SOUTHERN FORESTS IRRIGATION REFERENCE GROUP

REPORT

January 2023

BACKGROUND

The Western Australian Government announced in October 2022 that the proposed Southern Forests Irrigation Scheme, which centred around pumping water from the Donnelly River into a large dam on Record Brook and reticulating water via a pipe scheme to users in both the Warren and Donnelly catchments, was no longer supported by the WA Government.

The then Minister for Regional Development and Agriculture and Food, the Hon. Alannah MacTiernan MLC, established the Southern Forests Irrigation Reference Group to explore other practical measures to address climate change and provide water security for the horticulture industry including new infrastructure, water efficiency improvements and advice to the Warren Donnelly Water Advisory Committee on sustainable water policy to help build water security and resilience to support our local farmers. The Terms of Reference for the Reference Group are attached to this report.

The Reference Group is made up of local water users and community stakeholders, together with the local member of the State Parliament, Jane Kelsbie MLA, with a former Director General of the Department of Agriculture and Food as the independent chair. The other members of the Reference Group were Donelle Buegge, Denise Jenkins, John Omodei, Bob Pesotto, Monica Radomiljac, Tom Winfield and Brad Wren.

The Reference Group met on eight occasions in the three months from November 2022 to January 2023 and:

- received briefings from the Department of Water and Environmental Regulation (DWER), the Department of Primary Industries and Regional Development (DPIRD), the Food Agility CRC at Curtin University as well as consultants engaged by DWER and DPIRD on aspects of water management and engineering options for other potential integrated dams and pipe schemes;
- heard directly from over 20 growers and stakeholders regarding their views and specific ideas on how to address water security in the region; and
- visited water monitoring infrastructure and properties to look at water efficiency measures and large dam construction.

DWER and DPIRD were not members of the Reference Group and attended meetings by invitation to provide information and to observe some of its proceedings. The Reference Group invited briefings from DWER on the water allocation planning process, water carryover, some aspects of water regulation and modelling for the Southern Forests Irrigation Scheme and were given a tour of DWER's gauging stations across the catchment. On occasions, at the direction of the Chair of the Reference Group, departmental representatives were asked to leave parts of Reference Group meetings in order for the Reference Group to have a frank discussion amongst themselves.

Contact was made with the Karri Karrak Aboriginal Corporation (KKAC) through their Chair Professor Stephen van Leeuwen who indicated there was an interest to find out more about where this project is at, what are the future plans and how they might impact on Noongar cultural values and what opportunities may exist for Noongar entities as the project progresses. The KKAC requested a meeting in the period 13-18 March, 2023. However, the Reference Group was commissioned to report by the end of January 2023. As the KKAC meeting request was beyond the reporting period allocated to the Reference Group it was decided this request be forwarded to DWER and the Warren Donnelly Water Advisory Committee for their follow up at the requested time with the KKAC.

The Reference Group was assisted by its consultant adviser Mr Ben Drew (EMM Consulting), and the staff and contractors to DPIRD and DWER. The Reference Group is grateful for their support and advice.

WATER RESOURCE MANAGEMENT
in the Warren and Donnelly catchment areas

The Warren and Donnelly catchments located in the State's south-west cover an area of almost 6100 km^2, of which two-thirds (~4000 km^2) are covered by state forest, national parks, and nature reserves. The remaining cleared areas support one of the state's most productive irrigated agricultural regions and the communities of Manjimup and Pemberton. The Warren River (including the Tone River) and the Donnelly River originate 254 km and 154 km inland respectively in moderate rainfall zones (<800 mm/year) and both flow in a south-westerly direction through high rainfall karri country (>1000 mm/year) to the coast. Annual flows in both systems are highly variable.

Irrigated agriculture is almost entirely self-supplied through the annual capture and storage of stream flow in on-stream dams. Once these dams fill, they spill and fill adjoining properties to ensure all dams are supplied. While dams provide some habitat in irrigation areas, streamflow is also necessary to support important downstream social and ecological values. Given these characteristics, and the 5,000+ storages estimated across the region (accounting for licensed storages, small stock and domestic dams which do not require a water licence, and other minor watering points), water resource management in the region is complex and challenging.

To legally capture and use surface water users require a water licence for on-stream dams under the *Rights in Water and Irrigation Act 1914*. Exemptions from requiring a licence exist for the capture and take of water in some circumstances (e.g., where a spring arises on private property). Licence conditions typically require volumes of water to be bypassed/or released to meet the reliability needs of downstream dams and environmental flow requirements. The Department of Water and Environmental Regulation (DWER) manages ~65 GL of allocatable water, including 420 licenses, across both catchments in accordance with the Warren Donnelly Surface Water Allocation Plan (2012). The plan sets out 25 subareas and their allocation limits (the volume of water that can be sustainable taken annually). These limits are based on stream flows in the driest years and ensure that in almost all years, growers will receive their licensed volume and the environment also receives sufficient flows. In six of the highest use subareas ~10 GL of lower reliability (or variable take) water has been made available.

Currently, 15 of the 25 subareas are fully allocated meaning that any additional water can only be obtained through the trading of licences (within a subarea) or through the movement (pumping or release) of captured water to neigbouring properties.

The Warren Donnelly Water Advisory Committee is established under the *Water Agencies (Powers) Act 1984* and provides advice to DWER on water management issues within the catchments.

THE EFFECTS
of a drying climate

The State's south-west has been strongly affected by climate change over the last 50 years with rainfall declining by about 20% and annual river flows declining by an average of 80%[1]. In the Donnelly River (measured at Strickland gauging station) average flows have declined from ~110 gigalitres per year (GL/year) between 1975 and 1999, to ~50 GL/year from 2000 (Figure 1). A similar trend can be seen in the Warren River. Future climate estimates, as shown in the recent CSIRO[2] and DWER[3] reviews, almost universally show a continuation of this drying trend although the magnitude of change and the annual variability is less clear.

