Western Projects

Regional Water Strategy
Water Sharing Plan amendments
Floodplain Harvesting licencing

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NSW GOVERNMENT

What will we cover today?

Part 1: Draft Western Regional Water Strategy (this morning)	
What are regional water strategies?	1
New climate data sets and modelling	2
Key regional challenges and options	3
Next steps	4
Part 2: Water sharing plan amendments (this afternoon)	
Barwon-Darling Water Sharing Plan amendments	5
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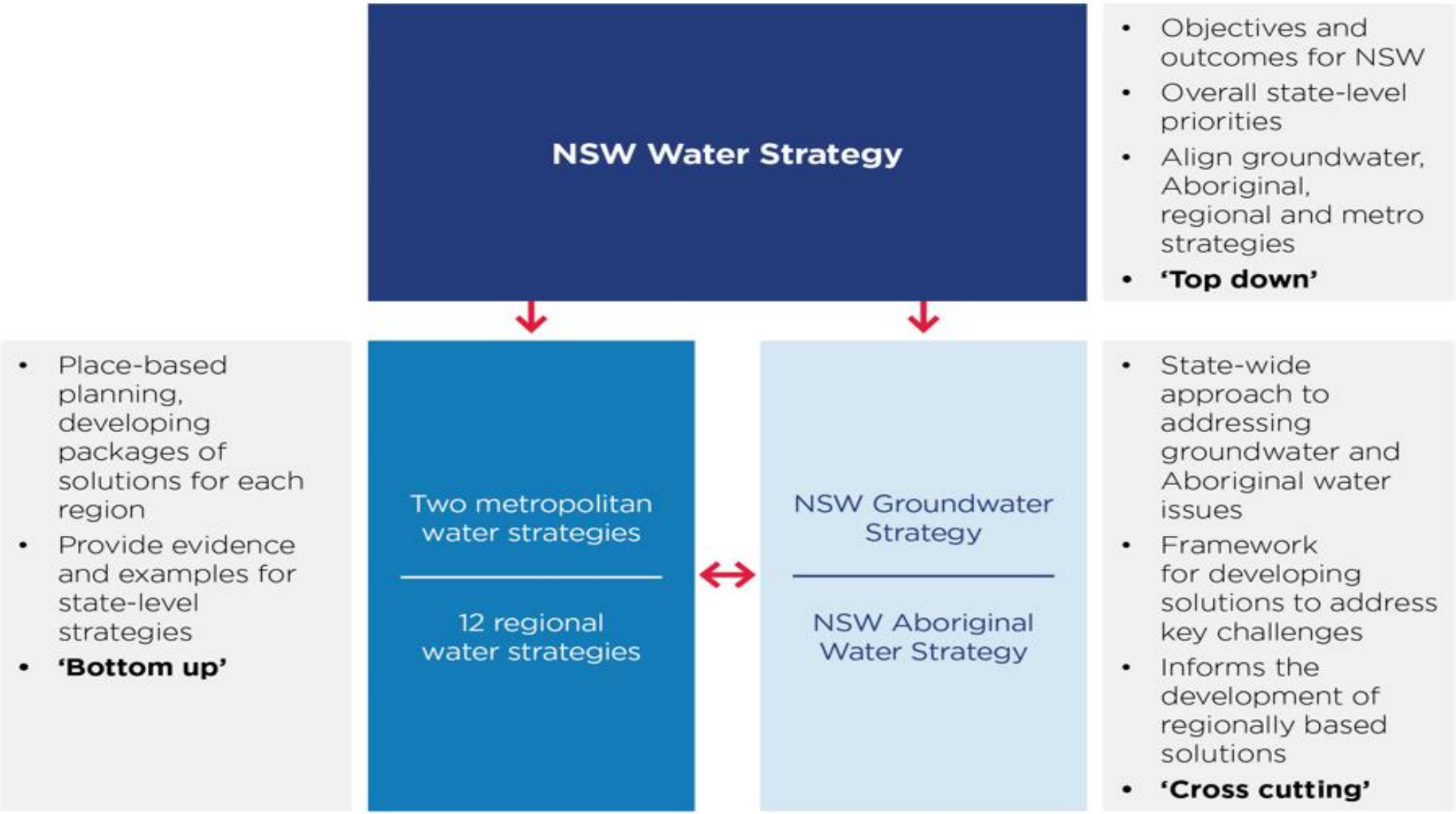
What are regional water strategies

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



Regional Water Strategies

Support the delivery of healthy, reliable and resilient water resources for liveable and prosperous regions

- Long-term strategic plans for the region
- Non-Statutory
- May trigger a review or an amendment to the NSW water sharing plans and water resource plans in the future

Deliver and manage water for local communities

Improve water security, water quality and flood management for regional towns and communities.

