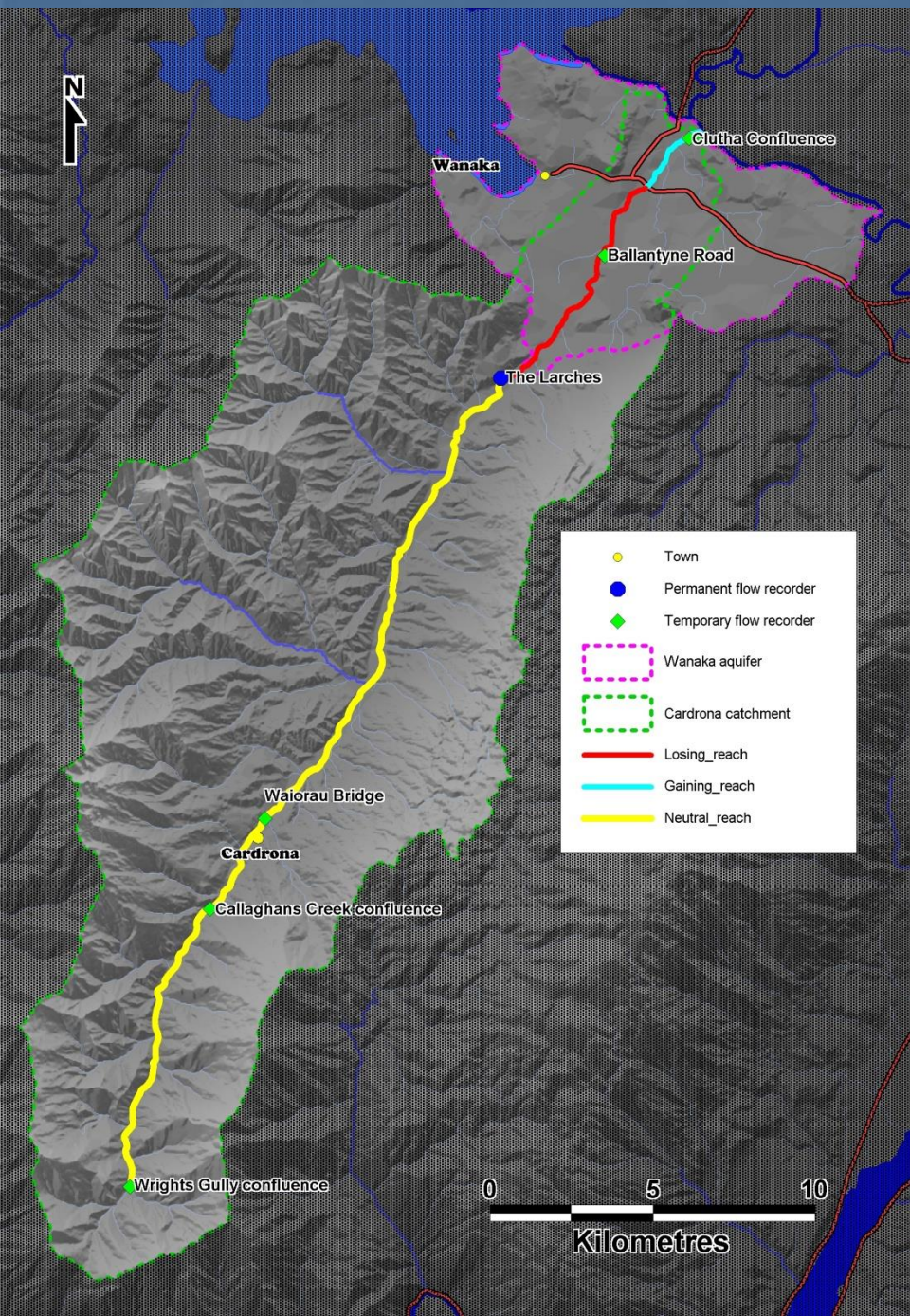


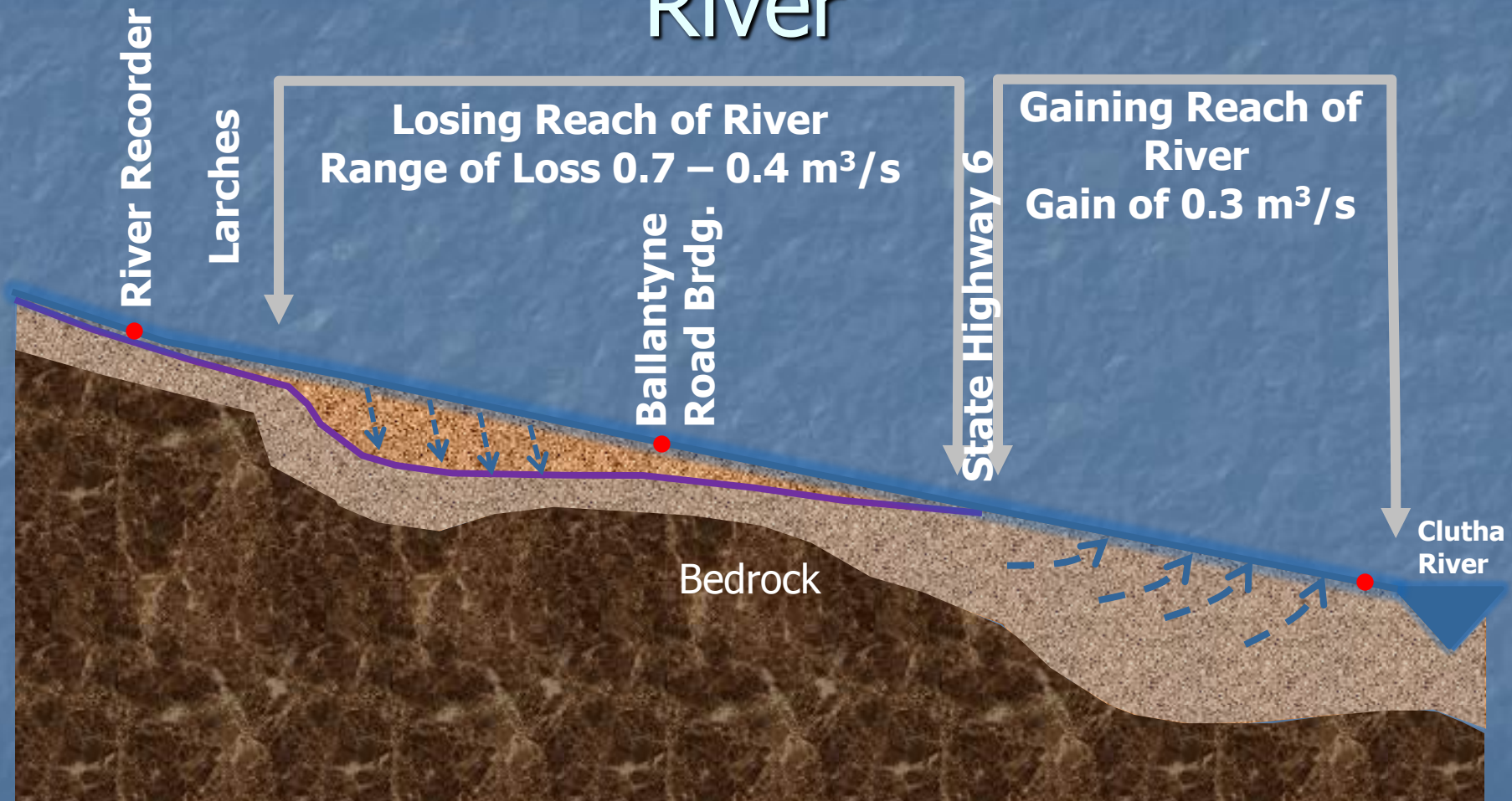
Water Resource Management for the Cardrona catchment

