After the storm: Harnessing urban runoff to benefit Jacksons Creek

Stormwater Victoria Conference

7th June 2023

VICTORIA State Government

Melbourne Water
Enhancing Life and Liveability

Melbourne Water | more than water

Water	Sewerage	Flood & drainage	Waterways and catchments
Providing clean drinking water to retailers	Treating sewage to recover and reuse resources where we can	Planning to manage flooding	Keeping our catchments healthy and resilient

We are in the decade that matters when the actions we take now will define our future.

Acknowledgment of country

Painting: *Naarm Warri,* by Norm Stanley

Outline

Today we are discussing the opportunity to address stormwater harvesting and environmental flow targets...

Issues

- Environmental flow shortfalls
- Stormwater excess

Opportunity

Addressing these issues together.

Case study:
Sunbury stormwater harvesting scheme (Maribyrnong River catchment)

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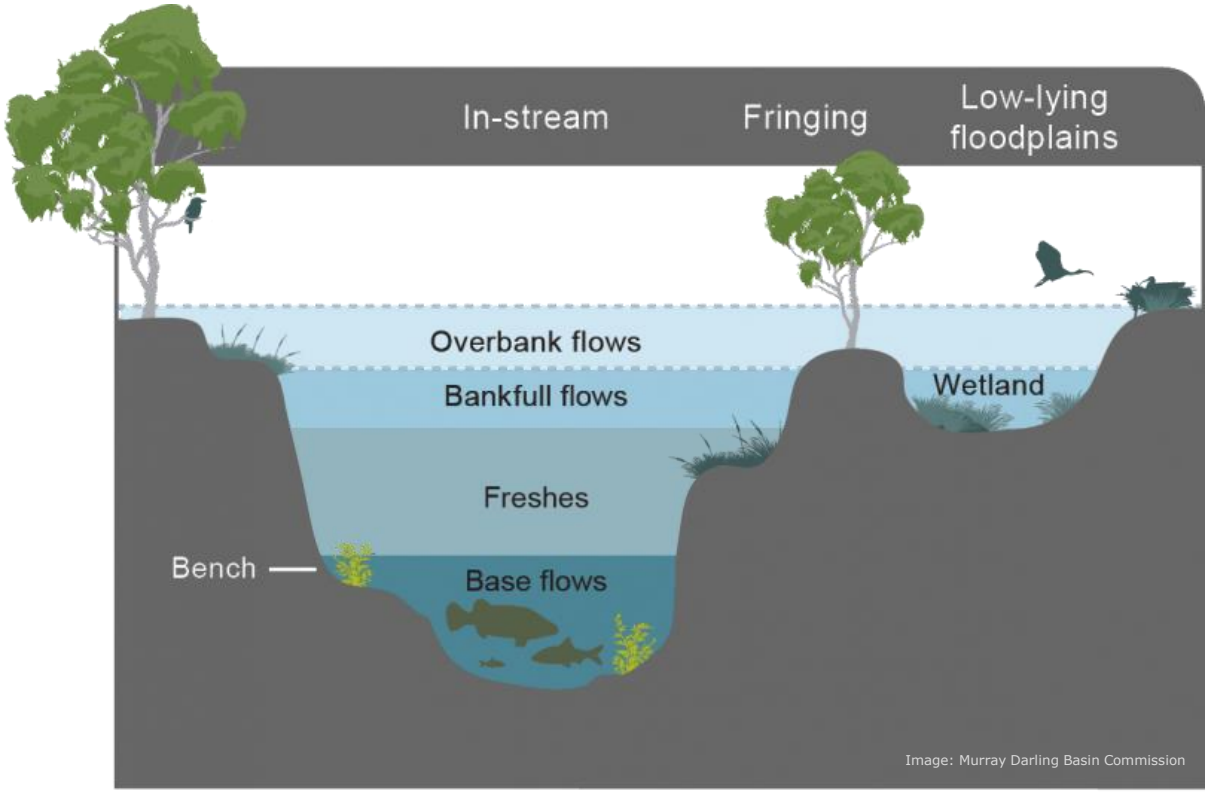
What is environmental water?

Water that is set aside to be used for plants and animals in waterways



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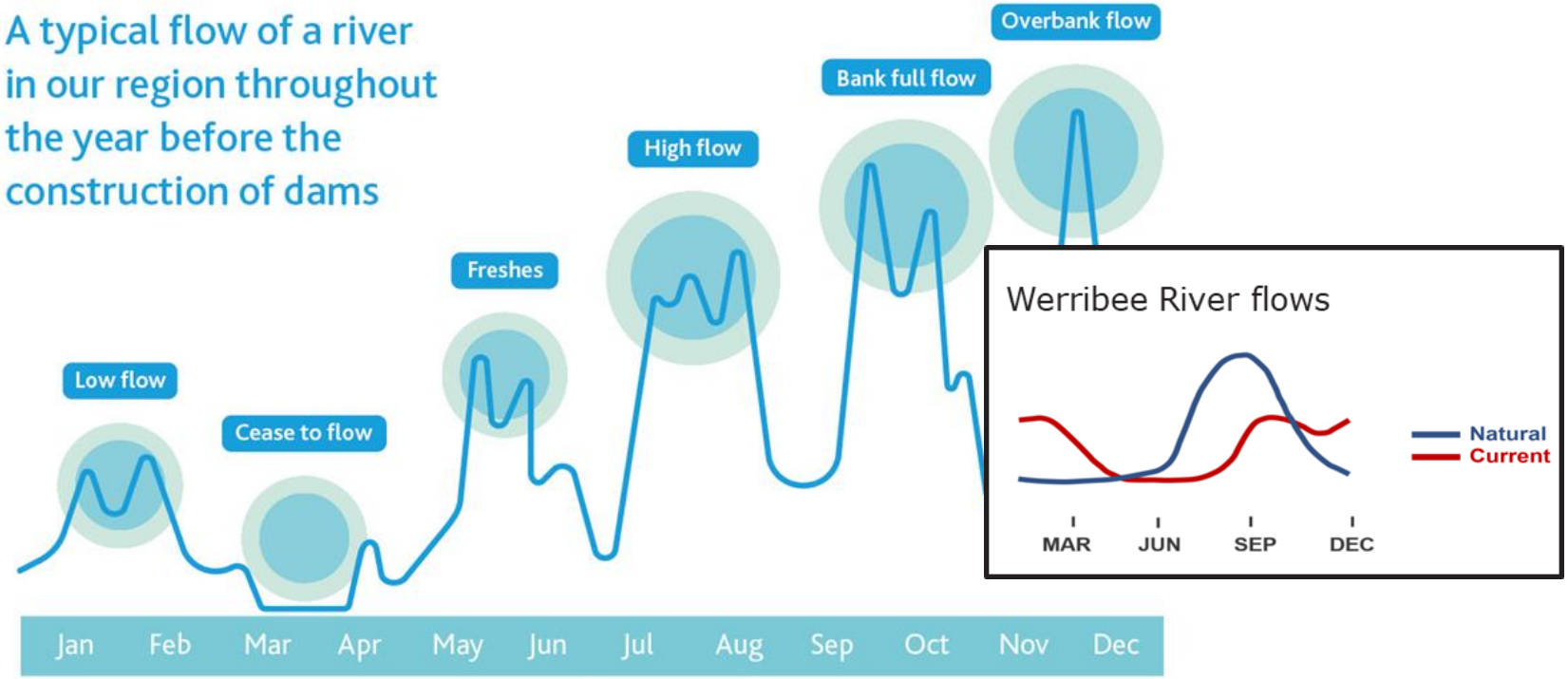
Why do we need environmental water?



