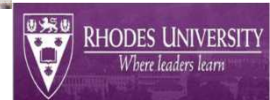


Understanding recent change in river-floodplain connectivity for river restoration in the Bavianaans catchment

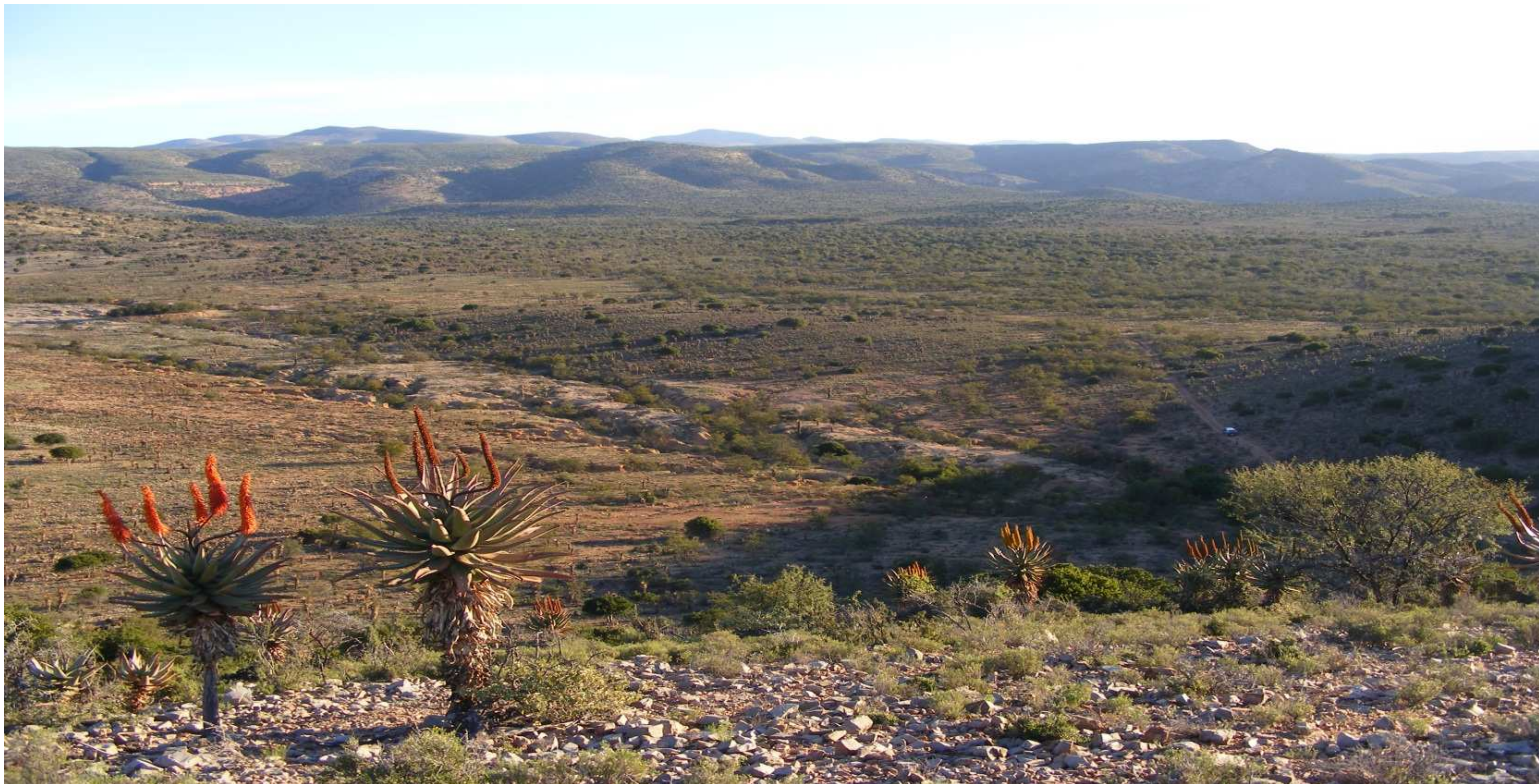


R Joubert, WN Ellery, K Rowntree
Department of Environmental Science, Rhodes University,
Grahamstown



Contents

- Geomorphic connectivity & rationale
- Baviaans River - floodplain 'dis-connectivity'
- Restoring connectivity
- Broader considerations for a Thicket catchment



