Jun 23rd, 5:00 PM - 5:15 PM

Session A6: Timing, Frequency and Environmental Conditions Associated with Mainstem-Tributary Movement by a Lowland River Fish, Golden Perch

Wayne Koster
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Patterns of connectivity between mainstem–tributary habitats for a lowland river fish

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Department of Environment, Land, Water & Planning

State Government Victoria

Background

- Connections between mainstem and tributaries important for range of ecological processes and functions

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- Mainstem–tributary movements important for maintaining fish populations in river networks

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- Connections between mainstem and tributaries important for range of ecological processes and functions
- Mainstem–tributary movements important for maintaining fish populations in river networks
- Hydrological regimes major driver of river ecosystems and provide cues for a range of important behaviours in fishes

Aims

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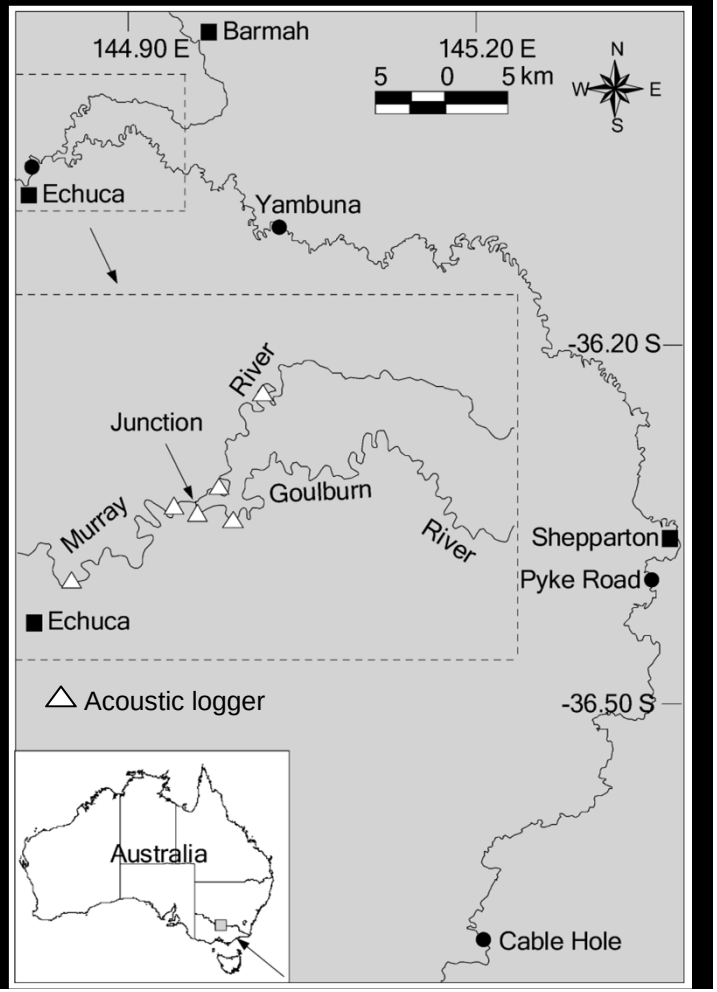
2. To determine whether the frequency and/or direction of mainstem–tributary movement change during the spawning period
3. To determine whether hydrology or temperature influences the occurrence of mainstem–tributary movements