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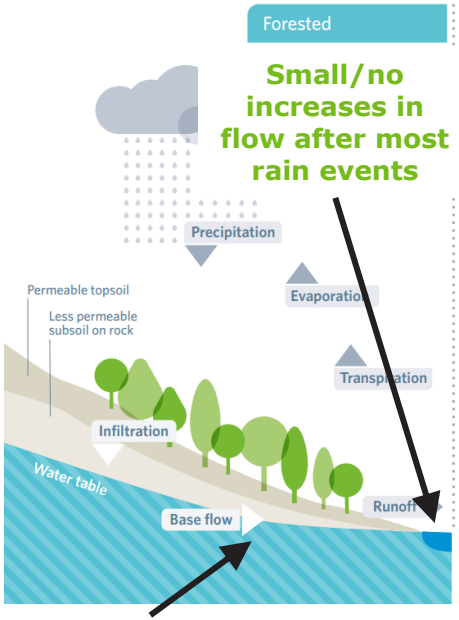
The stormwater problem

Stormwater flow in natural vs urban environments



Baseflow fed by filtered water

Values impacted by stormwater condition

Stormwater & environmental water targets

Opportunity!

Quality

Timing

Location

Quantity

Environmental water shortfalls

Stormwater harvesting targets

Location

Quantity

Beneficial reuse

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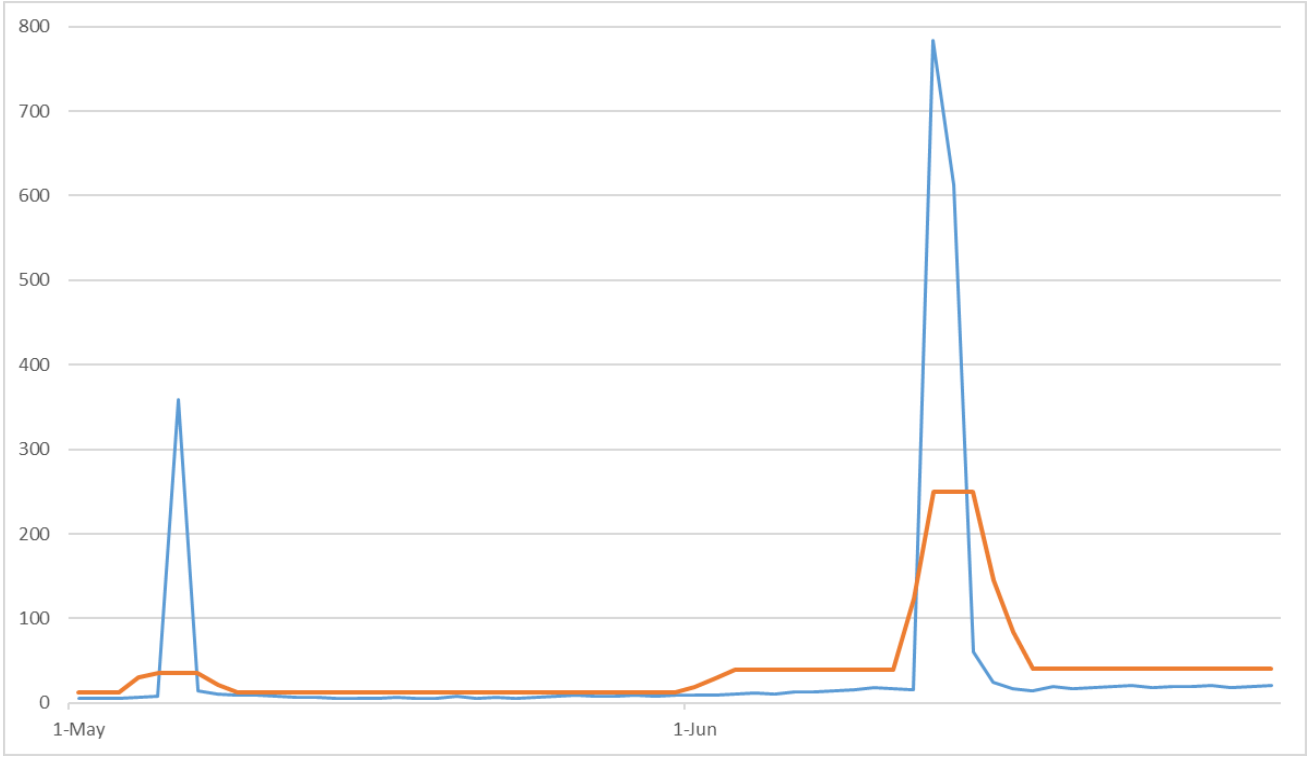
From problem to solution…

