



## MURRAY REGIONAL STRATEGY GROUP

### **Public Submission**

# **NSW Government: Draft Murray Regional Water Strategy**

**Murray Valley Private Diverters (Inc)**  
**Ricegrowers Association of Australia (Inc)**  
**Yarkuwa Indigenous Knowledge Centre**  
**Murray Irrigation Limited**  
**West Corurgan Irrigation**  
**Speak Up Campaign (Inc)**  
**Eagle Creek Pumping Syndicate (Eagle Creek)**

**Southern Riverina Irrigators (Inc)**  
(Berriquin Irrigators Council, Deniboota Landholders Association, Denimein Landholders Association, Wakool Landholders Association, West Berriquin Irrigators)

### **Submission Supported by**

Edward River Council

## Key Messages

- The Regional Water Strategies present an opportunity to reshape water management for the coming two decades and beyond. With a growing population and increased climatic extremes, now more than ever the time has come for Governments and communities to work collaboratively to ensure we are self-sustainable in producing staple foods, while at the same time caring for our environment.
- Local knowledge and understanding are paramount to identifying risks and opportunities for both the environment and productive capacity. Community-led groups such as Murray Regional Strategy Group (MRSRG), whose members include First Nations, industry, business and community groups can provide a conduit between Government and local knowledge.
- In its current form the draft Regional Water Strategy includes some alarming options which will further erode the property rights of the NSW Murray General Security entitlement.
- MRSRG call on the Department of Planning and Environment to revise their draft Regional Water Strategy in consultation with key industry stakeholders for NSW Murray to ensure efficient water delivery for the environment, communities and production.

## Background

Murray Regional Strategy Group (MRSRG) would like to commend the NSW Department of Planning and Environment on recognising the need to put water management plans in place to ensure our most precious resource is effectively managed over the next 20-40 years. MRSRG has consulted with its member organisations who all believe with correct consultation and interpretation, the regional water strategies could present a great opportunity to address many issues within the list of options going forward to secure water for towns, environment, and industry without further diminishing the water property rights of NSW Murray General Security holders.

MRSRG has grave concerns with the current options and consultation process presented in the regional water strategy, and fears the current draft has the potential to negatively impact industry and communities within the NSW Murray.

Australia is facing a food crisis, increases in costs-of-living and various economic challenges. They will all be affected if we do not make sure the Regional Water Strategy is fit for purpose.

Our member organisations will present their own submissions outlining specific concerns relevant to their membership, however, below is a list of concerns that our members have consensus on. As always, MRSRG welcomes being a conduit between Government and agencies to work collaboratively with local knowledge and understanding to identify risks and solve problems, saving Government money and time to ensure successful outcomes for all those involved.

MRSRG believe the draft regional water strategy has the potential to provide many opportunities, however better consultation on the risks and benefits of all 44 options is needed at all stages to ensure that it is done with communities and remove any risk of Murray General Security allocations being eroded even further.

**Please refer to the below a selection of identified concerns and recommendations from MRSNG in the table below:**

| <b>Consultations</b>  |
|---|
| <ul style="list-style-type: none"><li>- It is mentioned several times within the draft Regional Water Strategy that local councils, water utilities, NSW agencies and Aboriginal communities have been consulted; however, within our membership there has been a lack of local industry and key stakeholder engagement.</li><li>- The current process has further diminished trust, both farming and community groups have lost confidence in the ability of governments to deliver fair and balanced policy.</li></ul> <p>Recommendation:</p> <ul style="list-style-type: none"><li>- There is an opportunity for the Government to build strong working relationships with local representatives who can help to identify problems and develop strategies to improve water management and increase our water efficiency</li><li>- MRSNG recommend that RWS should be revised based on new and complete information from a much more rounded representation of <u>all</u> water users.</li><li>- MRSNG have been working with DPE on the Reconnecting Rivers Project and believe that Co-Design goes a long way to building trust and is a fairer delivery partnership.</li></ul> <p>Appendix A: Codesign</p> |

| <b>Climatic Change Data used within this draft Murray regional water strategy plan:</b>  |
|--|
| <ul style="list-style-type: none"><li>- Climatic assumptions are based on modelling using incomplete data and is based on worst case scenarios. It does not allow for a focus on conserving water or utilising it in wet times. While extremes are a possibility heading into the future, it is not the only option, and a wet extreme is just as likely as a dry one.</li><li>- A totally risk adverse strategy based on worst case scenarios will not be in the best interest of our state in the future. We need to build a strategy that uses local knowledge and supports local communities. We cannot accept that drought is the only option for future planning, otherwise we are at risk of not taking the opportunities in wet years.</li><li>- Modelling based on worst case scenario is dangerous and has the potential to further erode General Security (GS) water allocations.</li><li>- As a result, the opportunities which could come from above average rainfall years have not been considered</li><li>- A focus on climate change has resulted in an increase to reserves, without considering deliverables. To some this seems like another excuse to not allocate water for production, which is an erosion of property rights. More water in reserves with rule changes and characteristics of water changing will likely result in dams having to spill before Murray GS receives an allocation.</li></ul> <p>Recommendation:</p> <ul style="list-style-type: none"><li>- MRSNG believe that both extremes need to be considered, and a wet year should be capitalised on when making decisions.</li><li>- Consider opportunities that may present during years of above average rainfall.</li><li>- Revise the RWS to consider variable climate, using extensive, complete modelling.</li></ul> |

### **Murray General Security Allocations**

- The 44 options being considered all have the potential to further impact the property rights of Murray GS allocations. Any options which are considered need to improve the reliability of allocations for Murray GS, the RWS needs to find opportunities for water currently held by the environment to be used more efficiently.
- One solution for improving effective and efficient use of environmental water without extracting more from the productive pool is shown in Appendix B – Murray regional strategy group Roadmap.
- GS licenses disproportionately impacted with reduced pool, decreases reliability under all options

#### **Recommendation:**

- Engage with local key stakeholder groups, such as Murray Regional Strategy Group to investigate each of the 44 options once modelling has been completed, to identify the opportunities and challenges each present.