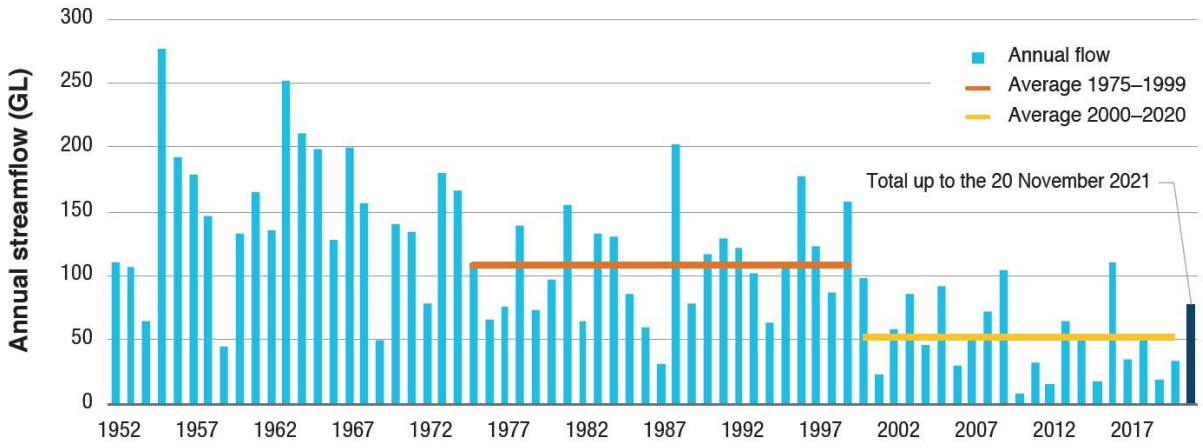


Figure 1. Total annual flows measured in megalitres (ML; 1,000 ML = 1 GL) in the Donnelly River (at Strickland gauging station) from 1952 to 2021 (Ref: DWER Water Information Reporting website[4])

[1] https://www.watercorporation.com.au/Our-water/Climate-change-and-WA/Climate-and-Southern-WA
[2] CSIRO, 2022, Future climate streamflow estimation in the Donnelly River catchment, CSIRO Land and Water, Australia.
[3] DWER, 2022, Future climate water supply estimates for the proposed Southern Forest Irrigation Scheme, Surface water hydrology series, Internal Report no. HY37, Perth.
[4] https://kumina.water.wa.gov.au/waterinformation/wir/reports/publish/608151/g06.htm

THE HORTICULTURE INDUSTRY

The Shire of Manjimup, which encompasses the Warren and Donnelly catchments, contributes more than one-sixth of the total value of horticulture in the state and accounts for 16% of the state's horticultural area.

The Shire produces[5]:

- 29% of the state's wholesale value of fruit;
- 6% of state's wholesale value of vegetables;
- 67% of the state's avocados, kiwifruit and processing potatoes;
- 61% of the state's apples;
- 35% of the state's seed potatoes; and
- is the major truffle producing area of the state.

In terms of product mix:

- Fruit comprises 79% of the total wholesale value of horticulture production in the Shire with avocado comprising 72% of the total value of fruit production from the Shire, and apples 21%; and
- Vegetable production comprises 18% of the total wholesale value of horticulture production with fresh potato comprises 40% of the total value of vegetable production and seed potato 23%.

The main shifts in the mix of horticultural enterprises over the decade has been a 60% increase in fruit crops, led by a four-fold increase in avocado production. Over the same period the production of potatoes has halved.

[5] The production data was provided by the Department of Primary Industries and Regional Development and is based on 2019-20 estimates.