Enable economic prosperity

Improve water access reliability for regional industries.

Recognise and protect Aboriginal water rights, interests and access to water

Including Aboriginal heritage assets.

Protect and enhance the environment

Improve the health and integrity of environmental systems and assets, including by improving water quality.

Affordability

Identify least cost policy and infrastructure options.

New climate data and hydrological modelling

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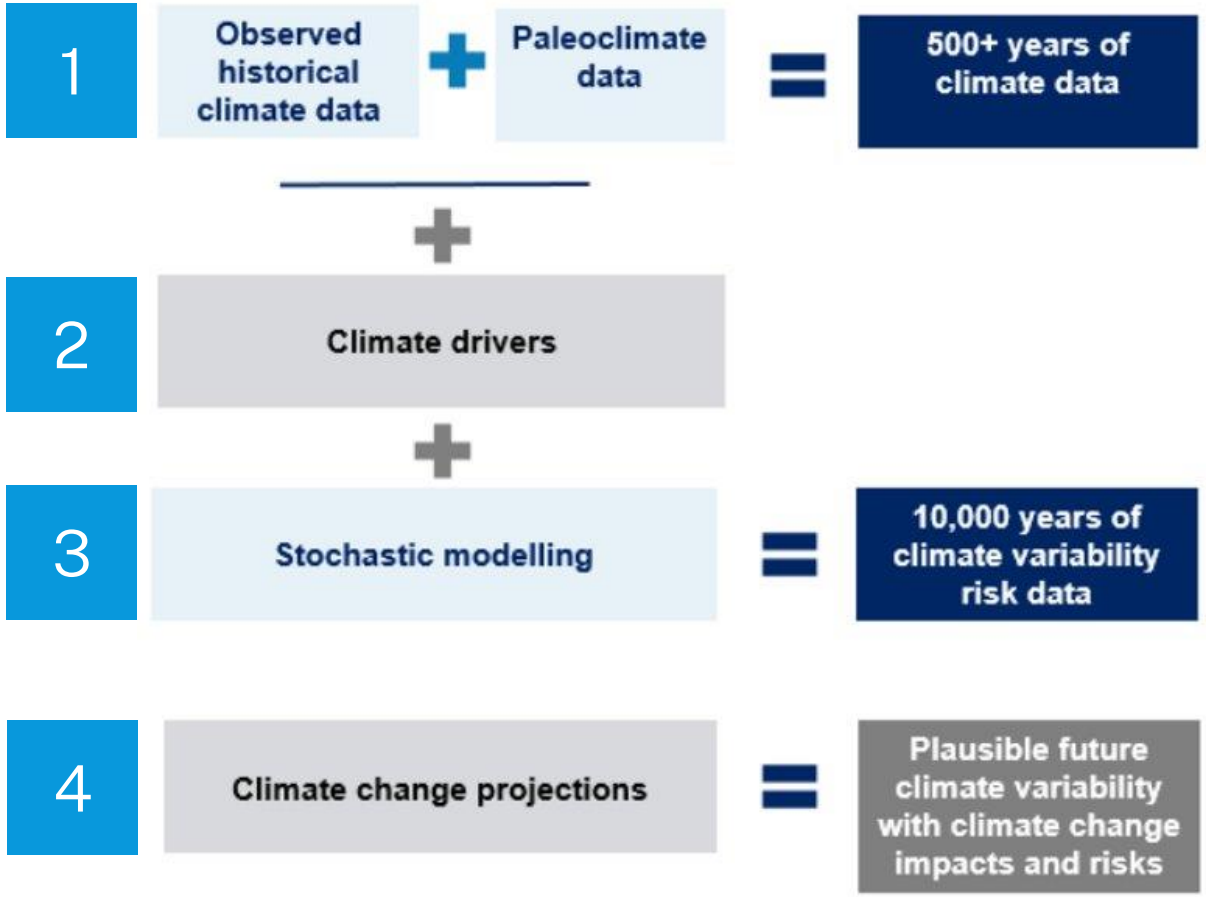
New climate science underpins our strategies



