



Summary of evidence of
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on behalf of Ngā Rūnanga of
Canterbury, Te Rūnanga o Ngai
Tahu and Ngāi Tahu Property
Limited



Contents

- Braided rivers
 - Flow allocation
 - Minimum flows
 - Gaps
 - Partial restrictions
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- Flow variability
 - Different types of surface water takes
 - Stream depleting groundwater

Braided rivers

(Section 3)

- Need
 - An abundant sediment supply
 - High stream gradient
 - Rapid and frequent flow variation
 - Erodible banks
- Rare world wide
 - Alaska, Canada, Himalayas, South Is of NZ.

Braided rivers

(Section 3)

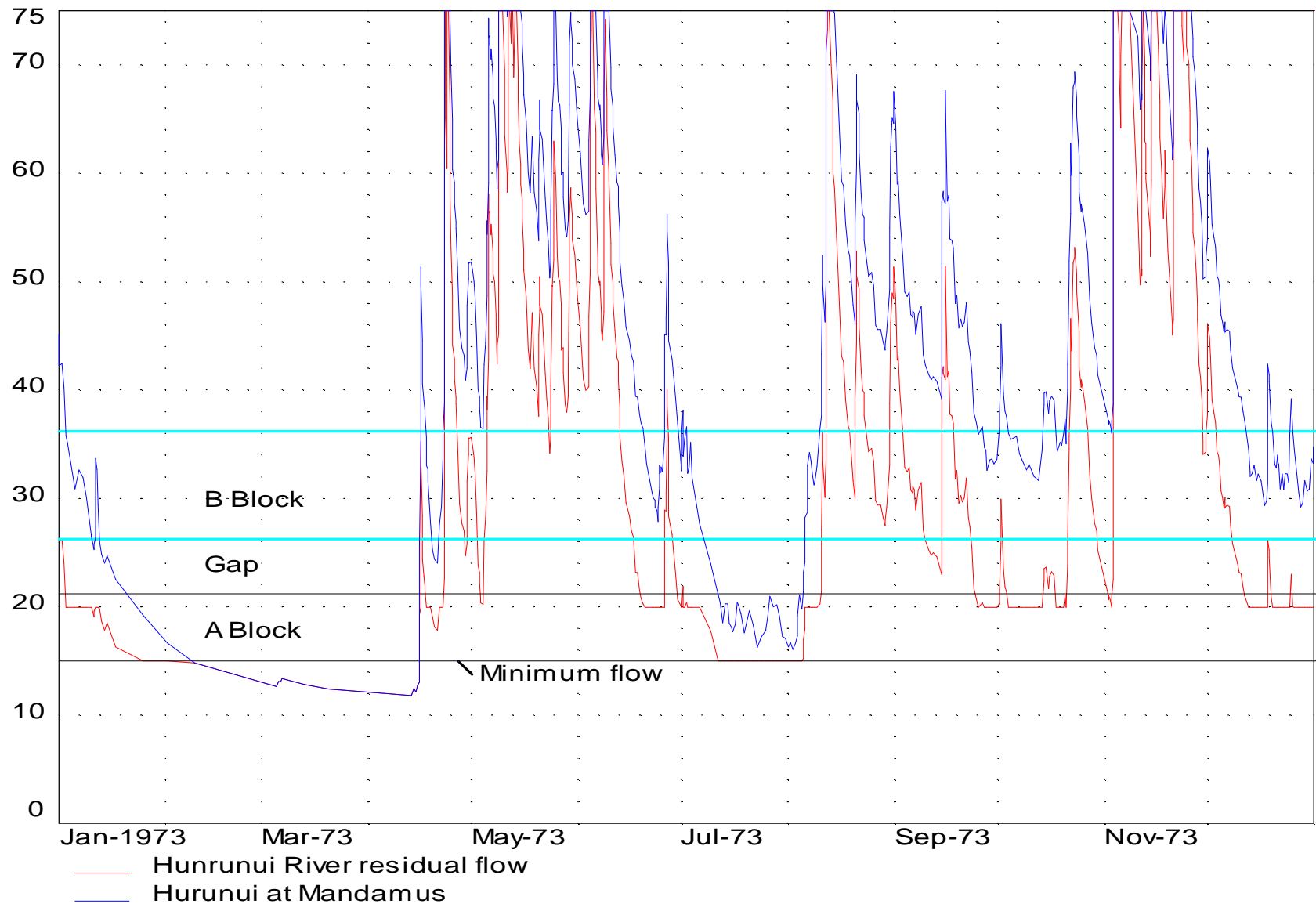


Allocation regime components

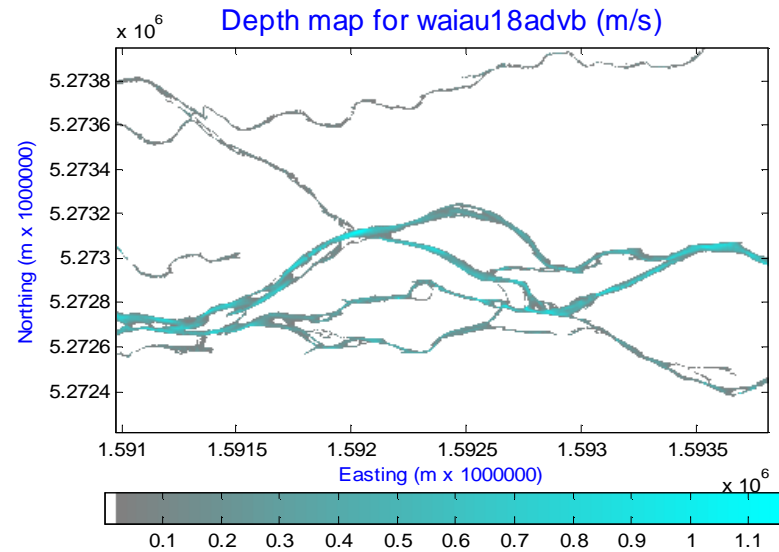
(Section 4)

- A minimum flow
- Allocation blocks
- Flow gaps
- Periphyton and silt flushing flows
- Preservation of bedload moving floods.