Methods

- Study area – Goulburn and Murray rivers, southeast Australia

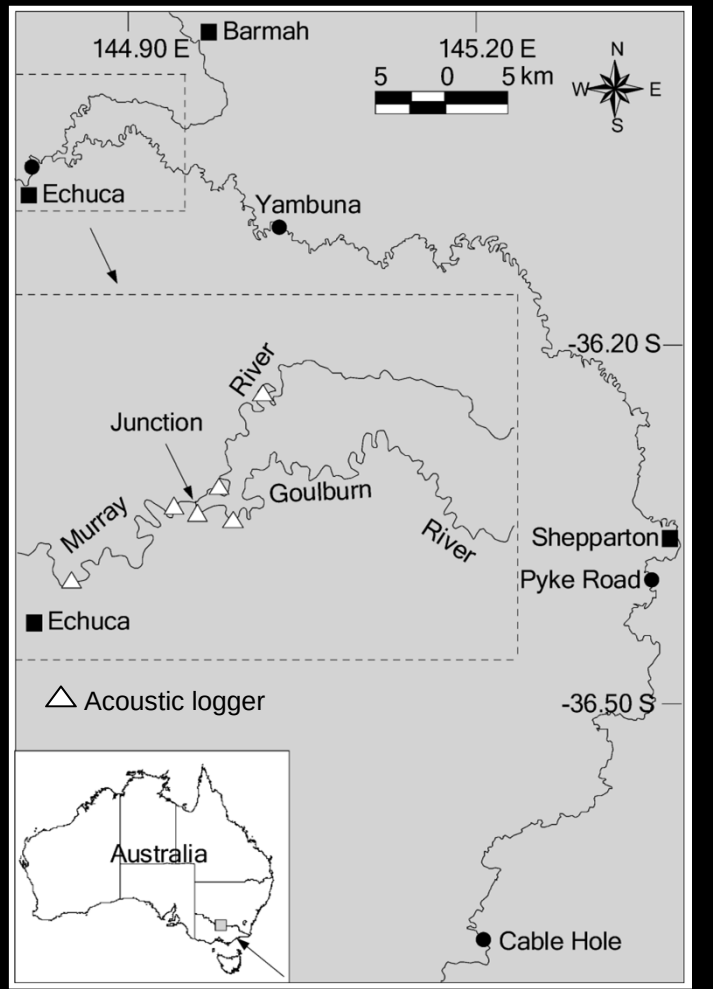
Goulburn River

Murray River



Methods

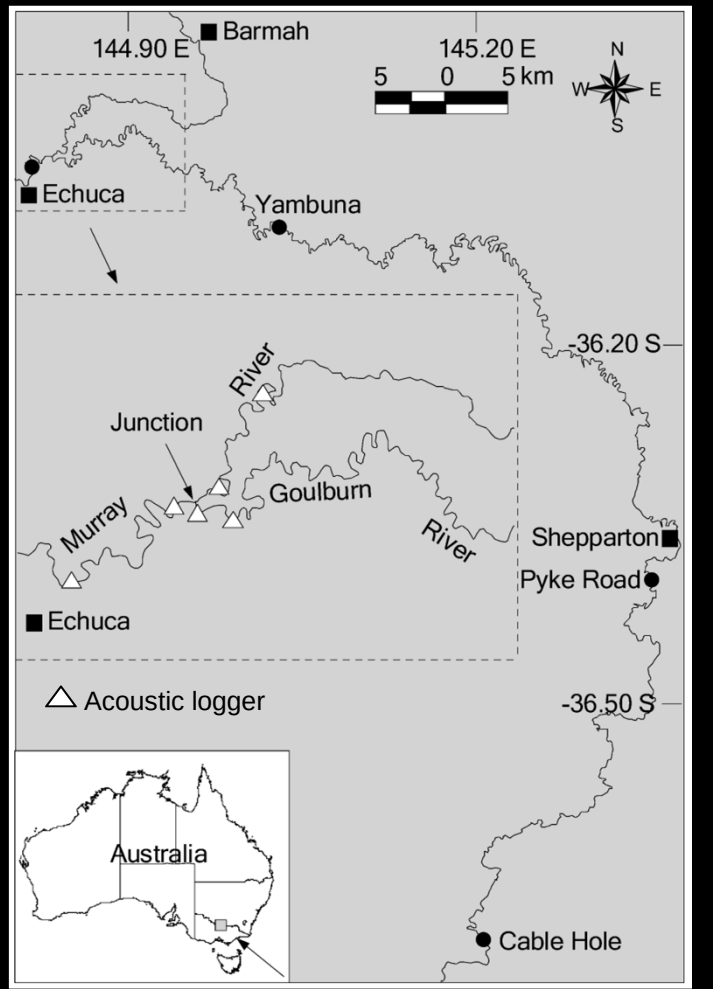
- Study area – Goulburn and Murray rivers, southeast Australia
- 79 adult fish tagged (2007-2009)



Methods

- Study area – Goulburn and Murray rivers, southeast Australia
- 79 adult fish tagged (2007-2009)
- 12 acoustic loggers deployed

(data collected 2007-2012)



Findings

- One quarter of Murray River (mainstem) fish moved into Goulburn (tributary)

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- Half of Goulburn River (tributary) fish moved into Murray (mainstem)

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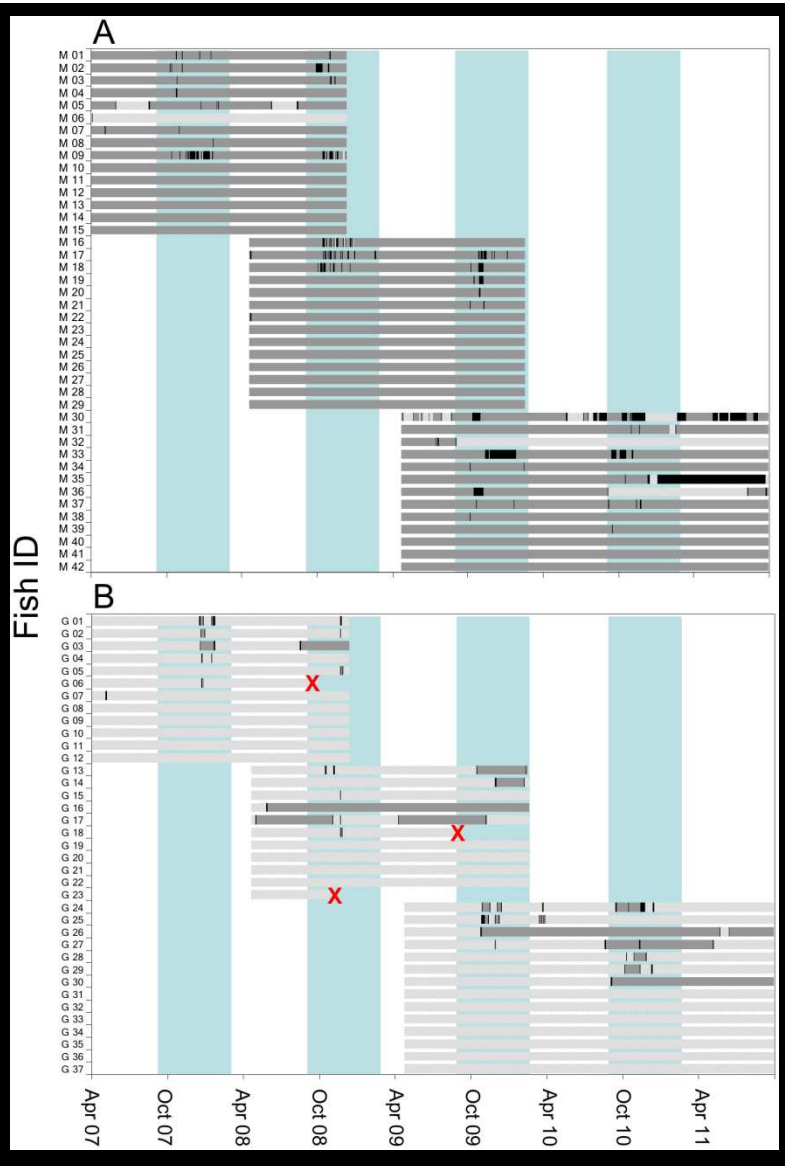
- One quarter of Murray River (mainstem) fish moved into Goulburn (tributary)
- Half of Goulburn River (tributary) fish moved into Murray (mainstem)
- Mostly temporary occupation, but ~10% shift between rivers

Findings

- Differences in temporal patterns of movement among rivers

  A – Fish tagged in Murray River (mainstem)