Introduction

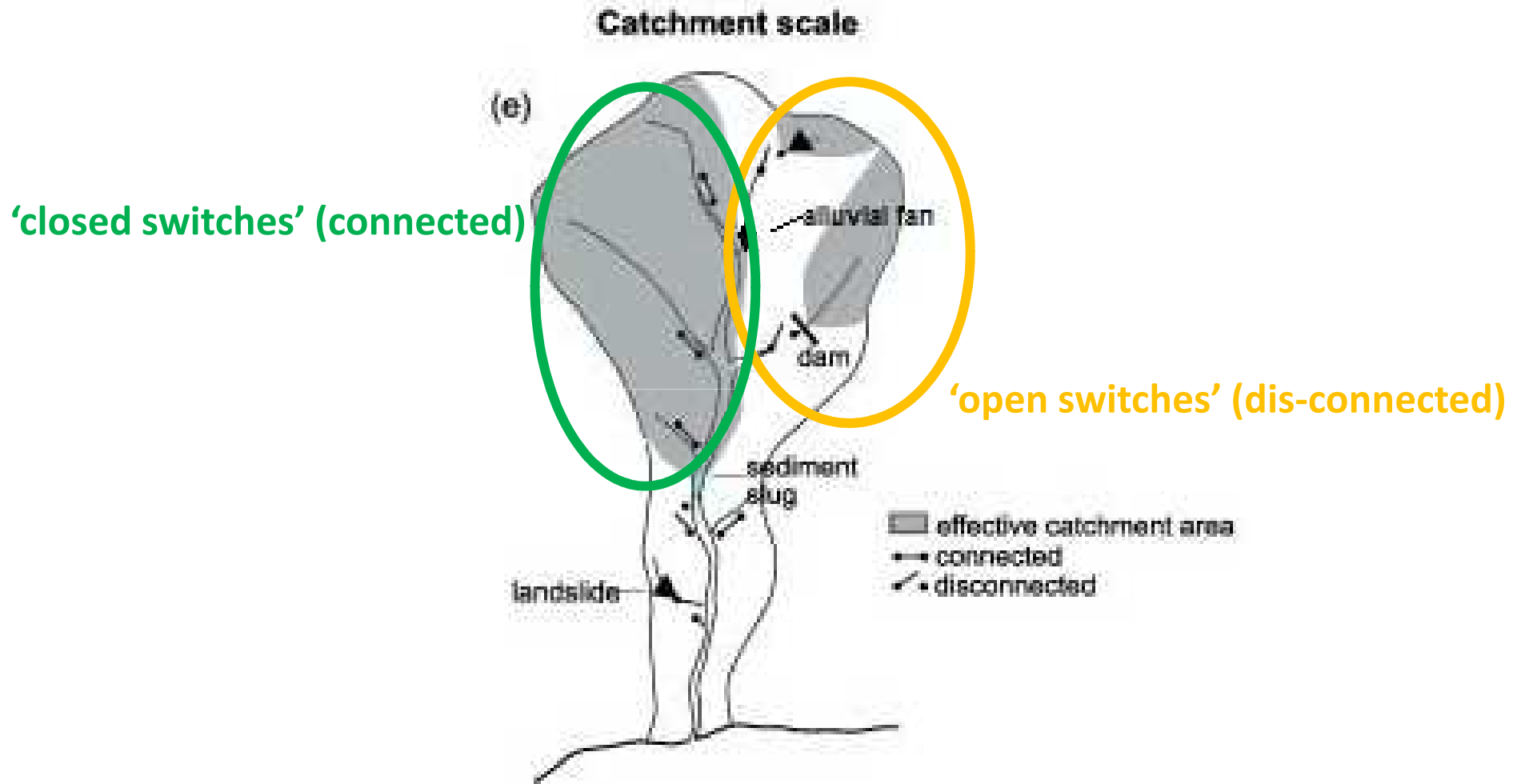
Why study geomorphic connectivity?

- Understanding complex systems (Brierley *et al.*, 2006; Harvey, 2002)
- Applications ----- river restoration (Kondolf, 2006)

