



Border Rivers Regional Water Strategy



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Acknowledgement of Country

We acknowledge that today we meet on many Aboriginal lands.

We acknowledge the traditional custodians of the lands and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work.



Today's presentation



NSW water strategy program

Approach to developing the Border Rivers Regional Water Strategy

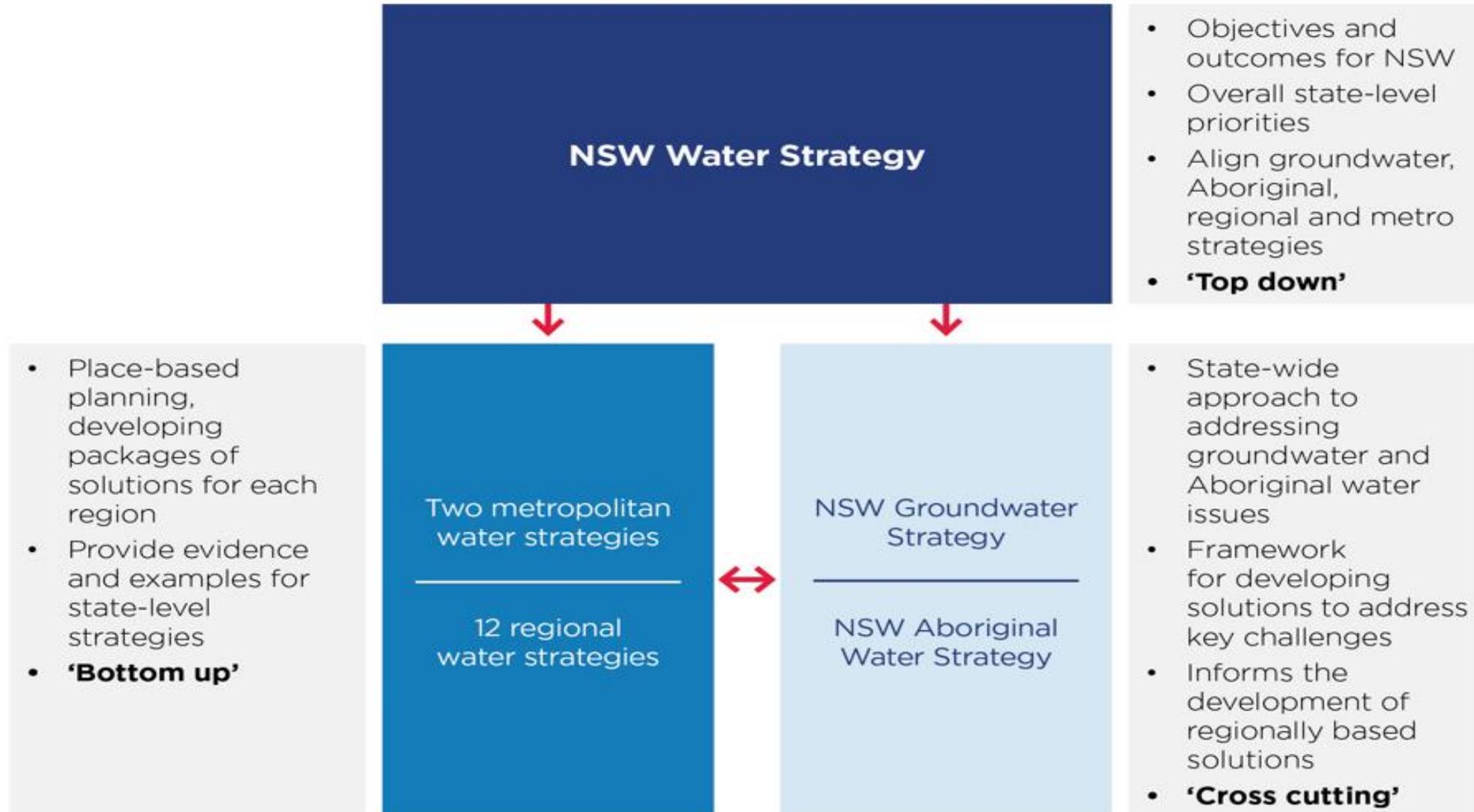
Regional challenges and shortlisted actions

Options that are not being progressed

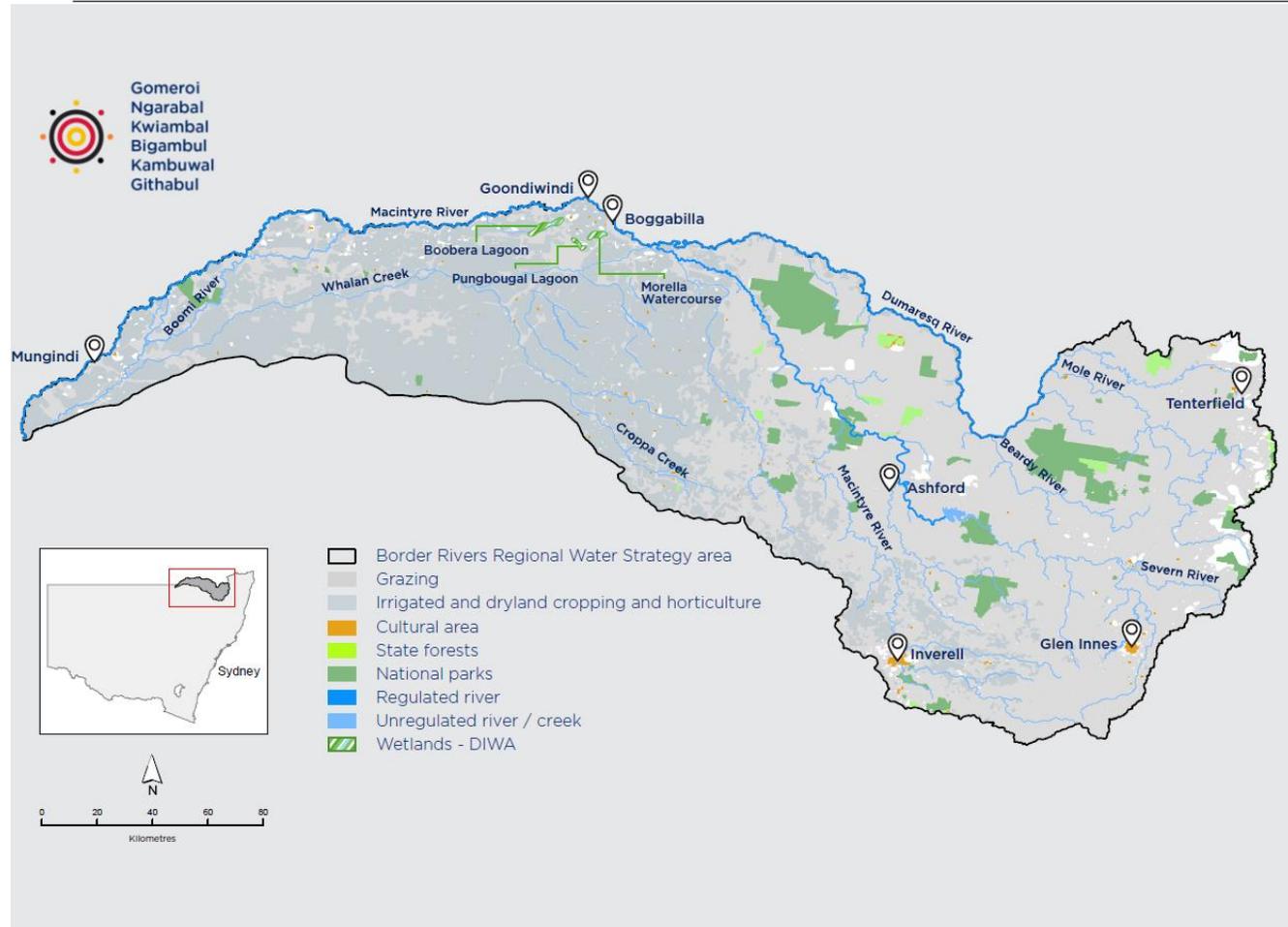
Public exhibition details

Water strategies in NSW

Strategies to improve the resilience of water services and resources in NSW



Border Rivers Regional Water Strategy



- Long-term strategies that inform future water planning and management
- Contain priorities and actions for:
 - towns and communities
 - industries
 - Aboriginal people
 - environment



Approach to developing the Border Rivers Regional Water Strategy

Approach to developing regional water strategies



Process for moving from long to shortlist



Stage 1
Filtering

Does the option help meet a key regional challenge?