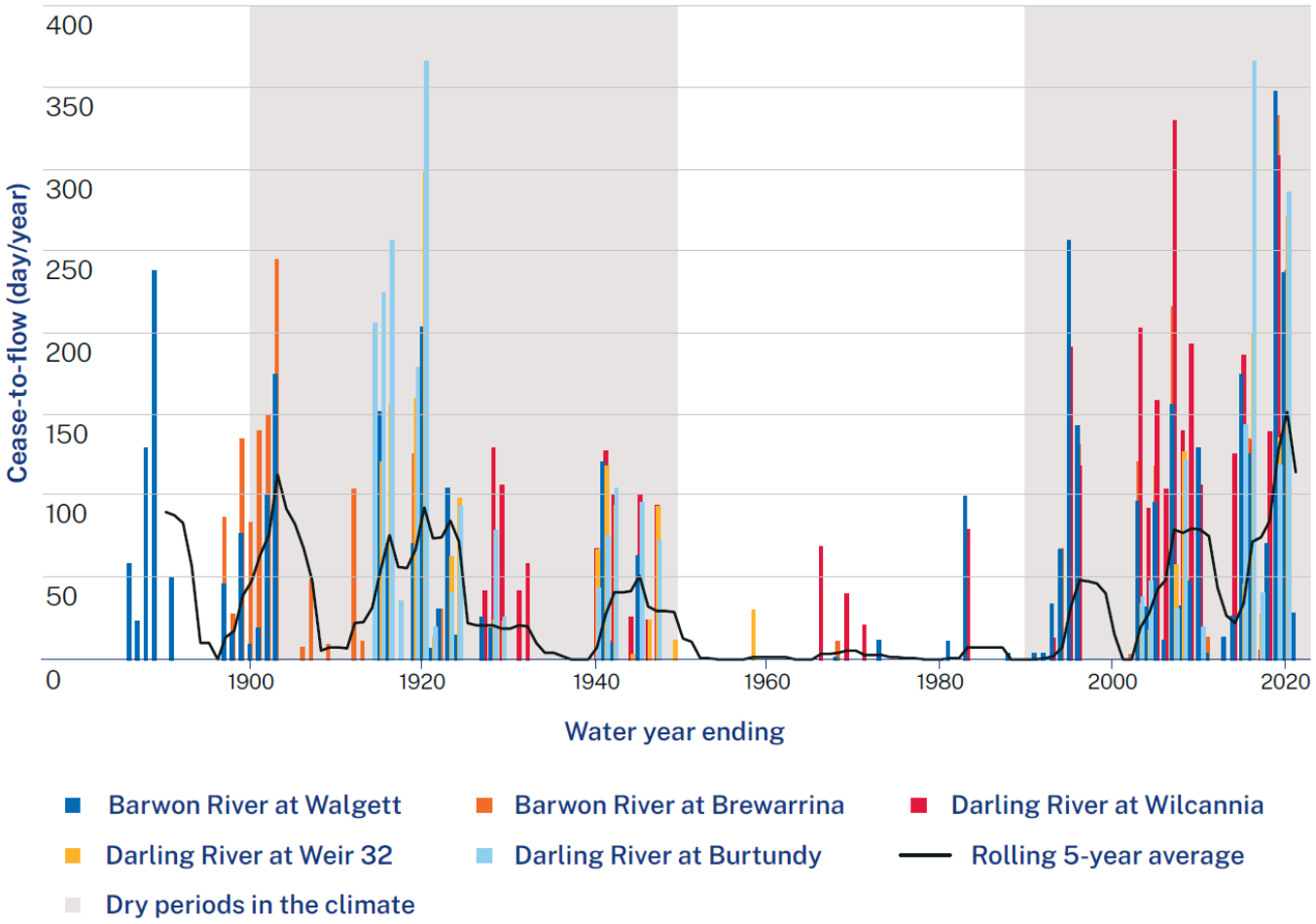
Using climate change projections

We have used the **most conservative result** from NARCliM 1.0 in our modelling

This scenario may not eventuate. But it helps us stress test the water system for strategic water planning.

What we know about the climate over the last 130 years

Number of cease-to-flow days per year at different locations on the Barwon–Darling



Historical data

The region cycles between wet and dry periods.

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

The river has stopped frequently during dry periods in our climate.