  B – Fish tagged in Goulburn River (tributary)



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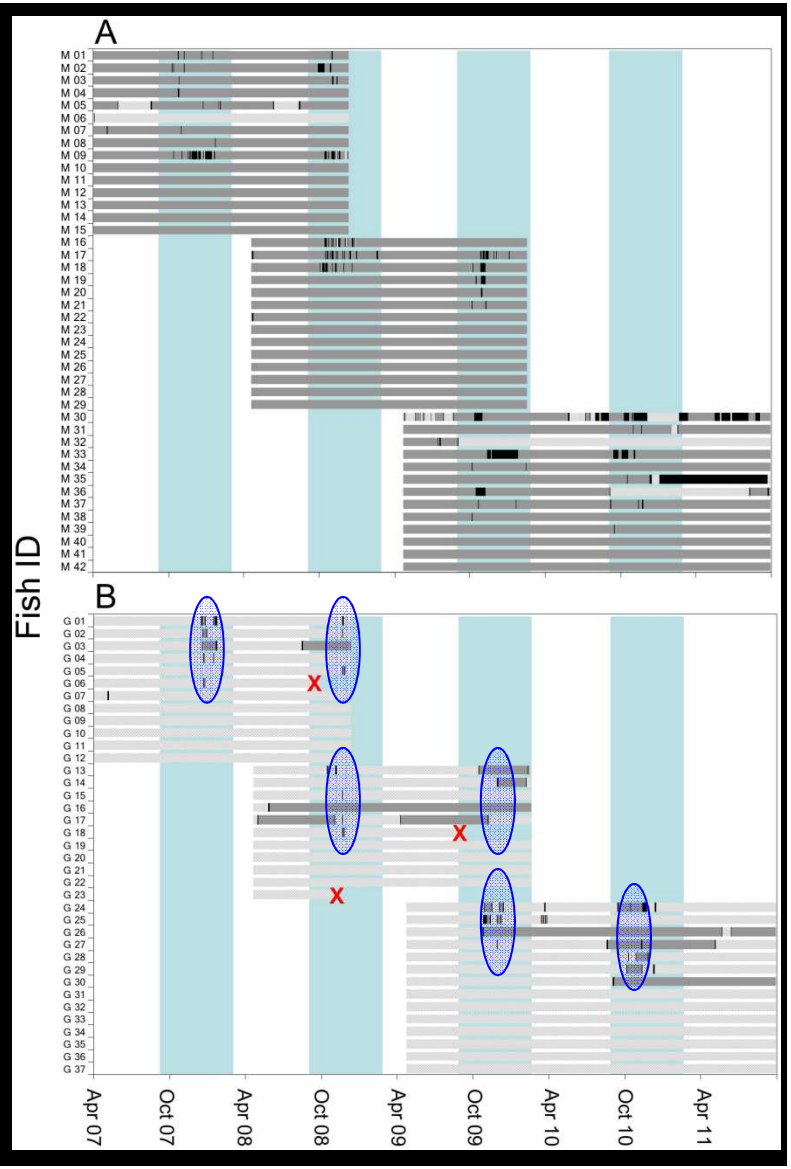