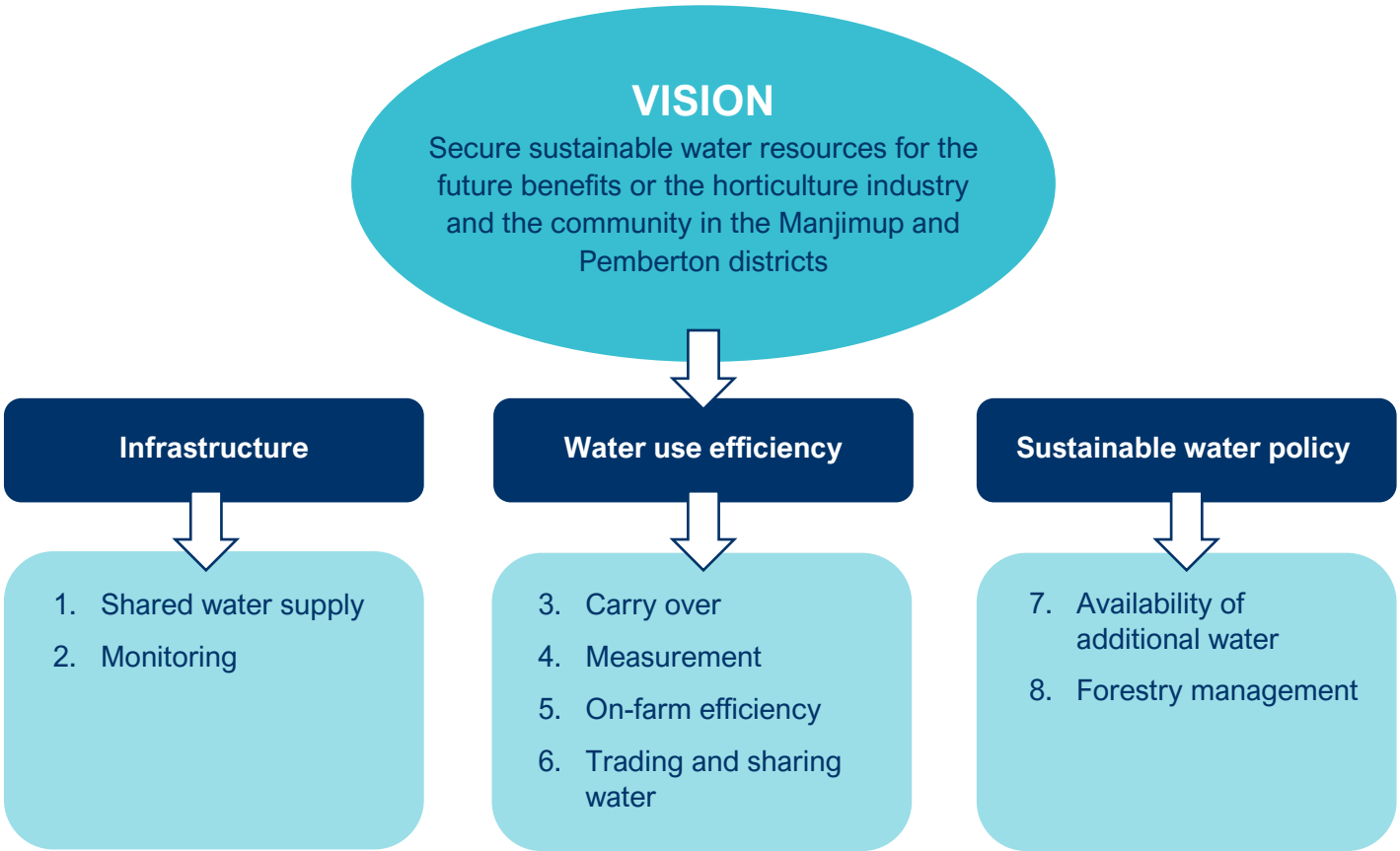
THE SCOPE OF THE REPORT

The report of the Southern Forests Irrigation Reference Group covers the key conclusions and recommendations to secure sustainable water resources for the future benefits of the horticulture industry and the community in the Manjimup and Pemberton districts.

The Reference Group focused on eight key areas grouped under the three objectives set out in its Terms of Reference:

- Assess and advise on irrigation infrastructure concepts that seek to maximise the use of available water through the capture, storage, and transport of existing and new water sources;
- Consider and explore the potential benefit of water efficiency measures and programs such as bird netting, irrigation methods, systems and improvements; and
- Provide input to the Warren Donnelly Advisory Committee on water policy matters relevant to the work of reference group.

The eight key areas the Reference Group addressed are interrelated but have loosely been grouped under the three objectives set for the deliberations of the Reference Group.



This report summarises the Reference Group's discussion on these eight key areas.

All of the Reference Group's conclusions and recommendations involve policy considerations. Throughout the document any references to policy are intended, in the first instance for referral back to the Warren Donnelly Water Advisory Committee as per the Terms of Reference.

It is important to note that the Reference Group was made up of growers and stakeholders, primarily with interests in, and knowledge of, the horticulture industry.

The Reference Group had a relatively short period of three months to focus on the issues affecting water security for the horticulture industry and was therefore limited from undertaking any substantial consultation and engagement with the broader community with interests in water security for the catchment, such as the Traditional Owners, natural resource management and environmental groups, and water users from the tourism, forestry, and other industries and businesses.

1. SHARED WATER SUPPLY

In 2022 the Southern Forest Irrigation Scheme (a shared infrastructure project proposal involving a dam and piped distribution across a large area of the Warren and Donnelly catchments) lost the support of the State Government due to several factors. These included concerns about the impact of climate change on long term water availability and perceived concerns from growers who felt that the Scheme would unfairly impact on the security and access to water for those not part of the scheme. There was also opposition to the scheme from parts of the community whose view was that the scheme would have unacceptable environmental impacts.

One task of the Reference Group was to consider alternative shared infrastructure ideas to identify whether there were circumstances under which they may be more broadly acceptable to the community. The Reference Group was presented with various ideas, from communal dams like Carpenters Dam that could store carry over water from growers or potentially capture water in high flow events and distribute via a pipeline within the same subarea or local tributary or elsewhere, through to alternate Southern Forest type schemes that would access water from various points in the Donnelly catchment and pump to a variety of existing dams sites (removing the need to clear native forest for a new dam). However, whilst presented with concepts, there were no alternative shared infrastructure schemes brought to the attention of the Reference Group with detailed design and prepared business cases ready for evaluation.

The Reference Group favoured solutions that empowered individual growers to drought proof their own operations with the water resources in their local subarea through options like allowing carry over, and variable take if additional sustainable volumes were proven to be available. Nevertheless, shared infrastructure "strata managed" private schemes developed by groups of growers in a subarea (or local tributary), or that communally stored carry-over water from different areas, could be viable and deliver shared water security outcomes and should not be ruled out.

This view was informed by ongoing concerns that the amount of water needed to support and ensure the economic viability of large scale shared infrastructure schemes, similar to the initial proposed scheme, would not be there due to the drying climate, as well as opposition to the concept of moving water from areas of surplus to areas of demand. The latter would impact the ability of growers in that area to use the surplus water to drought proof their own operations.

This was one of the more contentious discussions had by the Reference Group and there remained some division of positions based on those who supported shared schemes and those who did not. These views strongly informed the idea that the Southern Forest Irrigation Scheme would result in winners and losers and as was mentioned on multiple occasions by members of the Reference Group, harmed relationships between growers in the district. It is likely that any similar large scale scheme proposed in the future, irrespective of the scientific/economic rigour supporting it, would cause similar community angst.