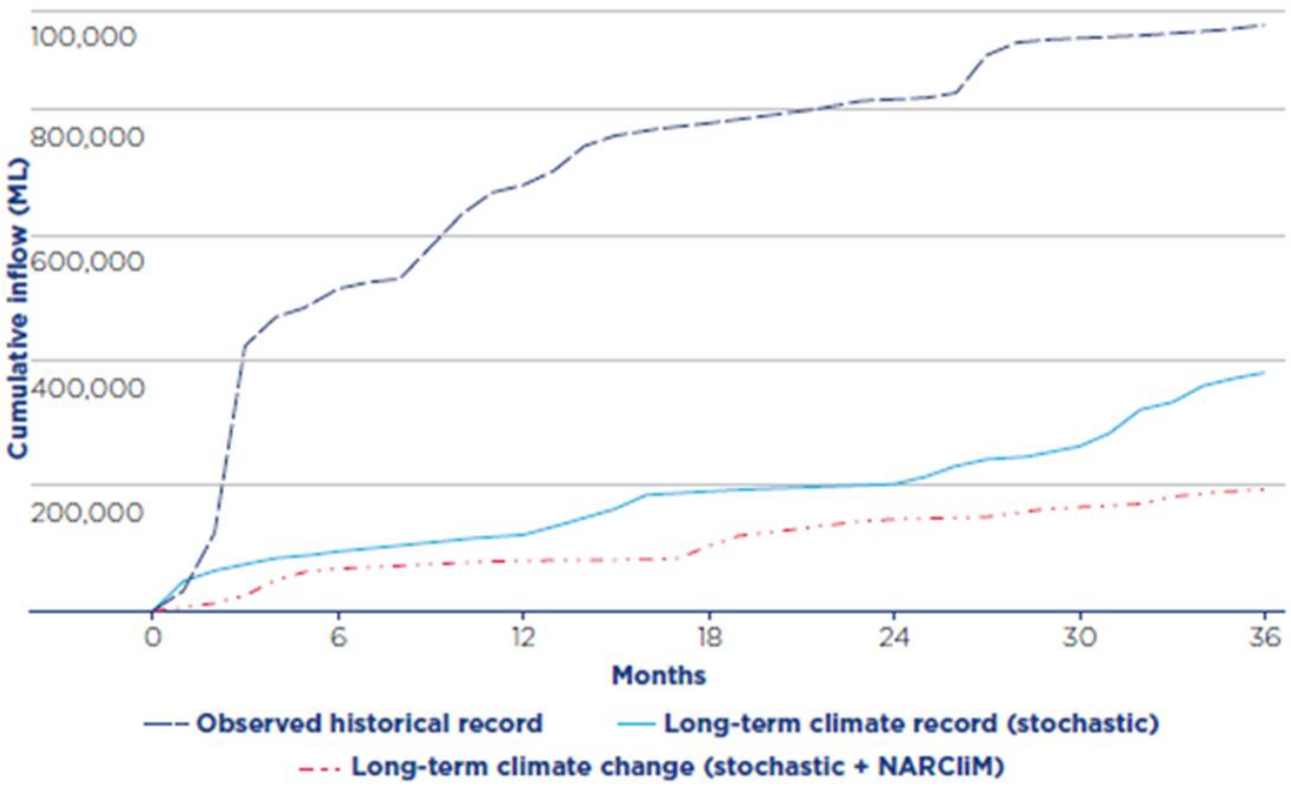
Future climate risks

Paleo-climate data:

- The region has always had wet and dry cycles

Worst case climate change scenario

- Changes in rainfall patterns and higher evaporation
- Fewer times when Northern Valleys connect with Barwon-Darling
- Median annual inflows could be 42% lower when compared to long term historical climate projections



NSW/ QLD inflows into the Barwon-Darling

The climate change scenario is a bookend scenario and may not occur

Key challenges and options

3

Key challenges

- Declining water security for towns and small communities
- Insecure water supplies affect the viability of businesses
- Aboriginal People have lost access to water
- Protecting and enhancing natural systems
- Reduced connectivity impacts critical needs
- Poor water quality