### ***Murray Regional Strategy group comments on long list of options***

#### **Inadequate water management framework to meet the needs and aspiration of Aboriginal people (1-7)**

*Opportunities to protect and strengthen cultural landscapes, practices, knowledge and traditions. Supporting empowerment, self-determination and economic advancement of Aboriginal people, as well as strengthening community wellbeing*

- Aboriginal communities across the Murray have so far not been engaged in any formal or respectful way to determine their needs and aspirations.
- It is critical that this occurs in a respectful manner recognising the extensive knowledges within their communities. Adequate time and resources but be provided to work with local communities to address these issues.

#### **Current water sharing arrangements based on 125 years of data (8-13)**

*Opportunities to consider the adequacies of existing water sharing and management arrangements in the region under a more variable and changing climate.*

- Option 8 would only gain industry and stakeholder support if it increases the reliability of NSW Murray General Security Allocations. There are more than enough conservative parameters having an impact on current Murray General Security Allocations, without another layer.
- Agree that a review of water allocations needs to take place (option 9), however this must be done in conjunction with extensive stakeholder engagement under a Co-design model (Appendix A)
- Conversion of water – HS/GS/town supply. MRSRG do not support the conversion of General Security to High Security or High Security to Town Supply. If towns need more water, they have other options such to secure water such as: going to the water markets to purchase, recycling options, or desalination. There is huge risk in converting water, which will again erode the property right of the NSW Murray General Security entitlement.

### **Insufficiently integrated land and water planning and management (14-19)**

*Opportunities to better integrate water resource management into other processes, including assessing current land uses and land-use trends in the Murray to better understand spatial changes in the region's water uses and emerging pollution and flooding risks.*

- Option 14 – Would need to be considered on both Vic and NSW side of the river.
- Option 16 – it would be unreasonable to assume that the template based on the Northern Basin floodplain management plan would be appropriate for Murray Region. It is a vastly different landscape.
- Option 18 –MRSG agree Groundwater salinity is a challenge that should be investigated, however credits for salt interception schemes need to be incorporated and assistance to those mitigating the incursion into groundwater needs to be provided.

### **Vulnerability of town water supplies and amenity (20-25)**

*Opportunities to improve policy and planning around water re-use and recycling and strengthen water security for local communities and important water-related amenities in the region.*

- There are many opportunities to provide backup supplies for towns in critical times or planning for the future. A variety of options should be considered from an impact and cost effectiveness point of view, to avoid third party impacts. (eg, recycling, desalination amongst others)
- Interregional connections have been considered in the past, at extensive cost, and poor consultation. We should learn from past.

### **Degradation of riverine and floodplain ecosystems (26-34)**

*Opportunities to address the risk to the environment, the ecology and groundwater dependent ecosystems and improve the health of the region's rivers and groundwater sources.*

- MRSG would like to ensure that water already recovered from the region is efficiently used, and other options should be considered using existing water for the environment rather than implying further extractions.
- Our members all agree no further water should be removed from productive use to achieve these options. The cost of these options also should not be worn by irrigators.

### **Limits to water availability in times of a changing climate (35-44)**

*Opportunities to better understand water use behaviour, and to develop strategies and information to build greater resilience.*

- There is a huge risk when considering an option under incomplete modelling. These options have the potential to negatively impact the reliability of allocation to Murray GS Entitlements. The NSW Murray has worn a systemic reduction in water availability and reliability of the Murray General Security, there is no question on this.
- A review of water markets and trade is already underway in response to ACCC.
- Key stakeholders are industry water groups within the Murray should be extensively involved in the decision making around these options to ensure that reliability of allocation is not impacted.

## Recommendations:

- Engage with Murray Valley key stakeholder groups, such as Murray Regional Strategy Group to investigate each of the 44 options, to ensure opportunities and challenges each present are identified. MRSG can assist with identifying which options will have the most cost-effective benefits, environmentally and economically, without compromising Murray General Security Allocations. A reliability impact Assessment must be completed for each of the considered options.
- Engage with local water specific groups, such as MRSG to deliver each of these options as co-designed projects. Working with industry/community groups on solutions will provide opportunities to identify how water moves through the region. This will allow for appropriate flows or infrastructure to be used to ensure the most efficient delivery of water - ie Roadmap – whole of system approach (Appendix B – MRSG Roadmap)
- Reliability impact assessment should be completed for each of the options considered
- MRSG does not support the impactor pays model used to fund water management in NSW, cost vs benefit should be completed for each of the options considered
- Deliverability VIC and NSW, population impacts, permanent plantings in Sunraysia, trade schedules, choke rules – interstate sharing agreement need to be reviewed
- River operations – are aware that there is a problem delivering water to permanent plantings downstream of the choke once they mature, however no one is prepared to publicly say this
- SA water 'below choke' (stress that this should not be zone 11) should be targeted if buybacks or more water recovery, as this is the only water that is able to be delivered. SA water is the only water that has increased, everywhere else has reduced. (Goulburn limit – terminology should be 'below system choke') – reduces what Goulburn contributes to Murray. It is requiring 1 million megalitres just to get 1 megalitre to SA border.