Knowledge gap

- South African catchments
- Government restoration programmes

Geomorphic connectivity



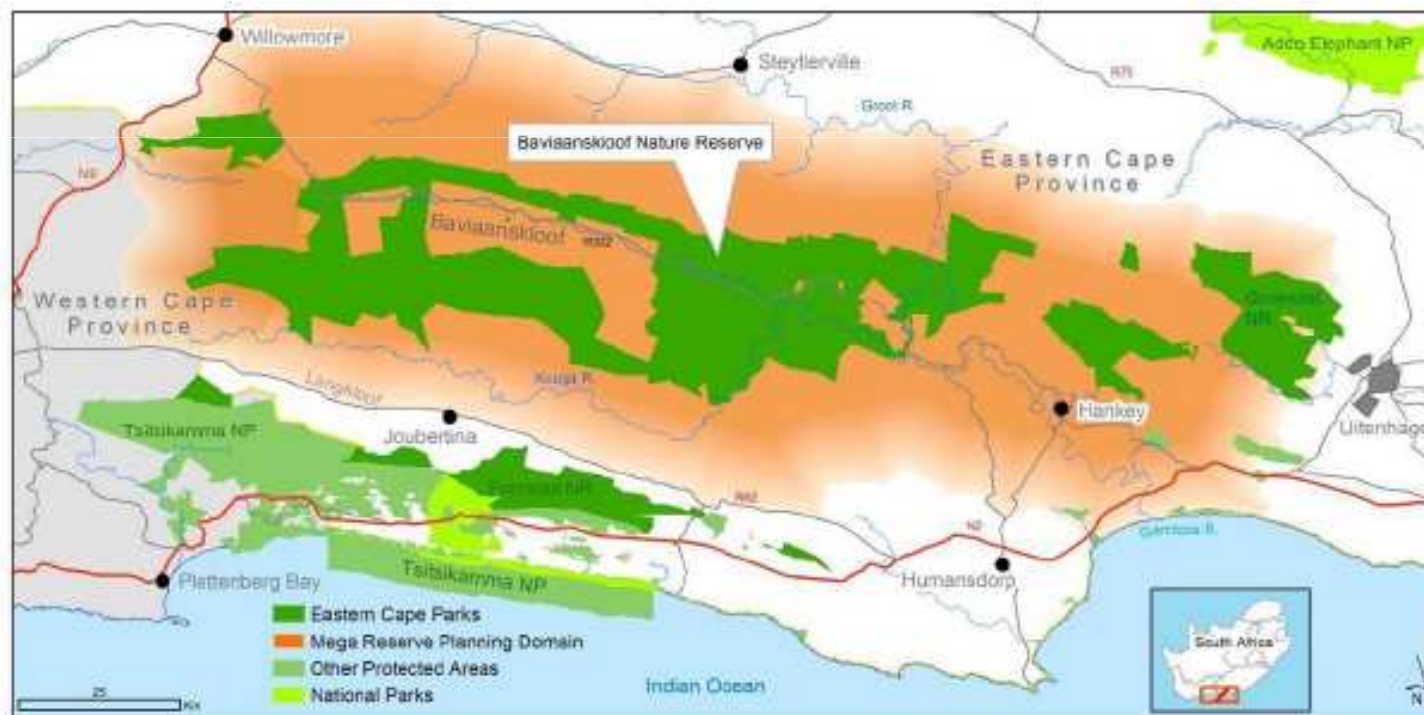
Source: Brierley *et al.*, 2006

Baviaans catchment

Important Thicket catchment

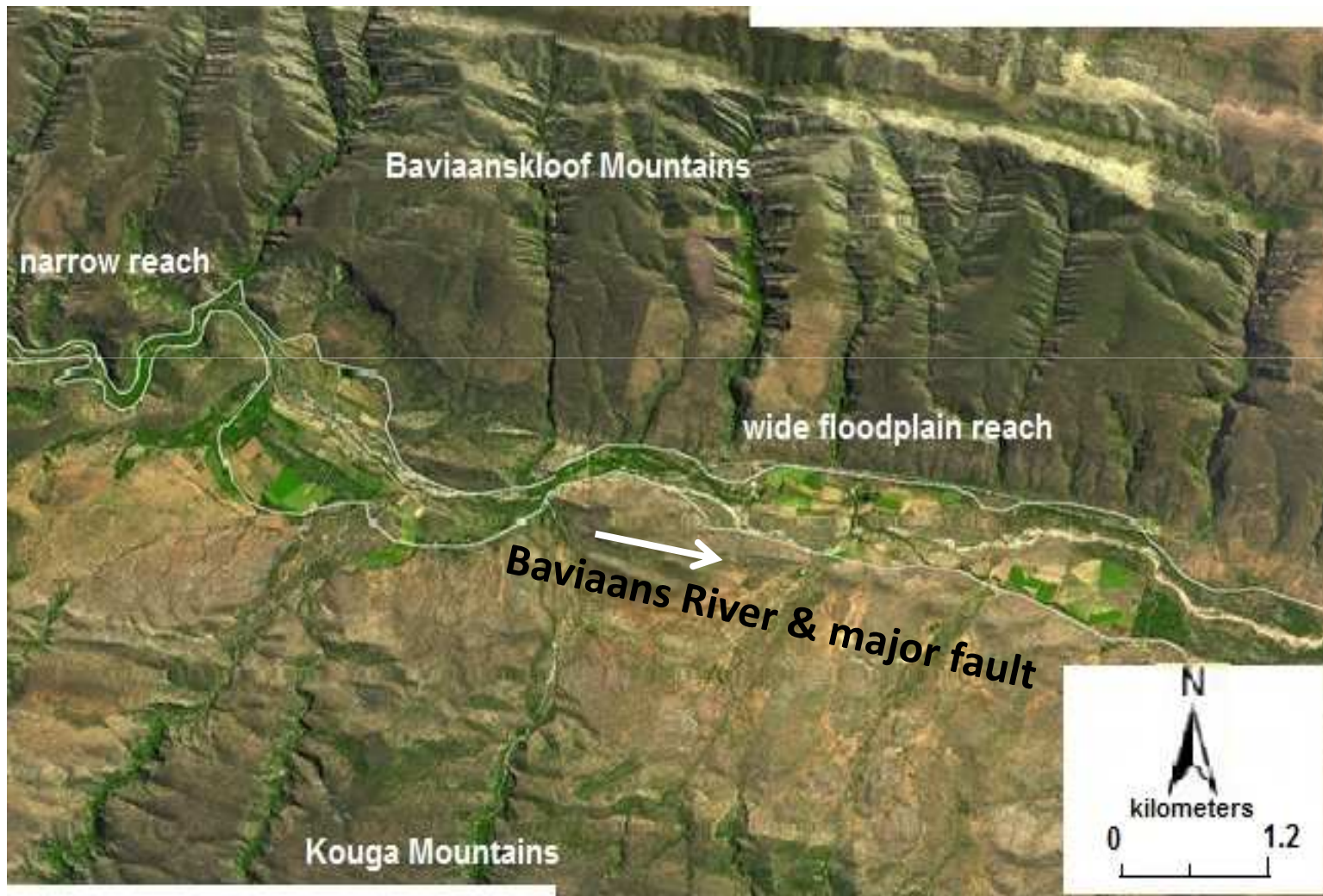
Recent channel incision

A case-study: system-specific connectivity, human influences, connectivity applications



Source: PRESENCE Learning Network, 2010