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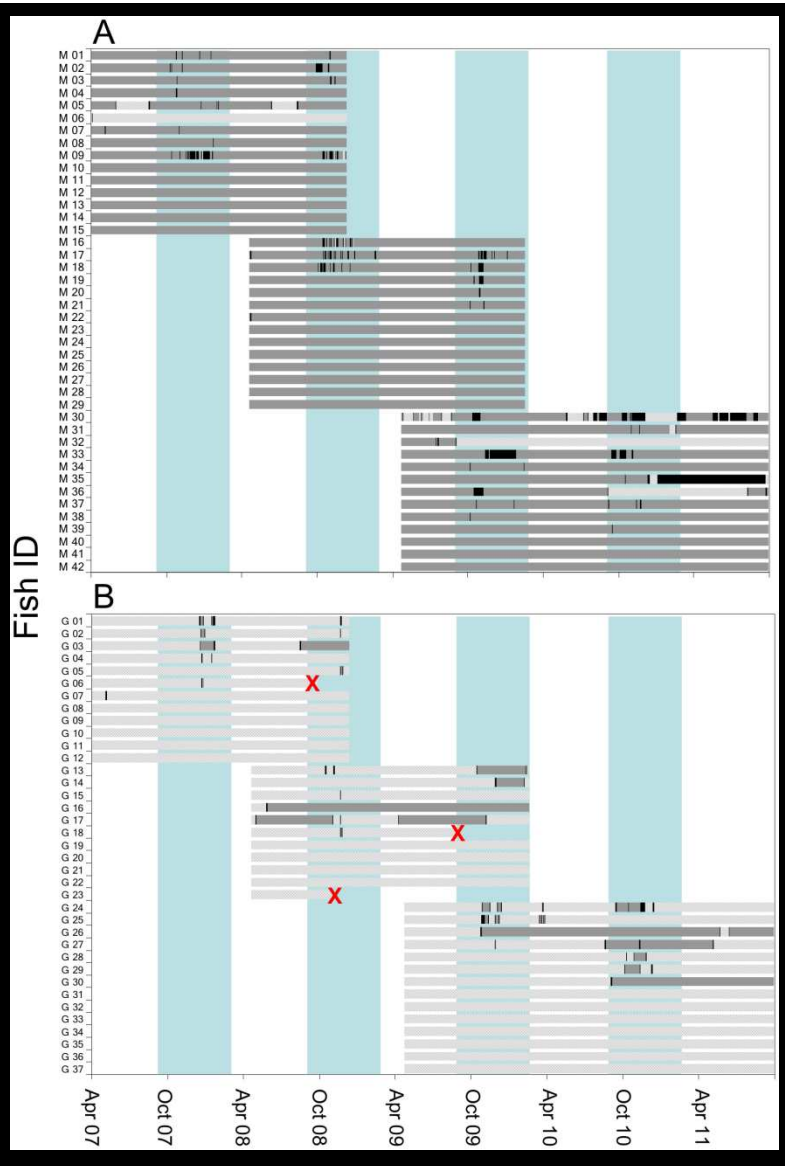
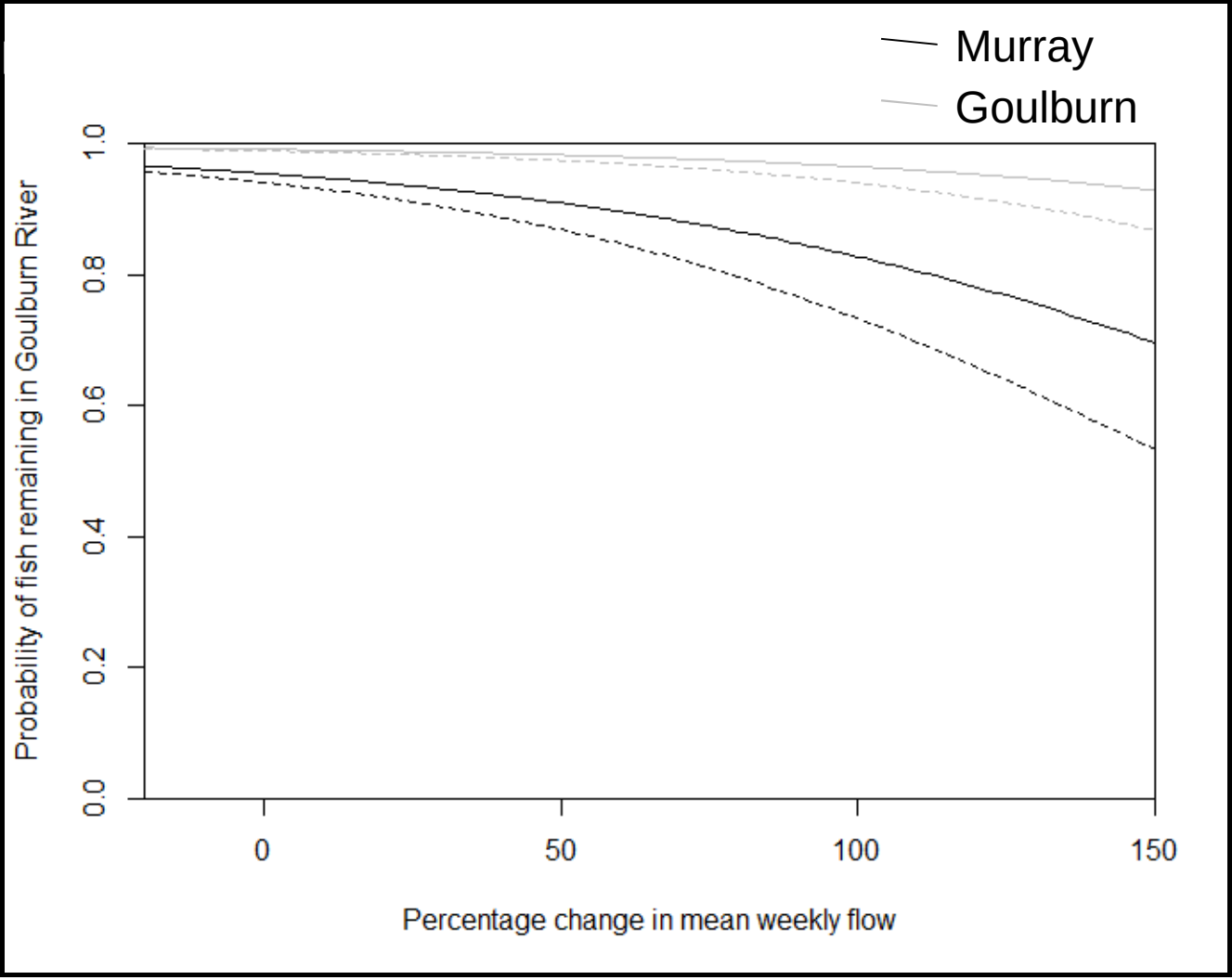