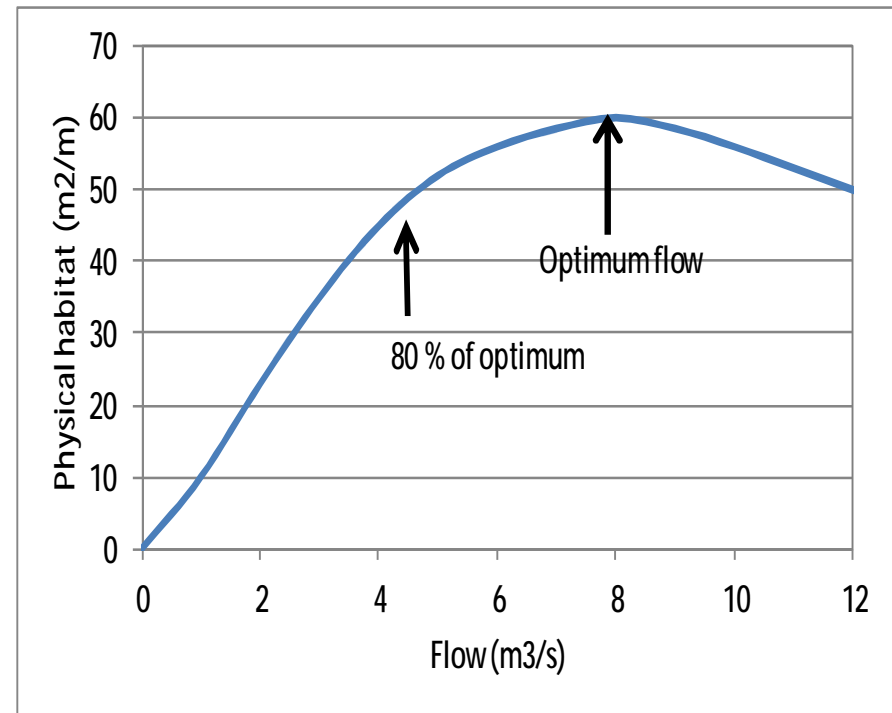
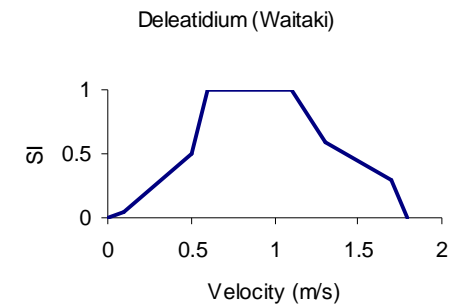
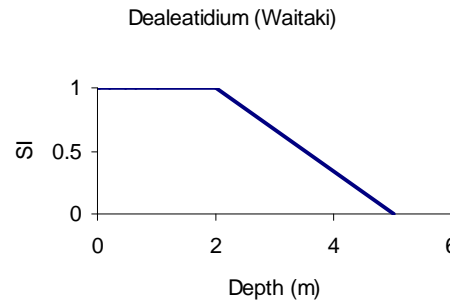
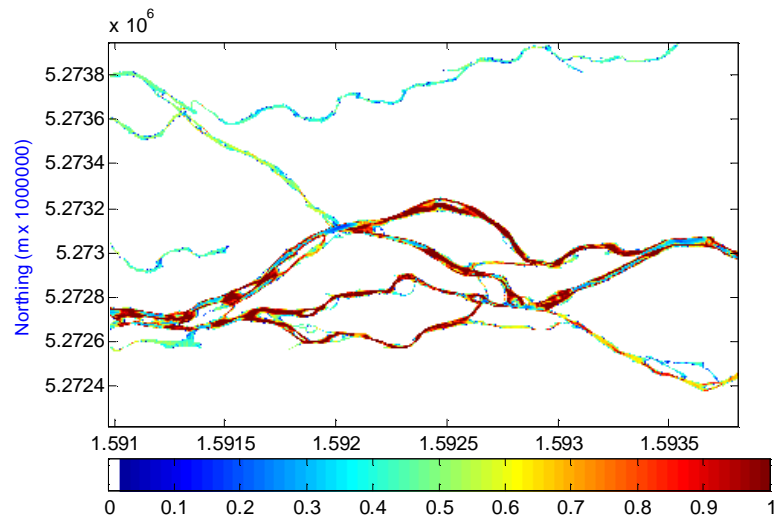
Allocation regime components