Matt Dale:
Jens Rekker

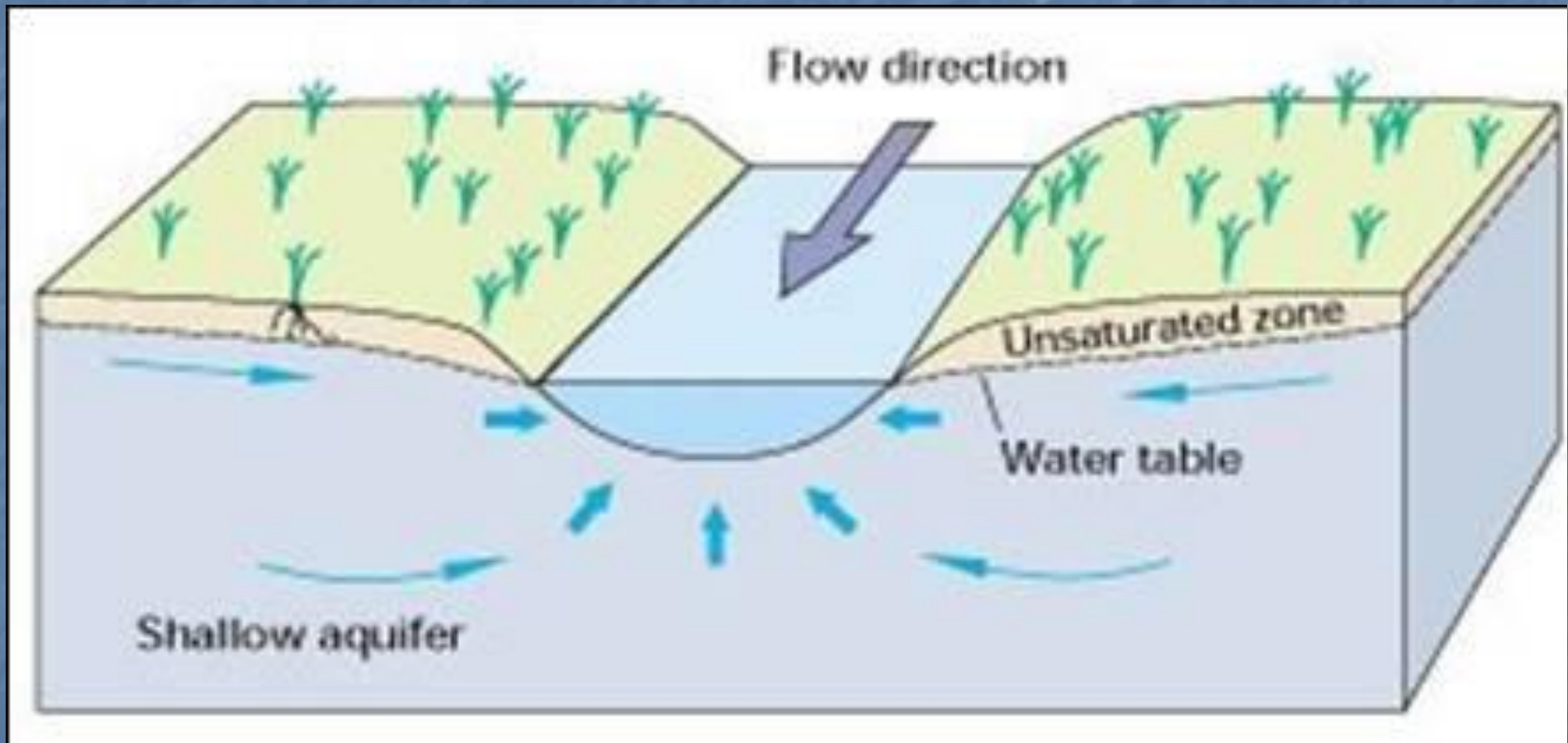


Surface water/ groundwater interactions in the Cardrona River

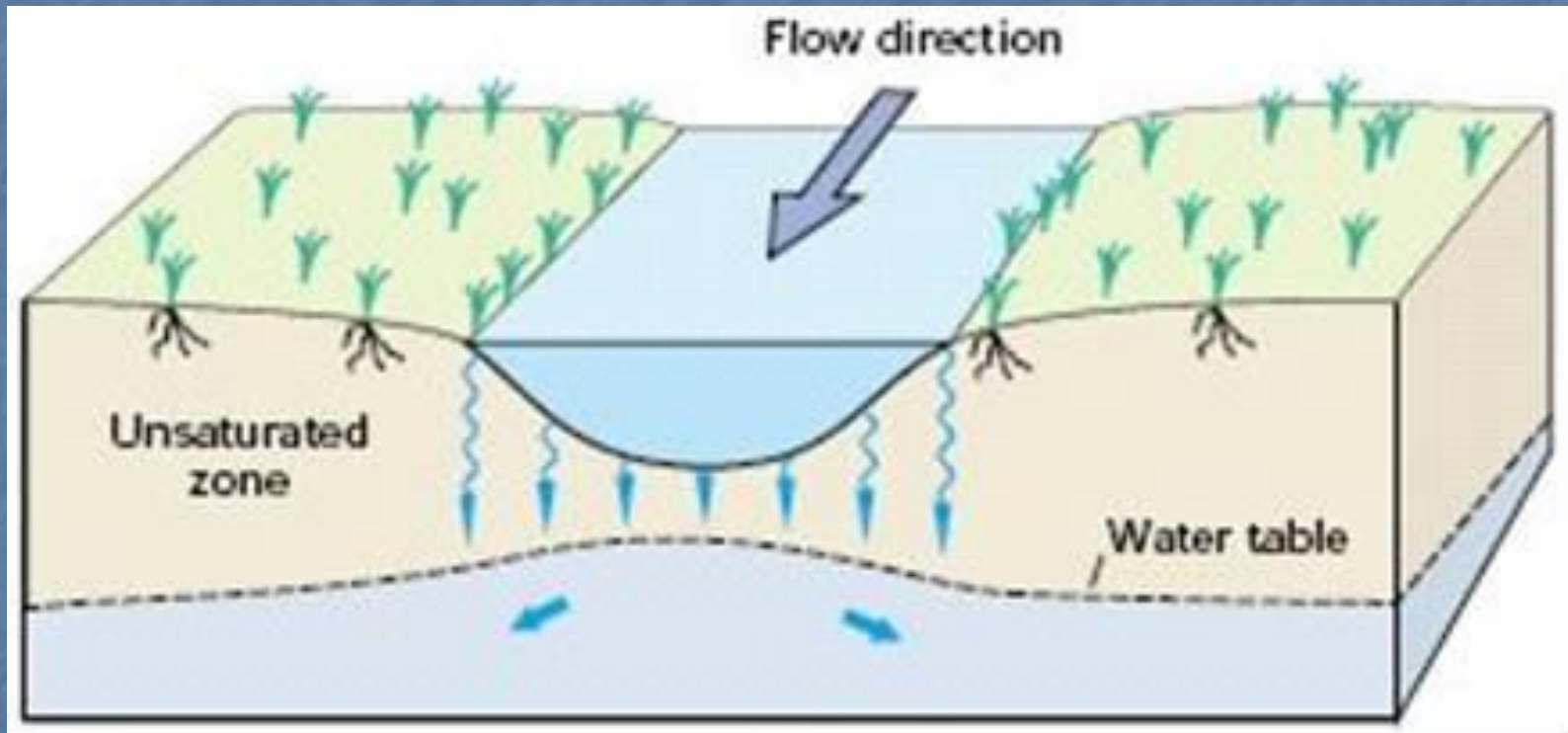
Cross-section of the lower Cardrona River