Baviaans River & connectivity: Valley & floodplain form



Flow and sediment regimes



Flash flood (seasonal)
Peak events (inter-annual)



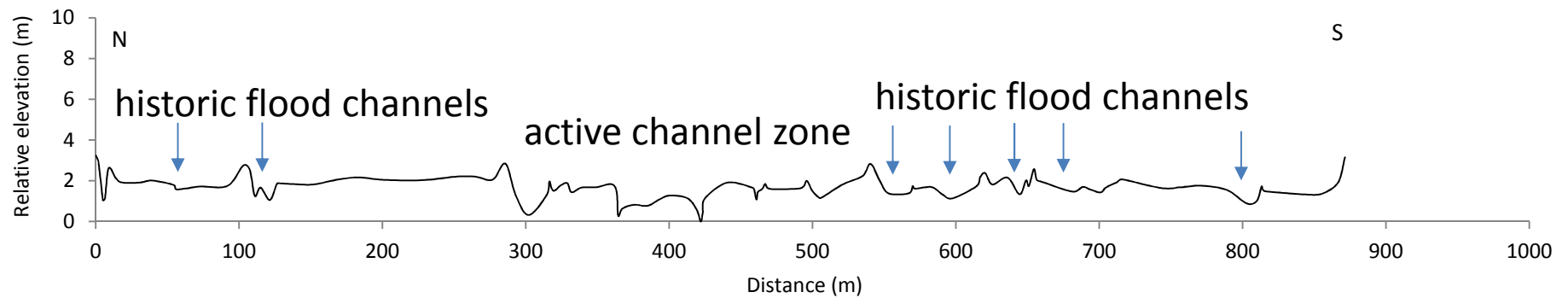
Inter- flood drying
Coarse sediment deposition

Channel form & dynamics

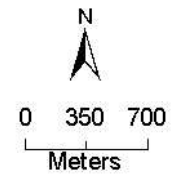
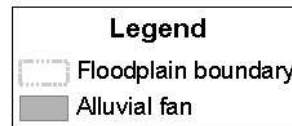
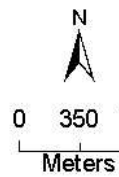
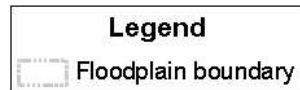
Braided, dynamic channel