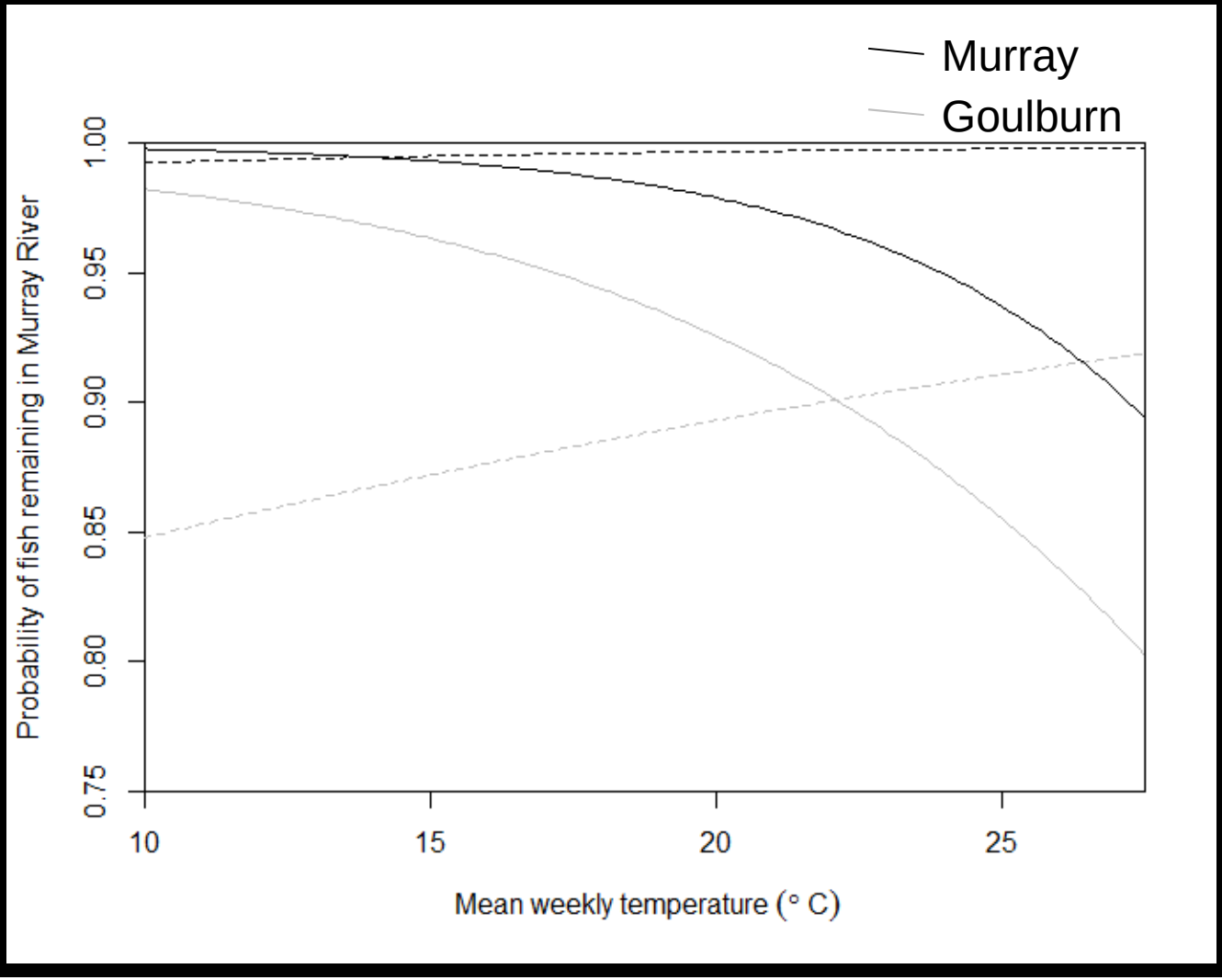
Findings

- Movement from tributary to mainstem



Findings

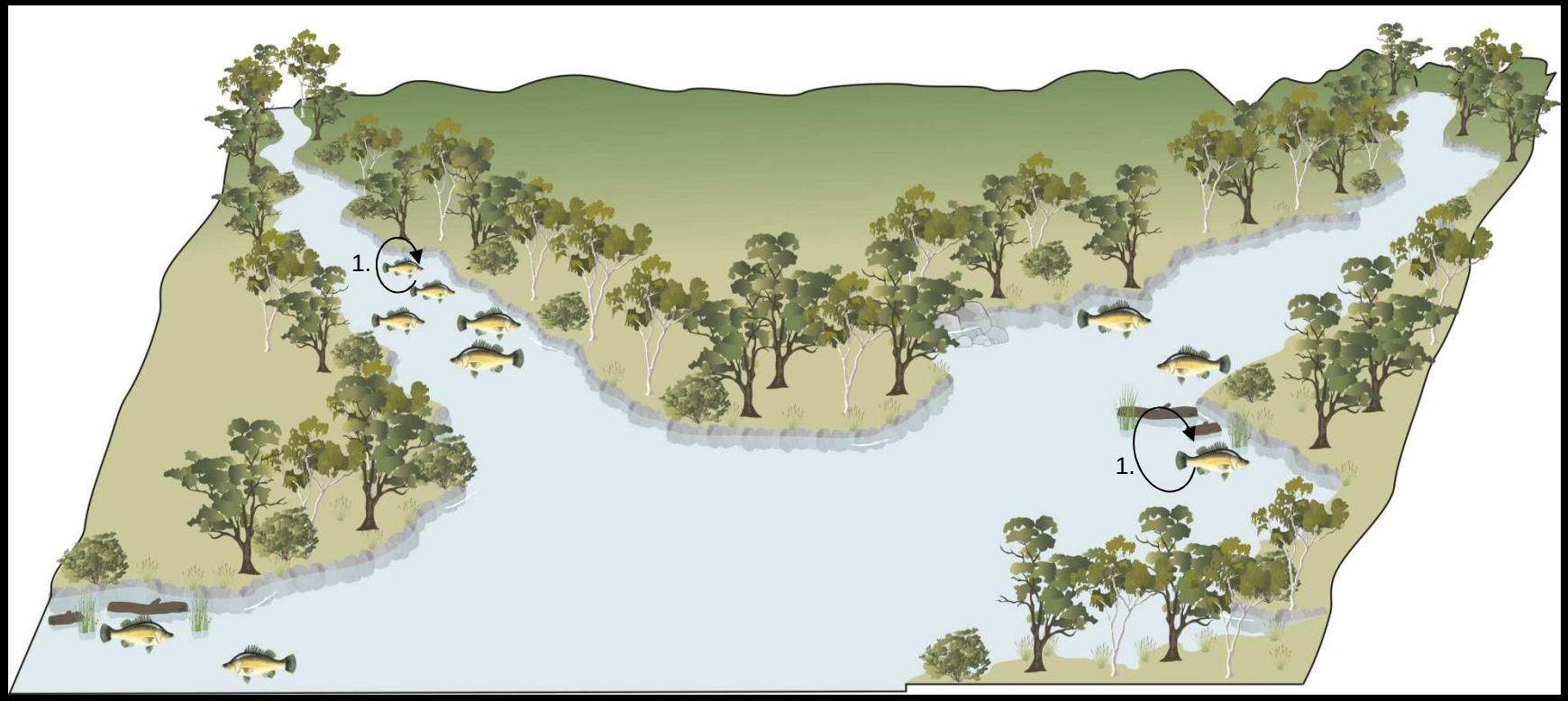
- Movement from mainstem to tributary



Conclusion

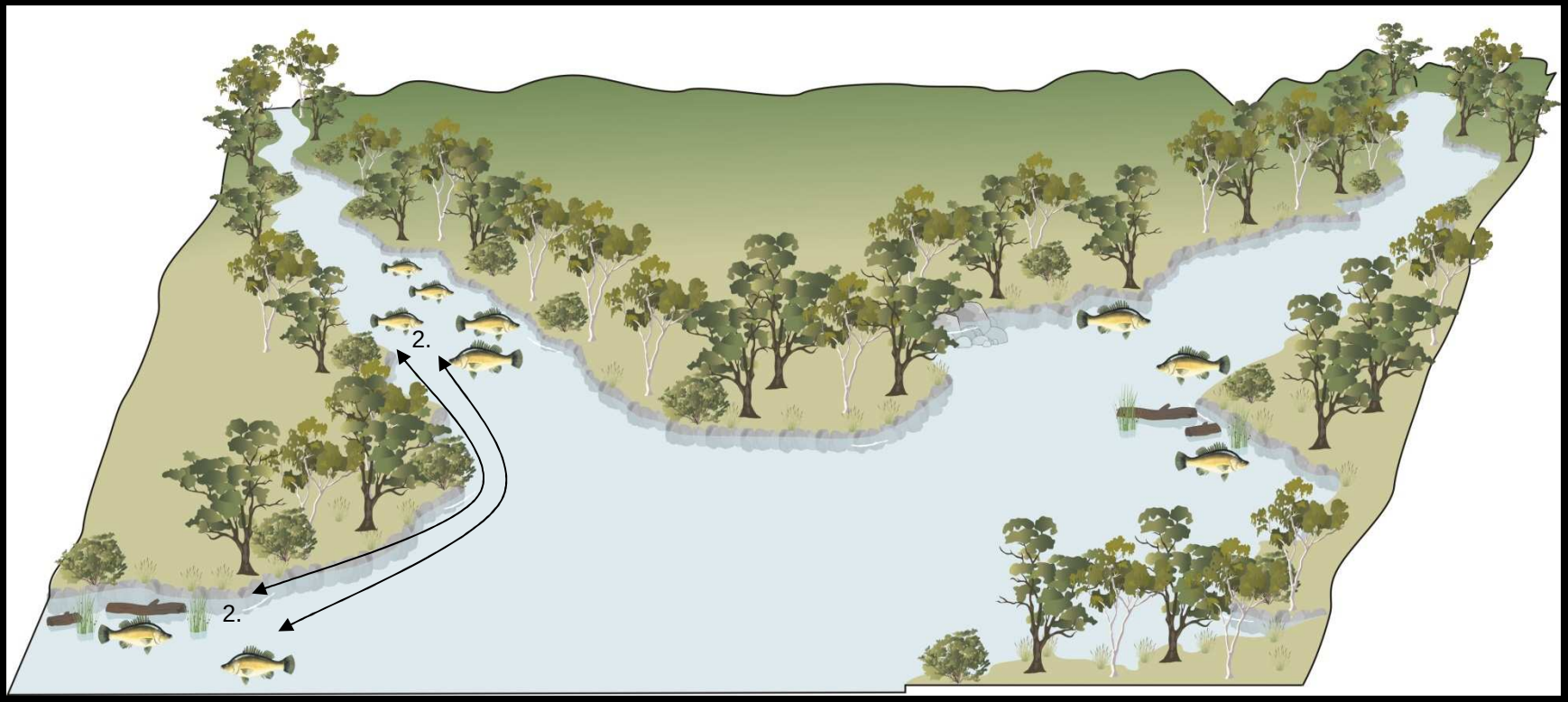
- Spatially and temporally complex pattern of movement between mainstem and tributary locations

Conclusion