Stage 2
Rapid assessments

Does the option effectively meet it's main objective?

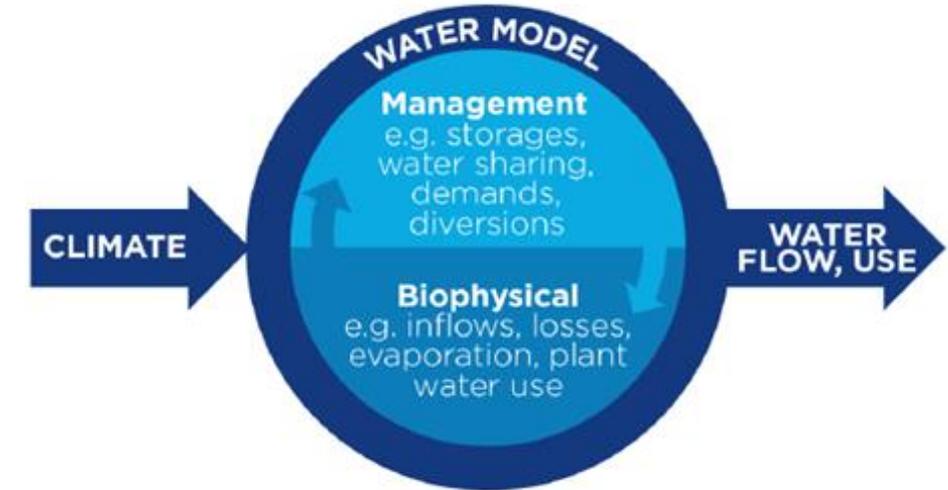
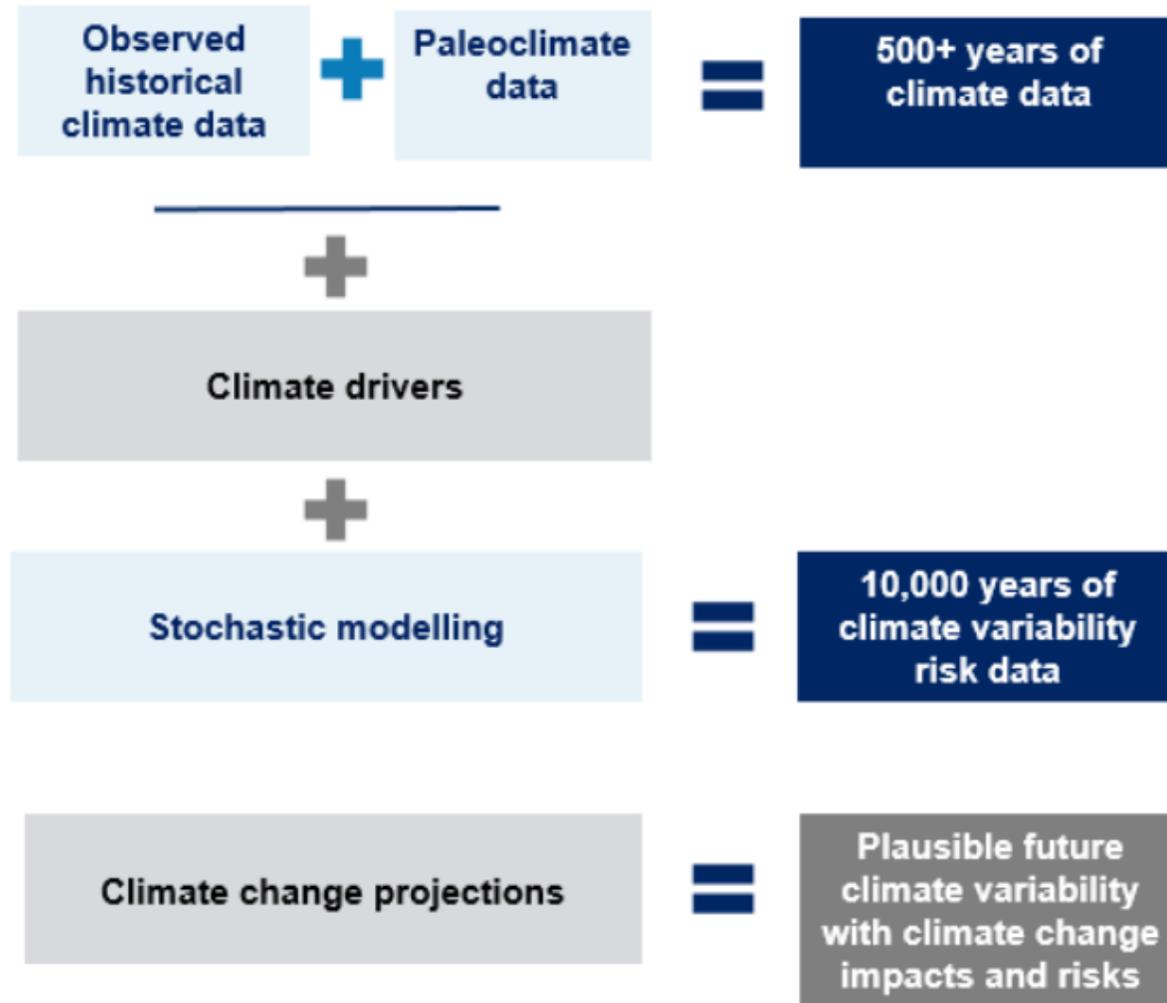


Stage 3
Detailed assessments

Detailed cost benefit and ecological analysis against different climate scenarios

New climate science

Ground-breaking climate science underpins our strategies



We have used the **most conservative** (driest) results from the NARClIM 1.0 data sets

This will stress test the water system and understand a worst-case climate scenario

The scenarios in these models may not eventuate, but it helps us be prepared.

What could the future climate look like?

Long-term climate (paleo-climate)

In the last 100 years, the region has cycled between wet and dry periods.

- 1900s–1950s: comparatively dry
- 1960s – 1990s: comparatively wet
- Since Millennium Drought: comparatively dry

These wet and dry cycles existed before historical records began.

Dry climate change scenario

Seasonal shifts in rainfall

- Reductions in May to July
- Potential increases in March

Higher evapotranspiration

- Largest increases in winter and spring

Higher minimum and maximum temps

- More hot days (temp over 35°C)

Reductions in long-term inflows

Regional challenges and shortlisted actions

Where should we focus first in the Border Rivers region?

Vision

Our vision for the Border Rivers is to support the delivery of healthy, reliable and resilient water resources for a liveable and prosperous region.



