'irrigated agriculture' for example cattle grazing or feedlots. Assuming the additional administration is not desirable for irrigators, this requirement for Rookwood Weir may render water from Rookwood less desirable than water from Eden Bann Weir or the Fitzroy Barrage. It also means that only irrigators who have a Land Management Code of Practice (presumably those who hold allocations from Rookwood Weir) are eligible to purchase other allocations from Rookwood Weir.

This scenario also raises the following governance questions:

a) Can water be easily tracked by the purchaser, the supplier/s and the regulator?

b) Is there potential to improve water tracking and accounting in the system, for example through the use of blockchain technology to manage water entitlements and draw down?

c) Is there potential to develop consistent operating rules for all water supplies in the Lower Fitzroy that may be used for agricultural irrigation purposes?

The current review of the *Water Plan (Fitzroy Basin*) *2011* by DRDMW may provide an opportunity to consider the current complexity of water supply governance in the Lower Fitzroy region, particularly for water used for agricultural irrigation purposes. It is also an opportunity for the region to take a proactive approach to environmentally-sensitive water governance, recognising the importance of the Fitzroy Basin to water quality

[10] https://www.sunwater.com.au/wp-content/uploads/Home/Projects/Rookwood/Land_Management_Code_of_Practice.pdf)

on the Great Barrier Reef. The Fitzroy is the largest catchment draining to the Reef and a major contributor of fine sediment loads. Some of the EPBC Act approval conditions reflected concerns relating to the increase in nutrient and pesticide loads that may result from an increase in irrigated agriculture in the Lower Fitzroy region. An option to consider would be extending the requirement for Land Use Management Plans to irrigators utilising the two other water supplies in the Lower Fitzroy, i.e., Eden Bann Weir and the Fitzroy Barrage. This decision would serve to demonstrate progressive water governance in northern Australia, improve economic efficiency of water markets by minimising environmental externalities, and increase consistency in operating rules between the three water supplies thereby improving operational efficiency.

Recommendation: Consider extending the requirement for Land and Water Management Plans to all holders of agricultural water in the lower Fitzroy, to generate greater commonalities in the system and increase the flexibility for water trading.

4. WATER MARKETS

4.1 The need for water markets in the lower Fitzroy

Historically there has been limited activity in water trading in the lower Fitzroy. Most water has been allocated to long-term industrial or urban users or small-scale enterprises holding water for stock and domestic uses, leaving only a limited amount of water for irrigated agriculture. There has been some trading activity within that sub-set, and notice boards hosted by Sunwater and Fitzroy River Water have helped to link potential buyers and sellers. However, this is changing rapidly for two main reasons:

- There is increased demand for water emerging in the region. This is partly due to increasing returns from irrigated agriculture as evidenced by rapidly increasing water prices across Queensland, and the development of new activities in the region, such as macadamia plantations and a new feedlot at Gogango.

- There are increased supplies with the completion of Rookwood Weir. Of particular note are the additional 40,000ML of medium security water supplies for agriculture from the weir, which provide a step change in supplemented supply to that sector.

One potential issue is that normal water products of either permanent trades or temporary (up to one year) trades may not suit all industry needs in the lower Fitzroy. On the supply side, some of the larger purchasers of water may take several years to fully use their entitlements so they may consider leasing some of their water for multiple years. On the demand side, there are a number of enterprises that are cautious about purchasing water, because of reasons such as (a) the capital involved (b) the time needed to develop infrastructure and establish irrigation, and (c) the learnings required to transition to irrigated agriculture and/or new crops. However, this group will need some certainty over water supplies to invest in development, so will need water to be available for several years rather than single-year transfers.

These issues suggest that the potential for water trading can be usefully considered in several dimensions:

- Three supplemented schemes, plus the unsupplemented water
- Permanent trades vs temporary / lease trades
- Underutilised water (varying amount in all schemes)
- Potential for further sale / leases (e.g. remaining Rookwood water)
- Temporal dimensions – likely to be strong demand for multiple year leases
- Capacity to pay – many smaller enterprises would find it easier to lease initially

These issues indicate the need to establish a roadmap to identify how a water market could emerge in the lower Fitzroy.