Cobble island



Tributary alluvial fans



Human activities

Cultivation on floodplain



Drainage furrows & earthen berms

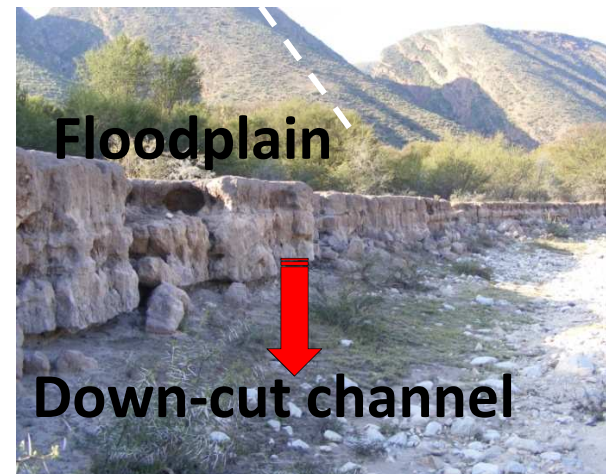


Connectivity of
water and sediment

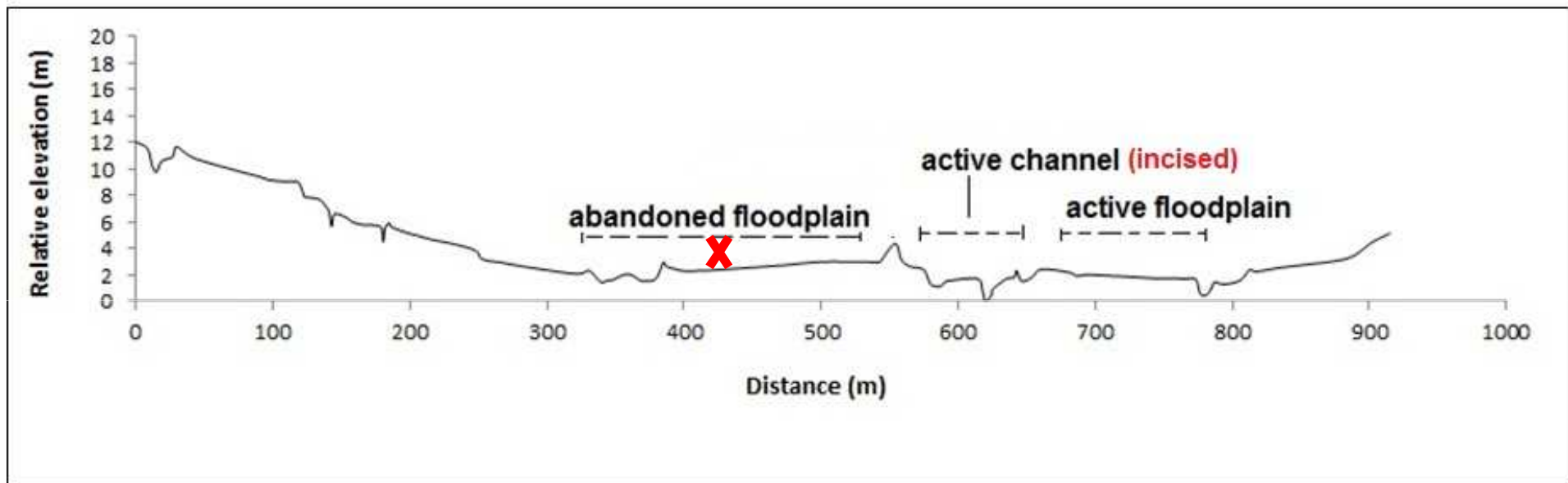
Pastoral farming and overgrazing



Recent river – floodplain dynamics



Channel – floodplain dis-connectivity

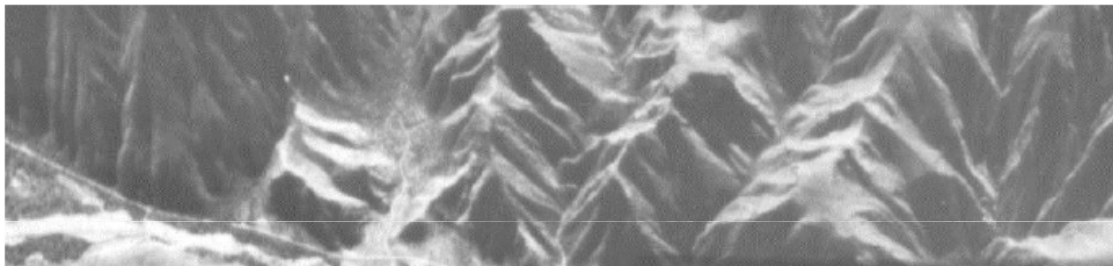


Channel form changes