Increased surface water security risks for towns in the region



Risk of reduced water availability will impact the regional economy



Dismantling barriers to Aboriginal water rights



Sustaining the health and resilience of natural ecosystems



Improving connectivity to support downstream needs

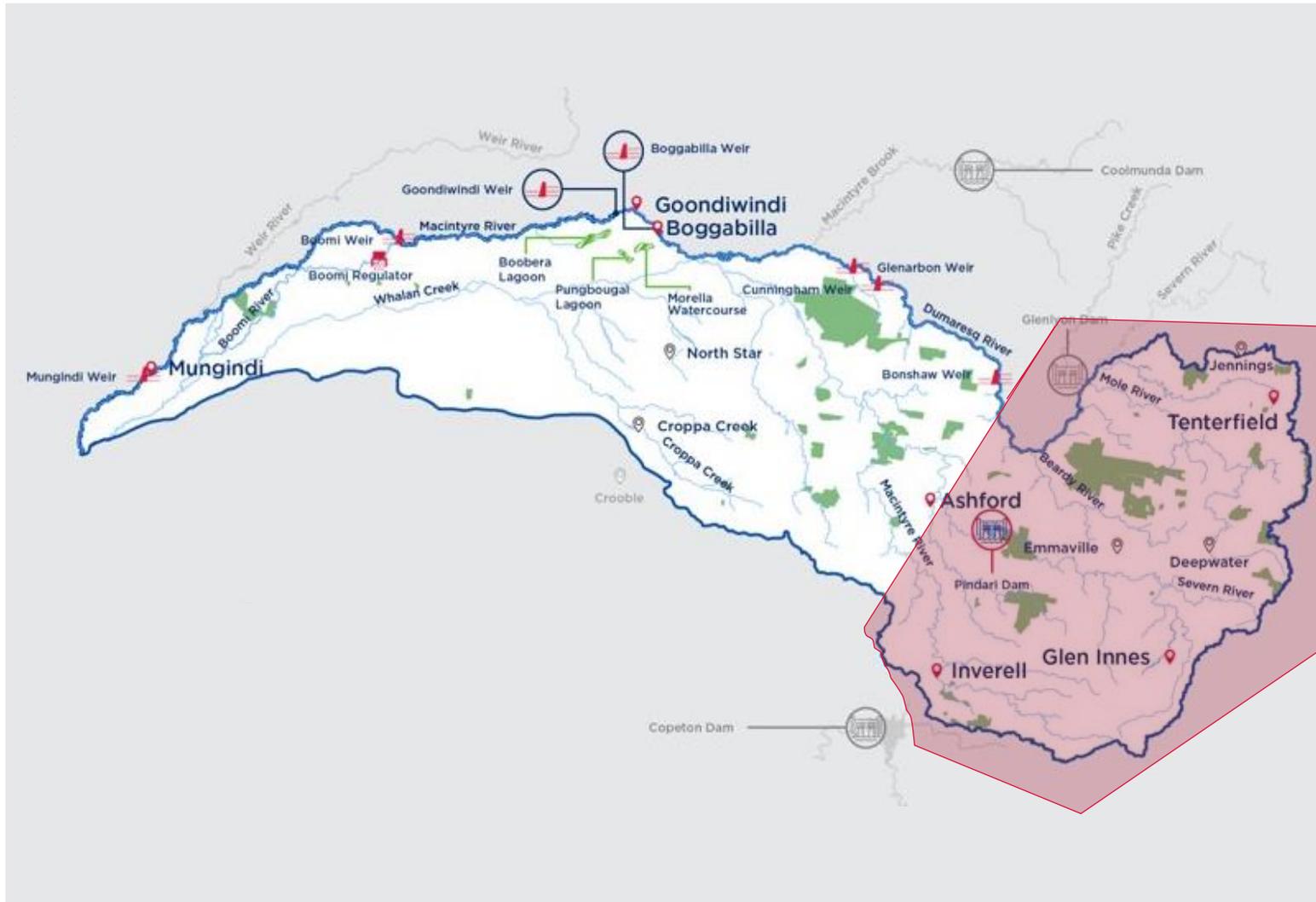


Increased water security risks for towns in the region

Town	Back-up groundwater drinking water supply available?	Surface water supply shortfalls average % of time	
		Long-term climate projection	Long-term worst-case climate change projection
Tenterfield	Yes	2.3%	11.3%
Glen Innes	Yes	0.4%	1.5%
Inverell	Nox	0.0%	0.0%
Ashford	No	0%	0%
Boggabilla	No	0.3%	2.7%
Mungindi	Yes	0.5%	4.2%

Risks are highest for Tenterfield

Secure the domestic water needs of towns - east

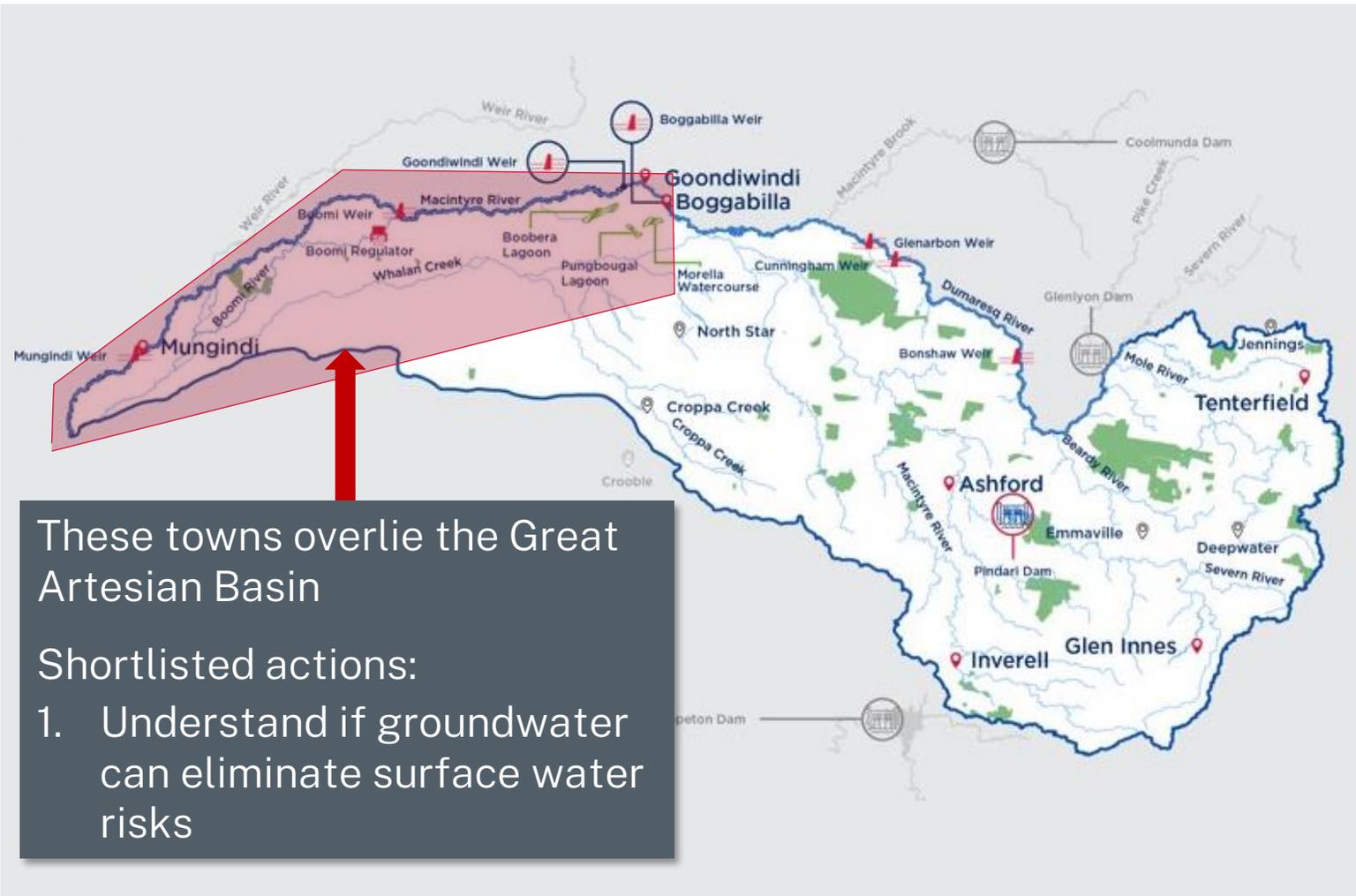


Viability of groundwater as a long-term drought backup is not clear.