4.2. The development of water markets in Australia

A powerful case for using water markets was summarised in the first report in this project (Rolfe et al. 2023). The National Water Commission (2011) noted that markets provide efficient, flexible and sustainable approaches to allocating water resources between competing uses, and have been widely adopted in Australia. The adoption of nationally agreed reforms to water management in Australia in 1994

and 2004 encouraged the development of more substantive markets. Key elements of this process included:

- Development of tradeable water access entitlements
- Development of trading rules to align with hydrological realities
- Tools to manage third-party impacts have been established
- More robust trading platforms and accounting systems have been put in place.

Australian water markets have evolved over time with subsequent reforms undertaken since 1980's. A timeline of water policy reforms in Australia based on Garrick et al. (2009):

- Separation of land and water rights in the 1980s
- COAG Water policy reform (1994)
- Murray-Darling Basin CAP (1995)
- Pilot inter-state trading (1998)
- National Water Initiative (2004)
- National Water Act (2008)
- Commonwealth Water Purchase Programme (2008).

Within the Murray-Darling Basin, Australian water market operations are carried out among various water trading zones with different rules applied to unused, carry-over water allocations and inter-valley trade restrictions (Holley and Sinclair 2016).

4.3. Water titles and trading

Water can be traded with or without land rights. Three types of tradeable water rights exist: water access rights, water delivery rights and irrigation rights. Water access entitlements are 'perpetual or ongoing entitlements to exclusive access to a share of water from a specified consumptive pool as defined in the water plan' (BoM 2024).

Water rights can be either bundled or unbundled. Bundled water products aggregate several rights into a single right. For example, water access entitlements, water allocations, water delivery rights, etc. can be bundled into a single water right. They can be specified according to the source (surface water vs groundwater), regulatory status (regulated vs unregulated systems) and the reliability level (high vs low). The types of water rights that can be traded in Australian water markets include (BoM, 2024; Seidl et al. 2020):

a. Temporary allocation markets b.

Forward allocation markets

c. Permanent allocation markets d.

Permanent entitlement leases e.

Carryover capacity

f. Options (call)

In Queensland, there are three types of water markets currently operating[11]:

- water allocation market – trading of registered water allocation titles
- seasonal water assignment market – seasonal assignment of water allocations and other entitlements
- relocatable water licence market – relocation of water licences from one parcel of land to another.

4.4. Water leases

Water leases are a type of contract between two parties to transfer water for an agreed price and term, normally greater than one year. The advantages of entering into leases rather than repeated temporary transfers is that they provide longer term arrangements, guarantee prices over a fixed term (reducing the risk of being exposed to spot prices), and reduce the transaction and administrative costs of more frequent transactions.Water leasing may be particularly relevant to the lower Fitzroy to match the needs of water holders with excess supplies in the short to medium term and the development aspirations of new irrigators.

In Australia, the terminology for the water lease market varies by state, reflecting regional differences in water management practices. The water lease market is known as limited-term transfer, term transfer, and temporary entitlement trade in Victoria, New South Wales, and South Australia, respectively (Australian Government 2015). These regional terminologies reflect localized approaches to water management and regulatory environments, playing a crucial role in enhancing the flexibility and efficiency of water use across Australia. In Victoria, a limited-term transfer (LTT) is the lease of a water share to someone else for a set period (from one to 20 years) without changing the share's ownership. An example of a water lease market in operation is provided in Figure 4.

Market activities in water leasing appear to be largely limited to New South Wales, Victoria, and South Australia as evidenced by zones where water leases can be traded on the Waterfind and Water Exchange platforms (Table 1). The Victorian Water Register (2021) shows an increasing trend of limited-term transfer leases in Southern and Northern Victoria. The increasing trend of limited-term transfer leases also observed in Tasmania[12].

Water leases are possible in Queensland and can be registered with the Department of Regional Development, Manufacturing and Water[13]. However usage of lease instruments appears to be limited, possibly due to differing regulatory frameworks, smaller water markets or lower requirements for structural reform.

[11] https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets
[12] https://www.tasmanianirrigation.com.au/water-trading
[13] https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/allocation