1. Most fish remain in their original ‘home’ river

Conclusion



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2. Some fish move between mainstem and tributary locations, characterised by temporary occupation, followed by fish returning to their original river

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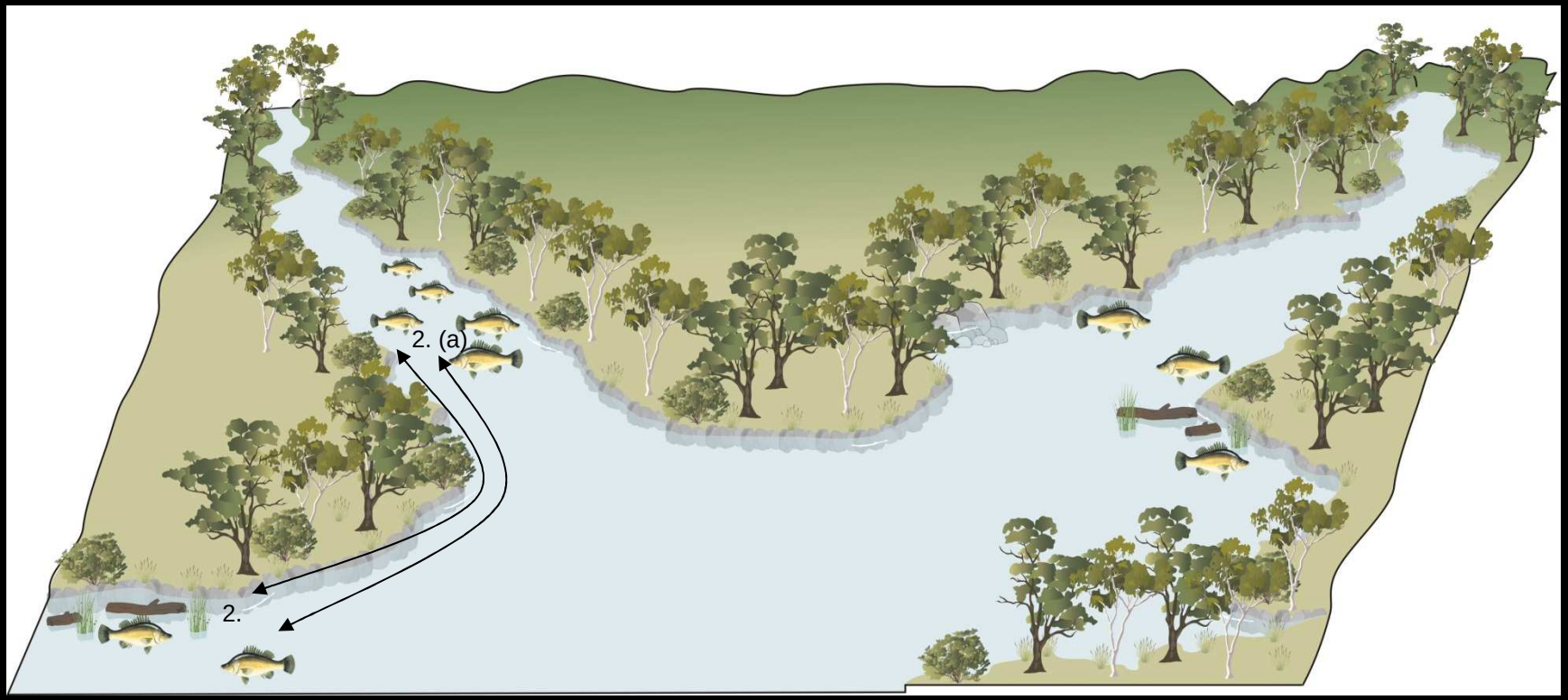