# MRSRG CO-DESIGN ENGAGEMENT FRAMEWORK

## Background

In the recent **NSW Water Management Regulation** (yet to be proclaimed), which is aimed at “a scheme to facilitate consultation and negotiations with owners and occupiers of land” sits 3 key pillars

1. No flooding without landowners’ consent
2. No compulsory land acquisitions, flood easements or works
3. Co-design of third-party impact mitigation

This need for co-design has again been reiterated and strengthened by the NSW Water Minister Melinda Pavey clearly articulating through media the need for working with local stakeholders to produce social-ecological acceptable outcomes.

## Definition of Co-design

Co-design is a design-led process that uses participatory methods to actively involve and empower all stakeholders in the design process of projects to help ensure the result meets their needs and is usable.

Underlying the principles of co-design is the idea that a collaborative, cooperative and community-centred approach leads to more efficient and effective outcomes.

Localism is a key aspect of co-design where strengthening the capacity for joint action requires power and resources to be delegated and devolved to the lowest capable level.

## Principles and our commitment to Co-design

Co-design means decision-making with, not on or for, local people. MRSRG invite and will work with governments and other groups to embrace the leadership and contributions of people who are most impacted by their decisions; locals.

These four principles help to shape how people can see themselves and others differently and to make co-design a reality:

**Principle 1 Prioritising Relationships** - *Co-design is founded on relationships, social connection, respect and trust*

**Principle 2. Sharing Power** - *Co-design requires power and resources to be redistributed to local on-ground sources*

**Principle 3. Localism** - *Co-design promotes local history, culture, identity, capacity, and jobs*

**Principle 4. Participatory Action** - *Co-design requires local people to be accepted as partners in everything.*

## Engagement Levels and Co-design

Appropriate engagement levels within a co-design process are essential. The IAP2 Public Participation model is a universally accepted and published engagement power level model (Figure 1). Co-design moves directly beyond low levels of engagement such Inform, Consult and Involve levels, to Collaborate and Empower Levels.

|                   | <b>Inform</b>   | <b>Consult</b>  | <b>Involve</b>   | <b>Collaborate<br/>(Co-design)</b>   | <b>Empower<br/>(Co-design)</b>                             |
|-------------------|---|---|--|--|--|
| <b>Goal</b>       | To provide the public with balanced and objective information to assist them in understanding the problems, alternatives, opportunities and/or solutions. | To obtain public feedback on analysis, alternatives and/or decisions.   | To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.                                   | To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.                            | To place final decision-making in the hands of the public. |
| <b>Promise</b>    | We will keep you informed.  | We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision. | We will work with you to ensure your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision. | We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible. | We will implement what you decide.                         |
| <b>Techniques</b> | Fact sheets<br>Web sites<br>Open houses   | Public comment<br>Focus groups<br>Surveys Public meetings   | Workshops<br>Deliberate polling  | Citizen Advisory Committees<br>Consensus building<br>Participatory decision-making   | Citizen juries<br>Ballots<br>Delegated decisions           |



## Conditions for Co-design

A number of conditions are needed for Co-design to occur. They include:

1. Support and Sponsorship
2. Time and Money
3. Culture and Climate
4. Commitments

|   |   |
|---|---|
| <p><b>1. Support and Sponsorship</b></p> <p>We need people to endorse and reinforce the approach we're taking and the outcomes we want to achieve. Funders and supporters help to build commitment, remove obstacles and overcome resistance as and when it arises.</p>   | <p><b>3. Culture and Climate</b></p> <p>Supportive culture and climate includes:</p> <ul style="list-style-type: none"> <li>• Authorising environments from formal and informal leaders</li> <li>• A focus on learning not control</li> <li>• Connective tissue to share learning, failure, success</li> <li>• Support to adopt the mindsets, especially when we regress to old ways of being</li> <li>• Support to develop the skillsets for co-design</li> <li>• Accountability to the people we engage through co-design (they can call us out)</li> </ul> |
| <p><b>2. Time and Money</b></p> <p>To do co-design we need time and money for:</p> <ul style="list-style-type: none"> <li>• Facilitation and convening (co-design is not free)</li> <li>• Paying people with lived experience for their time and for any expenses</li> <li>• Investing in approaches (after they have been co-designed)</li> <li>• Supporting lived experience capability and leadership</li> <li>• Prototyping, testing and learning (prior to implementation)</li> <li>• Communicating the work throughout to build commitment</li> </ul> | <p><b>4. Commitments</b></p> <p>Commitment to co-design looks like:</p> <ul style="list-style-type: none"> <li>• Focusing on outcomes (value) over outputs (busyness)</li> <li>• Following through into implementation</li> <li>• Staying committed to elevating the voice and contribution of lived experience</li> <li>• Practising cultural intelligence and widening inclusion</li> <li>• Partnering, not parenting</li> <li>• Sharing decision making, power and attribution</li> <li>• Value and reciprocity with co-designers</li> </ul>               |

## Co-design Project Process

Co-design follows a series of defined steps for partners to follow which involve:

1. Defining the **Problem**
2. Understanding the **Context**
3. Expressing the **Needs**
4. Proposing the **Options**
5. Agreeing on the **Solution-s**