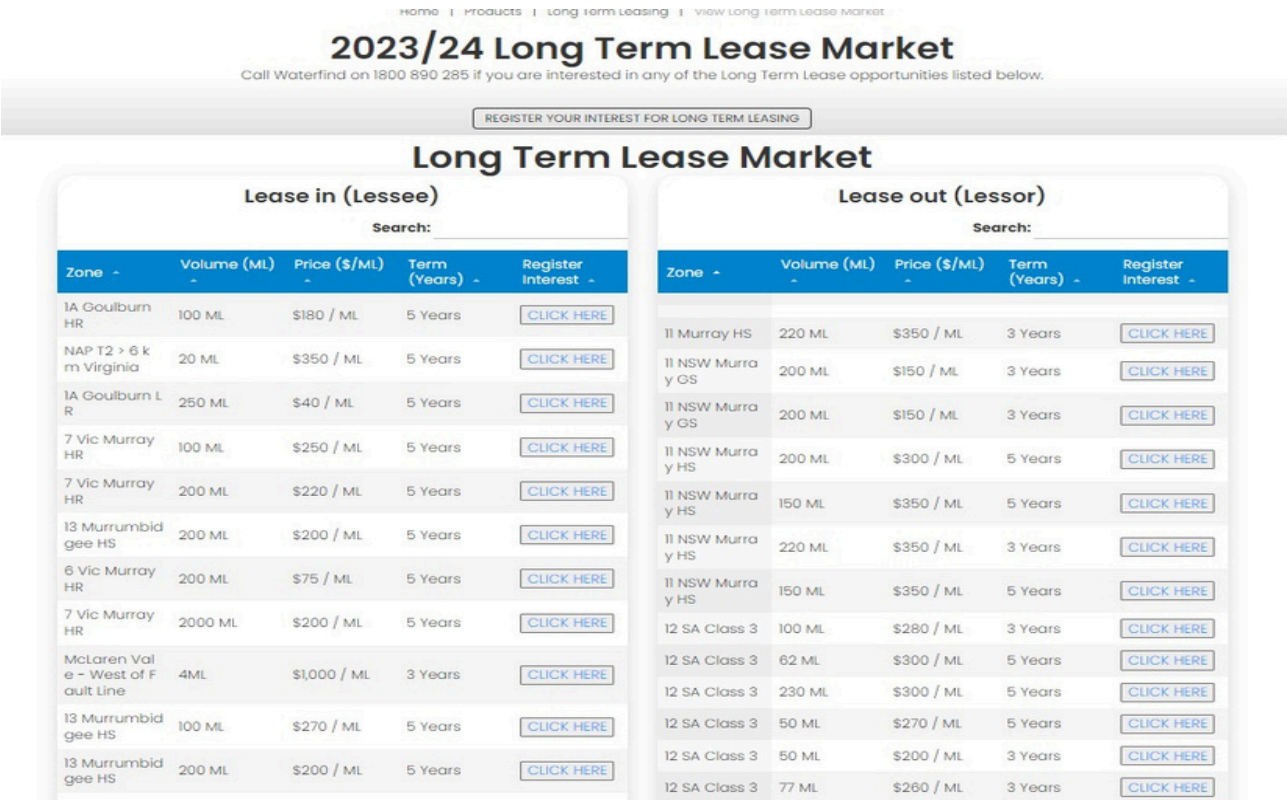


Figure 4: An example of a water lease market in operation (from the Waterfind platform)

In a separate process to registering water leases, lease arrangements can be registered through Sunwater[14]. The process begins with the lessor and lessee completing an Application for Water Supply Contract, available on Sunwater's forms page[15], and submitting it along with necessary documents such as customer profiles, company searches, and trust details. Once approved, a self-executing water supply contract and a Deed of Guarantee (if applicable) are issued. The lease completion involves transferring the water allocation upon receipt of the necessary lodgement summary and other documents, with a final release of the supply contract letter issued post-registration. The application deserves an administration and transfer fee, with response times typically around 15 business days from the receipt of all required documentation.

This summary indicates that an administrative process for leasing water already exists, with potential to either register a water lease with the Department of Regional Development, Manufacturing and Water, or in a separate process with Sunwater. It would also be possible to create bilateral leases between two parties, which could be agreements for recurrent temporary allocations over a certain period. However there is a gap in that there is no market process in Queensland to trade water leases, unlike the southern states. Options to address this may include negotiation with a water trading platform to include lease options in the lower Fitzroy or finding some other platform or local agent to advertise interest in buying or selling water leases.