Shortlisted actions:

1. Better understand water availability in fractured rock groundwater sources
2. Consider bushfire preparedness in water management planning

Secure the domestic water needs of towns - west



Options considered but not progressed

Infrastructure

Raising Mungindi weir – no improvements to water security for Mungindi and low BCR

Changing water sharing rules

Increasing essential needs reserve from 18 to 24 months

- Reduced but did not eliminate surface water risks.

Groundwater is a better option for towns.



Reduced water availability will impact the regional economy

Boom bust economy that relies on agriculture and water

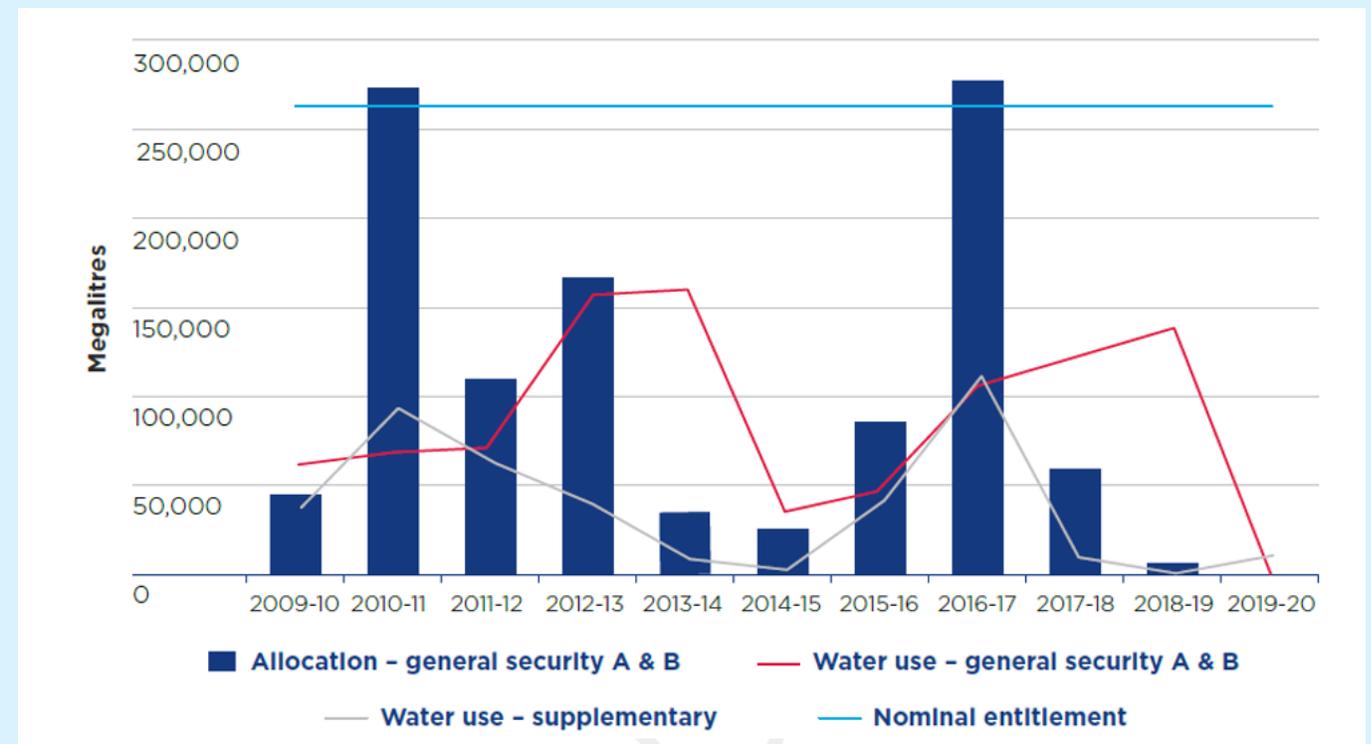
Agriculture is largest employer and contributes 20% to economic output

Limited ability for agricultural diversification

If nothing changes **worst case climate change scenarios** could result in:

- 45% decline in median annual inflows
- Reduction in general security B licence reliability to 10%
- 35% reduction in agricultural economic profit

General security and supplementary water availability and use in the Border Rivers valley 2009/10 to 2019/20



Support the economic future of the region

Shortlisted actions

- **Information and innovation:**
 - Improve public access to climate information and water availability forecasts
 - Support adoption of on-farm water use efficiency measures
- **Agricultural diversification:** Increase availability of high security licences
- **Economic diversification:** Ensure the water management framework can support sustainable economic diversification