1971



1986



1981/84 peak floods

2004

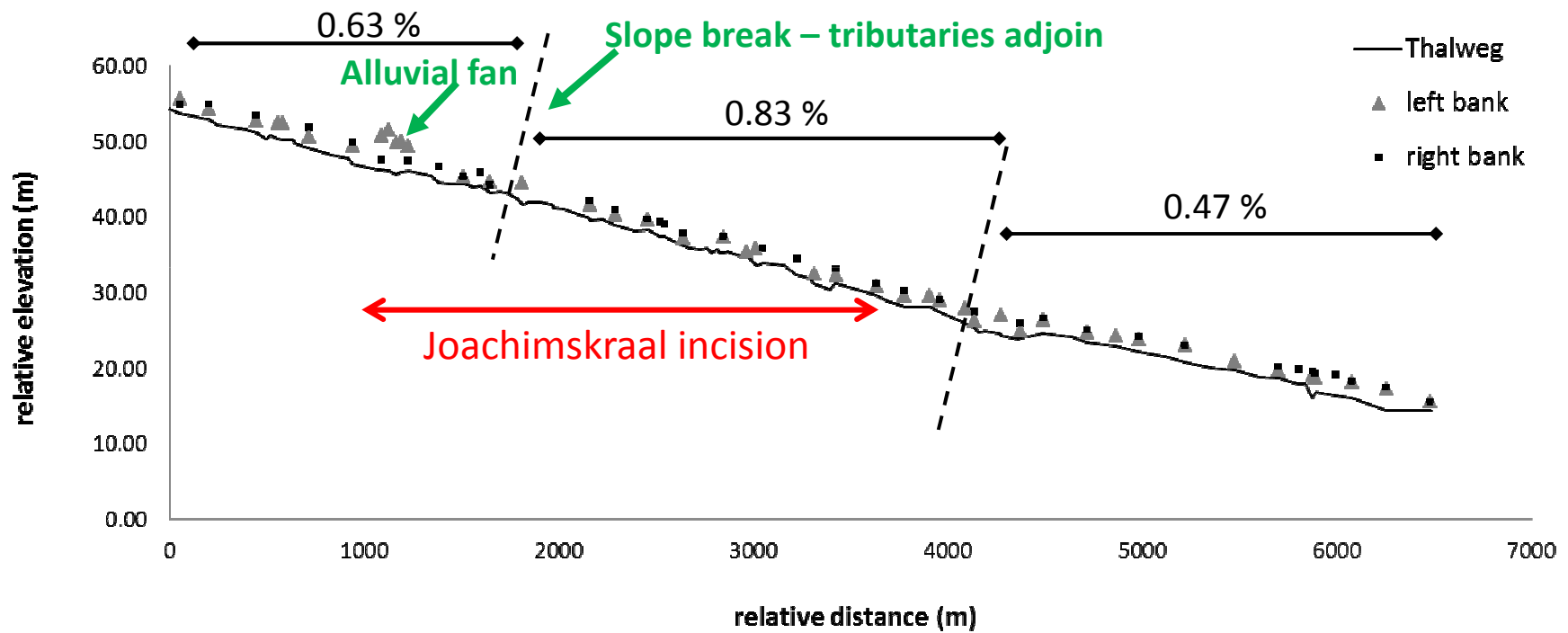


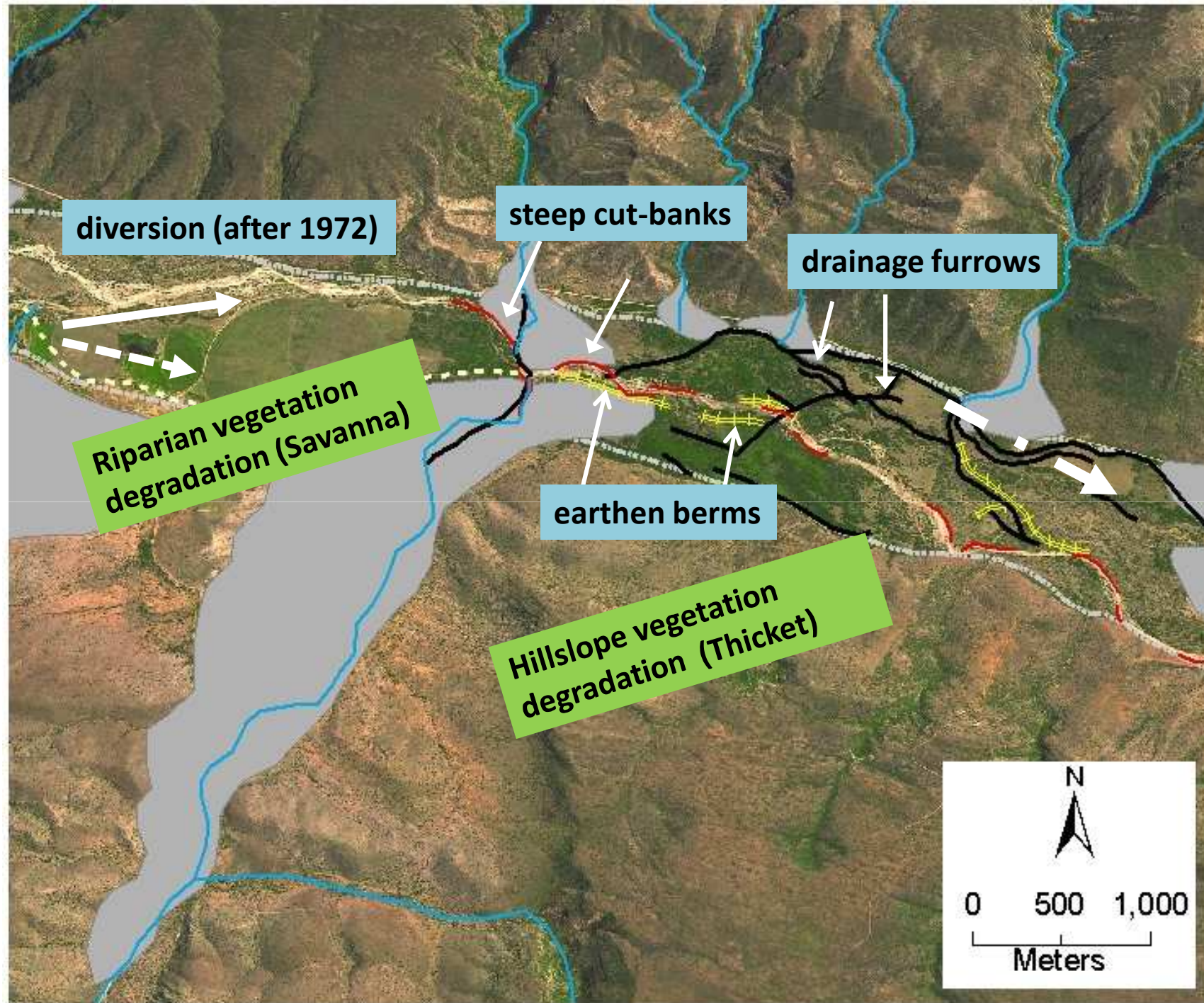
1996 peak floods



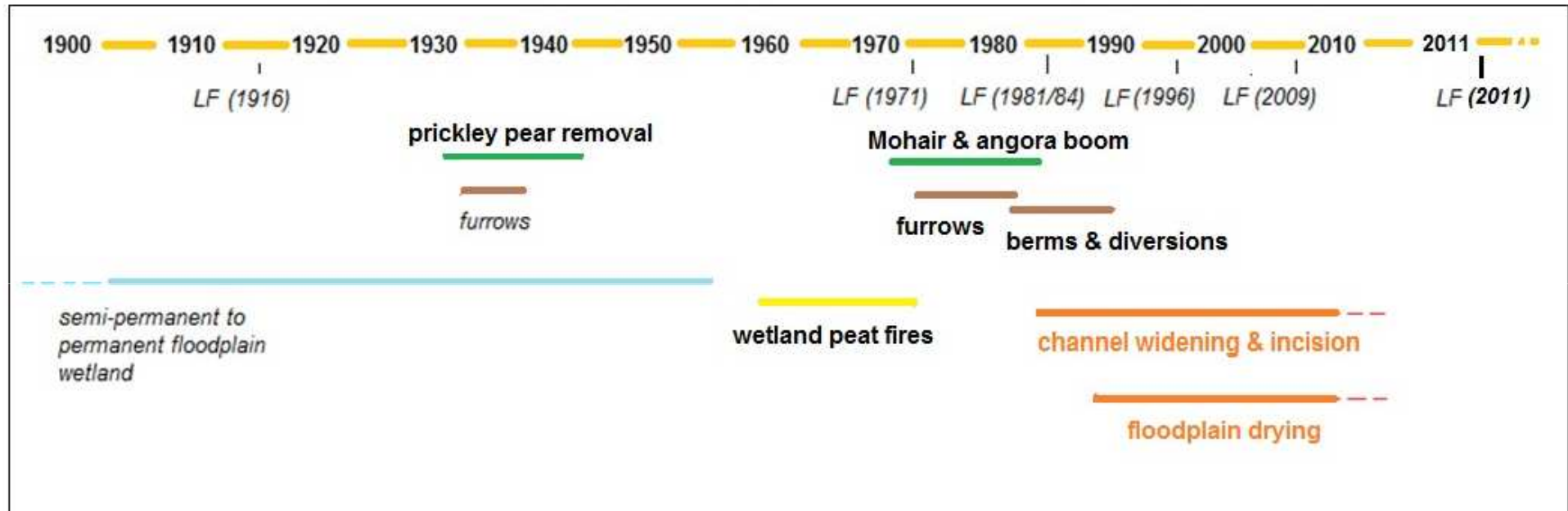
Drivers of change?...