Selecting a minimum flow



waiau model:run 20c:20 m3/9-12-08 - Habitat Preference Map - Deleatidium mayfly

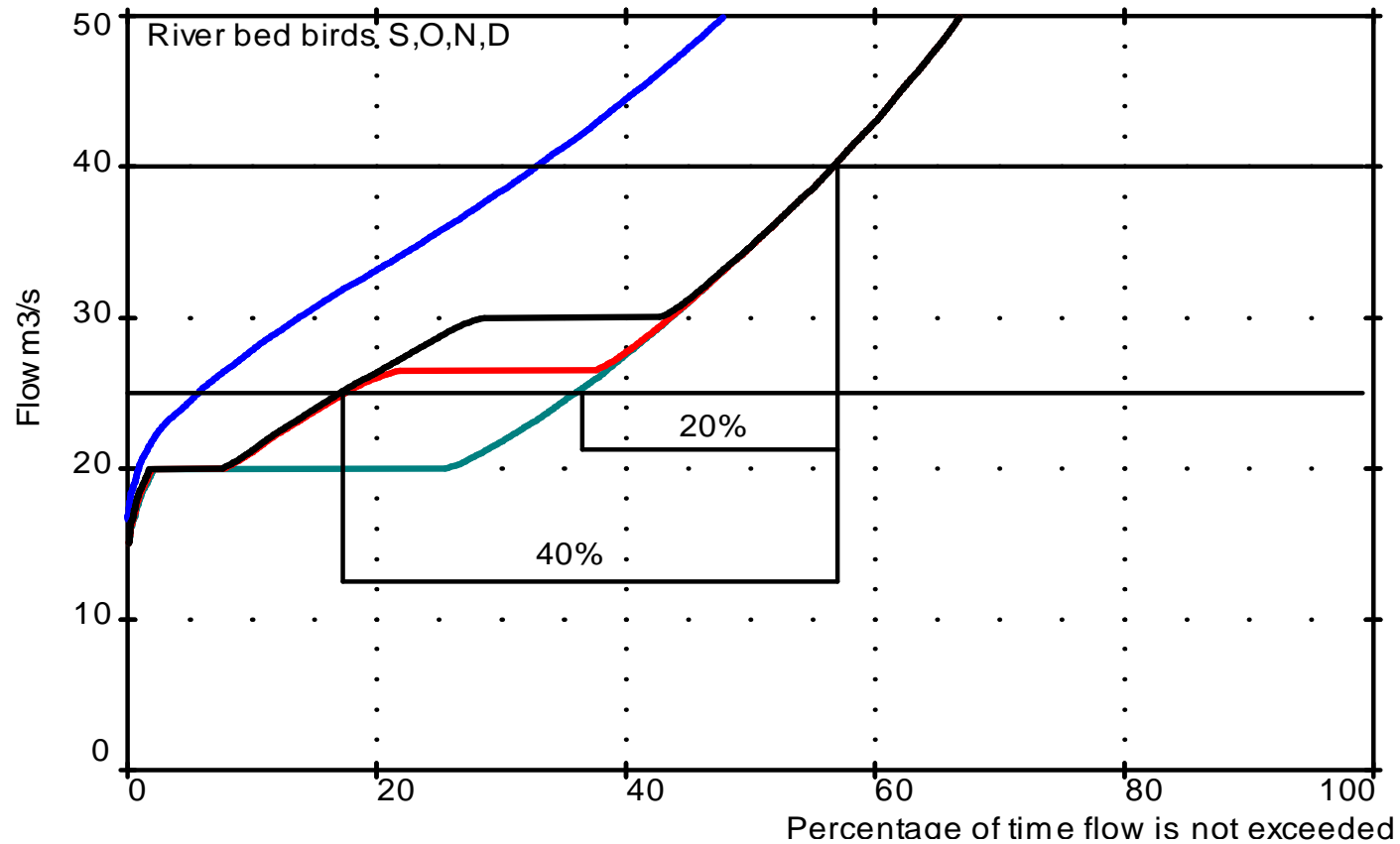


The function of gaps

(para 5.3)

- To provide for over allocation
- To ensure security of supply
- To provide for environmental or recreational flows