Barwon-Darling River at Bourke

Reduced connectivity impacts critical needs

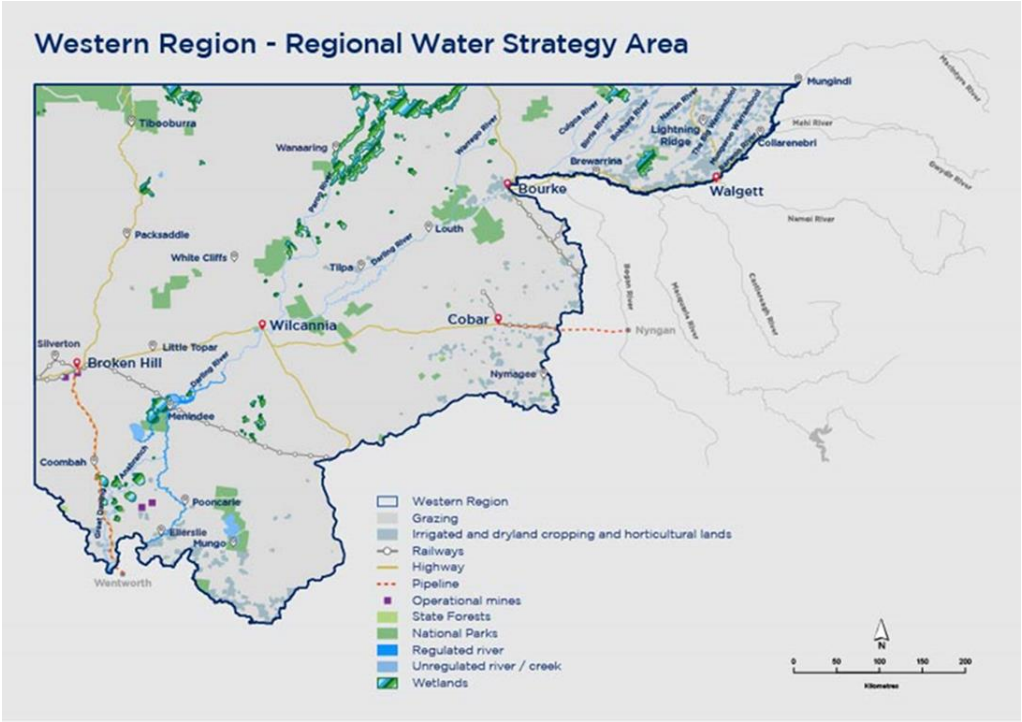
The Barwon-Darling and Lower Darling rely on flows from upstream catchments

- Over 90% of flows originate from upstream valleys – mainly during high flow periods

Connectivity is important during wet, dry and average years

Connectivity during extended dry periods is most challenging.

- The river naturally stops flowing from time to time.
- Water management tools have limited influence in extended dry periods
- Climate change could mean more extreme wet and dry periods



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 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 limits set by the Basin Plan
- move productive use of water from one valley to another
- secure connectivity between groundwater and surface water

Do you agree with these objectives?

How can we achieve these objectives?

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

Detailed analysis on these

Long list of options

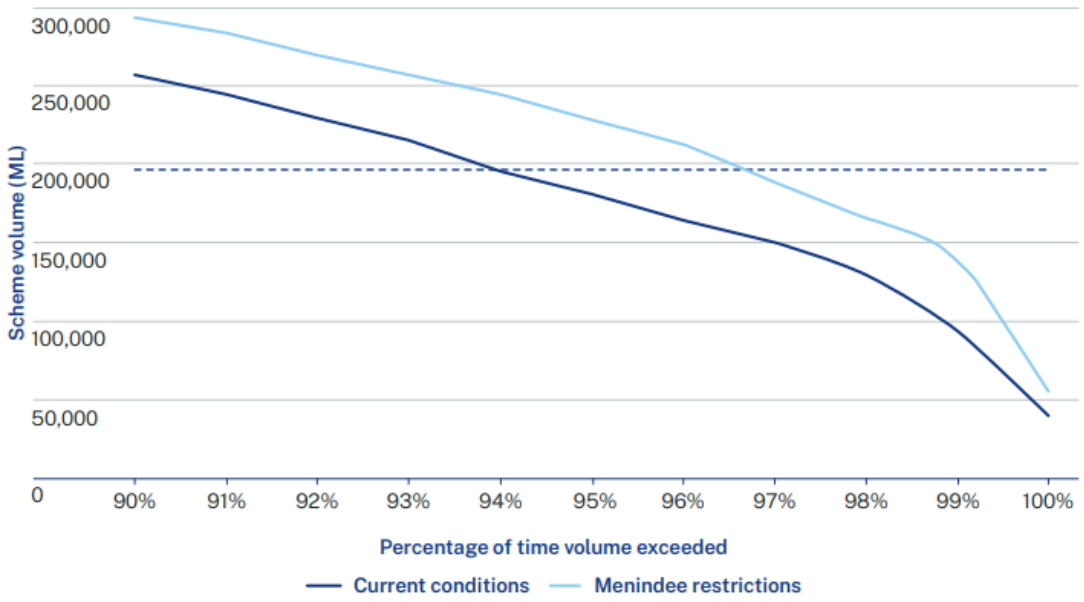
1. Proposed draft triggers under s324 of the *Water Management Act 2000*

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	**Lakes fall below 195 GL** - Up to 12 months critical human needs - Wetted habitats in Lake Wetherell	When there is enough water to restart the river
Northern valleys	Stage 4 drought or: cease to flow for 30 days: • 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
Menindee Lakes and Lower Darling Protect the first flush and support drought recovery.	Restrictions could be implemented if Menindee Lakes Storage[68] is forecast to fall below 195 GL. 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.
Northern Valleys Protect the first flush and support drought recovery.	Cease to flow for 30 days: • Border Rivers: below Goondiwindi Weir • Gwydir River: below Yarraman • Macquarie: below Warren Weir • Namoi: below Mollee Weir. Resumption of flow triggers are being developed for each of the Northern tributaries for lifting restrictions.
Algal suppression Preserve a flushing flow event to break up and disperse algal blooms.	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: a. Walgett – 250 ML/d b. Brewarrina – 510 ML/d c. Bourke – 450 ML/d d. Wilcannia – 350 ML/d.
Fish migration Preserve events needed for fish dispersal, spawning, and migration at appropriate times of the year.	Achieve the following: • 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. These targets will be revised once fishways are installed.