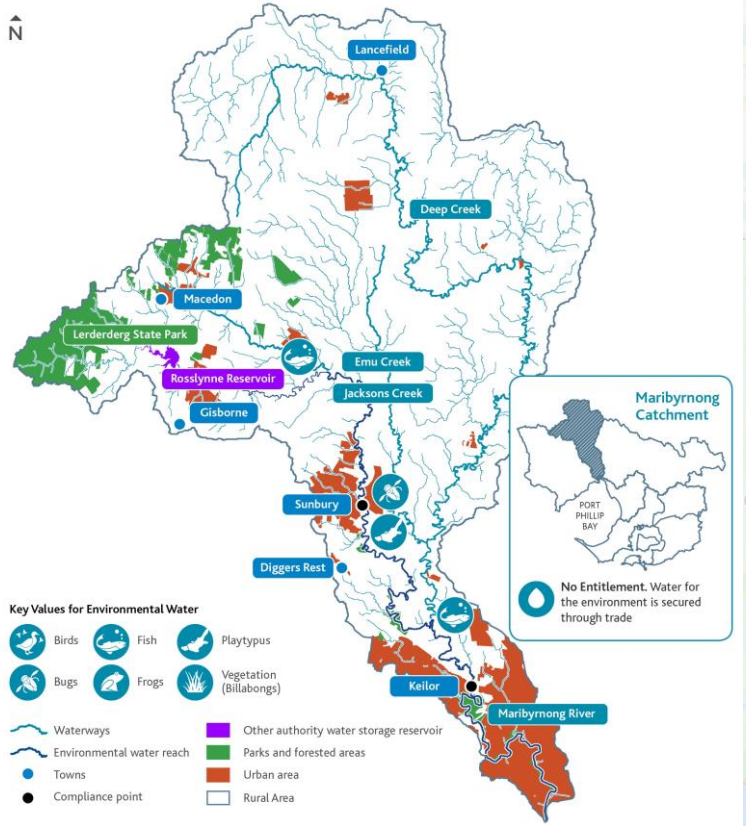
Example: 2,500 ML over two months…



Case Study

Maribyrnong River - Sunbury Growth Area

The Maribyrnong catchment



Shortfalls

What is Maribyrnong River's annual shortfall equivalent to?

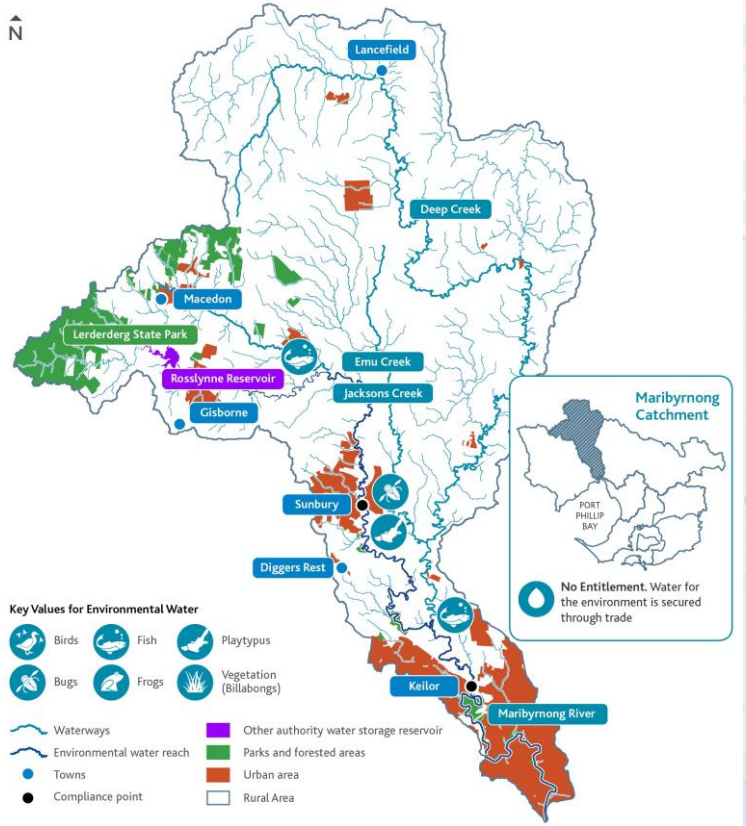
10 Olympic swimming pools (25ML)

Three MCGs (5,000 ML)

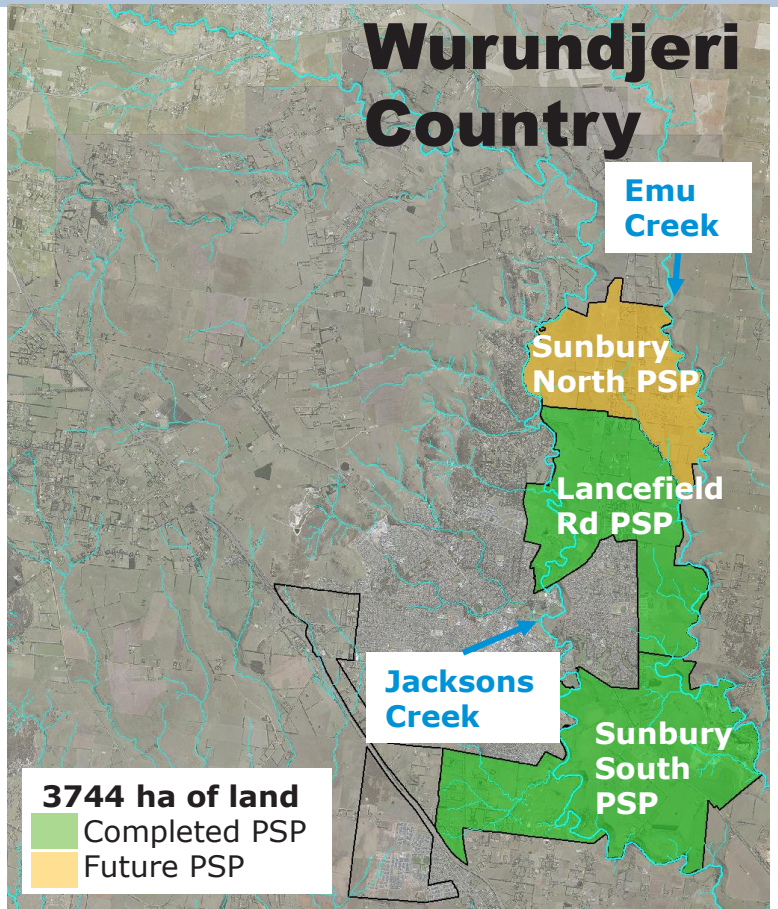
Two Lake Wendourees (7,000 ML)

Sydney Harbour (500 GL)