## Co-design Success for MRSG and Partners

These are the standards by which we will judge value and reciprocity:

| Aspects of decision-making       | Co-design Success   | No co-design process  |
|----------------------------------|---|---|
| <b>Defining the PROBLEM</b>      | <ul style="list-style-type: none"> <li>problems are social and political constructions</li> <li>problems can be re-framed through collaboration</li> <li>professional and lived experience are equally considered</li> <li>power is named, challenged and negotiated</li> </ul>   | <ul style="list-style-type: none"> <li>problems are environmental constructions</li> <li>problems are fixed or too narrowly defined</li> <li>insensitivity to local peoples' problem perceptions and experiences</li> <li>power and resources are tightly held</li> </ul>   |
| <b>Understanding the CONTEXT</b> | <ul style="list-style-type: none"> <li>honesty in answering "Why is this situation a mess?"</li> <li>all values, attitudes, beliefs and views are respected and considered</li> <li>a range of scales is considered, and a balance is accepted</li> </ul>   | <ul style="list-style-type: none"> <li>past failings and learnings are ignored</li> <li>key assumptions remain untested</li> <li>national interest is not tempered by equity and fairness at a local level</li> </ul>   |
| <b>Expressing the NEEDS</b>      | <ul style="list-style-type: none"> <li>slowing down to listen, connect and learn from local people</li> <li>needs are representative of the whole of the affected community</li> <li>people most impacted are placed at the heart</li> </ul>  | <ul style="list-style-type: none"> <li>local people not heard directly or without interpretation from consultants or staff</li> <li>powerful lobby groups and highly articulate people get what they want</li> <li>seeing marginalised people as a burden</li> </ul>  |
| <b>Proposing OPTIONS</b>         | <ul style="list-style-type: none"> <li>focus placed on answering "Are there any potentially bridgeable gaps?"</li> <li>ideas are created from nothing within a safe, inclusive and independently facilitated space</li> <li>information from diverse sources is accessible and is used to create new public knowledge</li> </ul>  | <ul style="list-style-type: none"> <li>pre-determined options that lack transparency, inclusivity and fairness</li> <li>having workshops to ask people's opinions but exclude them from critical decision making</li> <li>having different meetings with various groups of people and making decisions across them</li> </ul>   |
| <b>Agreeing the SOLUTION</b>     | <ul style="list-style-type: none"> <li>the agreed solution is the product of deliberative engagement and has super majority (80%) support</li> <li>the decision maker clearly communicates which recommendations they will and won't adopt, and why</li> <li>prototyping, testing and learning prior to full scale implementation</li> <li>decisions that significantly increase trust and build long term commitment to collaboration</li> </ul> | <ul style="list-style-type: none"> <li>rushing to a one-sided, pre-defined or a one size fit's all solution</li> <li>impacted people are unable to see how they influenced the final decision, or the agreed solution is not implemented</li> <li>destructive focus on control and completion</li> <li>decisions that further erode trust and lead to activism or apathy</li> </ul> |

### References

- Conallin, J., Dickens, C., Hearne, D., and Allan, C. (2017) Stakeholder Engagement in Environmental Water Management. In *Water for the Environment: from policy and science to implementation and management*. (Eds. A Horne, A Webb, M Stewardson, B Richter and M Acreman). (Academic Press: Cambridge)
- McKercher, K.A. (2021). *Beyond Sticky Notes*. Cammeraygal Country, Australia ISBN: 9780648787501. (<https://www.beyondstickynotes.com/>) Sticky notes
- IAP2 (2014). *Spectrum of Public Participation* ([www.iap2.org.au](http://www.iap2.org.au))

# MURRAY VALLEY ADAPTIVE ROAD MAP

## MV Stakeholders Concept Plan

### Basin People Connecting Our Rivers and Wetlands

*Social-Ecological outcomes through efficient water use for people and nature.*

#### VISION

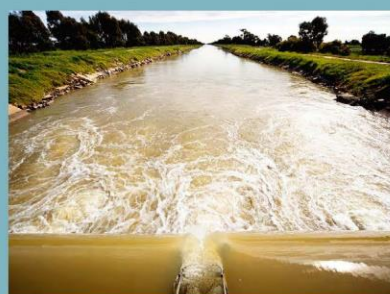
Socially and economically prosperous rural communities incorporating and enhancing major benefits for natural and modified environments through collaborative partnerships and investments in private infrastructure.