Gaining reach (Downstream of SH6)



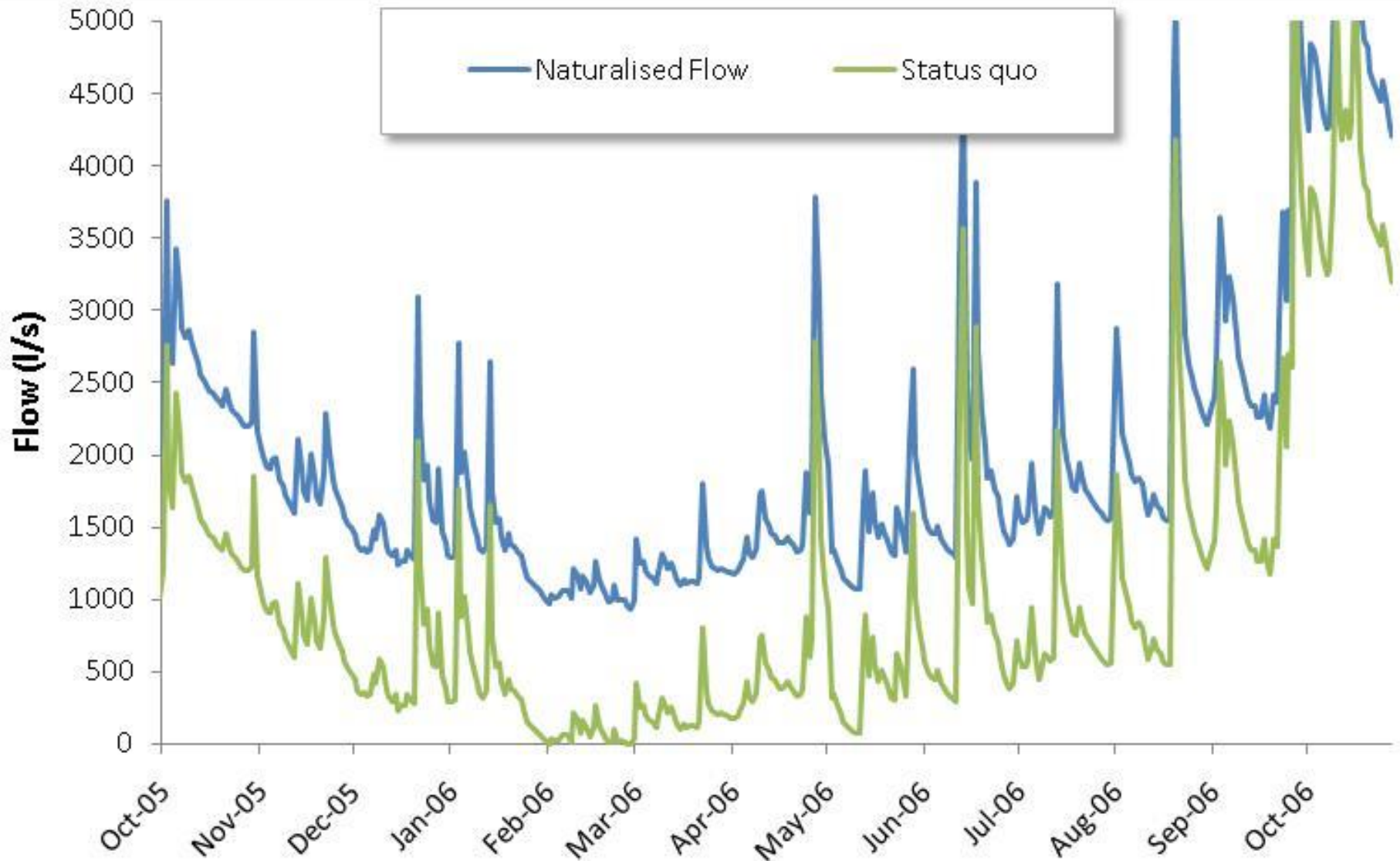
Disconnected losing reach (From The Larches to above SH6)