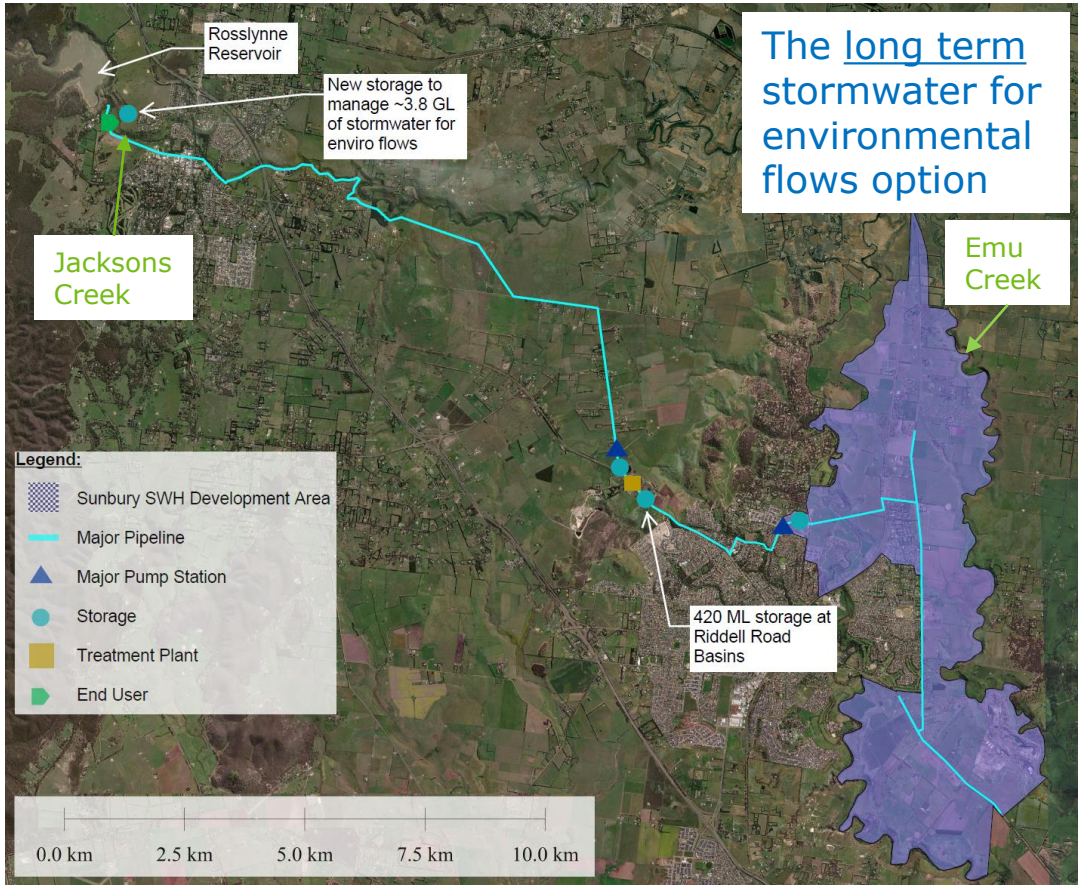
The Maribyrnong catchment



What's happening in Sunbury?

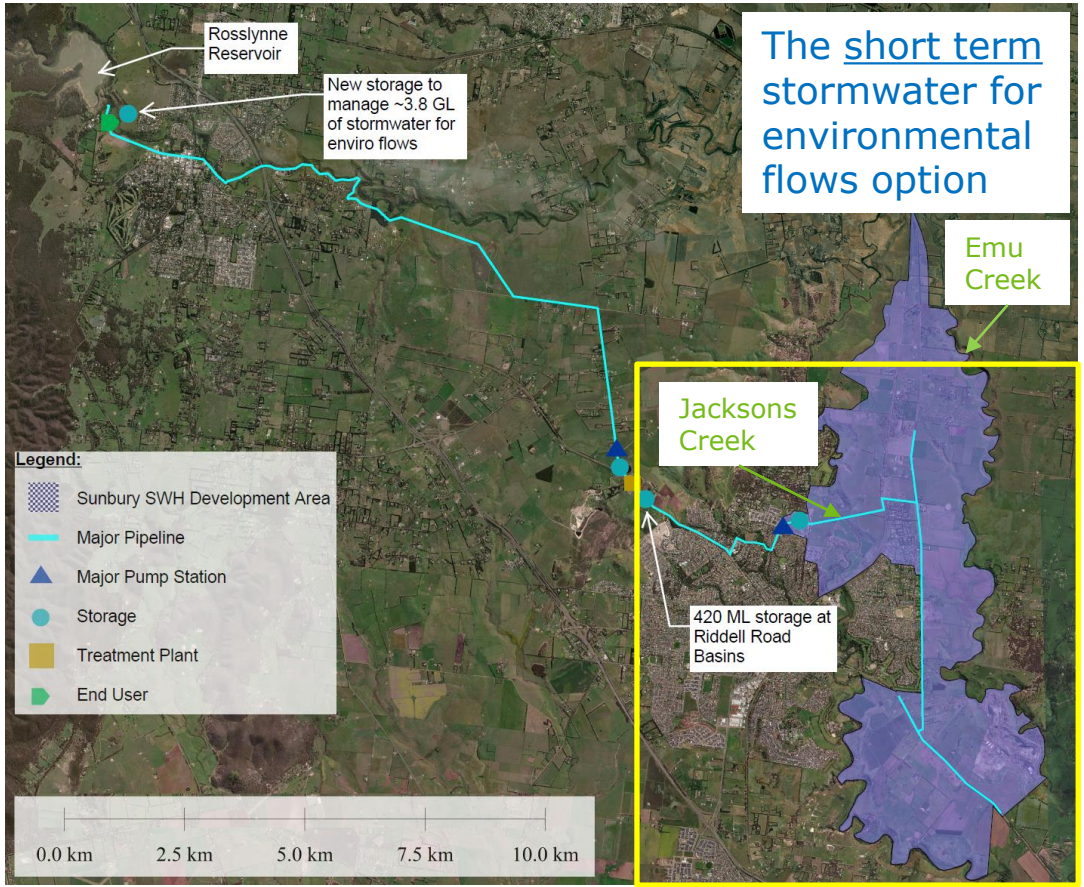


The solution to our problems?



Note: MW has not yet developed our adaptive plan for how we're planning on using the harvested stormwater over time

The solution to our problems?



Our key questions

Previous work

Does this option have a measurable impact on low-flow shortfalls in Jacksons Creek?