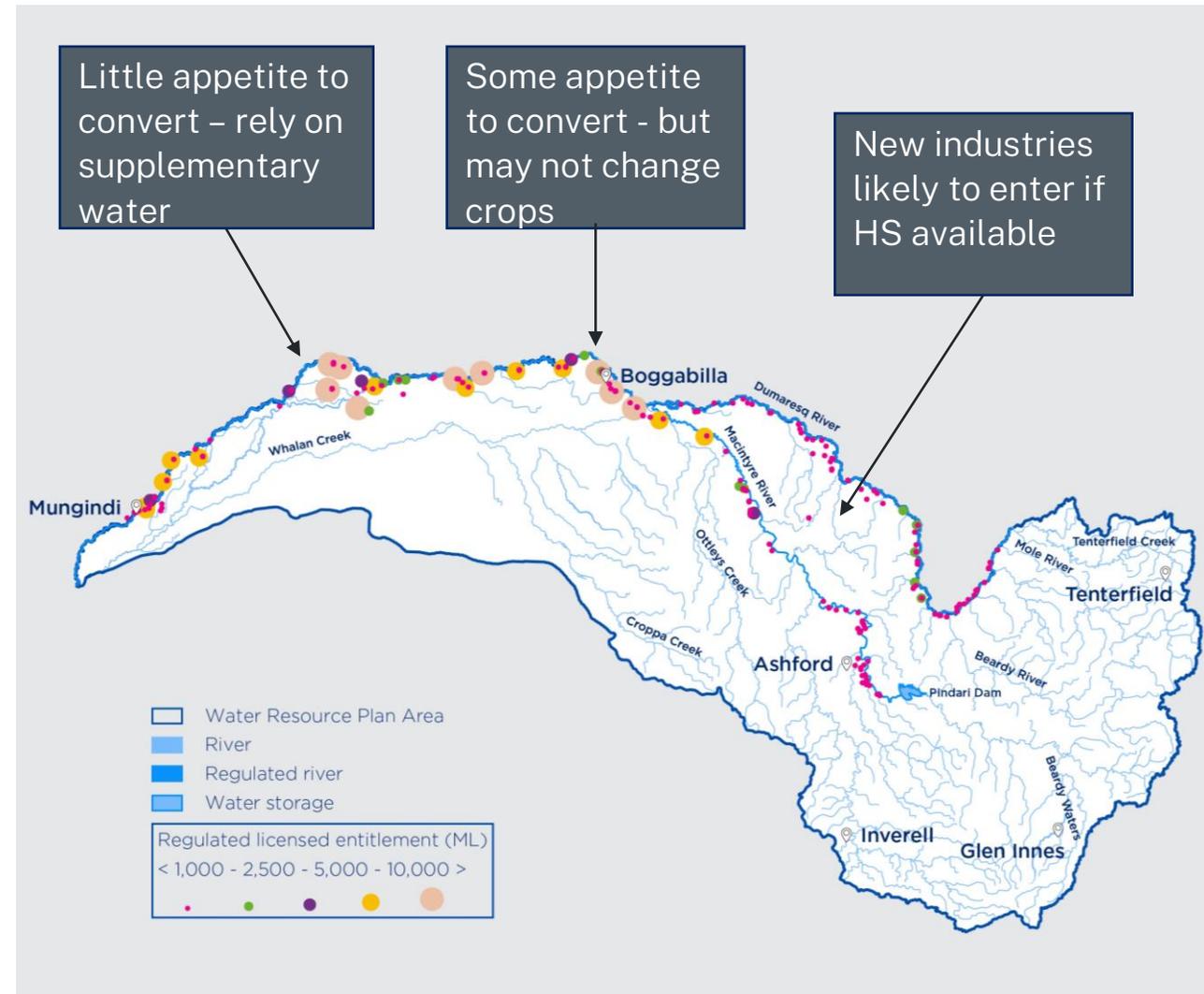
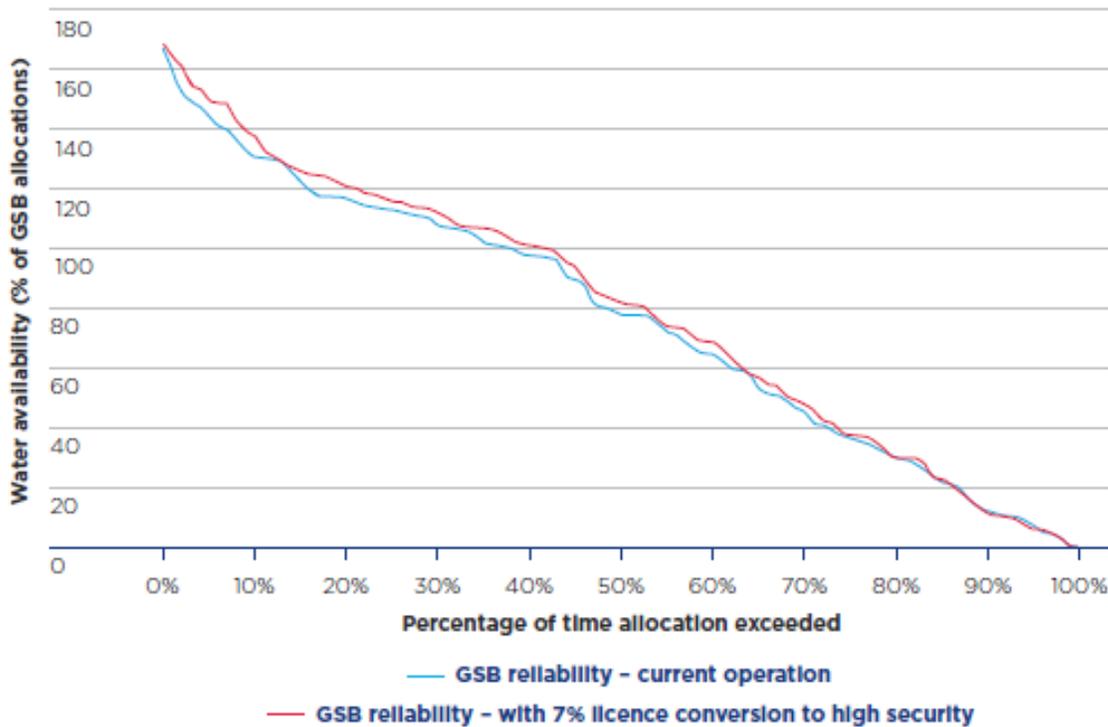
Options considered but not progressed:

- Mole River Dam
- Inland diversion scheme
- Raising Pindari Dam

Significant costs which did not outweigh the benefits of progressing

Increase the availability of high security licences

Impact of conversion of 16 GL (7%) of general security to 4 GL high security licences on reliability remaining general security licences





Dismantling barriers to Aboriginal water rights

'We can't sing our song no more, we can't live on the river no more to look after her, for you all.' (Gomerioi)



- Aboriginal people have lost access to water
- Seek involvement in water consultation processes
- Needs between communities vary

Develop ongoing arrangements for participation of Aboriginal people in water management

Aboriginal communities told us we need to

- Earn their trust
- Acknowledge needs differ between communities
- Adopt flexible approaches that can be driven locally

Improving arrangements will assist implementation other actions:

- Support place-based initiatives to deliver cultural outcomes for Aboriginal people
- Support Aboriginal business opportunities

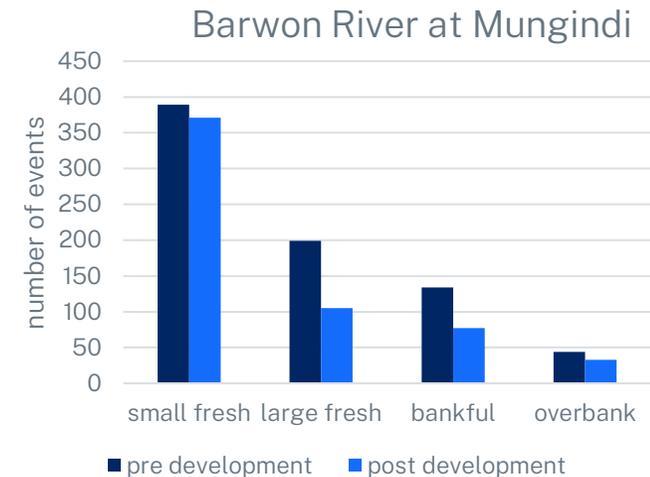
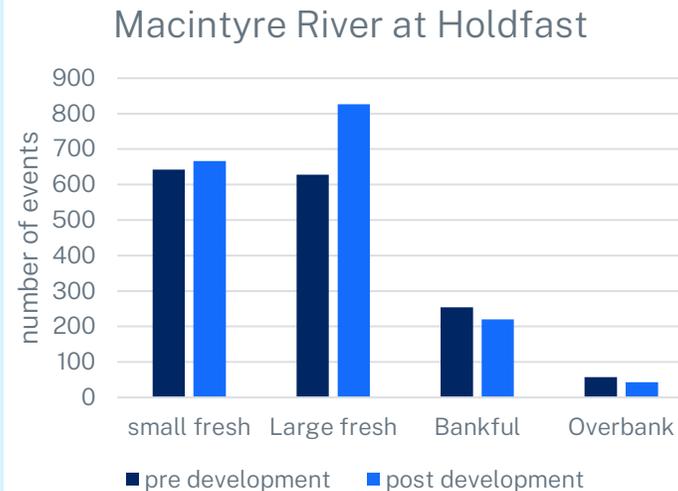




Sustaining the health and resilience of natural systems

- Infrastructure inhibits fish movement and life cycles
- Floodplain wetlands and anabranches rely on large flows
- River regulation has reduced large flows by 50% in the lower catchment
- Climate change could increase risks with 15% - 25% more cease-to-flow events and fewer overbank flows
- **Small amount of licenced environmental water**