[14] https://www.sunwater.com.au/customer/property-water-allocation-transfer-process/lease-of-water-allocation/
[15] https://www.sunwater.com.au/customer/forms/

Table 1: Water market regions offering long-term lease trading by platform

Waterfind	Water Exchange
Victoria Murray 1A HR	SA River Murray Zone 12
Victoria Murray 6 HR	VIC Murray (above choke) Zone 6 VIC
Victoria Murray 7 HR	Murray (below choke) Zone 7 VIC
NSW Murray 10 HS	Goulburn Zone 2
NSW Murray 11 HS	NSW Murray (Murrumbidgee) 13 HS
NSW Murray (Murrumbidgee) 13 HS	NSW Murray (above choke) Zone 11
SA Murray Class 3	NSW Murray (below choke) Zone 10
Victoria Murray 1A LR	NSW Groundwater
Victoria Murray 6 LR	
Victoria Murray 7 LR	
NSW Murray 10 GS	
NSW Murray 11 GS	
NSW Murray (Murrumbidgee) 13 GS	
Other	

Source: https://www.waterfind.com.au/products-services/long-term-leasing/long-term-leasing-expression-of-interest/
Source: https://www.waterexchange.com.au/

Recommendation: Explore options for water lease instruments to express an unrealised market for medium term water arrangements in the lower Fitzroy; identify water trading platforms or other exchange mechanisms to bring potential buyers and sellers together; and, recommend options to register or contract lease arrangements.

4.5 Factors and barriers to water market operations

The purpose of this section is to highlight some literature about the key issues that we identify for Lower Fitzroy. Water Governance Report 1 (Rolfe et al. 2023) has identified several major challenges to water trading. They included the challenges of water market design, establishing water entitlements and ensuring pre-conditions for a market to operate smoothly. The latter aspect is crucial when establishing a water market for Lower Fitzroy and is further expanded below.

(a) Thin markets

A thin market refers to a market with a small number of buyers and sellers, which typically constrain the trading activity. A thin water market is challenging to establish and operate because it may struggle with price volatility, a lack of reliable price signals and higher transaction costs. High transaction costs identified in the Lower Fitzroy system can be an inhibitor to water trade. Some of these transaction costs have been mentioned in Report 1 are summarised below:

- Potentially high cost of water quality monitoring that would be added to water price
- Landholders' compliance with the Land Management Code of Practice
- Comparatively higher water prices due to high administrative and regulatory costs and possible substitution effects
- The cost of water accounting and entitlement tracking from multiple sources

(b) Economies of scale

Surface water systems exhibit economies of large size (Young 1986). Scale is one of the pre-conditions to ascertain a water market's readiness. Generally, a water market requires a sufficient number of buyers and sellers to create liquidity and facilitate transactions (BoM 2024). Improving the volume of supplemented water in the Lower Fitzroy helps to address one necessary condition for trading although this alone would not be sufficient. The data in Appendix One shows that the volume of supplemented water in the lower Fitzroy makes it the fourth largest region in terms of supplemented supply, smaller than the Burdekin, Mareeba-Dimbula and Nogoa-Mackenzie districts, but larger than the St George, Bundaberg, Mary Valley and Condamine districts. However, when industrial and urban supplies are excluded, the remaining supplemented supplies of approximately 55,000ML in the lower Fitzroy system place it below the Bundaberg and St George systems, but larger than the Mary and Condamine systems.

The water market participants must trade an adequate volume of water to overcome potential inefficiencies. One of the challenges is building a critical mass of trade volume in the Lower Fitzroy system given minimal permanent trade currently. It is widely established that water scarcity provides the impetus for global water markets. A diverse pool of participants ensures that there is competition, transparency and price discovery in the market. However, there is not a specific threshold for the number of buyers and sellers, as it can vary depending on regional dynamics and market conditions. One of the challenges for the lower Fitzroy system is that agricultural water holdings are quite concentrated, with two corporations holding approximately 55% of agricultural water supplies. This may limit the potential for ongoing market activity.

The water volumes traded in a market is an indication of its maturity. For example, in the Murray-Darling Basin, annual water traded is 20% of total water rights available (Grafton et al. 2011). Effective trading has been observed with a dozen to hundreds of buyers and sellers in certain smaller zones of the Murray-Darling Basin although larger participation and larger volumes are typical. Another barrier to water trade pertinent to the Lower Fitzroy region is the availability of alternative supply sources. The amount of unsupplemented water, particularly ground water in the system is not insignificant. Irrigators tend to augment effective water supplies by resorting to the source with the lowest opportunity cost. As water prices rise, irrigators wanting to access additional supplies may explore options for unsupplemented water rather than purchasing supplemented supplies.