Yes! Alluvium found that we could significantly reduce summer average absolute shortfalls (from 35% to 1%)

Our key questions

Previous work

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Yes! Alluvium found that we could significantly reduce summer average absolute shortfalls (from 35% to 1%)

Current work

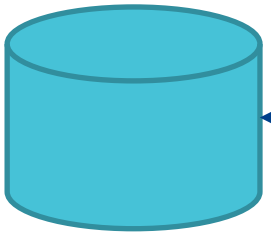
How long can this option use enough stormwater to protect waterway condition?

What are the option's benefits, risks and infrastructure requirements?

Is this option worth pursuing over other short-term options?

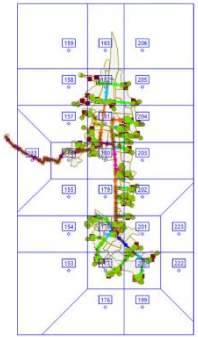
The process

Riddell Rd Basins



Stormwater that can be harvested

InfoWorks ICM



The process

Stormwater runoff from Sunbury under do-nothing

eWater Source

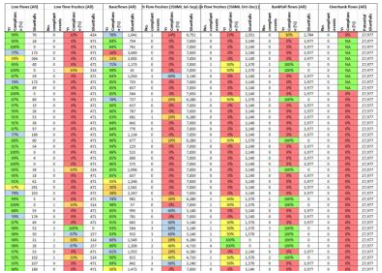
InfoWorks ICM

Riddell Rd Basins

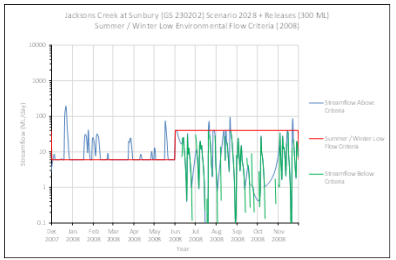
Stormwater that can be harvested

Do-nothing flow time series

E-flow compliance tool



Do-nothing e-flow compliance and shortfalls



The process

Stormwater runoff from Sunbury under do-nothing

eWater Source

InfoWorks ICM

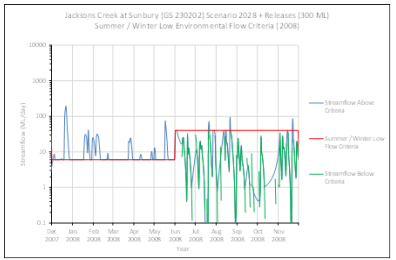
Riddell Rd Basins

Stormwater that can be harvested

E-flow release if
- Stormwater is available
- There is a shortfall

Flow time series with stormwater releases

Do-nothing e-flow compliance and shortfalls



The process

Stormwater that cannot be harvested

eWater Source

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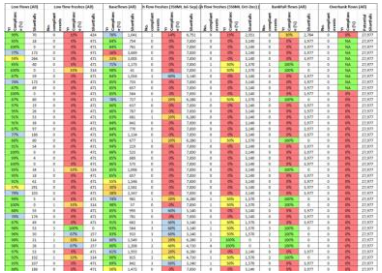
Riddell Rd Basins

Stormwater that can be harvested

E-flow compliance tool



Flow time series with stormwater releases

The process

Stormwater that cannot be harvested

eWater Source

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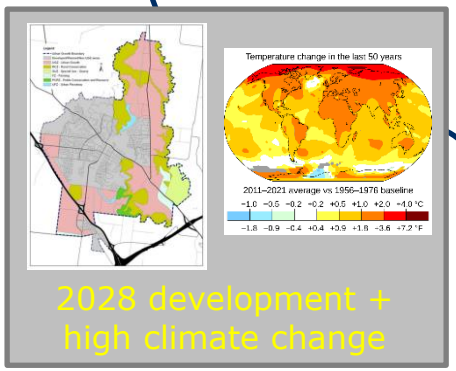