Modelled change in number of flow events, pre and post development



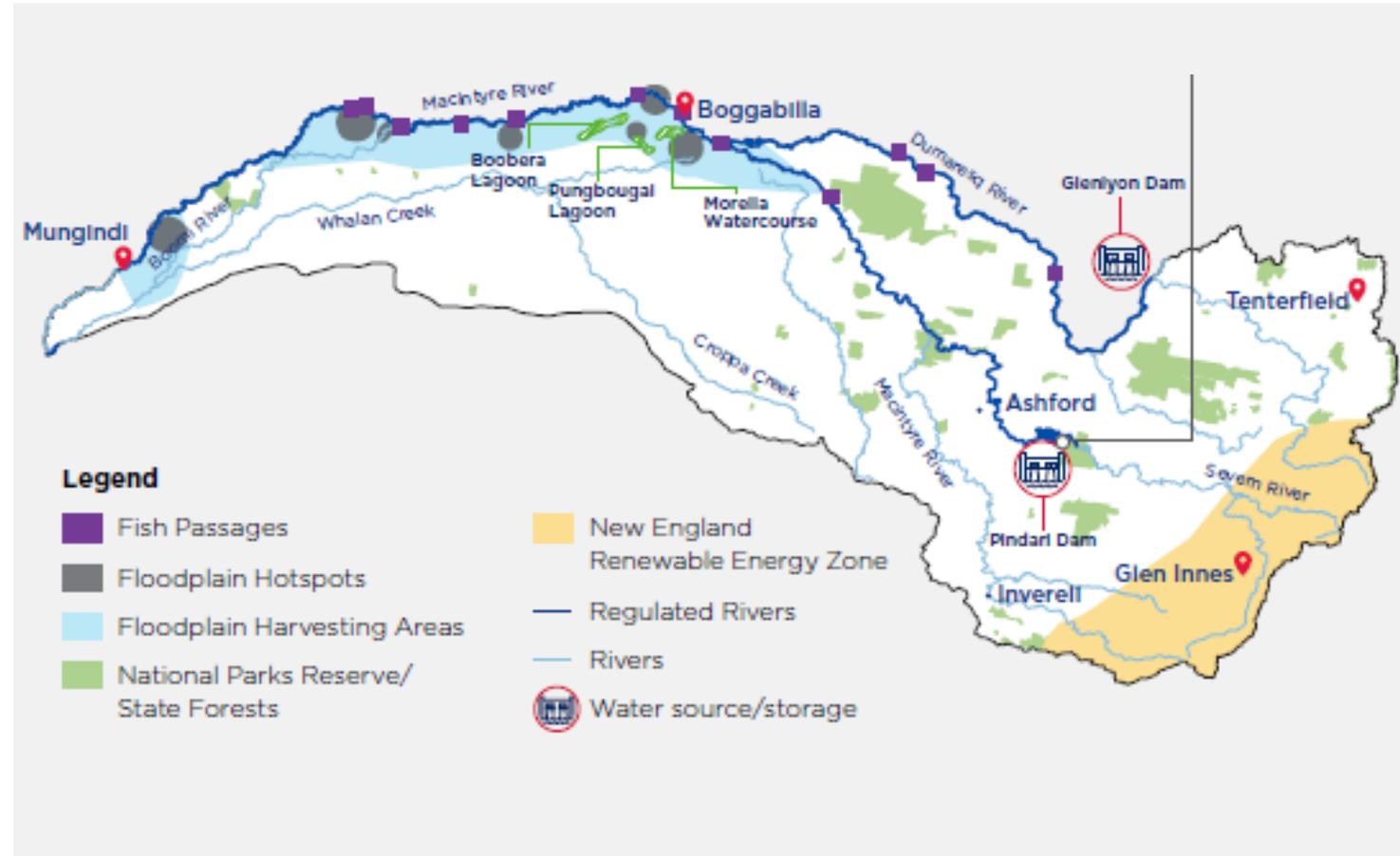
Mitigate the impact of infrastructure on fish

Native fish need to be able to move along water ways to survive and reproduce

- Remediate fish passage at 10 priority sites
 - Opens up 660 km in the Macintyre and Dumaresq rivers

Related actions

- Identify significant riparian, wetland or floodplain reaches to protect or rehabilitate



Coordinate the management irrigation water release and environmental water

All water, including natural events and irrigation release, has potential to contribute ecological condition of rivers and wetlands.

This action will investigate opportunities to:

- understand key gaps in the flow regime
- protect important flows without impacting on water users
- adjust delivery of irrigation orders to match natural flow events more closely.

Related actions

- Identify and address physical barriers to the delivery of water for the environment
- Provide clarity for environmental needs in drought operations

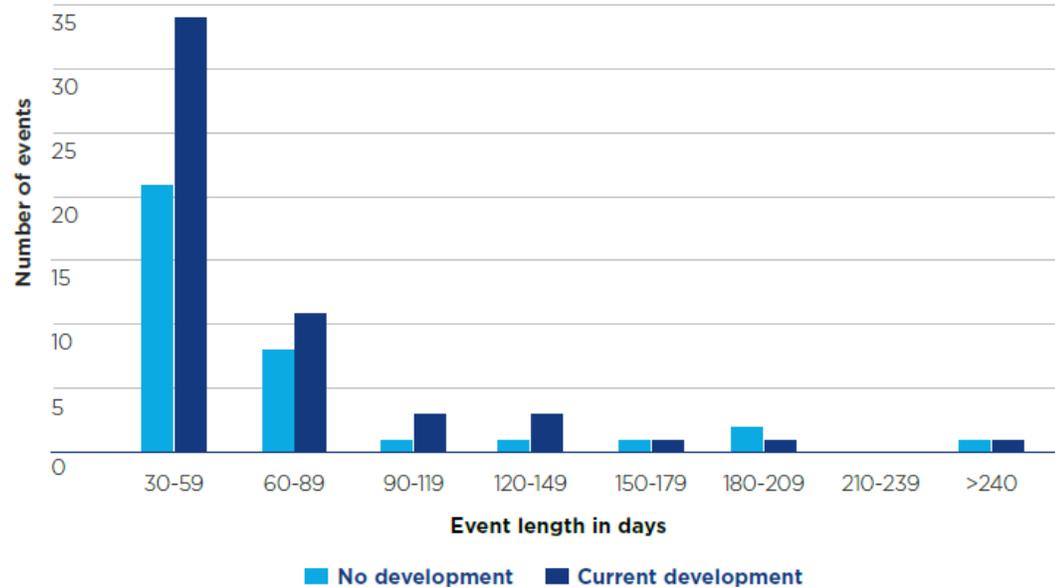




Improve connectivity to support downstream needs

- Barwon-Darling communities rely on water coming in from the Border Rivers
- Border Rivers contributes 20% of Barwon-Darling inflows
- There have always been times when the river has not connected to the Barwon
- Under dry climate scenario flows from Border Rivers into Barwon- Darling could reduce by 40%