(c) Encouraging market activity

Several strategies have been identified to enhance water trading and address the thin market problem in the Lower Murray region, which are also relevant to the lower Fitzroy:

1. *Increase water market transparency* – Providing clear and easily accessible information about the latest water prices and water trades can build trust and encourage participation in the water market. Some of the market information can be made available on the water register website including allocation trades, available water (including how much water is available to whom and where) and trade opportunities including any zonal trade limits (DECCA 2023).
2. *Reduce trade restrictions* – Policies that minimse barriers to water trading can make the market more fluid and efficient. In particular, policies that lower the costs of water quality monitoring, compliance costs of land management code of practice and regulation and simplifying trading rules ensure trading rules are straightforward and fair (MDBA 2024).
3. *Enhancing market efficiency through better trading platforms* – Establishing and/or facilitating access to better trading platforms would enable allocating water resources to those who value them most.
4. *Improve market confidence* – Simple and consistent operational/system rules and enforcement policy, reliable data market and trading rules would enhance the confidence of all market participants encouraging more active participation (DECCA 2023).

The most important of these issues to the lower Fitzroy are improving trading platforms, increasing market transparency and improving market confidence, which are addressed in the next three sections. Issues around trade restrictions have already been covered in relation to the separate water supply schemes in the lower Fitzroy and the impacts of having tighter environmental rules for water allocations from Rookwood Weir, so are not discussed further.

(d) Improving water market transparency

One of the challenges in developing water markets in the lower Fitzroy is that potential users are not familiar with market platforms and agents, and do not have access to good market information.

Two major water trading platforms can be identified in Australia, **Waterfind** (www.waterfind.com.au) and **Water Exchange**, as well as smaller platforms such as **Waterpool** (www.waterpool.org.au) and **H_2OX** (www.xpansiv.com/h2ox/). Both major platforms cover the seven water trading zones in Queensland: Mareeba-Dimbulah, Burdekin-Haughton, Nogoa-Mackenzie, Bundaberg, Qld Mary Valley, Upper Condamine Border Rivers, and St George. In central Queensland the Waterfind platform appears to be more focused on the Bundaberg region, whereas the Water Exchange platform has more focus on the Nogoa-Mackenzie system. There are a larger number of water brokers, including two national organisations (RuralCo and Elders) and a number of more regionally or state-based organisations (Appendix 3).

Potential interest in the market could be streamlined by referring water holders and farmers to a preferred platform and potential agents so that interest was concentrated rather than diffused across platforms and agents. However, concerns about market conduct in the Murray-Darling Basin (ACCC 2021; Quinliven 2022) mean that recommendations need to be impartial. One option might be to provide the local industry with information about water trading platforms and agents, but identify the platform and agent that are the preferred supplier for Sunwater in Queensland[16].

Recommendation: Provide the local industry with information about water trading platforms and agents, and also identify the platform and agent that are the preferred supplier for Sunwater in Queensland.

Recommendation: Recommend that Sunwater and Fitzroy River Water use their website to direct interest from industry in the lower Fitzroy to one or more water brokers.

Another aspect of market transparency is that farmers and water users have limited access to clear information about the sector and water prices. The lack of timely access to market information is an issue in many water markets in Australia (ACCC 2021). While the Queensland Government provides summaries of water market data[17], the data is typically lagged and only provides price averages. Additional analysis that provided trends and highlighted differences in prices and volumes would be useful. For example the Waterfind and RuralCo platforms provide a weekly newsletter to subscribers that highlights key sales and commodity trends that help to provide more insights into market conditions. One option to explore will be for a water trading platform or agent to provide some form of market information and analysis directly to interested parties in the lower Fitzroy region.

Recommendation: Explore options for providing relevant and timely water market data for local industry, including drawing on the water trading data and water sales data published through Business Queensland.

[16] Ruralco Water is Sunwater's most recommended water broking firm among all others. The other recommended water broking firms by Sunwater are Waterfind Australia, National Water Brokers, and Queensland Water Brokers

[17] Monthly repors are available at https://www.business.qld.gov.au/industries/mining-energy-water/water/water-markets/market-information

(d) Improving trading platforms

The atomised nature of water supply schemes in the lower Fitzroy catchment is reflected in the Water Exchange platform. Figure 5 demonstrates how the seven zones are represented on the Water Exchange platform, while Figure 6 demonstrates how the central Queensland zones are broken up under the general Nogoa-Mackenzie icon on the Water Exchange platform. The Fitzroy Barrage and Lower Fitzroy Water Supply Schemes are listed separately while the Rookwood Weir Water Supply Scheme is not yet listed on the platform.