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	✓ 3% reduction in time Menindee Lakes is below 195GL	Initial estimate of potential change in overall water taken by licences: Gwydir: 1% reduction Namoi: 1% reduction
Algal suppression	✓	Changes in total long-term diversions: Gwydir: 3% reduction Namoi: 3% reduction
Fish migration	Minimal benefits	

2. Can general security held environmental water help meet downstream needs?

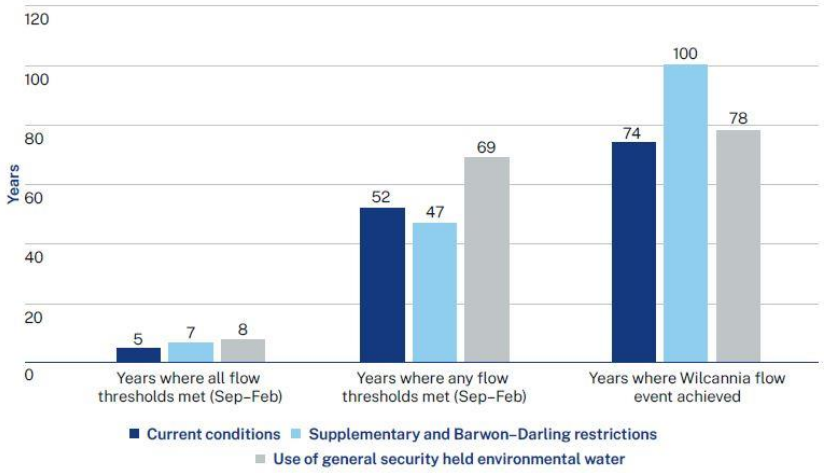
Results are mixed

- Held environmental water: could help meet lower flow targets, but limited by volume.
- Restrictions on supplementary licences: could help meet higher flow targets but the timing may not align with needs

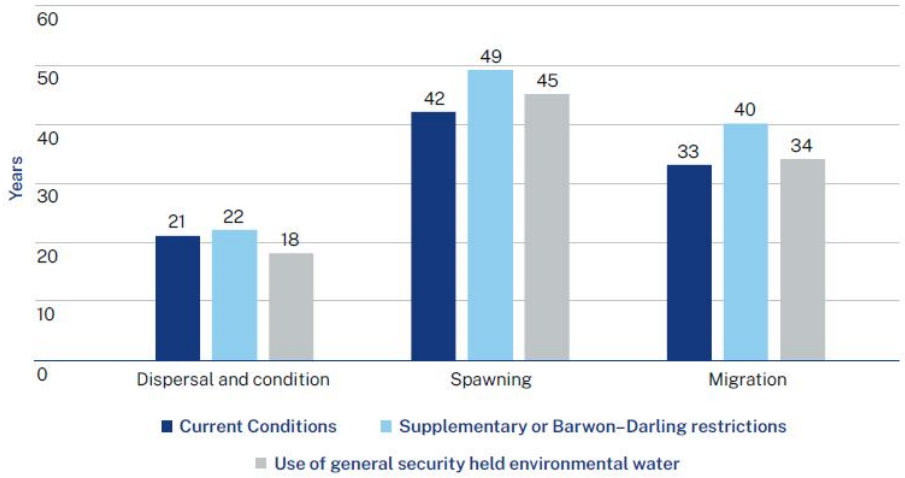
Note these are bookend, theoretical scenarios that compare using entire HEW portfolio with reducing all supplementary licences.