Modelled cease-to-flow (<10ML/d) periods at Mungindi



This is being progressed through the Western Regional Water Strategy



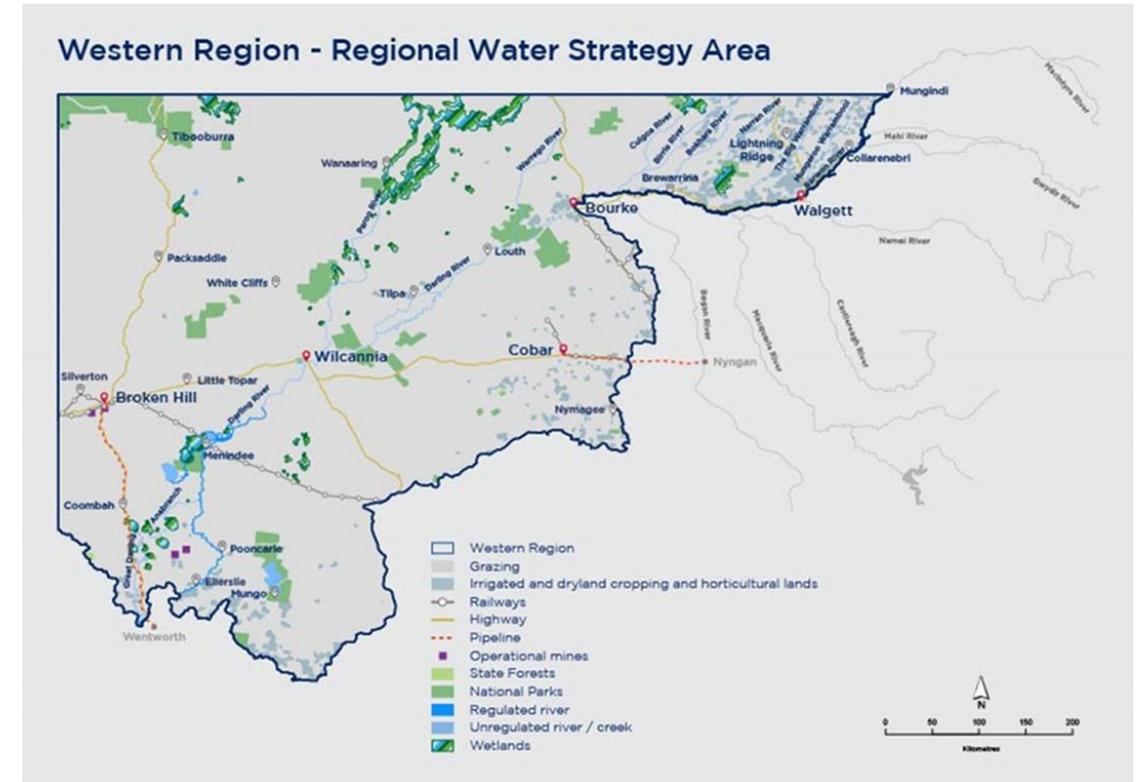
Actions shortlisted to respond to this challenge

- Investigate ways to improve connectivity with the Barwon-Darling River on a multi-valley scale
- Fully implement the NSW Floodplain Harvesting Policy
- Remediate unapproved floodplain structures



Context for connectivity action

- The Barwon-Darling and Lower Darling rely on flows from upstream catchment
 - Border Rivers contributes approx 20 % of Barwon Darling inflows
- Connectivity is important during wet, dry and average years
- Connectivity during extended dry periods is most challenging
 - Water management can influence short cease to flow periods, but not long dry periods
- Some stakeholders believe water is being taken by lower priority licences upstream when downstream needs have not been met



There is no clear agreement on what an acceptable level of connectivity is and how we can improve it

Connectivity objectives – what should we focus on?



Proposed connectivity objectives

- Reduce the impact of cease to flow periods
- Protect the first flush of water after an extended drought
- Support water quality and reduce risk of algal blooms forming
- Support fish migration

The work is not intended to:

- maintain a constantly flowing river
- reduce the overall amount of water being taken out of rivers, consistent with limits set by the Basin Plan
- move productive use of water from one valley to another
- secure connectivity between groundwater and surface water

How can we achieve these objectives?

1. Use emergency powers in the legislation (temporary water restrictions)
2. Change the timing around when licence holders can take water
3. Major reform programs
 - Overhaul water sharing arrangements
 - New or larger infrastructure



Detailed analysis



Long list of options

1. Proposed draft triggers under s324 of the *Water Management Act 2000*

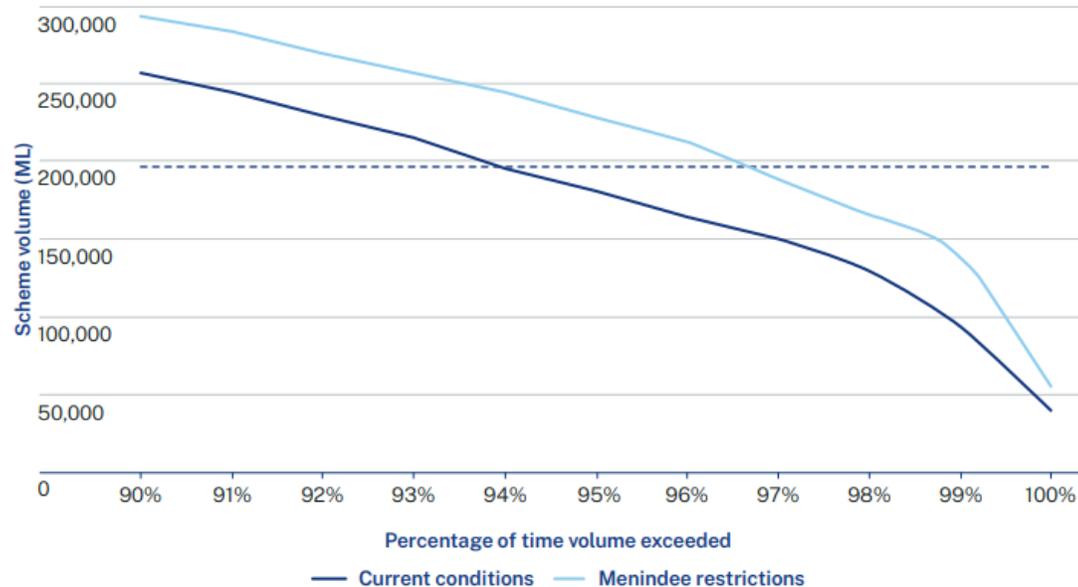


Objective: protect the first flush of water after an extended dry period

	Implementing	Lifting
Wilcannia	Cease-to-flow for 120 days	400 ML/day for 10 days (or 4,000 ML)
Bourke	Cease to flow for 60 days	972 ML/day for 10 days (or 9,720 ML)
Menindee Lakes	<p>Lakes fall below 195 GL</p> <ul style="list-style-type: none"> - Up to 12 months critical human needs - Wetted habitats in Lake Wetherell 	When there is enough water to restart the river
Northern valleys	<p>Stage 4 drought or: cease to flow for 30 days:</p> <ul style="list-style-type: none"> • Border Rivers: below Goondiwindi Weir • Gwydir River : below Yarraman • Macquarie: below Warren Weir • Namoi: below Mollee Weir 	Resumption of flow targets for each of the Northern tributaries

1. Initial analysis of 195GL Menindee target

Menindee Lakes volumes over time when applying restrictions when Menindee Lakes is below 195GL



Region	Reduction in overall water take
Border Rivers	1%
Gwydir	1%
Namoi	1%
Macquarie	No change
Barwon-Darling	Small reduction likely

Modelling assumptions:

- use total Menindee storage (not active) across all lakes.
- Restricted supplementary licences, B-Class licences, C-Class licences when the lakes were below 195GL and lifted when lakes were above 250GL (total storage)
- Data does not include last drought