It is expected that the platform will continue to list the three supply schemes separately, which may limit ease of access for participants. Even if the schemes have to be listed separately as different markets, options to report buy and sell opportunities as well as completed trades and market prices for the consolidated region would be helpful.

Recommendation: Explore options for the major water trading platforms to report buy and sell opportunities as well as completed trades and market prices for the consolidated lower Fitzroy region.



Figure 5: Water trading zones in Queensland listed by Water Exchange.

Source: https://www.waterexchange.com.au/



Figure 6: Water trading zones in the Fitzroy Basin listed by Water Exchange.

Source: https://www.waterexchange.com.au/

5. CONCLUSIONS AND RECOMMENDATIONS

Untilrecently,the water resource management system for the lower Fitzroy has been sufficient for various needs, with two supplemented schemes in the river system and a robust regulatory and administrative framework provided under the *Water Plan (Fitzroy Basin) 2011*. However, the system is rapidly becoming more complex, with additional demands emerging for urban, industry and agricultural needs, and the new Rookwood weir now completed.

There are three major reasons for fostering water markets to become more active in the lower Fitzroy.

- Markets should underpin gains in efficiency from transferring water from lower value or no use to higher value uses, helping to create economic returns in the region;
- Water markets will make it easier for new enterprises to source water supplies and establish in the region which will capitalise on higher demand from investors; and
- Water markets will improve water utilisation from the current low rates, which is a prerequisite for planning for additional water supplies in the region.

A key challenge in the lower Fitzroy is to stimulate water markets to be more widely used and effective. A major advantage is that the underlying systems for water trading and water markets are in place. Water entitlements are established under the *Water Plan* (*Fitzroy Basin*) *2011,* and DRDMW manages the entitlements, registering changes in ownership. The region is already included in water trading platforms such as Water Exchange and Waterfind, and major water agents such as Ruralco already operate in the area. However major challenges remain.

There are a number of challenges that relate to scale and structure. In terms of scale, the lower Fitzroy is now the fourth largest region in Queensland in terms of supplemented supplies with the addition of Rookwood weir. However, most of those supplies are reserved for industrial and urban uses, so the amount of water available for agriculture is quite small at approximately 55,000ML. An additional factor is a concentration in ownership with two corporations currently holding approximately 55% of agricultural water entitlements. These scale issues limit the scope of the market. In terms of structure, the lower Fitzroy comprises three separate supplemented supply systems. This is reflected in water trading platforms so further limits market operations. Major governance changes would be required to combine those three systems into a single pool of supplemented water in the system.

On the operational side a major issue that limits the potential for water markets to operate are more strict environmental conditions that are attached to allocations from Rookwood Weir. Unless farmers have an approved Land Use Management Plans, they are not entitled to use water from Rookwood. This effectively limits the market for the major pool of water to the small number of landholders who already have Land Use Management Plans in place. On the plus side, the new Land Use Management Plans cover all water sources on a farm, so landholders with allocations from more than one supplemented supply schemes do not have differentiate their water management between different sources of water.

For landholders wishing to become involved in water markets there are major issues around products and information. In relation to products, there appears to be opportunities for long term leasing arrangements as new water supplies transition into the local economy. However, trade in water leases does not appear to be routine in Queensland compared to the southern states, even though the regulatory system recognises lease arrangements. On the information side there are important gaps in knowledge about how the system works and the zoning rules, how to find water trading platforms and agents who represent the area, and how to access updated water price and trading information.

These structural, operational and information issues around market design will be relevant to new water industries across northern Australia, so should be considered in the earlier stages of project planning.

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Appendices:

APPENDIXONE:Scaleof supplemented water regions in Queensland

Water Trading Zone	Supplemented High Priority		Supplemented Medium Priority	
	Entitlement water volume in GL	Cost/ML/annum	Entitlement water volume in GL	Cost/ML/annum
NOGOA MACKENZIE	46	27.46	186	11.63
ST GEORGE	3	20.86	82	20.86
UPPER CONDAMINE BORDER RIVERS	0	32.39	22	32.39
QLD MARY VALLEY	10	14.37	22	14.37
BUNDABERG	44	12.43	33	12.43
BURDEKIN HAUGHTON MAREEBA	100	21.10	980	21.10
DIMBULAH LOWER FITZROY	204	15.10	204	15.10
	76		90	
- Fitzroy Barrage	*50.4*		*11.6*	
- Eden Bann weir	*25.5*		*3.1*	
- *Rookwood weir*	*0*		*76.0*	