Conclusions:

- Infrastructure improvements on an individual farm basis would be the most effective drought proofing strategy for the region.
- The Reference Group was advised of prospective dam sites on private land for future consideration for shared infrastructure if water is proven to be available and where there was viable interest.

Recommendations:

1. Government funding and policy should enable growers to manage their own water security on-farm.
2. Shared infrastructure proposals to improve water security within a subarea should be enabled and encouraged.

2. MONITORING

Understanding of the Warren and Donnelly catchments and their management, including water availability, water for the environment and rules for water use, are all underpinned by DWER's network of gauging stations and monitoring. The current network comprises 17 operating gauging stations, all of which are telemetered and can be openly accessed on the DWER's Water Information System website. There are approximately 60 other locations where data has been or is still being collected. These include previous gauging station locations and project sites where information was collected for a period to answer local questions about flows or the local stream environment.

This monitoring has provided a good general overall understanding of flows at the catchment and subarea scale. However, the recent CSIRO review of the Donnelly River's flow model and information used to build it, identified several gaps in understanding of the dynamic processes influencing flows in forested and cleared areas over time and in response to climate change.

Further enhancements of the monitoring network are needed to better understand these complex systems and fill some of these knowledge gaps. The Reference Group saw the priority for these improvements to be the establishment (or upgrade) of high-quality telemetered flow (and salinity) measurement at the bottom of cleared areas (such as the Upper Lefroy Brook, Lefroy Brook, Smith Brook, East Brook, Wilgarup, Four Mile/Big Brook and Upper Donnelly subareas). The Reference Group visited an existing state of the art gauging station near the bottom of the Manjimup subarea. DWER highlighted the costs associated with monitoring can be high, noting that this site had capital costs of approximately $500,000 and requires DWER staff to regularly maintain it. Given the costs, any additional monitoring will need to be unequivocally identified as necessary to increase the understanding of the water resource system and thoroughly scoped with consideration given to the level of monitoring required (to see if cheaper alternatives are possible) and the cost of resourcing of DWER maintenance. Over time these improvements, by deriving an improved understanding of the interactions between climate, land-use and water resources, will enable improvements to the modelling and allocation decisions (which may include further variable take) and water security.

The Reference Group was also presented with examples of where growers had a different view of flow data than DWER. The monitoring network and stakeholder involvement should be designed such that DWER and growers have the same understanding regarding flow and any other water information. Transparency and trust in the data is critical.

Conclusions:

- Improvements in the measurement and transparency of water flow and water quality information is a high priority to improve the knowledge of the system.
- Greater use of local knowledge will lead to an improved and shared understanding of the water system.

Recommendations:

3. There is a requirement for increased capital and operating funding for stream measurement stations to improve the confidence in the catchment modelling and the timeliness of measurement information into the future.
4. Mechanisms to improve the engagement of growers and stakeholders in the observation and interpretation of monitoring data need to be developed.

3. CARRY OVER

Variability of stream flow is expected to increase because of the drying climate and so strategies to improve water security will become increasingly important in continuing to maximise productivity and build industry resilience.

Many growers in the Warren and Donnelly catchments attempt to manage the risks to their farm operations from variable stream flow by not using, and instead storing a proportion of the annual water entitlement that their licence allows them to capture each year. This water is either kept in their on-stream dams or in some circumstances pumped to an off-stream storage (e.g. spring or stock dams) ensuring that water is available in the subsequent year(s) for crop needs if the region experiences an exceptionally low rainfall/flow year and sufficient water can't be captured.

A common issue raised by stakeholders who presented to the Reference Group, was there should be a policy to allow more on-farm infrastructure options to carry over the unused annual allocation of water their licence entitles them to so they could effectively drought proof their own operations as the climate dries. It is envisaged this policy change would allow growers to enlarge/construct on-stream dams that can hold larger amounts of water than their existing annual licensed entitlement, allowing for greater storage of unused portions of their annual entitlement. A carry over policy does not mean additional volumes of water can be captured above the licensed annual entitlements.

Policies to allow carry over are commonly used in other similar systems and jurisdictions in the Eastern states. DWER advised that there are some considerable challenges to implementing such a policy but that together with the Warren Donnelly Advisory Committee are exploring the potential and regulatory framework necessary for carry over. The challenges of a such a policy include ensuring adequate dam capture and storage measurement is undertaken, metering and reporting of water usage and ensuring ongoing compliance measures can protect downstream users and the environment.

If additional volumes of water are proven to be available through revisions of the modelling and the revised water allocation plan, the infrastructure changes necessary to allow for carry over could also be used to capture additional water in high-flow years as variable take.

Conclusions:

- The Reference Group strongly supported maximising the use of on-stream dam sites for carry over while still meeting license and bypass arrangements designed to protect downstream flows to other users and the environment.

Recommendations:

5. A carry over policy needs to be developed and implemented as soon as possible incorporating the allowance for on-farm dam infrastructure to carry over water from season to season.
6. Investment in metering, on-farm water measurement and bypass management will be necessary to ensure carry over can be implemented sustainably and compliance with associated enabling license conditions.

4. MEASUREMENT

To date water allocations in the Warren and Donnelly catchments have been managed through a largely "passive" management system with minimal to no on-farm water measurements required by the regulator (e.g., dam levels, usage volumes). This is a common approach used throughout Australia where water is still readily available to allocate, there is minimal trading and competition for water, there are low risks to downstream users and environments, and limited resources to manage compliance. Several factors are now driving the need to increase on-farm water measurement in these catchments for the benefit of both individual growers and the State.