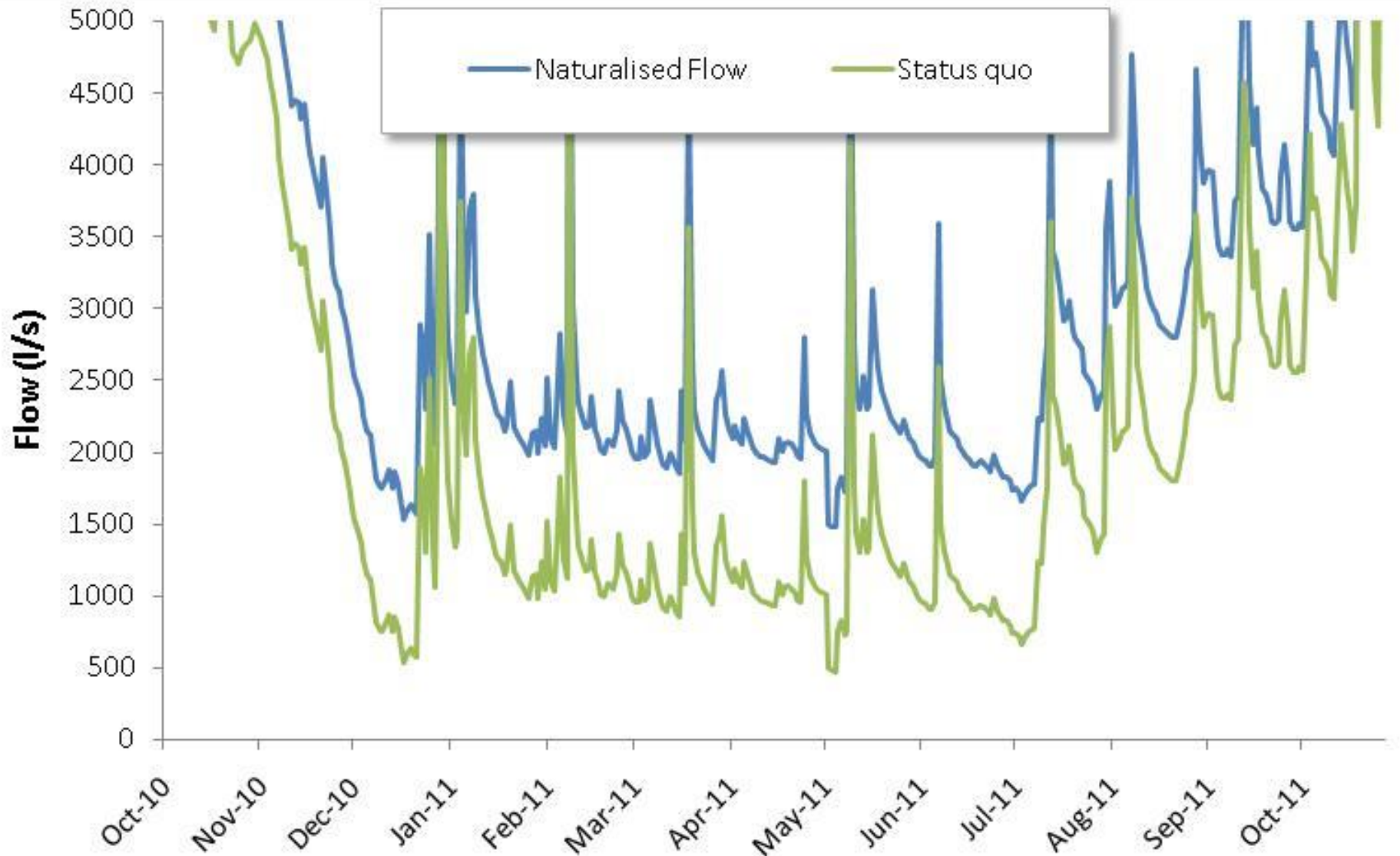
Minimum flow scenarios

1. Status quo – Carry on with the current set-up
2. Flow continuity – maintain surface flows throughout the irrigation season
3. Dual minimum flow – Maintain flow continuity until the end of Jan to allow juvenile trout to leave the Cardrona