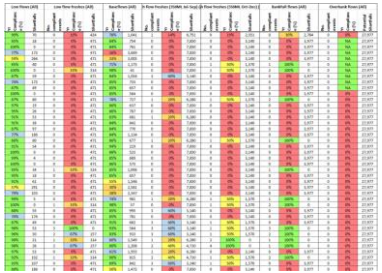
2028 development + high climate change

420 ML

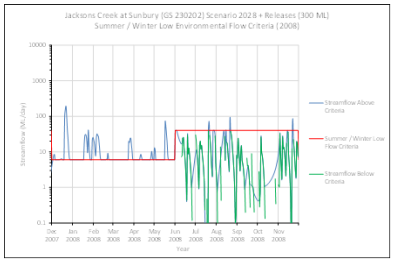
Stormwater that is used for e-flows

Flow time series with stormwater releases

E-flow compliance tool

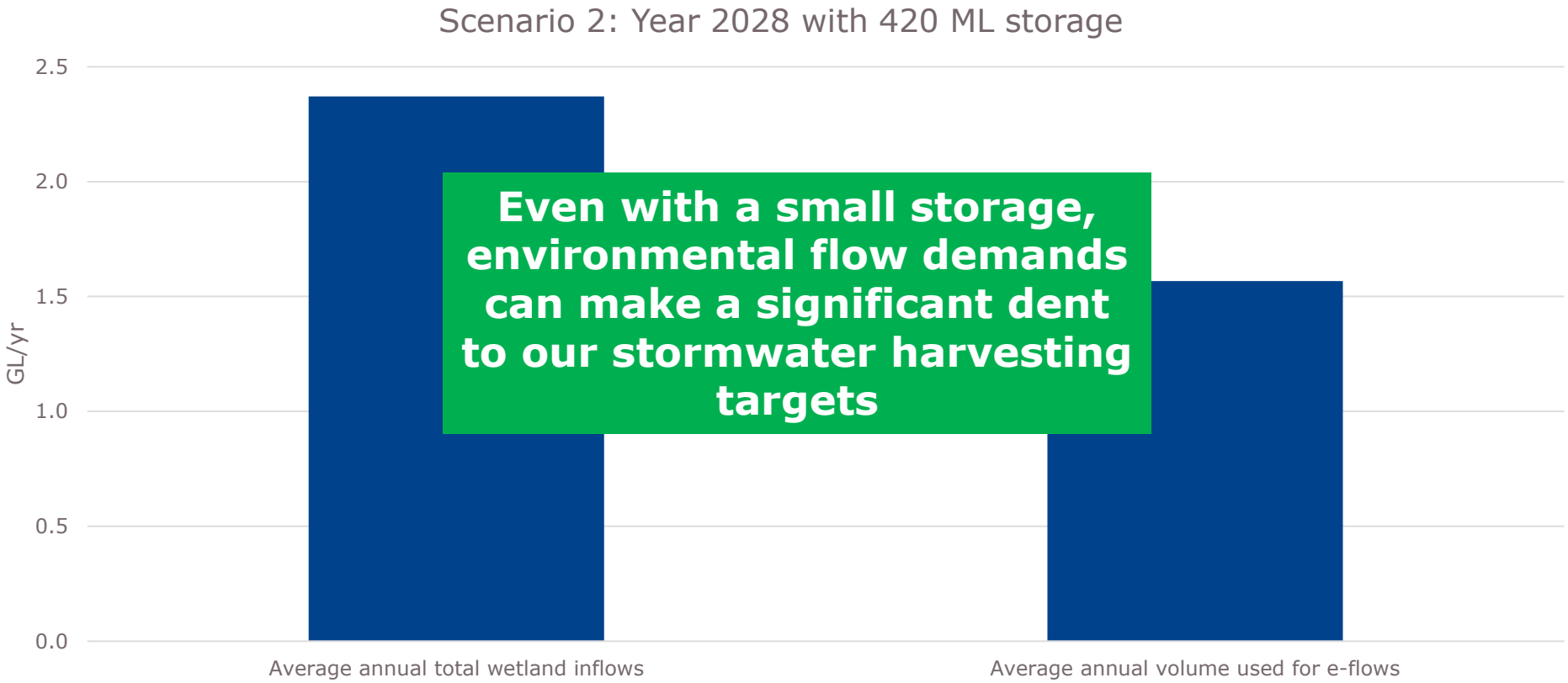


E-flow compliance and shortfalls with stormwater releases



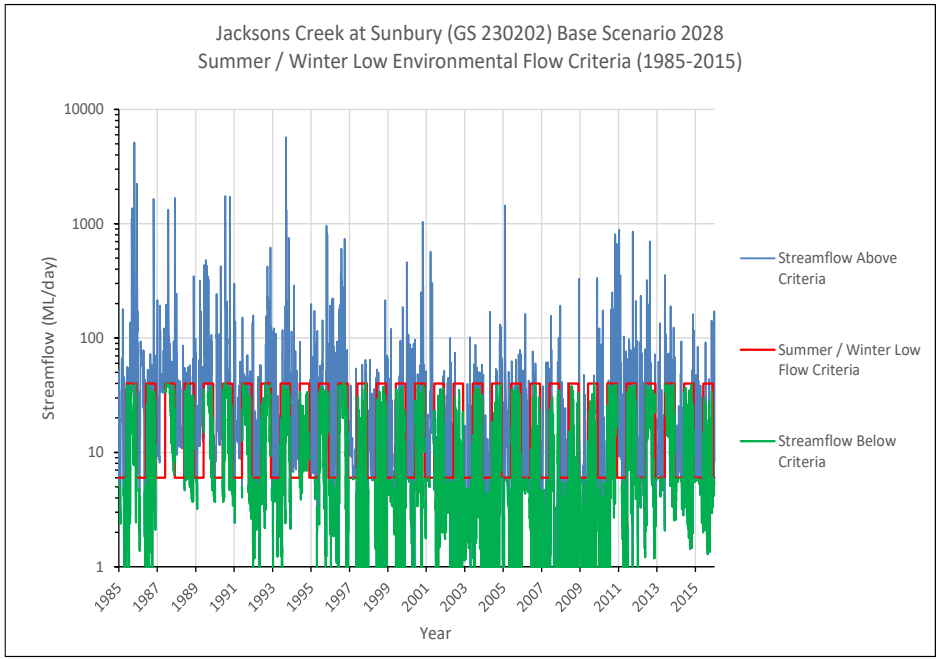
Findings to date

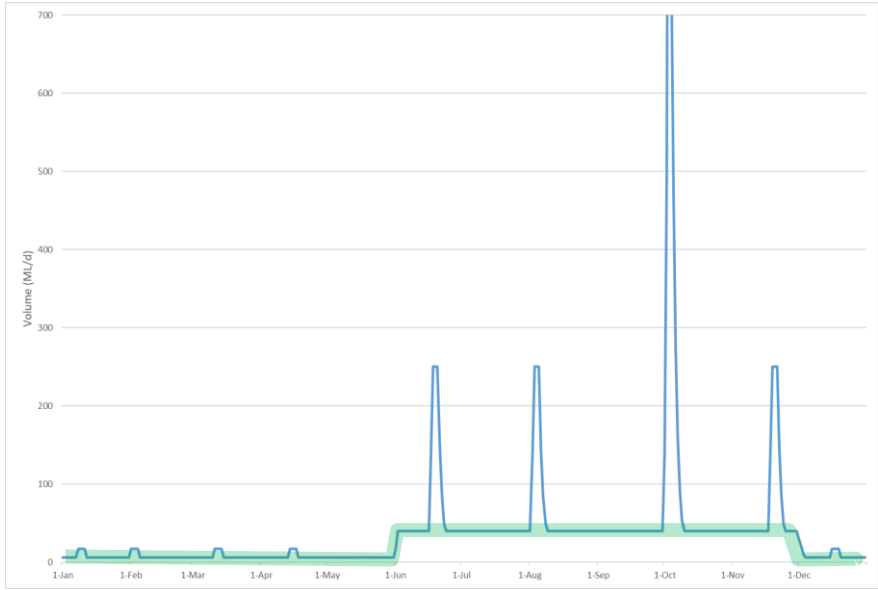
Impact on our stormwater harvesting targets