Slope thresholds

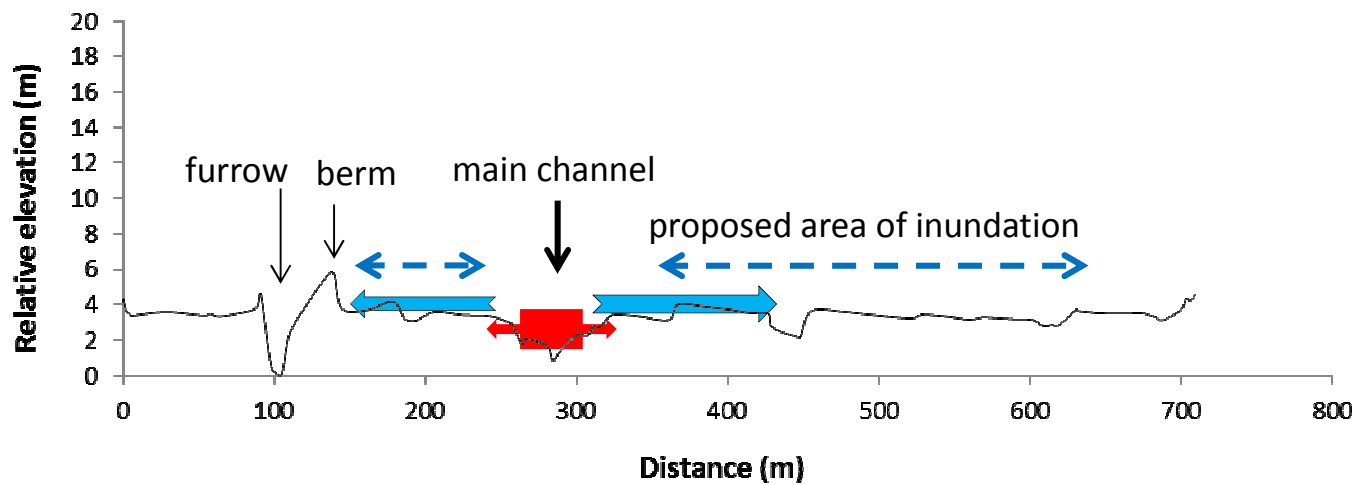
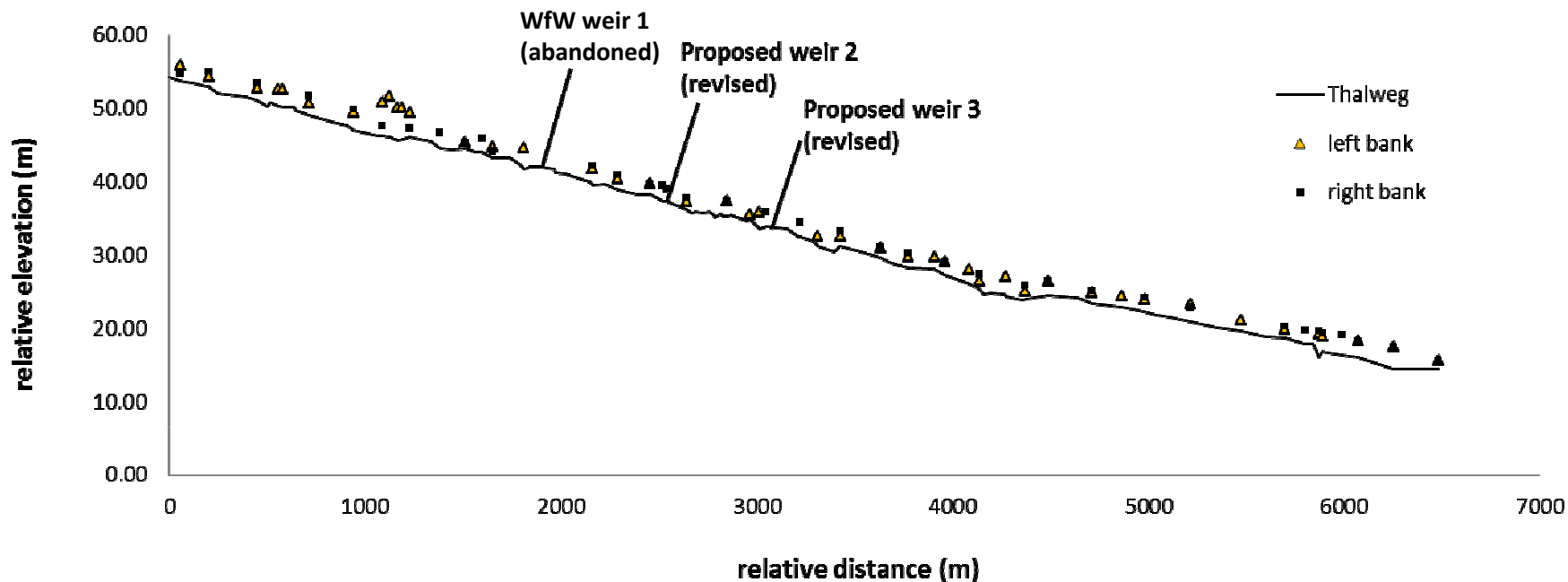




Intersection of human & natural drivers?



Restoring connectivity



Considerations for a Thicket catchment

Connectivity scales and holism
Restoration goals and trade-offs?



References

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