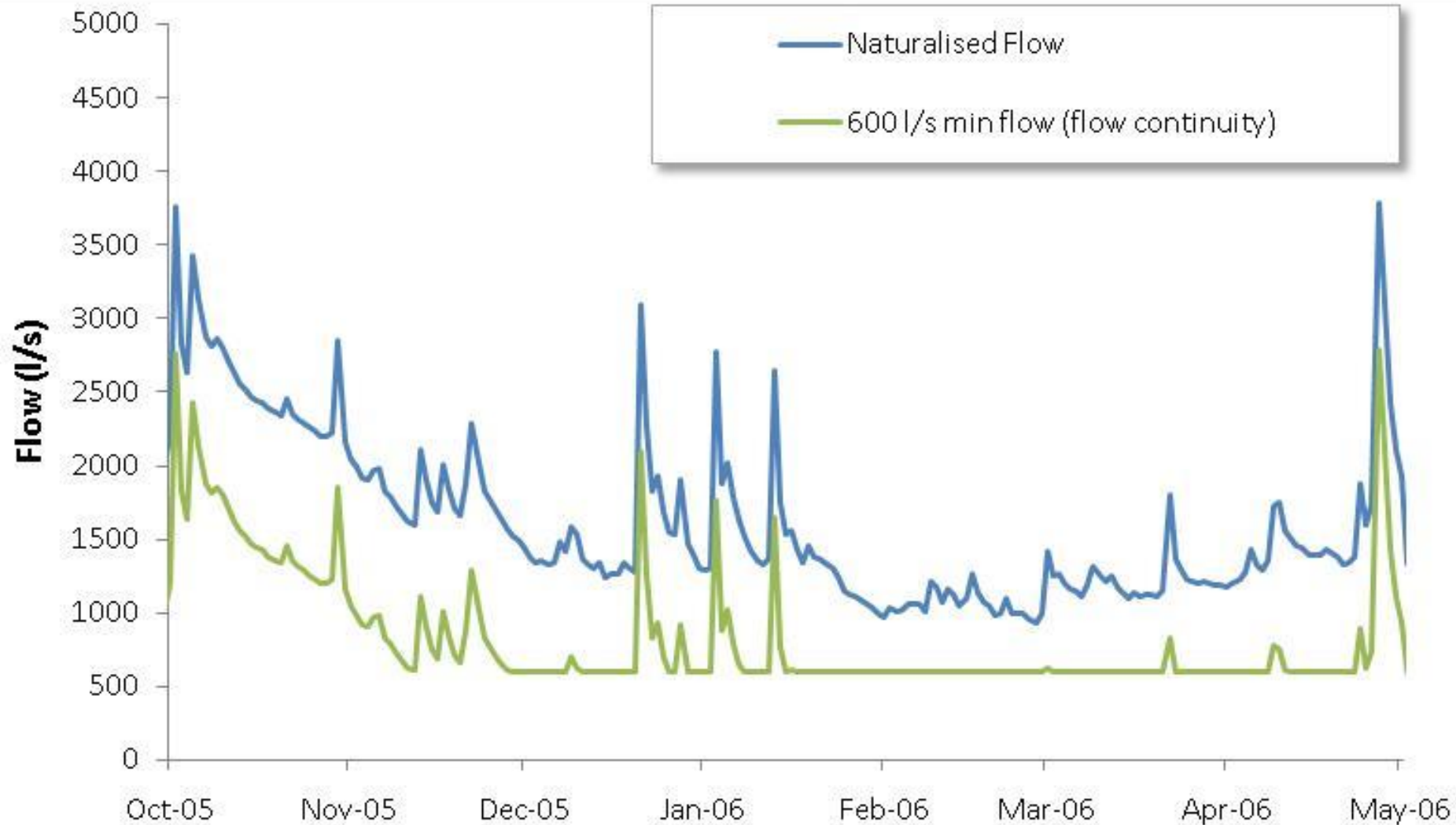
Status quo – Dry year



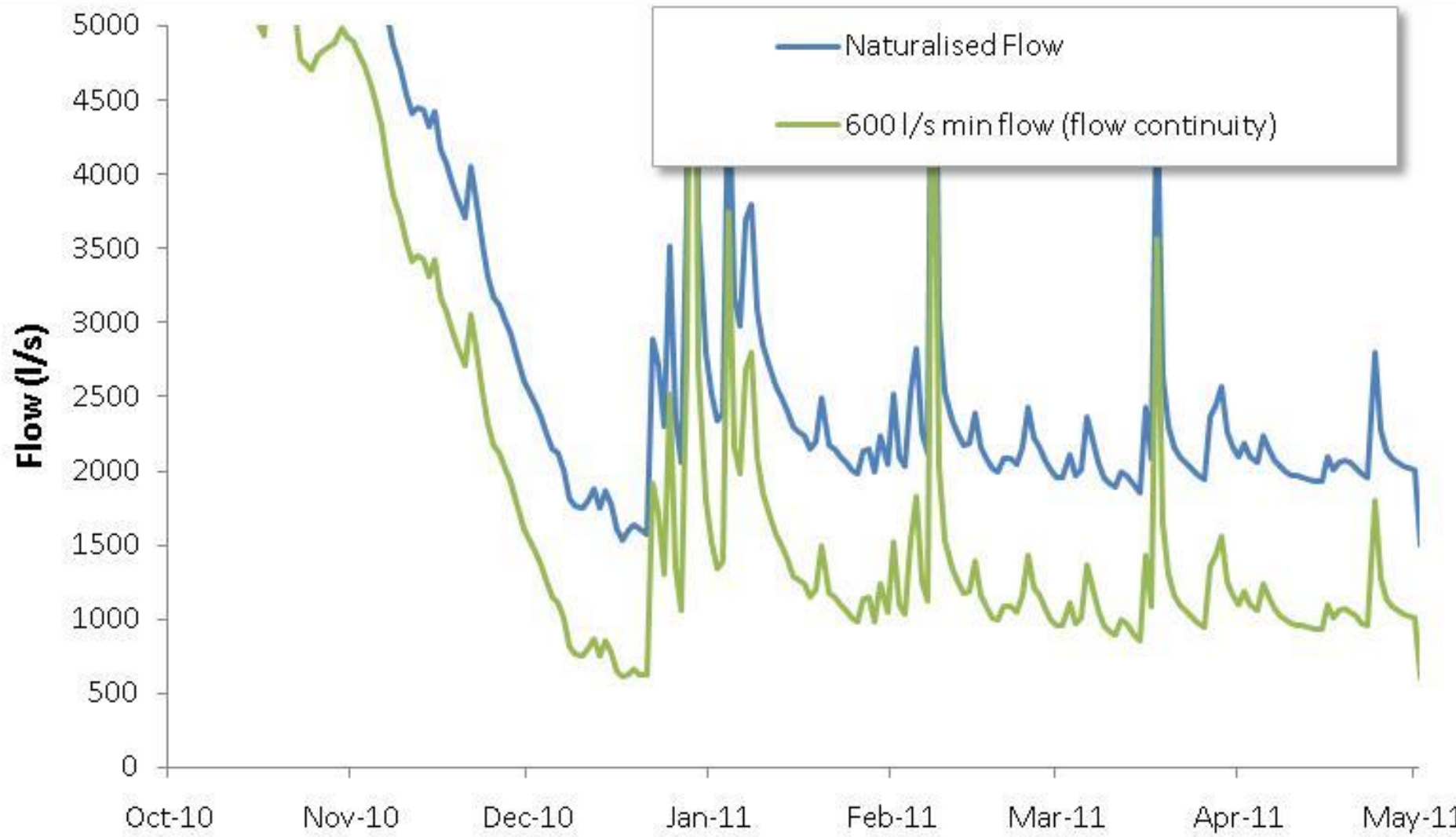
Status quo – Wet year



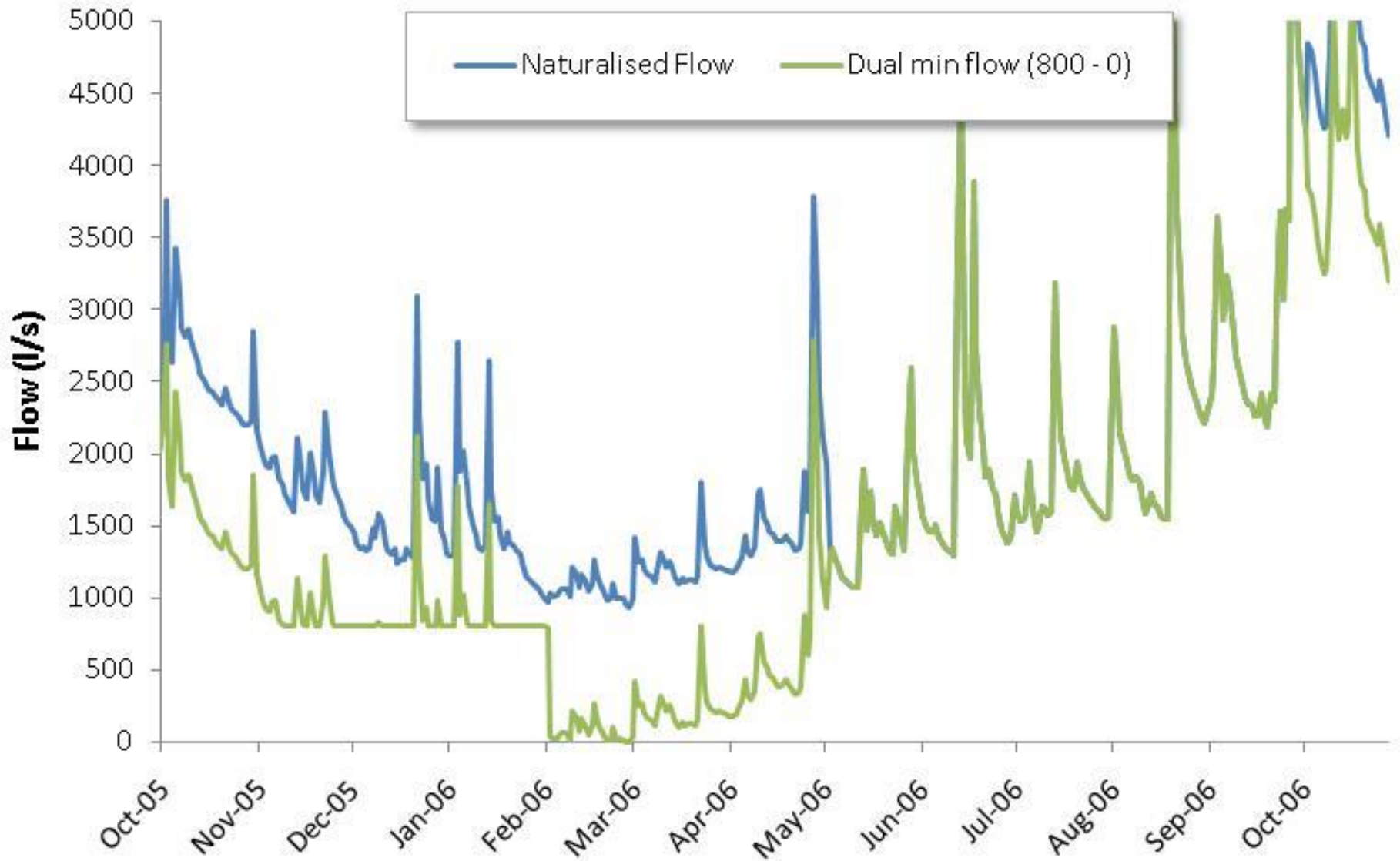
Flow continuity (600 l/s) – Dry year



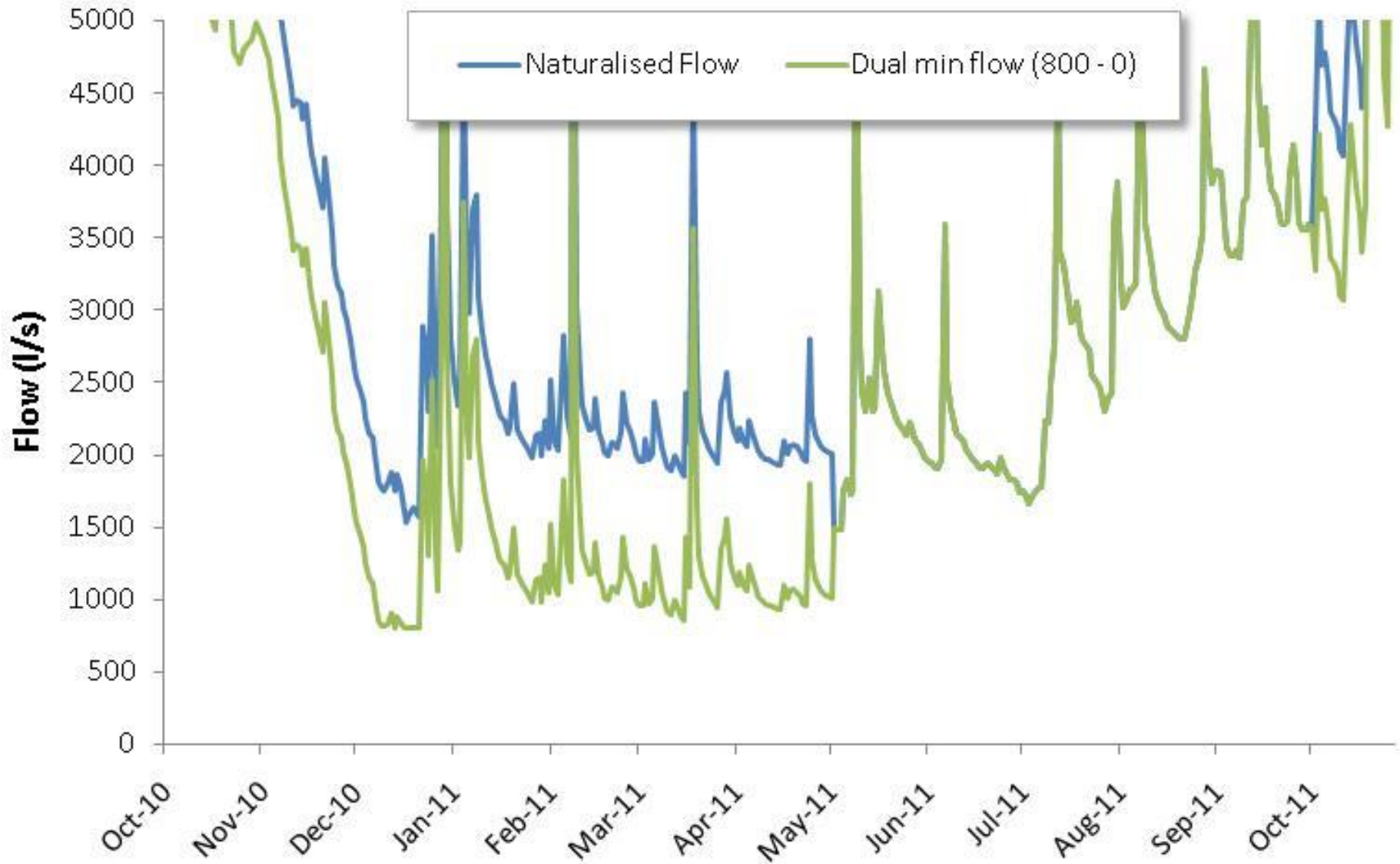
Flow continuity (600 l/s) – Wet year



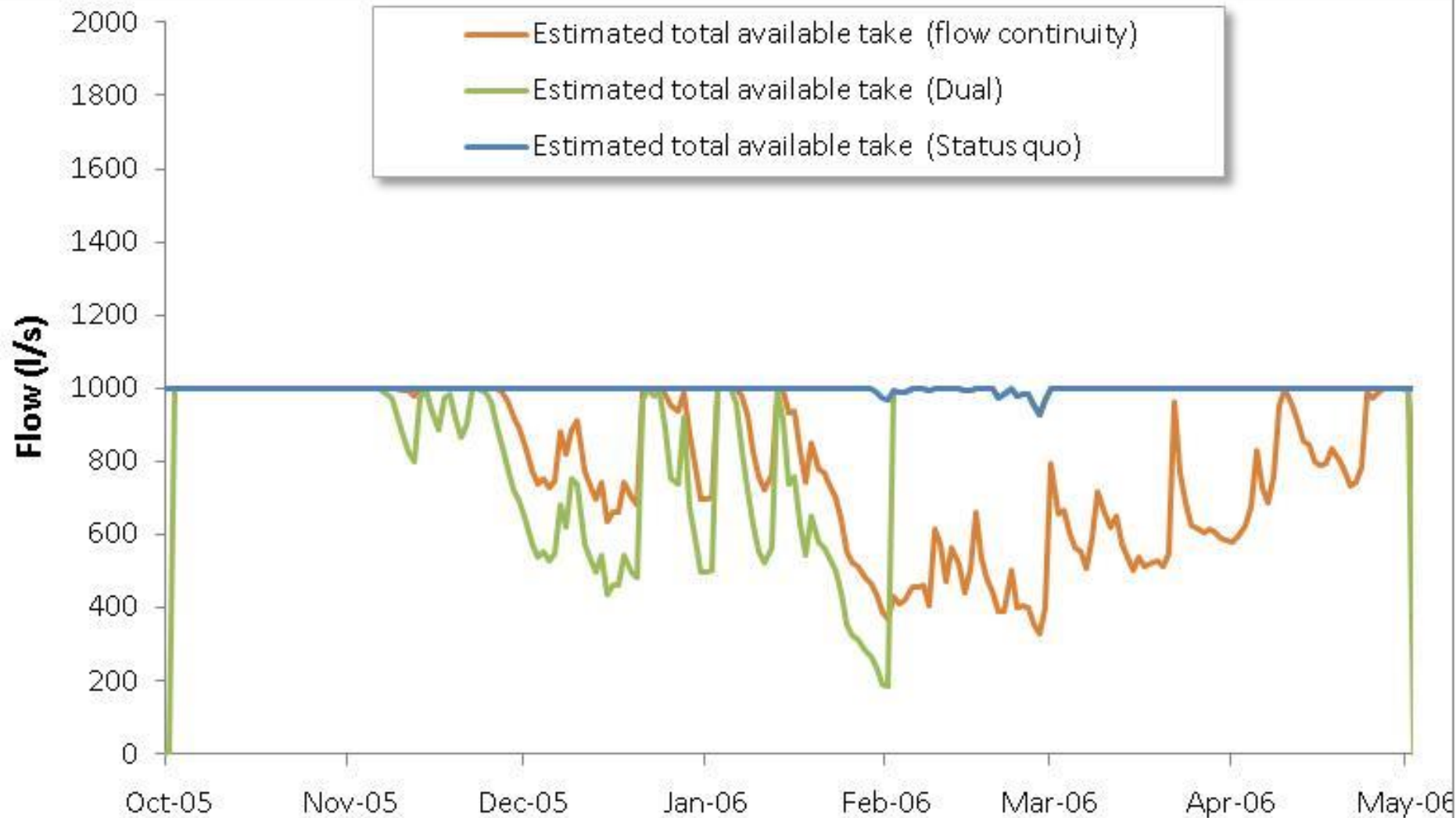
Dual min flow (800 – 0 l/s)– Dry year



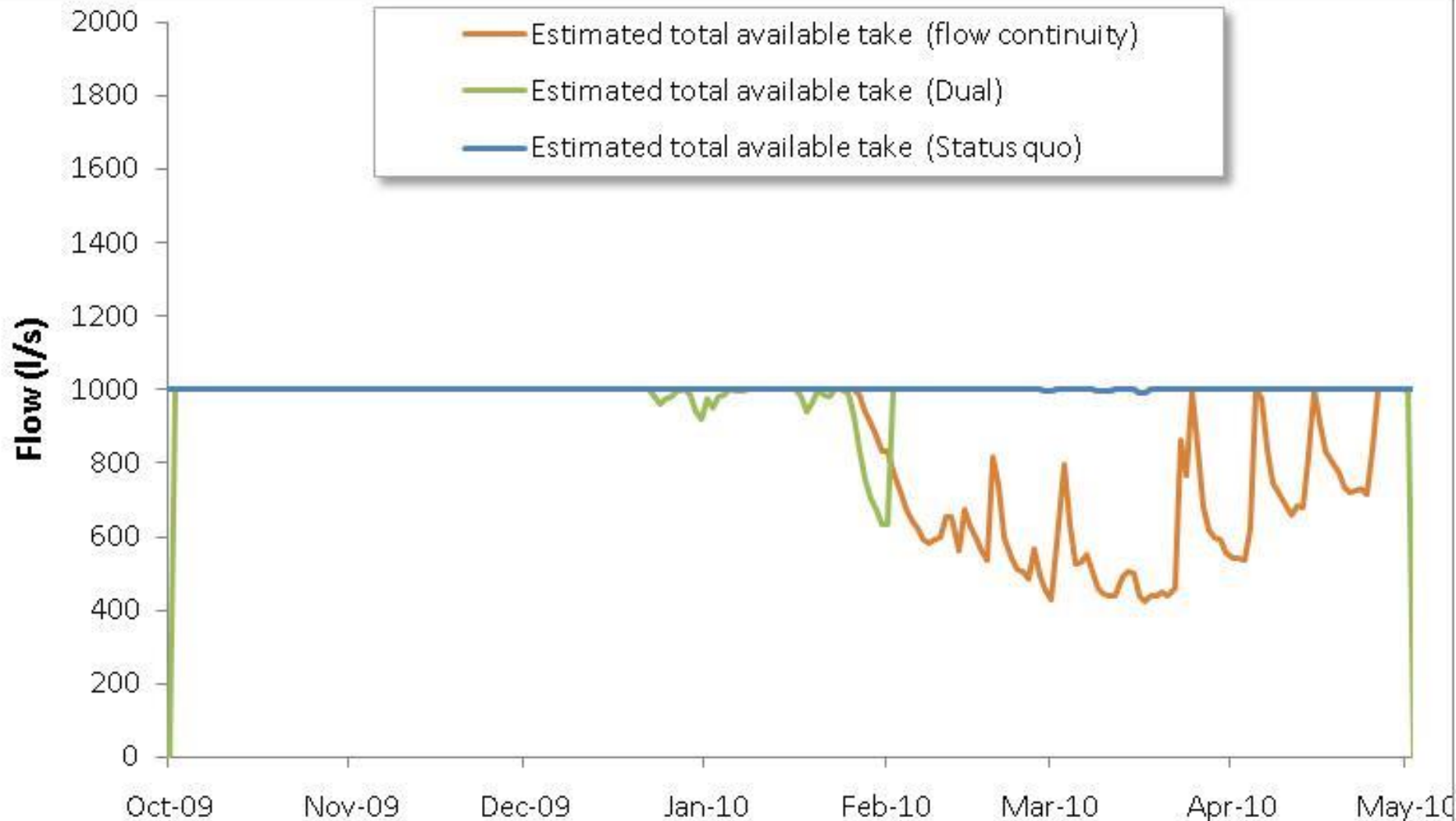