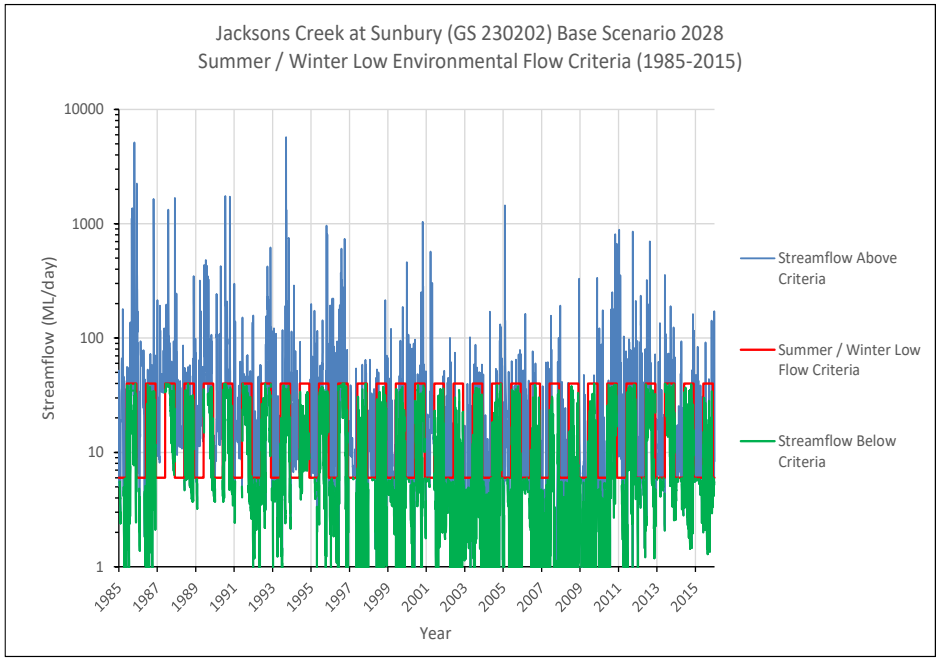
Even with a small storage, environmental flow demands can make a significant dent to our stormwater harvesting targets