The Reference Group heard from several growers how the accurate measurement and data collection of water information during storage, distribution, and application of water, allowed for better decision making for water and pump cost savings. The work being undertaken by the Food Agility Cooperative Research Centre team from Curtin University with growers to quantify, benchmark and understand water profitability and productivity relies on increasing the amount of on-farm water information collected. To maintain productivity, growers will be increasingly incentivised to have comprehensive on-farm water information to ensure water is being used to its maximum value.

With climate change driving declines in stream flow and reliability, more on-farm water information is needed to account for all water in the landscape and ensure robust and reliable long-term sustainable water planning. Much of the modelling and planning work to date has been based on assumptions about the volumes of water captured, stored and used. Without improvements in the accuracy of this information it will be difficult to provide the level of certainty about water resources necessary to ensure a productive and resilient horticulture industry. Similarly, there are increasing community expectations for accountability for sustainable water resource management and protection of forest and river environments that service other important Southern Forests nature-based tourism and recreation industries.

Increased on-farm measurement is also necessary to manage day to day compliance issues for tracking water entitlement use, trading, and ensuring bypass volumes are maintained. It will also be critical in building confidence to support new more flexible policies for carry over, and if there are any additional volumes of water available, for variable take opportunities.

Conclusions:

- Increased on-farm water measurement of storage, distribution and usage (metering), and including bypass and release volumes, will ensure that growers are able to better understand and adapt their water use and remain resilient to the drying climate, and DWER can sustainably plan for and manage the water resource.

Recommendations:

7. Government subsidy schemes to incentivise water users and offset the cost of installing the requisite on-farm water measurement infrastructure are recommended to ensure a sustainable water supply for the horticulture industry and the environment.

5. ON-FARM WATER EFFICIENCY

On-farm water efficiency improvements can increase the productivity of horticulture enterprises as well as help growers build resilience to the expected declines in water that may be reliably delivered due to climate change. Water use efficiency can be improved in the storage (reducing evaporation), distribution (losses through leakage and by maintaining water pressure in the distribution piping), and application (matching supply to plant demand) of water.

There was plenty of evidence that technology solutions are available and that growers were adopting appropriate water efficiency improvements and water management practices to suit their individual farm enterprise mix. Pumping water costs money and so there is an inherent driver towards adopting the water use efficiency, especially in terms of the available distribution and application technologies. Switching from movable pipes and sprinklers and overhead sprinklers to understorey sprinklers and drippers was common. Other technologies, such as smart pumps to maintain pressure in lines, netting and soil moisture probes and computerised irrigation control systems were being adopted as and when it suited the crop types and individual farm operations.

The Reference Group met with Mark Gibberd and Julia Easton from the Food Agility Cooperative Research Centre Curtin University team to be briefed on the work they were doing with local growers to quantify water profitability ($ per megalitre per hectare) and productivity (tonnes per megalitre per hectare). The Group also heard from DPIRD researchers and learnt of research that had been done, or was being done, to provide the evidence for different water efficiency measures, including desalination and potential gains for reducing storage losses due to evaporation from dams by such means as strategic tree planting to reduce wind impacts on evaporation rates, better dam design and artificial floating cover.

One of the issues identified was the increasing complexity of computerised controlled irrigation systems requiring skills in interpreting data and making adjustments to irrigation systems.

The Reference Group was briefed on levels of salinity, particularly in the Warren catchment, and potential ways of improving water quality through desalination, timely water release and blending strategies.

Conclusions:

- There is considerable potential for gains in water use efficiency as and when the benefits are clear in each grower's own situation. The Reference Group generally concluded that making changes to improve water efficiency on-farm should be a private commercial decision.
- There is potential for improvements in data analytic management skills to maximise the efficiency of water storage, distribution, and application.
- There are potential technologies for managing salinity levels.

Recommendations:

8. There is a continuing need for funding for the research and demonstration of water saving technologies relevant to the Warren and Donnelly catchments and how to integrate these into on- farm water management.

6. TRADING AND SHARING WATER

Water trading already occurs, although limited, in the Warren and Donnelly catchments. Given geographic limitations, the most common form of trading is the one-off or short-term sharing of captured water with neighbouring properties who need additional water towards the end of the irrigation season. This is typically done through downstream dam releases or small-scale local piping. These are referred to as agreements, applications for which should be submitted to DWER. Trading and relocation of all or part of a water licence to a new location (the entitlement to capture water annually, not an actual volume of water) is rare given the inability to trade across subarea boundaries, the likely impact of increasing the take of water on existing growers in the new location, and the need to reduce, remove or modify the trader's dam infrastructure.

The Reference Group's discussions regarding trading primarily focused on future policy concerns about how this would be treated under the new water legislation (a Water Reform Bill is understood to being drafted for introduction into the WA Parliament in the near future). The Reference Group discussed the merits of a "green bill" to facilitate consultation.

The Reference Group heard from several growers and stakeholders who were adamantly opposed to water licences being able to be traded without being tied to land. This is the approach used in many water systems in the Eastern states (e.g., the Murray Darling system) and is promoted by the National Water Initiative for which WA is a signatory. Although current legislation and licensing arrangements prevent the purchase of water without land use, the Reference Group was concerned whether a new approach to trading was being contemplated in the new Water Reform Bill. The group was worried about water speculation, rent seeking, and the security of water for priority agricultural land. In relation to the latter point there was also a view expressed that water resources should continue to be only traded within a subarea, and not between subareas.

Some issues were raised with the current time it takes to process water agreements such that it may discourage it from occurring. Options involving the simplified registration of small to moderate volume agreements to share water between properties were discussed. The Reference Group also heard from DWER and presenters that there is a high level of underuse in the region. It is estimated that up to 30-50% of water captured annually is unused, potentially representing a significant missed opportunity for local industry. Although one of the main reasons growers choose not to use their full licensed volume each year is to manage for dry years, there is likely to be significant value in increasing trading to use water.