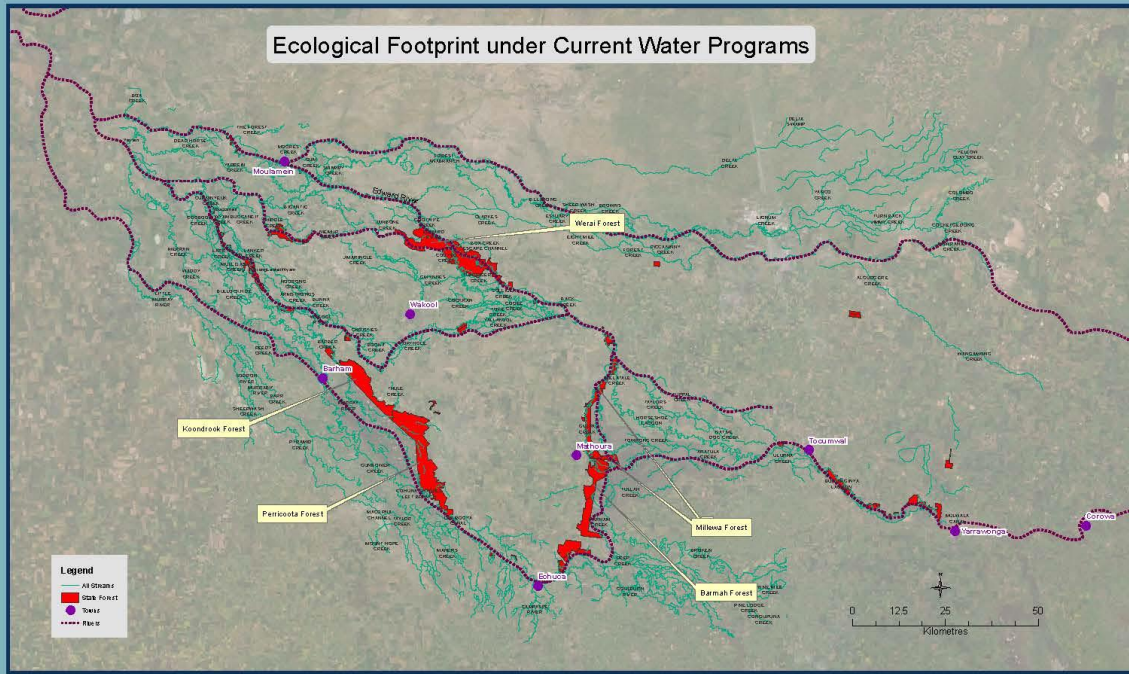
#### MISSION

Increase the ecological footprint of the Murray Valley, through community developed solutions to increase ecological connectivity and water efficiency while decreasing third party impacts.

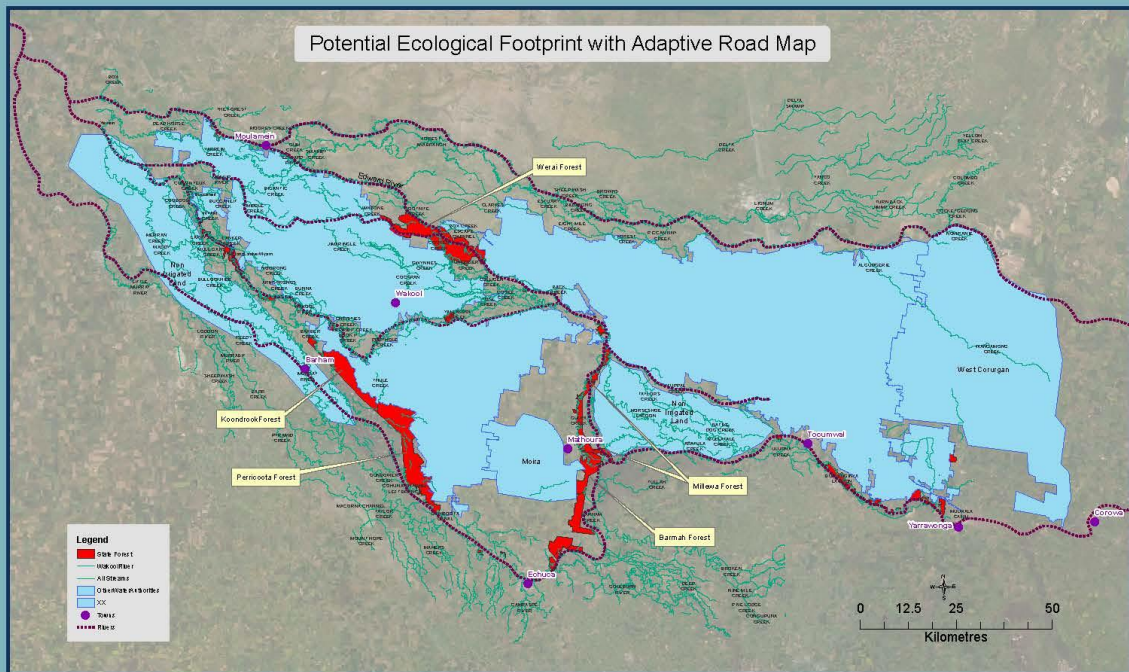
#### GUIDING PRINCIPLES

- The Murray Valley supported Aboriginal people for countless generations and continues to be their basis for cultural and economic well being. We acknowledge this cultural landscape now supports diverse communities across the region.
- A new focus on Community developed strategies, partnering with Governments to efficiently deliver operational and environmental water while maximising the Murray Valley's ecological footprint
- Broaden ecological outcomes and community engagement with environmental water via a new multiple methods approach for the 2750GL as part of the Sustainable Diversion Limit Adjustment Mechanism
- Recognising physical limitations of Murray, Goulburn and Edward (Kolety) River systems and interconnected flood risks
- Understanding the ecological role of consumptive water and private land in the region, and how system changes can negatively impact the ecology of the whole system
- Improved opportunities with Murray Valley's major ecological assets through positive interactive relationships with public/private landholders and local communities
- Work with local stakeholders and affected parties to achieve cooperative solutions for environmental and operational water in the Murray and Edward Rivers system limitations within known ecological and flood risks profiles
- Identifying regional solutions for circumstances when the Darling River is not providing connectivity flows
- Recognition of Murray Valley system limitations and risks of new irrigation demands downstream of the Barmah choke





Ecological footprint (highlighted in green) in the Murray Valley under the current objectives of the Murray Darling Basin Plan and Environmental Watering Programs.  
 Outcomes: 550km<sup>2</sup> and limited public/private partnerships



By utilising private infrastructure broader ecological outcomes are significantly increased through partnership models for public/private land.  
 Outcomes: 11,913km<sup>2</sup> ecological footprint with reduced third party impacts and increased community participation and support.