Removing all supplementary licences OR using the entire HEW portfolio will have impacts that have not been analysed

Algal suppression targets



Fish migration targets



2. What are the operational constraints?

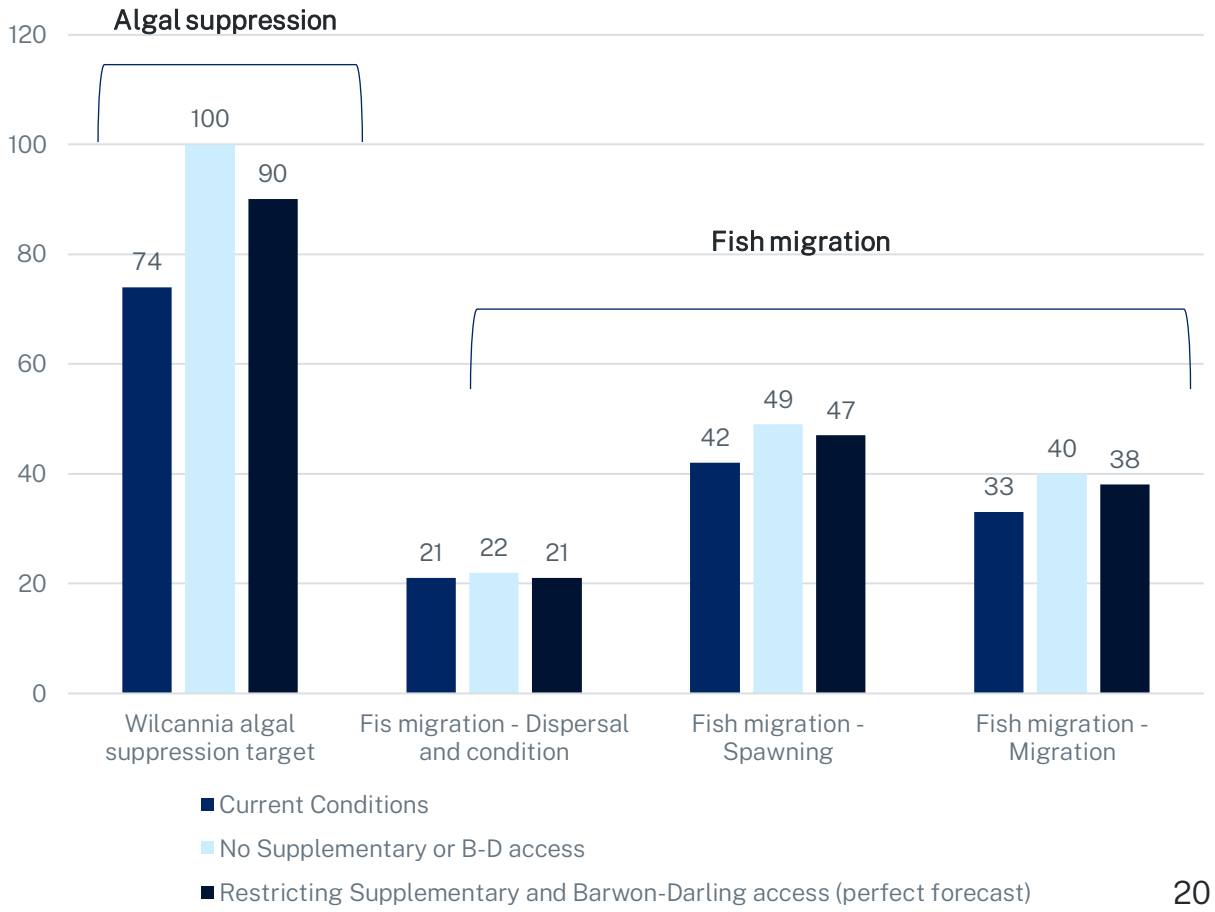
Approach relies on accurate forecasting:

- Impacts on licence holders depend on how accurately we can forecast.
- Benefits do not change substantially
- We cannot implement the targets by using flow forecasting alone

Options on a way forward if the targets are implemented:

- Rules based approach – clearer but less effective
- Operational decision making – more complex operationally but could be more effective

Number of years the algal suppression and fish migration targets are met under a perfect forecasting scenario compared to a bookend scenario by removing all lower priority licences



2. Summary: can changing the timing of water being used by lower priority licences improve connectivity outcomes?

- There could be benefits in implementing targets at certain times, but overall, it will not solve connectivity issues.
- The benefits are likely to be marginal and they come with impacts and trade-offs
- Operational challenges remain. Alternative options implementation methods are needed
- Climate change will change the flows in the river – we may not be able to achieve what we have had in the past
- Further consultation and analysis is needed to progress these actions.