Conclusions:

- Although currently limited, sharing of water is an important part of ensuring water security for growers moving forward provided it is linked to land and only traded within a subarea.
- Modernising and clarifying administrative processes to streamline trades and agreements will assist in the utilisation of unused water.
- The Water Reform Bill scheduled to be introduced in the near future will potentially have large impacts on growers in the Warren and Donnelly catchments.

Recommendations:

9. The Warren Donnelly Water Advisory Committee should be briefed in order to understand the implications of new Water Reform Bill and be able to provide feedback on these issues and other issues of relevance to growers and the local community.
10. Administrative rules should be revised to streamline trading of licenses and agreements, particularly where they pose a low risk to the water resource.
11. Enable local farm to farm infrastructure mechanisms for enhancing water trading.

7. AVAILABILITY OF ADDITIONAL WATER

While evaluating the State government's support for the proposed Southern Forests Irrigation Scheme, an independent review of DWER's modelling of the effects of climate change on stream flow volumes and reliability for the Scheme was requested.

The review conducted by the CSIRO[6] concluded that over the next 40 years, average streamflow in the Donnelly River catchment may reduce by 30 to 40 percent compared to current averages. This varied the annual supply volume for the Scheme from the initial business case of 95% reliability of 9.3 GL, down to a range of scenario models with annual average supply of between 1.9 and 8.6 GL. Most scenario iterations yielded on average less than 4GL. This and several other factors resulted in the WA Government withdrawing any further interest in supporting the proposed Scheme in its proposed form. Over time this potential volume of water will increasingly come from the cleared farmland in the Manjimup subarea. The opportunity for this water to be captured in high flow years and allocated in that subarea should also be considered following appropriate modelling and during development of the new water allocation plan.

The Reference Group heard from several stakeholders that were not comfortable with the current information available to DWER to safely proceed to allocate any additional water in either the Warren or Donnelly catchments without risking the reliability of existing water entitlements and impacts to downstream environments.

The Warren Donnelly Surface Water Allocation Plan was last prepared in April 2012 and is due for review and a new plan developed. It is expected this new plan will include an update to the modelling and assessment of any available unallocated water throughout the Warren and Donnelly catchments and how it may be taken sustainably (if at all). It is also expected the new plan will address the priority for horticulture on prime agricultural land against other uses, such as mining and plantations, the impact of forest management practices, and a number of other allocation policy issues (e.g., enhancement of the ability to carrying over unused water).

Conclusions:

- Updated climate and streamflow modelling has bought into question the risk of any additional water allocations ahead of the planned update of the Warren Donnelly Surface Water Allocation Plan.

Recommendations:

12. The new Warren Donnelly Surface Water Allocation Plan needs to be expedited based on science and extensive stakeholder consultation.
13. No additional large-scale volumes of water should be made available until the new Warren Donnelly Surface Water Allocation Plan has been finalised.

[6] CSIRO, 2022, Future climate streamflow estimation in the Donnelly River catchment, CSIRO Land and Water, Australia

8. FORESTRY MANAGEMENT

Forestry, both native and plantations, will have a significant effect on water security in the Warren and Donnelly catchments if not accounted for accurately and managed appropriately.

Forest runoff has diminished rapidly in recent decades due primarily to reduced rainfall and increased evapotranspiration driven by changing climate. The recent CSIRO review of modelling in the Donnelly catchment also identified that forestry operations, involving clearing and revegetation, also strongly affected streamflow as seedlings grow into mature trees.

The Reference Group was concerned that the recent policy announcement to cease logging in the region will reinforce trends of diminished flows from forests as dense, replanted trees that were to be thinned and cleared may now not be. It is understood that the impact to the water balance of native forests from the end of logging is being considered under the Draft Forest Management Plan 2024-2033[7]. Investigations into ecological thinning may demonstrate a positive impact on stream flows if regionally applied, however it is understood there is no up to date scientific information available for the Warren Donnelly catchments to support the magnitude of impact, or to determine if recovery of streamflow will result.

There are also increasing drivers for plantation forestry on-farmland for carbon offsets or to better utilise land (with limited water availability). If these types of development occur, they are likely to contribute significantly to reduced stream flow and impacts downstream water security for agriculture and river environments.

A review of the adequacy of current land use decisions by local government in preventing these impacts was suggested along with the exploration of opportunities to regulate the establishment of plantations under the Water Reform Bill were identified as worthy of further study. It was also suggested that the next Warren Donnelly Surface Water Allocation Plan should also make sure that the impacts of forest management and the establishment of plantations on future water availability are modelled and that appropriate water management policies are considered, including possible regulation.

It is understood some stream flow and groundwater monitoring has recently been reinstated in Barlee Brook, a forested tributary of the Donnelly River, with the aim of continuing to build a better understanding of how forest runoff and stormflow will evolve over time with climate change. The Reference Group believes. It would also be beneficial for ecological thinning trials to be undertaken in monitored catchments to enable the assessment of the effect on stream flow and consideration of long-term benefits of the practise to water security.

Conclusions:

- Native forest and plantation management strategies have a significant impact on the availability of water for horticulture and the stream environment.

Recommendations:

14. When developing land use and water management legislation, plans and policies, consideration should be given to minimise the impact on stream flow and water availability.
15. Reinstate flow monitoring on Record Brook, and other streams as required, to define the impact of climate and forest management, improve understanding of run off processes and test potential treatments like ecological thinning.

[7] Draft Forest Management Plan 2024-2033, Conservation and Parks Commission 2022

CONCLUDING COMMENTS

Government funding support

The Reference Group understood that the Commonwealth Government had earmarked $40 million and the State Government $16 million for capital infrastructure, originally earmarked for the Southern Forests Irrigation Scheme. The withdrawal of the State Government's support for the Scheme has brought into question the fate of these earmarked funds.