# MURRAY VALLEY ADAPTIVE ROAD MAP

## Basin People Connecting Our Rivers and Wetlands

*Social-Ecological outcomes through efficient water use for people and nature.*

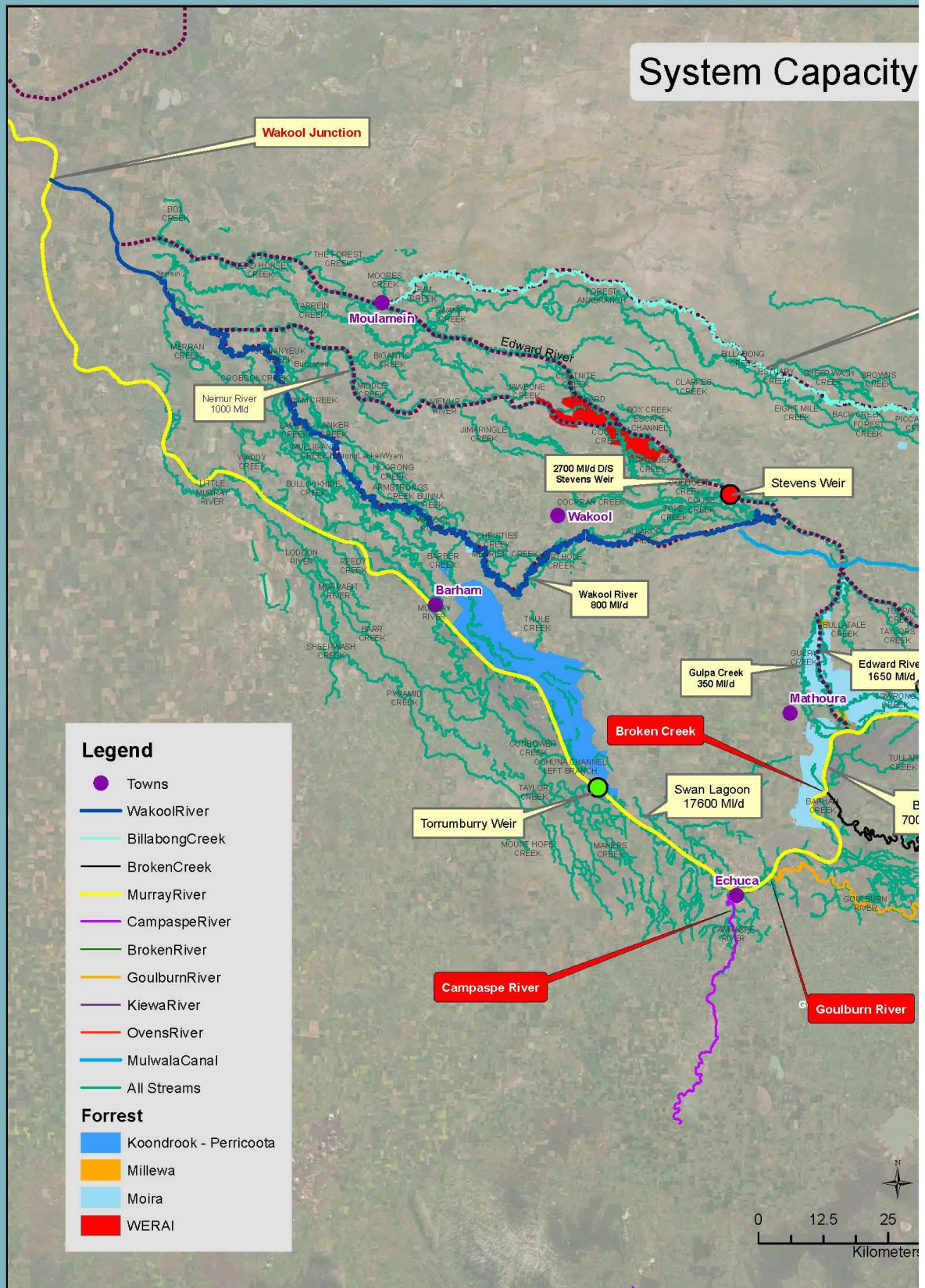
### Partnerships for Pathways to Positive Water Outcomes:

- Review and improve existing water delivery options to maximise environmental and operational outcomes
- Community led partnerships to identify relevant risks and opportunities within the maximum flow limits, identified in the Yarrawonga to Wakool Junction Constraints Management Strategy Business Case (up to 25,000 ML/d)
- Increase opportunities for enhancing and expanding the ecological footprint; delivery of environmental and operational water using private and public infrastructure
- Enabling *Positive Pathways* for Murray Valley people working towards broader ecological goals
- Recognition of the social, cultural, economic and ecological importance of maintenance of base flows and connectivity (native refugia, stock and domestic/irrigation surety)
- Increased partnerships for Government/private monitoring of environmental outcomes.