Dual min flow (800 – 0 l/s)– Wet year



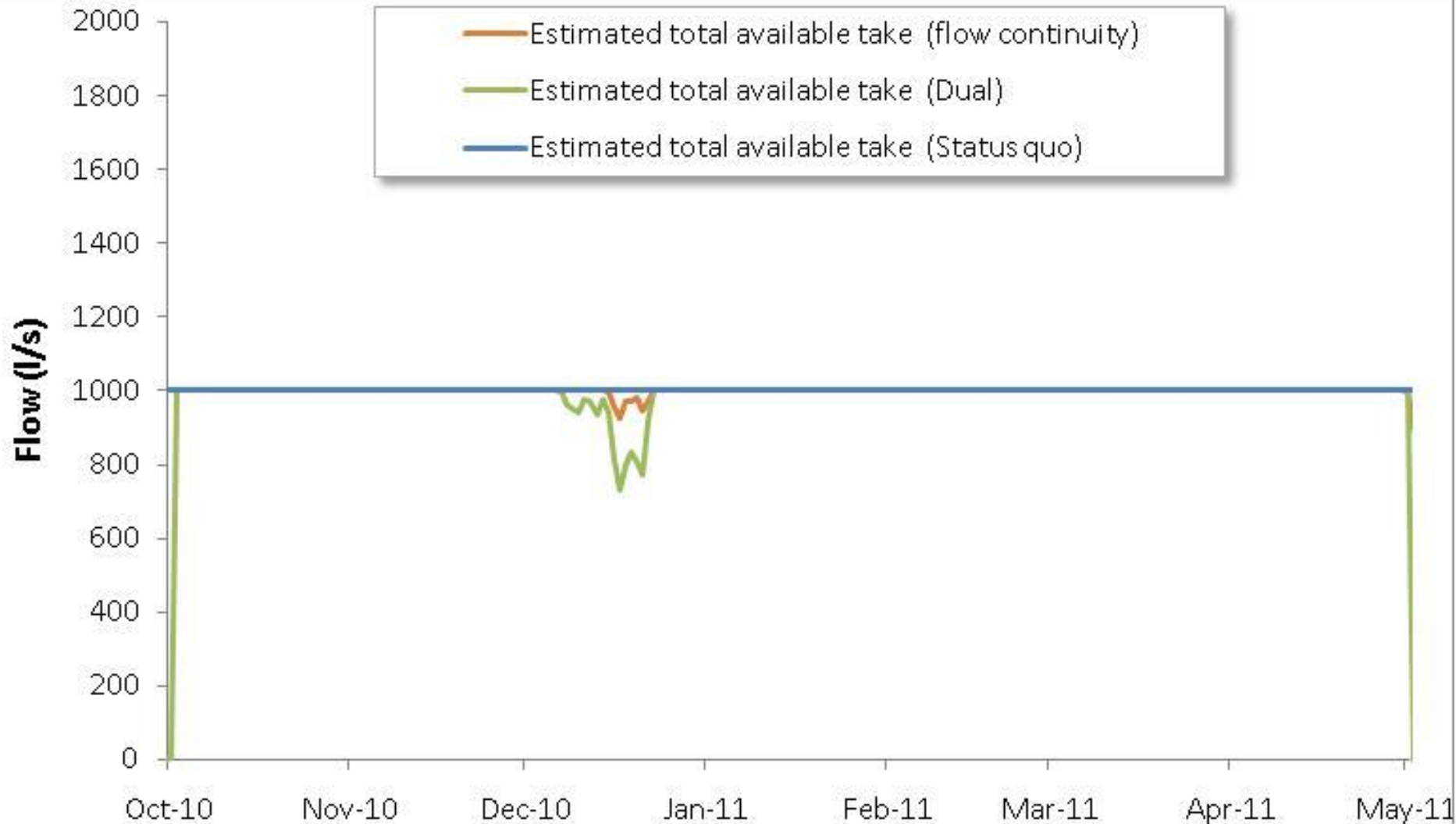
Water availability – Dry year



Water availability – Average year



Water availability – Wet year

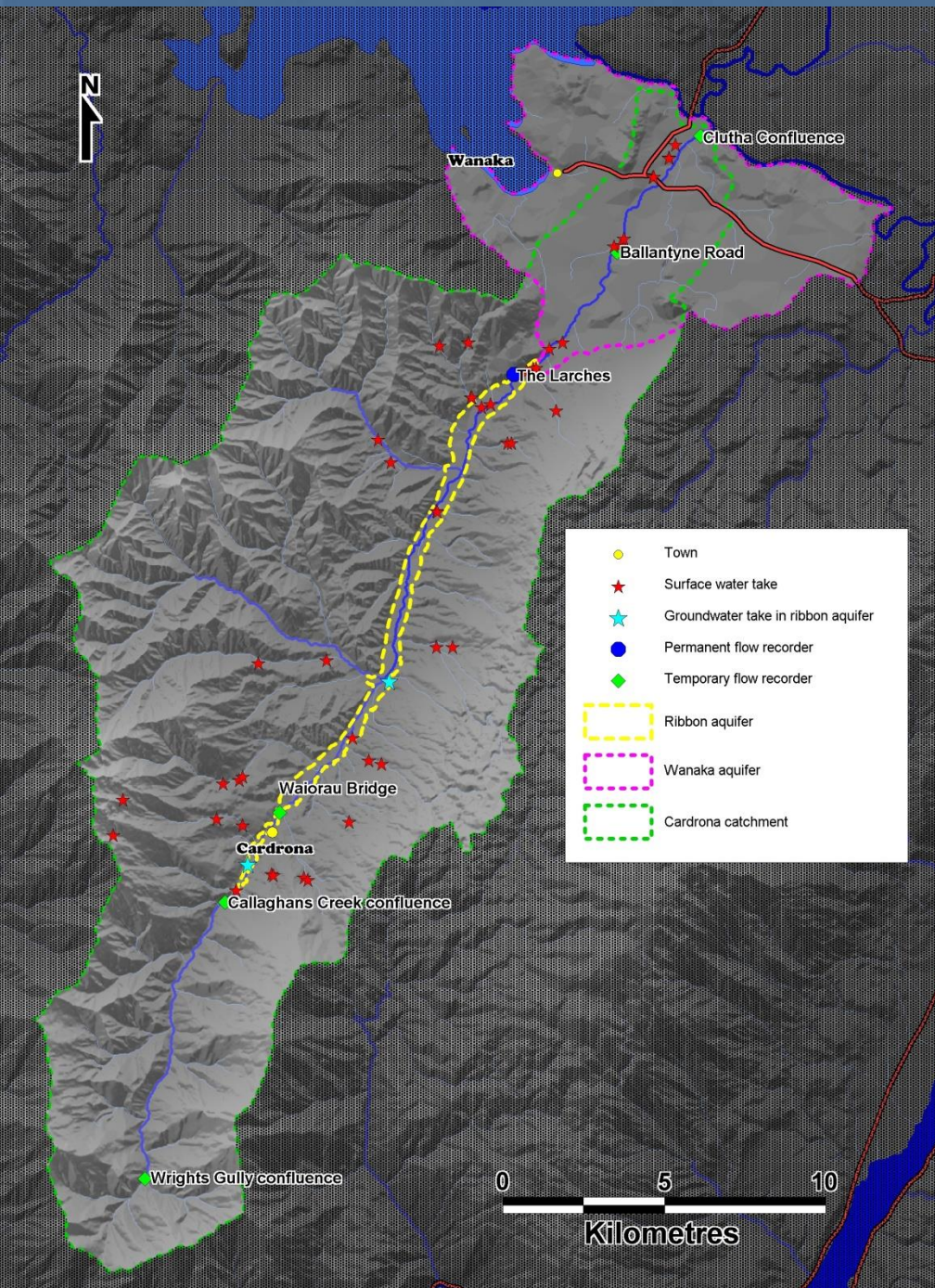


Integrated water resource management

- Using groundwater to offset reductions in surface water availability
- Clutha/Lake Wanaka water scheme
 - Comparisons with Lindis?
- In-catchment storage
 - No go

Hydrology of the lower Cardrona River – a summary

- Approximately $0.7 \text{ m}^3/\text{s}$ (700 l/s) of surface water is lost to groundwater between The Larches and SH6.
- Once surface flows cease in the losing reach, groundwater levels in the Wanaka aquifer drop sharply
- Approximately $0.3 \text{ m}^3/\text{s}$ (300 l/s) returns to the river between SH6 and the Clutha confluence



- There is a total of 2.411 m³/s of primary allocation in the Cardrona catchment
- It is estimated that 1 m³/s of this is actually taken during the irrigation season



Natural values of the Cardrona River



Introduced fish

- Brown trout
 - Rainbow trout
 - Brook char
- The Cardrona River is considered a locally important brown and rainbow trout fishery
- Is one of the main spawning and juvenile rearing rivers for both brown and rainbow trout in the upper Clutha