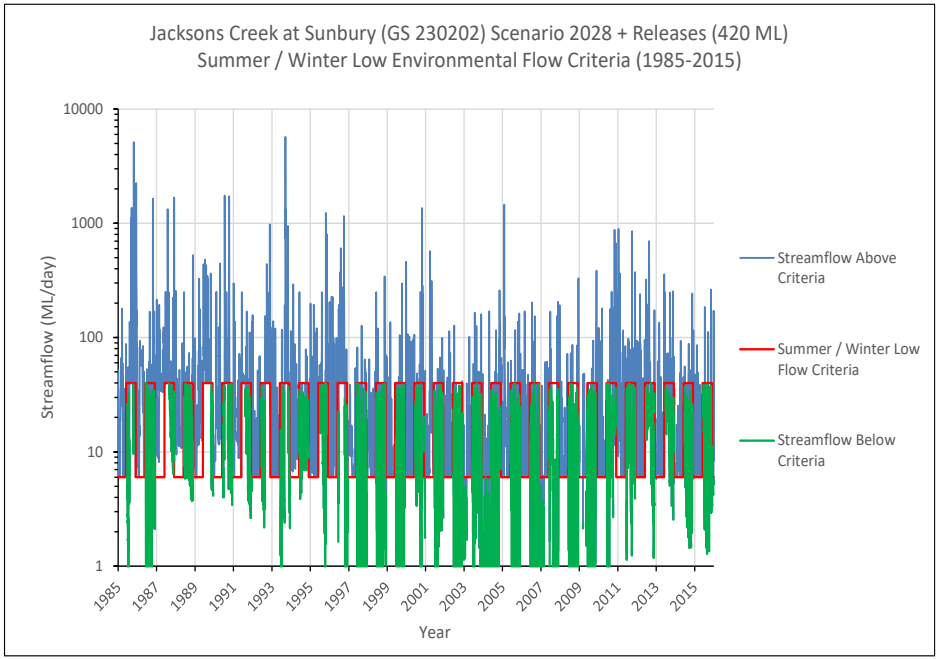
Impact on environmental flows



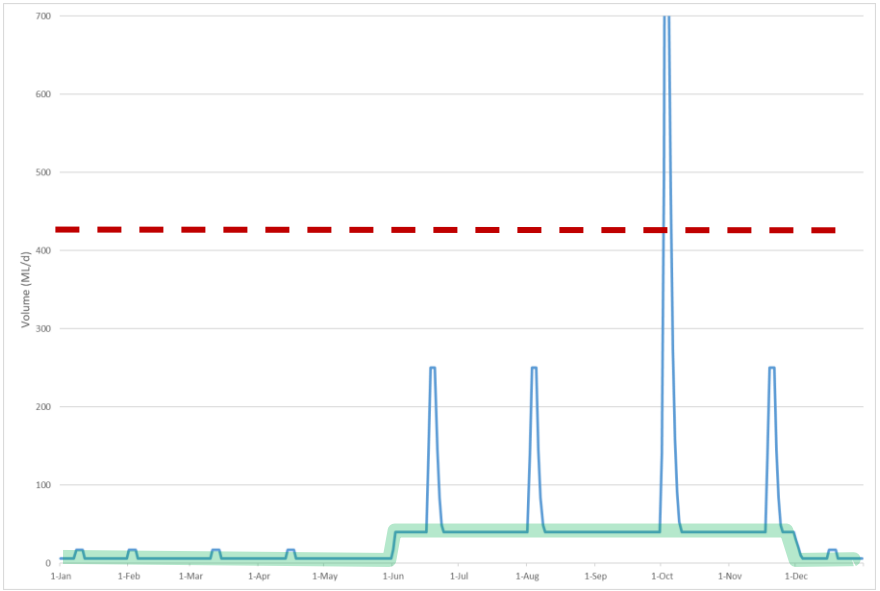


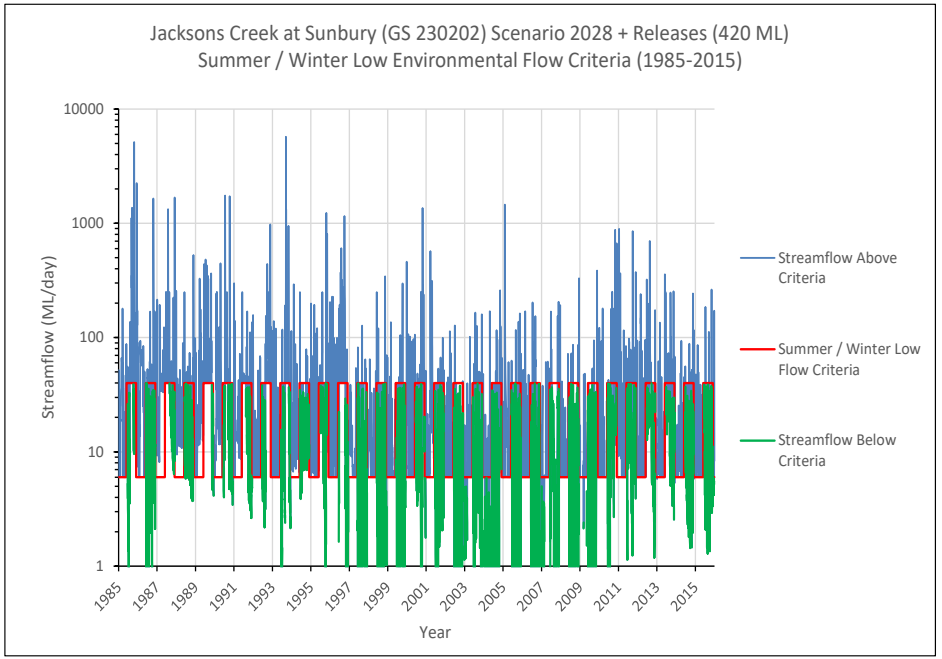
Impact on environmental flows





Impact on environmental flows





Impact on shortfalls

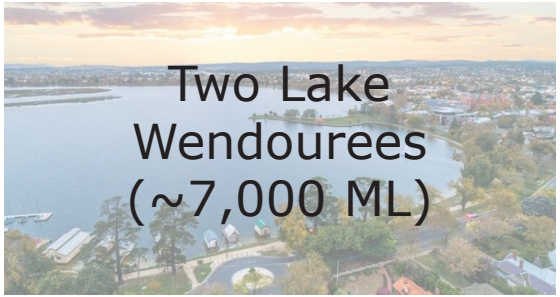
	Base case (2028) [ML]	2028 harvesting (420ML storage) [ML]	Reduction from base case
Low flow shortfalls	4,657	3,480	25.27%
Fresh shortfalls	2,183	1,748	19.97%
Total shortfalls	**6,840**	**5,228**	**23.57%**

Opportunity!

Environmental water shortfalls

Stormwater harvesting targets

Impact on shortfalls



Next steps

Model more scenarios to determine how long this option can protect waterway condition

Assess water quality benefits and risks to Jacksons Creek

Determine infrastructure required

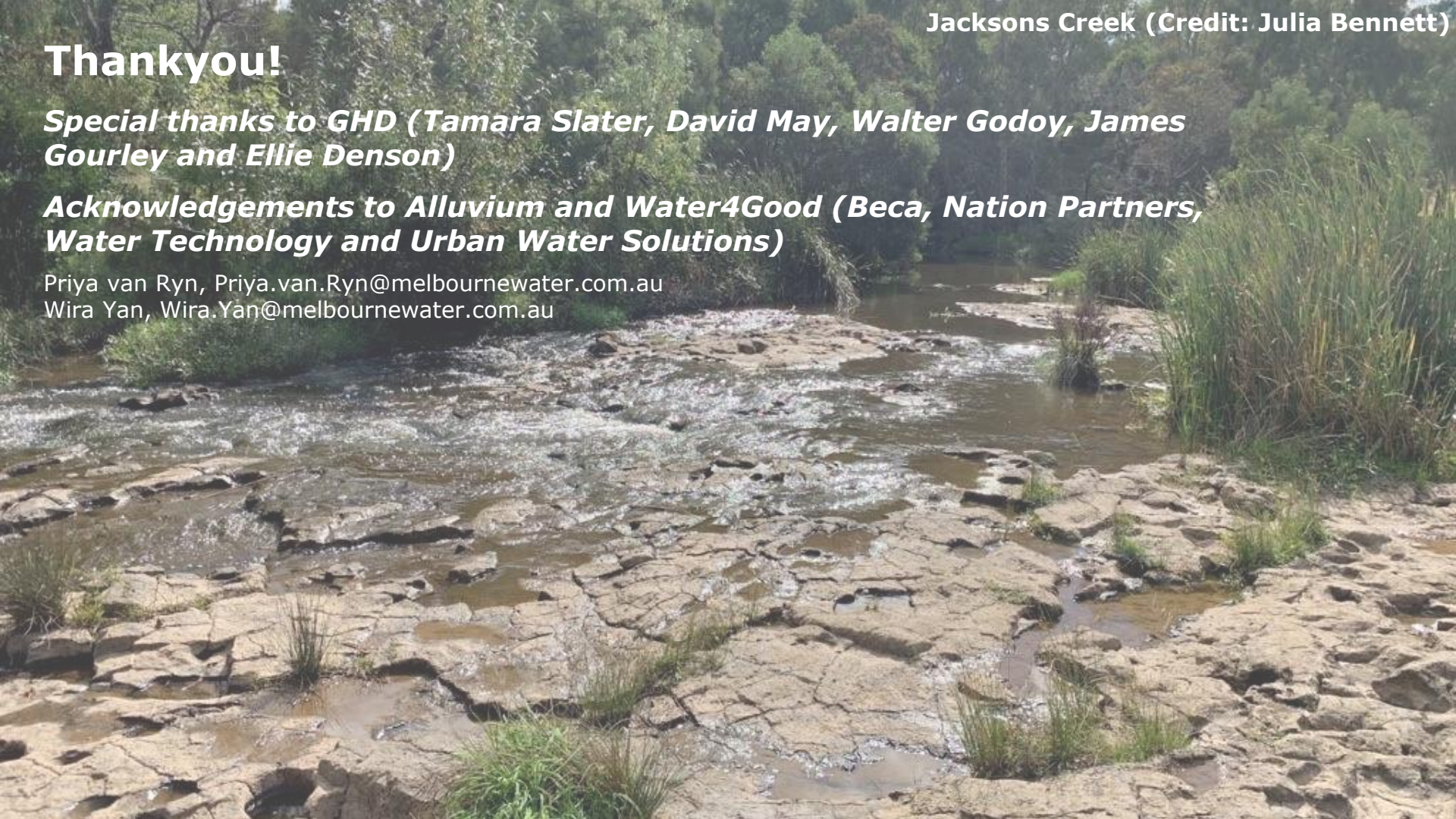
Develop business cases and incorporate findings into our adaptive plan

Key takeaway messages

Stormwater harvesting and environmental flows are both needed to protect our waterways

A small storage can make a big difference to achieving our stormwater harvesting and environmental flow targets

Stormwater harvesting and environmental flow targets can be compatible with one another



Jacksons Creek (Credit: Julia Bennett)

Thankyou!

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Acknowledgements to Alluvium and Water4Good (Beca, Nation Partners, Water Technology and Urban Water Solutions)

Priya van Ryn, Priya.van.Ryn@melbournewater.com.au
Wira Yan, Wira.Yan@melbournewater.com.au