### Outcomes:

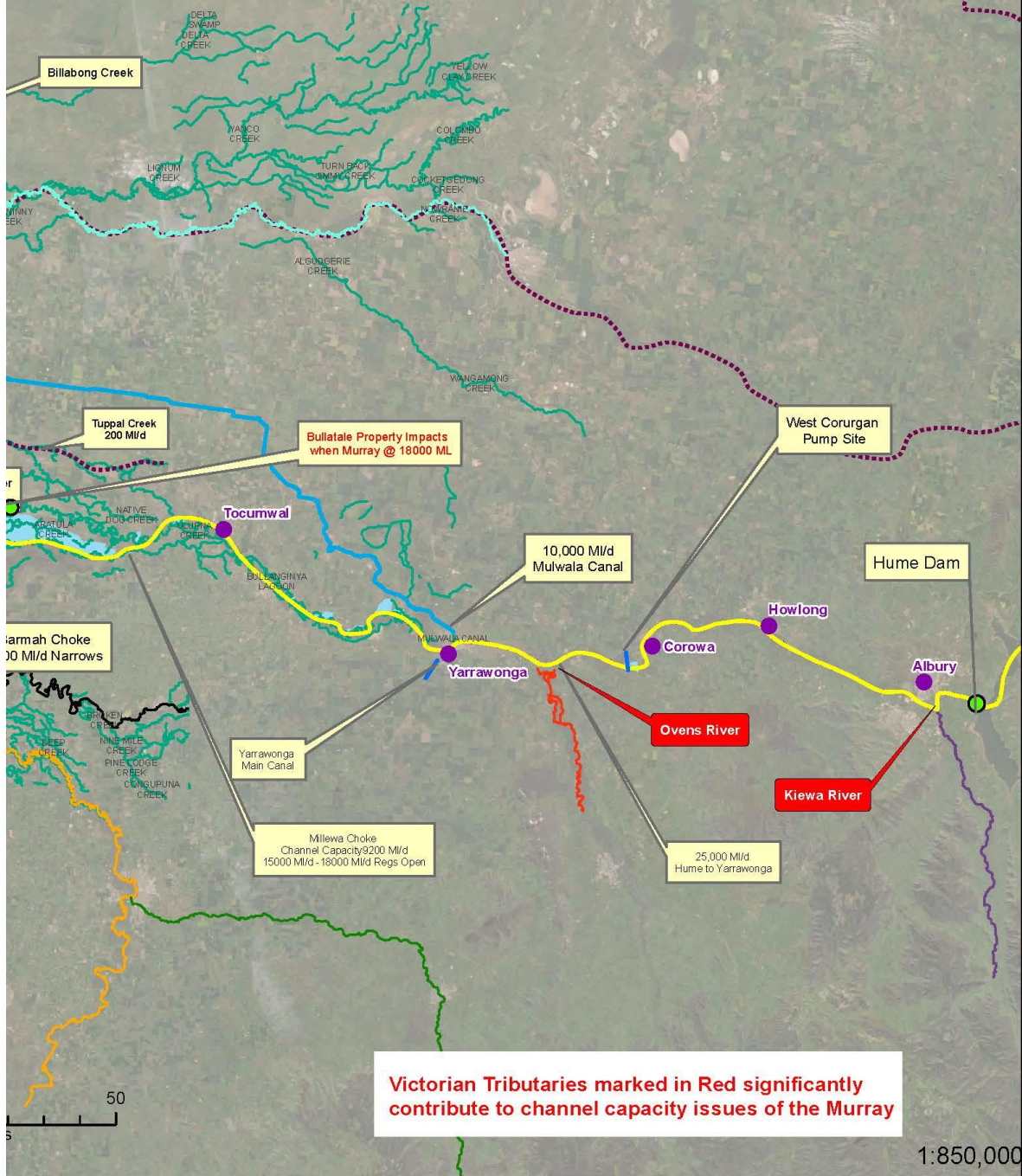
- Increased ecological footprint through waterway and wetland connectivity throughout the Murray Valley and beyond
- Increased efficiencies for delivery of environmental water on private and public lands using irrigation and private infrastructure, including Murray Valley natural creeks
- Delivering existing operational and consumptive water to address system limitations with reduced losses. Enables increased delivery flexibility and multiple timing potential within diverse delivery systems
- Investments will enable increased flexibility and multiple timing options for delivery of existing operational and environmental water with significantly reduced losses
- Building on established models for success; Governments, communities and landholders working together to achieve ecological outcomes
- Murray River Objective and Outcomes Operational Rules must address increased flood risks from Basin Plan flow objectives and limits of the Central Murray Floodplain Plan. This includes timing, frequency and duration of environmental flows.
- Significant cost benefits to Australian Taxpayers through explicit co-designed and agreed measures with affected parties
- Enhancing cultural outcomes through partnerships and holistic water management
- Strengthened regional economic outcomes for the Murray Valley, riparian landholders, General Security irrigators and Tourism operators
- Plan is consistent with Living Murray objectives that identified infrastructure investments as an effective mechanism to deliver environmental with reduce flooding risks.

# System Capacity



# Limits

*By utilising natural waterways, irrigation infrastructure both private and public throughout the NSW Murray Footprint we can increase the ecological footprint dramatically*





## Environmental and Operational Flows – Murray Valley

Multiple natural capacity limits exist in the Murray, Goulburn, Edward/Wakool River systems. Building Community/Government partnerships, valuing local knowledge, recognising risk thresholds and need for adaptive management, is essential to achieving environmental and operational benefits through and within the Murray Valley.

Defining operational and environmental flows is required to avoid third party impacts such as riparian landholders, elevated flooding risks, reliability of Murray General Security entitlement holders, and to appropriately apportion system losses downstream of the Barmah Choke associated with exceeding natural capacities.

- Zone 1 – Hume to Yarrawonga
- Zone 2
  - Murray, Goulburn - Yarrawonga to Torrumbarry
  - Edward River (kolety) offtake - to Stevens Weir
- Zone 3 – Stevens Weir to Wakool Junction

## Regional Flood Risks

Major floods occur from multiple scenarios, including singular or combined sources. Managing zonal flood risks is a critical component for managing environmental flows and achieving community participation. The Murray Valley is subject to unique flood risks through -

- Dartmouth and/or Hume Dam releases
- Victorian catchments conditions, e.g. Ovens River (Vic) unregulated flows merging with the Murray River
- Victorian catchment conditions - Goulburn River (Vic) merging with the Murray downstream of Yarrawonga Weir (if Goulburn and Murray Rivers are in major flood, Murray River flows are naturally directed into Edward/Wakool system via Deniliquin), with overflows also impacting the Wakool and Neimur systems
- Barmah/Millewa and Perricoota/Koondrook forest systems antecedent conditions have the potential to elevate major flood events following environmental watering events, if subsequent significant rainfall occurs, in mountain catchments
- Murray River (Barham capacity limits) – higher or flood flows naturally move north across the floodplain into Edward/Wakool system once channel capacity is exceeded, including flooding of the Koondrook/Perricoota Forest