2. Will restricting lower priority licences help meet downstream connectivity needs?

Target	Trigger for restrictions
<p>Menindee Lakes and Lower Darling</p> <p>Protect the first flush and support drought recovery.</p>	<p>Restrictions could be implemented if Menindee Lakes Storage⁶⁸ is forecast to fall below 195 GL.</p> <p>If releases have ceased below the Menindee Lakes, restrictions would not be lifted until the Lakes were forecast to have enough water to provide up to 12 months of water for human needs and allow the river to be restarted.</p>
<p>Northern Valleys</p> <p>Protect the first flush and support drought recovery.</p>	<p>Cease to flow for 30 days:</p> <ul style="list-style-type: none"> • Border Rivers: below Goondiwindi Weir • Gwydir River: below Yarraman • Macquarie: below Warren Weir • Namoi: below Mollee Weir. <p>Resumption of flow triggers are being developed for each of the Northern tributaries for lifting restrictions.</p>
<p>Algal suppression</p> <p>Preserve a flushing flow event to break up and disperse algal blooms.</p>	<p>To achieve a flow of 3,000 ML/day for 7 days at Wilcannia if flows are below the following triggers throughout the spring/summer period:</p> <ol style="list-style-type: none"> Walgett – 250 ML/d Brewarrina – 510 ML/d Bourke – 450 ML/d Wilcannia – 350 ML/d.
<p>Fish migration</p> <p>Preserve events needed for fish dispersal, spawning, and migration at appropriate times of the year.</p>	<p>Achieve the following:</p> <ul style="list-style-type: none"> • Dispersal and condition: 15,000 ML/d for 15 days at Bourke between July and September • Spawning: 15,000 ML/d for 15 days at Bourke between October and April • Migration: 14,000 ML/d for 15 days at Brewarrina between October and April. <p>These targets will be revised once fishways are installed.</p>

We have looked at:

- Flows needed to meet connectivity objectives
- Whether changing the timing of water taken by lower priority licences helps improve downstream needs
- High level impact analysis

2. Will restricting lower priority licences help meet downstream connectivity needs?

Objective	Effectiveness in meeting objective	Impacts on diversions over the long term
Reduce impact cease to flow	N/A	N/A
Protect first flush	<p>✓</p> <p>3% reduction in time Menindee Lakes is below 195GL</p>	<p>Initial estimate of potential change in overall water taken by licences: Border Rivers: 1% reduction</p>
Algal suppression	<p>✓</p>	<p>Changes in total long-term diversions: Border Rivers: 4% reduction</p>
Fish migration	Minimal benefits	

Options not progressed

Analysis outcomes for major infrastructure

Costs outweighed benefits

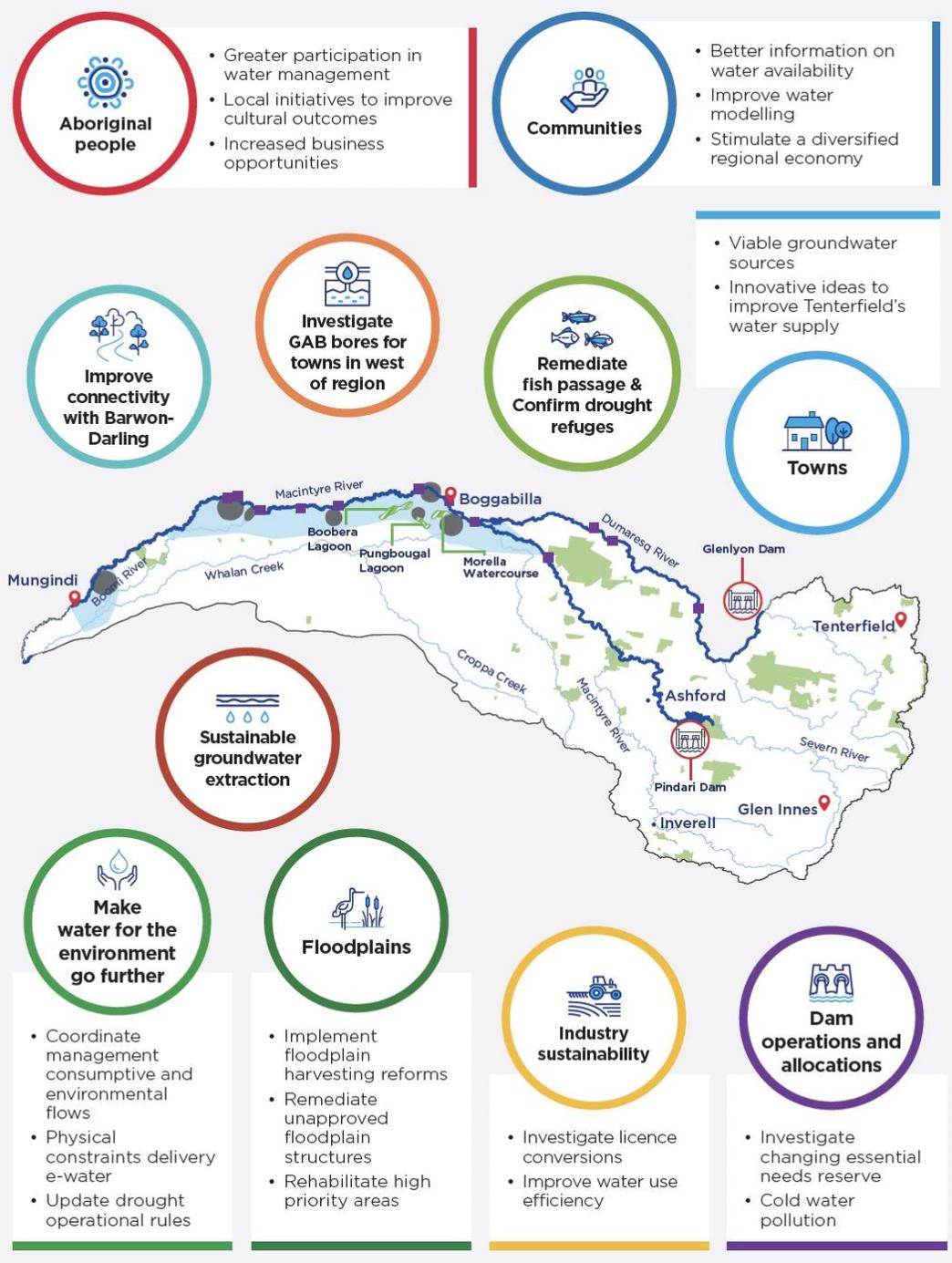
Option	Net present value	Benefit cost ratio
Raise Pindari Dam (10 m)	> - \$300 million	<0
Increase capacity Mungindi Weir	> - \$54 million	<0
Inland diversion into Mole River	>- \$ 4 000 million	<1*
Inland diversion into Pindari Dam	> - \$1 000 million	<0.1

* Assumes all water used for high licences

The long list contained 54 options

- 29 options shortlisted into 21 proposed actions
- 16 options are being progressed through other processes
- 7 options not progressed

Next steps



We are seeking your feedback

- Do you support the shortlisted actions?
- Are there options that did not make the shortlist that you think should have?
- How should government prioritise the implementation of the shortlisted actions?
- How do you want to be involved in the implementation of actions?
- Are there existing initiatives that would support delivery of any actions?

Public exhibition

There are different ways to have your say

1 June to 29 June

Public information sessions

Webinar 21 June

Visit our website for more details
www.dpie.nsw.gov.au/border-rivers-regional-water-strategy

Final strategy - end 2022

 <p>Interactive map Explore and comment! Our interactive map gives you the opportunity to comment on shortlisted actions for the Border Rivers region in a simple and fun way.</p> <p>Get started</p>	 <p>Aboriginal water actions Provide comments on proposed actions to improve Aboriginal water outcomes</p> <p>Get involved</p>	 <p>Make a formal submission Download a form or submit online</p> <p>Start your submission here</p>
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Questions