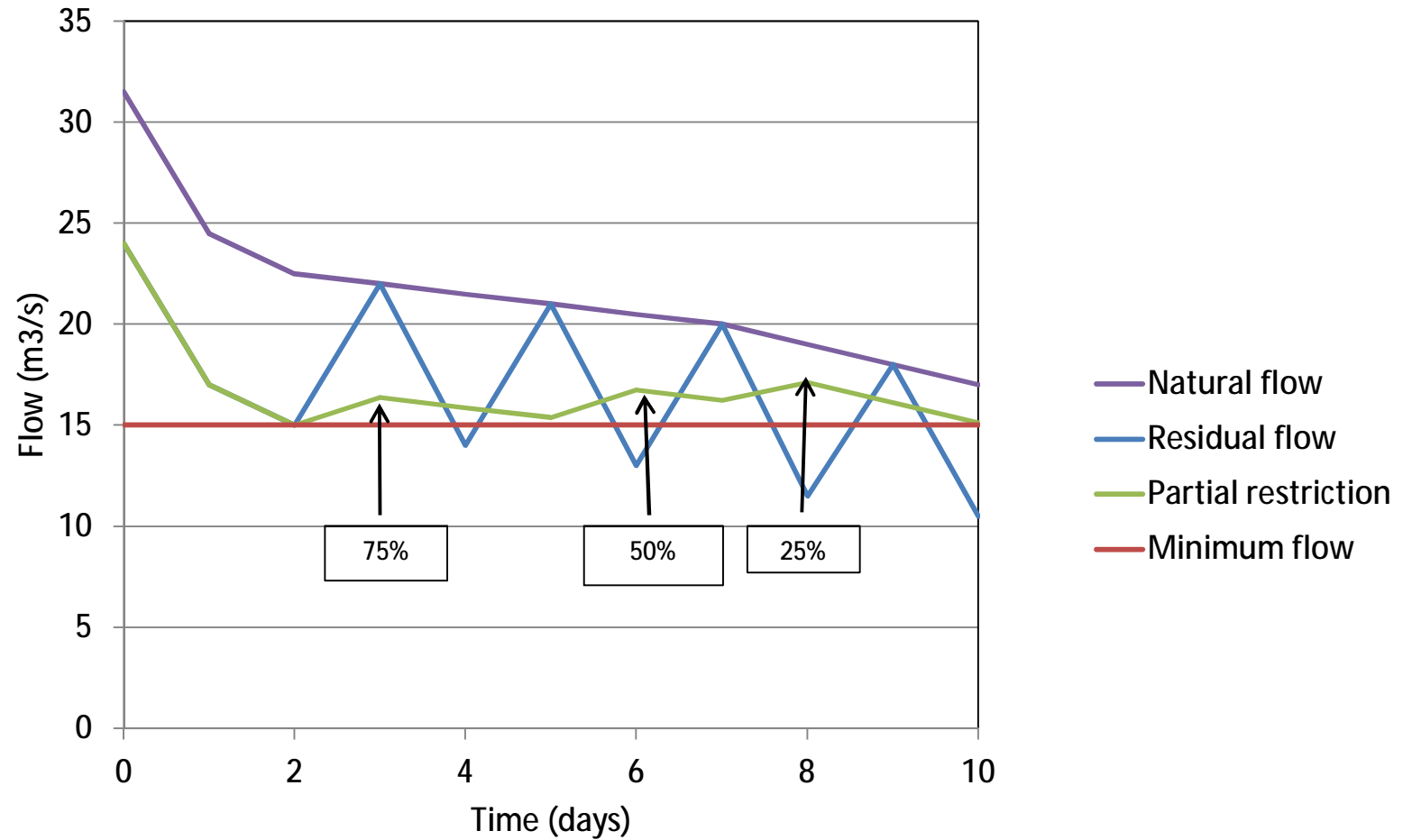
Gaps for environmental flows



- Natural flow
- A block 6.2 m^3/s , no gap, B block 10 m^3/s
- A block 6.2 m^3/s , 6.5 m^3/s gap, B block 10 m^3/s
- A block 6.2 m^3/s , 10 m^3/s gap, B block 10 m^3/s

Partial restrictions

(Section 6)



The need for flow variability for braided and gravel bed rivers

(Section 7)

- For periphyton and silt flushing
 - For moving bed load to form new channels
 - For moving bed load to nourish the coast
 - To open, or keep open, river mouths
 - To provide flow, turbidity or temperature signals to start fish migration.
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- Water that flows to sea is not wasted!!

Different types of surface water abstraction

(Section 8)

- Different types of surface water abstraction have different effects on residual flows
- Run of river takes
- Takes to storage
- Double consented takes.

Stream depleting groundwater takes

(Section 9)

- Stream depleting groundwater takes and surface water takes need to be managed together.
- For example: Abstraction restrictions for a river need to be applied to stream depleting groundwater takes associated with that river.