Further, the Reference Group understood that any capital funding from the Federal Government would be at least contingent on matching State Government funds, if not with a committed contribution from water users.

The Reference Group understand that any recommended government funding proposals will require the development of detailed business cases to enable consideration by both the Federal and State Government. Based on the review of the eight areas that the Reference Group focused on the following components are suggested as worthy of further development for consideration of public funding support by governments.

Monitoring infrastructure

The building of further gauging and monitoring stations will improve the understanding of the water resource systems in the Warren and Donnelly catchments and lead to more security for industry and the environment including monitoring the effects of forest management practises.

The Reference Group supports the development of business cases for government funding of this infrastructure. Whilst using the latest available technology or telemetry and automatic data transmission for efficient operations, the Reference Group recognises there will be an ongoing increased operational cost to DWER for the maintenance and analysis of the information generated.

On-Farm Water Security Infrastructure

The Reference Group was supportive of growers being able to "drought proof" themselves in the face of a drying climate and more variable seasonal rainfall and stream flows by building the appropriate on-farm infrastructure storage capacity for water security.

This would require capital expenditure for on stream and off stream dams to enable the storage of carry over and possibly variable take water in years of high stream flow, whilst ensuring the necessary essential bypass infrastructure to allow for downstream users and the environment flows. In addition, the Southern Forest region is a unique recreational and tourism area for Western Australia with over 80% of the Manjimup Shire in forest and the Warren and Donnelly Rivers. These attributes need priority protection of environmental stream flows.

The Reference Group considered that expenditure was therefore needed to ensure the effective measurement of water flows into and out of properties, use on property, and accurate and easy to use bypass infrastructure. The Reference Group considered that investment in this on-farm water measurement capacity should be a necessary precursor to allowing a water user to access carry over and any future variable take provisions.

It was considered that the cost of such infrastructure should be primarily borne by the individual water user. However, the Reference Group was generally, but not universally, supportive of a case for a government funding scheme to encourage the adoption of on-farm accurate measurement infrastructure and increased dam capacity to store carry over water.

Such a scheme would have community wide benefits for the economic and social sustainability of the region as well as providing for the on-farm measurement and monitoring of water flows to protect the environment.

Expenditure eligible for a contribution for government funding could include:

- Flow meters, recording equipment and telemetry for monitoring in real time flows out of dams;
- Water use flow meters on pumps to record water use;
- Bypass infrastructure; and
- Dam construction and enlargement to accommodate carry over water (small proportionate subsidy with most of the cost borne by the individual aimed at ensuring appropriate environmental and water efficiency objectives were met in the construction).

The Reference Group considered that one criterion for any funding assistance would be that growers would need to pay for and submit an accurate volume measurement of any existing and new constructed dams in their application. The Reference Group also considered that any distribution infrastructure, such as pipes and pumps, should be exempt from any government subsidies and bourn by the individual.

The scheme could also apply to any shared infrastructure scheme that may be developed in the future. These would be especially relevant for water users that did not have appropriate sites for dams or enlargement of existing dams was not feasible.

Doppler weather radar

Although not strictly water security related, the Reference Group received a presentation about the case for government investing in a Doppler weather radar. There is a view that there is an important gap in BOM's Doppler radar system in the State's south-west. The Reference Group was advised of the potential benefits of having a Doppler weather radar coverage for the Manjimup Shire. This could be located either in the Shire or at some determined site in the State's south-west to ensure as wide a coverage.

In terms of water security for the horticulture industry the clear benefits of this radar coverage would be for irrigation scheduling. In addition, there would be other farm productivity benefits for scheduling spray operations and for early warning of frost events. There would also be public safety benefits for bushfire control and, depending on its range and siting, possibly boating safety.

This infrastructure would need to be maintained by the Bureau of Meteorology, but its capital construction cost could be using State and possibly Federal Government funding.

Development of the new Warren Donnelly Surface Water Allocation Plan

Although not strictly all capital expense, there is a case for an extraordinary allocation for operational funds to DWER to expedite the development of the new Warren Donnelly Surface Water Allocation Plan with the required science and community consultation required.

Updates are required to DWER's local and catchment modelling, including DWER's Planning and Allocation Tool (PAT) used to assess local licence applications, trades and reliabilities, and the stream flow modelling used to assess climate change impacts and establish sustainable allocation limits and environmental flows.

Additionally, there are some other information needs that are critical to managing the system consistently and sustainably. These include but are not limited to:

- updating the understanding of levels of underuse in both catchments;
- a review of existing variable take arrangements;
- an audit of bypass arrangements to ensure water is moving through catchments and maintaining downstream reliabilities and environmental values; and
- and better understanding of the ecological value of dams in the landscape.

These are critical to delivering an improved plan that provides the necessary water security for growers and ensures sustainable outcomes for the region in a drying climate.

Additional water policy issues

The Terms of Reference for the Reference Group asked it to "Provide input to the Warren Donnelly Water Advisory Committee on water policy matters relevant to the work of reference group." Accordingly, so far in its report the Reference Group has only provided conclusions and recommendations on water policy matters that directly impact on the overall sustainability of water supplies to the horticultural industry.

However, during the course of its work the Reference Group heard from a wide range of growers and stakeholders about many issues in the policy and management of water that don't directly affect the overall security of water resources for the horticulture industry. These are listed below and are provided to the Warren Donnelly Water Advisory Committee for their information.