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 a) Movement of tributary fish into the mainstem is common during spring/summer, particularly during changes in flow

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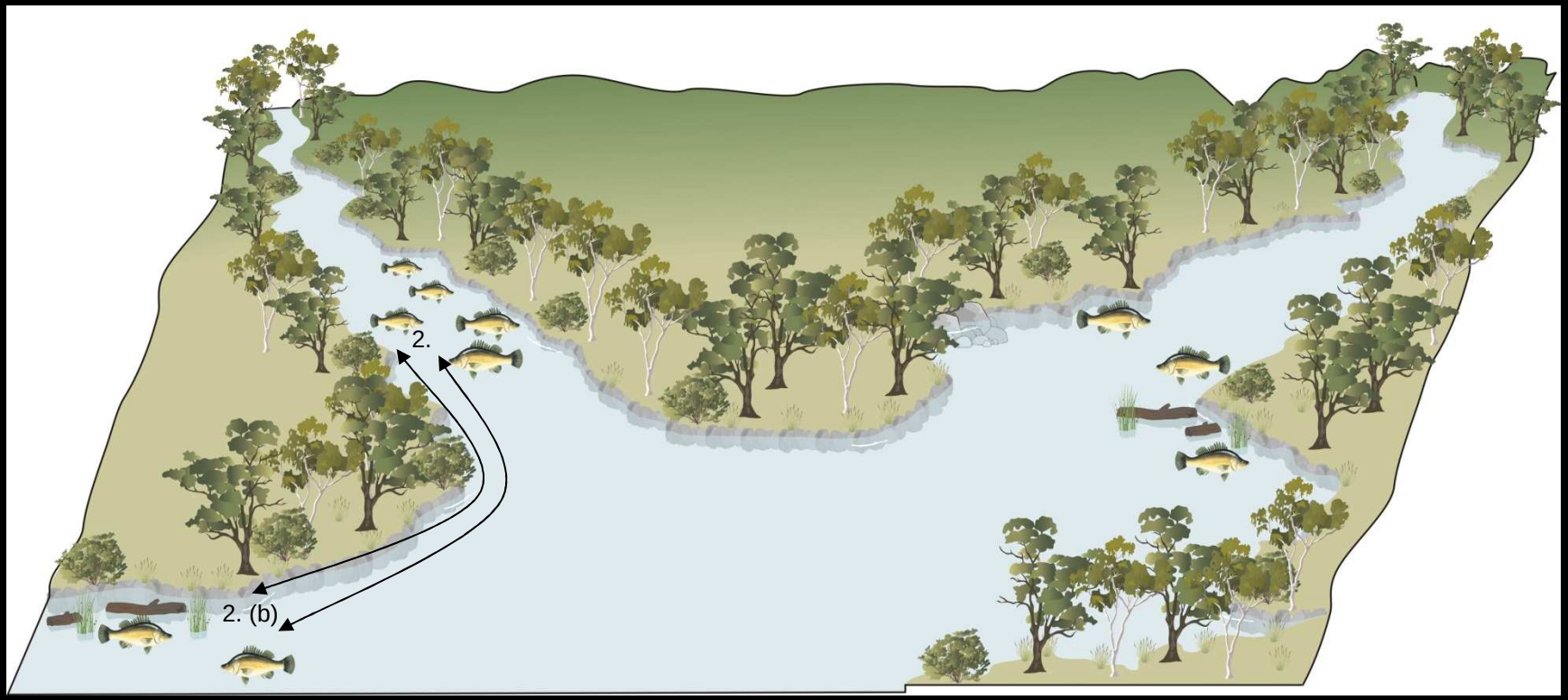