# Environmental Flow Scenarios

Managing environmental flows in zones 1, 2 and 3 – potential options for community acceptance

- Maintenance of all commercial and base operational flows within existing capacity limits/Barmah Choke rules and natural river bank limitations except where agreement is reached that utilises existing infrastructure.
- Environmental flows and MDBA Pre-requisite Policy Measures (piggy-backing), must be subject to capacity limitations, infrastructure limitations and avoidance of additional flood risks, all conditions required to achieve broad community acceptance
- Zone 1: Hume to Yarrawonga regulated conditions (25,000 ML/d)
- Zone 2:
  - 1) Yarrawonga to Barmah Millewa retain current regulated conditions (15,000 ML/d)
  - 2) Investigate additional flow options for Yarrawonga to Stevens Weir – Murray/Edward/Wakool system for environmental purposes only, not exceeding a combined total Mid Murray flow operational footprint of 25,000 ML/d (operational & environmental)
  - 3) Additional flows above 15,000 ML/d are restricted for environmental flow purposes only and protected to the Murray Mouth (SA)
    - Murray Irrigation offtake – investigate options to deliver environmental flows within channels subject to capacity availability and downstream flow impacts (Edward/Wakool)
    - Yarrawonga -Stevens Weir (Zone 2) – utilise private and in forest infrastructure opportunities to maximise environmental outcomes, subject to all third-party impacts being fully investigated, addressed and flood risk prevention strategies included in all operational requirements including Murray River operating rules and enacted prior to the event being initiated.
- Stevens Weir – Wakool Junction (Zone 3) recognition of restricted flow capacity within zone 3 for Wakool River (800 ML/d), and downstream of Stevens Weir (2,700 ML/d) and Colligen/Niemur River (1,000 ML/d). Investigation of additional infrastructure to maximise environmental flows.



Adaptive Road Map - Concept Plan is an initiative of the Murray Regional Strategy Group - A coalition of water users including: Murray Valley Private Diversers, West Corugan Private Irrigation, Eagle Creek Pumping Syndicate, Southern Riverina Irrigators, Ricegrowers Association Australia, Murray Irrigation Limited, Yarkuwa, Speak Up Campaign. The Murray Valley Adaptive Road Map Concept Plan is supported by Murray River Action Group.

## Community Supported Environmental Flow Options: Mid-Murray

### **CURRENT: Murray River Regulated flow conditions: Yarrawonga to Barmah Choke 15, 000 ML/d release from Yarrawonga is managed within Millewa and Barmah choke limitations by operating NSW & Vic in-forest regulators**

This flow threshold also achieves connectivity within the system for river channels, creeks and low lying wetlands and providing breeding opportunities for biota, and limits risks of third party impacts.

- Further infrastructure investments can increase connectivity between main river channel and low-lying wetlands and off-channel habitats (e.g. Millewa/Gulpa Koondrook/Perricoota, Werai), provide breeding opportunities for instream and wetland biota and encourage dispersal, and establishment of permanent wetlands.
- Utilise public & private infrastructure to enhance options for priority and disconnected wetlands, fish passage and to utilise connectivity between main channels and smaller creeks (e.g regulated creeks and ephemeral systems).

**Late Winter/Spring releases frequency as required – system maintenance.**

### **OPTION 15,000 – 18,000 ML/d additional environmental release from Yarrawonga managed within Millewa and Barmah Forests by operating NSW & Vic in-forest regulators and through additional infrastructure on public and private land**

Flow threshold aimed at a spring pulse to stimulate breeding and dispersal in river and wetland biota, (e.g. flow specialist fish). Pulse event to stimulate breeding of flow dependent fish species and increase connectivity to forest wetlands and reconnection events for low lying wetlands.

- Infrastructure investment required such as, maintaining property access, functions of farm fixtures (e.g. pumps, roads etc).
- Use private infrastructure to maximise river channel connectivity to Edward River and/ or creeks and wetlands and encourage biota breeding and dispersal.

**Late Winter/Spring releases; Non annual and to be negotiated.**

### **OPTION: 18,000 - 25,000ML/d an environmental release from Yarrawonga to achieve significant ecological benefits in Barmah/Millewa, Perricoota/Koondrook, Werai forests and associated wetlands within the system, initially done in 2000ML/day increments from 18000ML/day to assess flooding and associated third party impacts. Investigation for any additional short pulsed environmental flows to a maximum of 25,000 ML/d, is conditional on Governments recognition of antecedent flooding risk conditions to private property, Murray, Edward/Wakool System. Governments must ensure flood risk avoidance to prevent private property impacts in the Murray, Edward/Wakool system**

Flows are aimed at watering of off-channel habitats including key large forest wetland sites (Millewa, Koondrook/Perricoota, Werai.). Regional Flooding risks are significantly increased and must be recognised and prevented, including direct engagement with effected parties.

- Increase connectivity between river channels and forest wetlands, enhance breeding opportunities for river and wetland biota (e.g. wetland fish colonial nesting birds).
- Investigation of additional in-forest infrastructure to maximise environmental outcomes.
- Infrastructure investment required such as, maintaining property access, functions of farm fixtures (e.g. pumps, roads etc).
- Zone 2 & 3 impacts need to be carefully considered and negotiated with relevant parties.

**Late Winter/Spring; Non annual event and to be negotiated.**

### **Non-irrigation Winter Base Flows in main river channels**

These flows are aimed at maintaining connectivity in the larger river channels (e.g. Murray, Edward) within the drying phase period for river banks and wetlands. Encourage breeding of winter active biota (e.g. Murray Crayfish). Consultation with community on timing, duration and frequency to open system infrastructure to allow flowing environments and translucent flows to occur.