Water licencing

- Security of licences - Licence holders in the Warren and Donnelly catchments do not currently have property rights for the water entitlement licences they hold. Licences are customarily renewed every 10 years but there is no absolute certainty that the water licences will be renewed, or attached conditions altered. Security to support appropriate investment in water infrastructure and farm plans requires greater certainty of at least 21 years, with renewal negotiated at least 5 years prior to the expiry of the license.
- Transparency of general conditions on licences – should be available on public register to ensure scrutiny and transparency.
- Licence renewal processes– licensees should be routinely notified by DWER prior to expiry of their licence.
- Exemption for licencing of spring dams should remain.

Allocation of water resources

- High priority for access to sustainable water for the horticulture industry is essential for maintaining the economic and social benefit of the industry to the region and the State. This needs to be foremost in the determination of any land use, forestry management and water policy legislation and management.
- Subarea allocation – available water allocation volumes and licences should not be transferred between subareas.
- First in first served – this policy approach worked up until there was not so much pressure on the availability water resources, but there are frustrations with the way the process works now with applicants being assessed and told no water available and then finding out someone else has been granted an allocation a short time after.
  Variable take – if it is identified that there are additional volumes of water available through variable take and if carry over policy is progressed, there will need to be consideration of how they interact, including for those who have already been allocated variable take and those who have not applied for, or been granted variable take.

The role of the Warren Donnelly Water Advisory Committee

The Warren Donnelly catchment is a complex distributed stream capture water management system. To function effectively this requires a strong partnership relationship between licencees and DWER.

The management of the water system presents many more challenges in monitoring and measurement than systems which either measure water flows pumped from bores or through piped delivery systems from a central water source. DWER have developed the current management system for the catchment, through a policy of having the allowable dam size equal to the quantity of the water licence to minimise the measurement and monitoring required, and fixed winter take periods for water from streams.

This management regime was satisfactory whilst there was plenty of unallocated water available for use that could be made available on a "first come" application process. More recent climate and stream modelling is highlighting expected changes to the long-term availability of water and variability and has resulted in a tightening of the allocation of additional water. This coupled with the variable impacts and unintended externalities from the attempt to accommodate the Southern Forest Irrigation Scheme and integrate it with the existing distributed self-managed dam model, has resulted in a widening gap of understanding, misinformation, and a lack of confidence in DWER by the water licence holders

Throughout the course of the Reference Group's term, it was made aware of issues that called into question the effectiveness of the current structure and remit of the Warren Donnelly Water Advisory Committee.

The Warren Donnelly Water Advisory Committee, with six positions for community and industry representatives, exists to provide advice to DWER in regard to surface water management and allocation within the Warren and Donnelly catchments. However, significantly it is only required to provide advice "to the extent that is requested" and is chaired by and reports to a DWER representative.

The Reference Group heard several examples from stakeholders who claimed that DWER decision making was not transparent and, on many occasions appeared inconsistent. This contributed to an overall disquiet and distrust of the decision-making processes.

Transparency and a greater active participation by growers and the community in the development of effective water management policy in this catchment is viewed as essential.

One solution put forward was for the establishment of an independent statutory body comprised primarily of local water users to manage the catchments. However, there was no discussion of how this would be funded, staffed, or operated.

An alternative option, favoured by the Reference Group, would be to revise the Terms of Reference and have the Advisory Committee independently chaired and report to the Minister for Water. While noting the current development of the new Water Reform Bill, this could be done under either section 109 of the *Water Agencies (Powers) Act, 1984*, or perhaps with more authority if established as a "Local water resources management committee" under the *Rights in Water and Irrigation Act*, *1914 (as* amended *2000).*

ATTACHMENT A

Terms of Reference

Southern Forests Irrigation Reference Group (SFIRG)

Objective

The Government is committed to a sustainable approach to secure water resources for the future benefit of the horticulture industry and community in the Manjimup-Pemberton district. To that end, the key objectives of the Reference Group are:

- Assess and advise on irrigation infrastructure concepts that seek to maximise the use of available water through the capture, storage, and transport of existing and new water sources,
- Consider and explore the potential benefit of water efficiency measures and programs such as bird netting, irrigation methods, systems and improvements, and
- Provide input to the Warren Donnelly Advisory Committee on water policy matters relevant to the work of reference group.

Membership

The Group's membership will include:

- An independent Chairperson,
- 6-8 community/industry representatives, and
- Jane Kelsbie MLA, Member for Warren-Blackwood (local member).

The Group will be Chaired by Mr Ian Longson, a former Director General of the WA Department of Agriculture and Food. Ian will be supported by technical experts (government and non-government). Membership will have a strong focus on water users in the Manjimup-Pemberton district. Nominations are currently being sought from the community.

The Chair will oversee the preparation of a report to the Minister for Agriculture and Food and the Minister for Water that captures the advice of the Group, which will seek to bring together community views on a range of holistic and practical recommendations to support a sustainable horticultural industry into the future.

The DPIRD and DWER will provide technical and scientific support, but will not act as voting members of members of the Group.

Background

The Manjimup-Pemberton district is the most significant horticultural production area in WA with an estimated GVAP of $268 million per annum. Irrigated agriculture is the largest user of water in the area, occupying around 4000 hectares of land within the surface water catchments of the Warren and Donnelly rivers.

The Government remains committed to working with the community to develop a range of measures to assist the region to respond to challenges of climate change. The Government wishes to embark on a new approach that seeks to identify actions such as infrastructure improvements and water efficiency measures that are sustainable and support water security for the horticultural industry and community.

The work of the Group will complement the work of the Warren Donnelly Water Advisory Committee, which provides advice to government on water planning and policy matters in the Warren-Donnelly catchment.

Conflict of Interest

The Chair will provide the opportunity for members to identify any actual, perceived, or potential conflicts of interest at the beginning of each meeting. The Chair will determine the action taken by the member to manage the conflict of interest. Any information made available to members that is identified as commercial-in-confidence, private and confidential, or generally of a confidential nature, must not be provided or allowed to be provided to third parties.