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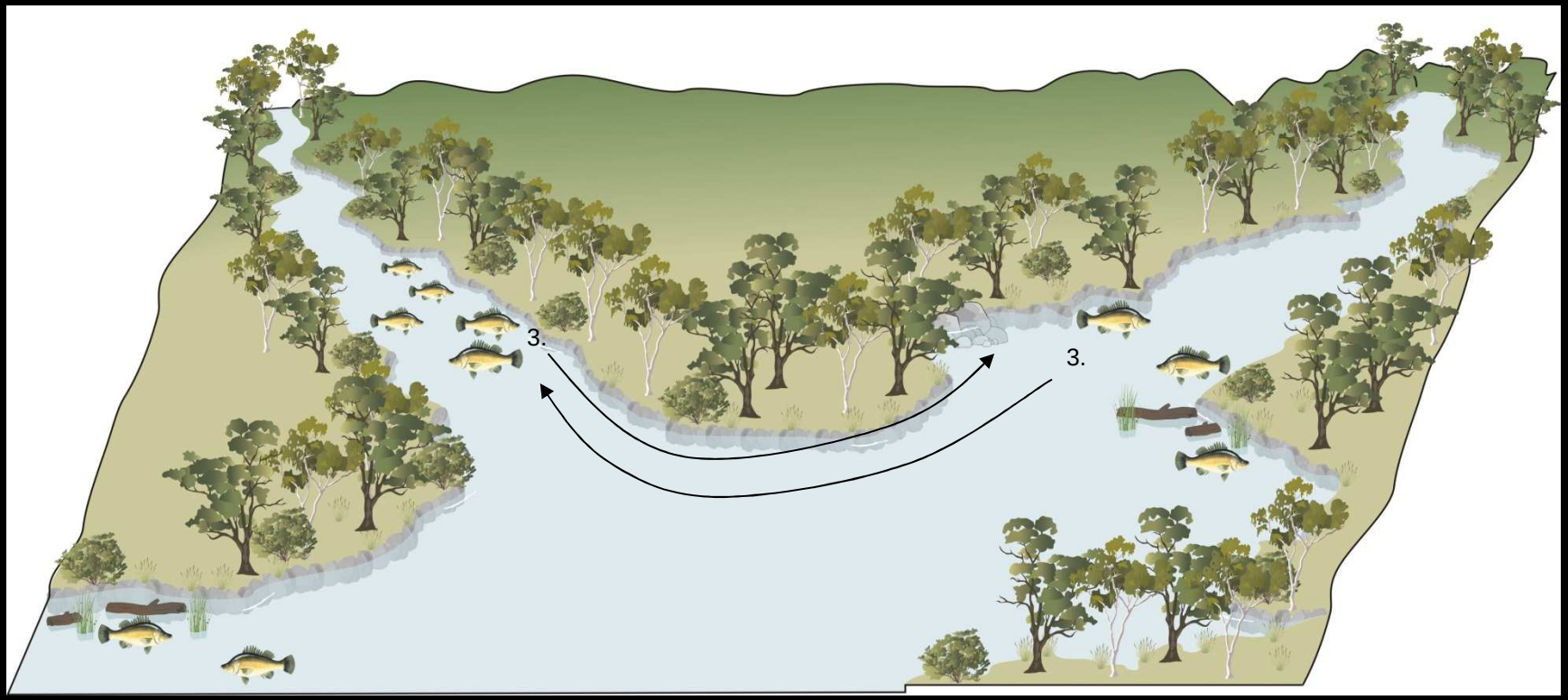
a) Movement of tributary fish into the mainstem is common during spring/summer, particularly during changes in flow

b) Movement of mainstem fish into tributaries is not concentrated during any one period

Conclusion



1. Most fish remain in their original ‘home’ river
2. Some fish move between mainstem and tributary locations, characterised by temporary occupation, followed by fish returning to their original river.
3. Some fish shift between mainstem and tributary locations and do not return

Conclusion

- Spatially and temporally complex pattern of movement between mainstem and tributary locations
- Fish populations don't conform to artificially constrained management units

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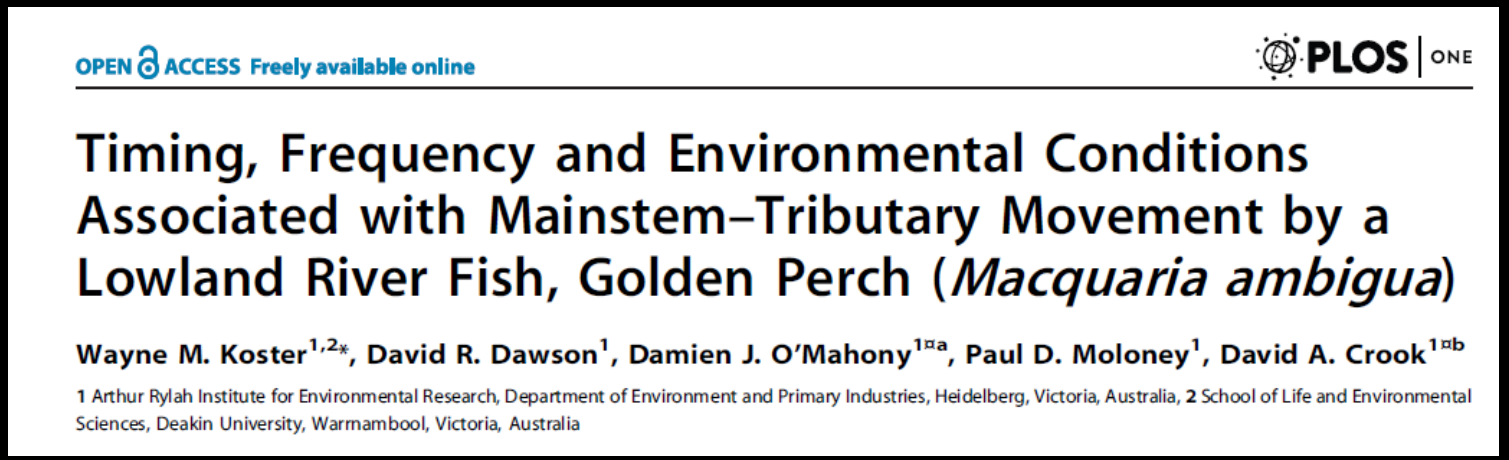
- Spatially and temporally complex pattern of movement between mainstem and tributary locations
- Fish populations don't conform to artificially constrained management units
- Important to consider flows to facilitate connectivity among rivers
- Environmental flow recommendations need to be developed interdependently across rivers

Acknowledgements

- Dave Crook (Charles Darwin University)
- Paul Moloney (Arthur Rylah Institute)
- Simon Casanelia, Geoff Earl, Mark Turner, Wayne Tennant, Megan Judd (Goulburn Broken Catchment Management Authority)



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Timing, Frequency and Environmental Conditions Associated with Mainstem–Tributary Movement by a Lowland River Fish, Golden Perch (*Macquaria ambigua*)

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