Source: https://www.waterexchange.com.au/

APPENDIX TWO: Extract of the Land Management Code of Practice relevant to water holders in the lower Fitzroy

The Code applies to:

• each purchaser of water from Rookwood Weir who proposes to use water for the purpose of irrigated agriculture (called Irrigators);

• new Irrigators as well as existing Irrigators purchasing extra allocation;

• all types of irrigated agriculture and all scales that purchase Rookwood Weir water; and

• to the irrigated agriculture on a property irrespective of the availability of other sources of water or the proportion of total water supply afforded by the water purchased from Rookwood Weir on that property.

The Code does not apply to:

• existing unsupplemented allocations and water users in the Fitzroy River sub-catchment that are not purchasing additional water,

• farming operations that are not irrigated agriculture e.g. cattle grazing or feedlot unless graziers irrigate supplementary feed areas.

If an Irrigator grows more than one type of irrigated crop (such as in rotation) then they will need to comply with the management practices applicable to each crop. The Code is to be attached as a condition of sale of water for irrigated agriculture and will include a requirement for Irrigators to provide annual notification of compliance. If non-compliant, Sunwater will undertake steps whereby water may cease being sold to that entity (elaborated upon in Section 8). Compliance with the Code does not replace the need to comply with State-based Reef Protection Regulations or any other Commonwealth or State obligations, which may relate to the activity.

Source:
https://www.sunwater.com.au/wpcontent/uploads/Home/Projects/Rookwood/Land_Management_Code_of_Practice.pdf

APPENDIX THREE: Water broking firms

SL No	Water Brokers	Websites
1	Ruralco Water	https://www.ruralcowater.com.au/
2	Waterfind Australia	www.waterfind.com.au
3	Queensland Water Brokers	www.queenslandwaterbrokers.com
4	National water broker	http://nationalwaterbrokers.com.au/entitlement-lease/#
5	Elders	https://elders.com.au/for-farmers/water-trading/queensland/
6	RayWhite	https://raywhiteruralhayplains.com/water-exchange
7	AGRI RURAL NSW	https://agriruralnsw.com/
8	B&H (Breed & Hutchinson)	https://www.breedandhutchinson.com.au/water-trading/
9	Online-Ag Pty Ltd	https://online-ag.com.au/water-trading/
10	Southern Rivers Water Borkers	http://www.southernrivers.com.au
11	HPL (Hay Plains Livestock)	https://raywhiteruralhayplains.com/livestock-services
12	Graeme Hayes	https://www.ghrealestate.com.au/water
13	JLB Livestock and Property	http://www.jlbuchanan.com.au/water/
14	BR&C	https://www.brcagents.com.au/
15	Platinium Ag Services	https://www.platinumagservices.com.au/
16	Nutrien Ag Solutions	https://www.nutrienagsolutions.com.au/water
17	Nutrien Harcourts	https://nutrien.harcourts.net/au/office/sconemerriwa/farm-supplies
18	Luke Ryan Real Estate	https://www.lukeryanrealestate.com.au/
19	Southern Australian Livestock	https://www.salrealestate.com.au/
20	Mannes agencies	https://mannesagencies.com.au/water/
21	H2OX	http://www.h2ox.com
22	J P Conaughton	http://www.jpconaughton.com.au/
23	Water Partners (Aust) Ltd	waterpool.org.au
24	Breed and Hutchinson Pty Ltd	http://www.breedandhutchinson.com.au
25	AGnVET Services	www.agnvet.com.au
26	Wilks Water	http://www.wilkswater.com.au
27	Water Trading Warehouse	NA
28	Landmark Water	http://www.landmarkwater.com.au
29	Peter Hennesy Water	http://www.peterhennessywater.com/
30	Integra Water Services	http://www.integrawaterservices.com.au
31	Waterpool Coop	NA
32	True Blue Water Exchange	truebluewaterexchange.com
33	Terra Ag	www.terraag.com.au
34	Aquire Land & Water	www.aquire.agency
35	Key Water	www.keywater.com.au
36	Paul Smith Water Sales	NA
37	Landsend Water Services Pty Ltd	NA
39	R & D McCurdy Water Broking Services Pty Ltd	www.mccurdywaterbroking.com.au

Source:https://www.waterexchange.com.au/,https://awba.org.au/membership/members/