Long list of connectivity options

- Modify and/ or remove non-town weirs
- Reallocating 15GL in the intersecting streams to the environment
- Replenishment flows from the tributaries:
  - Increasing dam reserves
  - Changing end of system rules
  - Environmental water
- Deliver water down the Great Darling Anabranch
- Changing the operation of Menindee Lakes
- Regulating the Barwon-Darling River

Declining water security for towns and small communities

- Most towns do not have secure water supplies. Driven by:
  - Irregular inflows
  - High evaporation rates
- Water security risks could increase under a dry climate change scenario

Options to consider:

- Augment town water supplies through larger weirs and groundwater (Better Baaka)
- Water efficiency measures

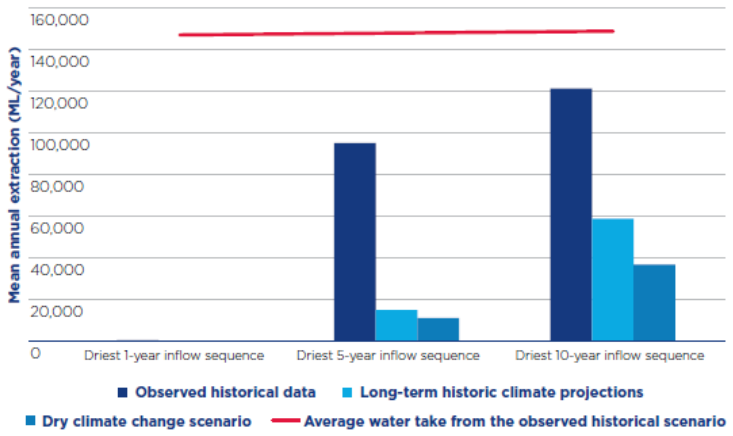
Insecure water supplies affect the viability of businesses

- Important regional industries, such as mining, agriculture and tourism, rely on water to survive.
- Groundwater use limited by quality
- A dry climate change scenario could result in less water available for industry use during dry periods, but potentially more during wet periods

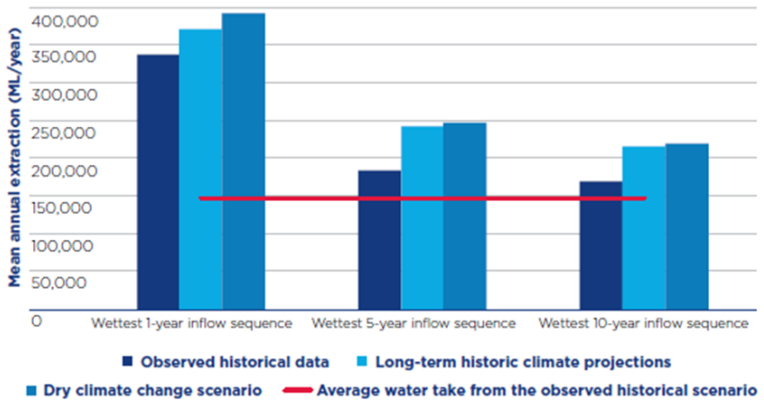
Options to consider:

- Water efficiency measures
- Better use of groundwater

Average annual water extraction for A, B and C class licences in the driest 1-year, 5-year and 10-year climate sequences under different climate scenarios



Average annual water extraction for A, B and C class licences in the wettest 1-year, 5-year and 10-year climate sequences under different climate scenarios



Aboriginal people have lost access to water

- Seek involvement in water consultation processes
- Community needs are location specific
- General community support for:
  - River Rangers
  - Regional water committees
  - Access to cultural and commercial water licences

Declining health of natural systems

- **The Barwon-Darling River is a significant ecological and fish movement corridor in the Basin.**
  - Infrastructure inhibits fish movement and life cycles
- **46% of NSW's inland wetlands and internationally significant national parks are in Western region**
  - River regulation has contributed to a reduction of moderate to high flows
- **Extended droughts are damaging to the environment**
  - could become more frequent under climate change scenarios

Options to consider:

- Fish options – screens, fishways, aeration technology
- Removing constraints, improving floodplain connections
- Riparian restoration
- Protection of groundwater dependant ecosystems

Managing the impacts of poor water quality

Poor water quality is a persistent concern in the Western Region impacting all water uses.

Caused by:

- Land management practices
- High flow from runoff and low / no flow periods
- the high clay content of alluvial soils in the Western region

Options to consider:

- Review Lower Darling environmental water allowance rule
- River and catchment recovery program
- Additional water quality data, research and modelling
- Manage groundwater salinity

Process for moving from long to shortlist

Some options have already been shortlisted – Better Baaka and some connectivity options

Next steps

Community consultation sessions:

- Menindee – 15 June
- Walgett – 28 June
- Bourke – 30 June

For more information, please visit:
water.dpie.nsw.gov.au/plans-and-programs/water-management-in-far-west-nsw

To contact us:
regionalwater.strategies@dpie.nsw.gov.au

Submissions close 13 July 2022