



RANGITĪKEI RIVER SCHEME- ABOVE BULLS

STRATEGY- Then, now and future

THE STORY OF THE AWA

The Rangitikei River creates not only a love for its beauties but a respect for its powers, both for evil and for good. The good it has done has been to lay down beautiful rich flats; swamps in its old course, terraces above, and, as if impatient of man's determination to subdue its work to his own uses, it often seeks to remind him who is the master. The Maori it seemed to look upon with favour, for he never attempted to curb its turbulent temper, befitting rather by its contributions to his food supply. We have seen that from time immemorial it had- save when it suddenly changed its course-remained within the narrow limits of its channel, its banks fringed with beautiful bush and forming a highway for its inhabitants. The Pakeha, however, was soon to turn the bush to his own needs and the flats to his use, and this river resented and began to tear away at its banks.

Early Rangitikei by James G Wilson 1914



Bulls Bridge c. 1870



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SCHEME HISTORY

63km Reach of the River from Scotts Ferry & Tangimoana to Rewa, Rangitikei Valley Road below Vinegar Hill



Est. 1952 No. 1 Review

1962 No. 2 Review

1994 No. 3 Review

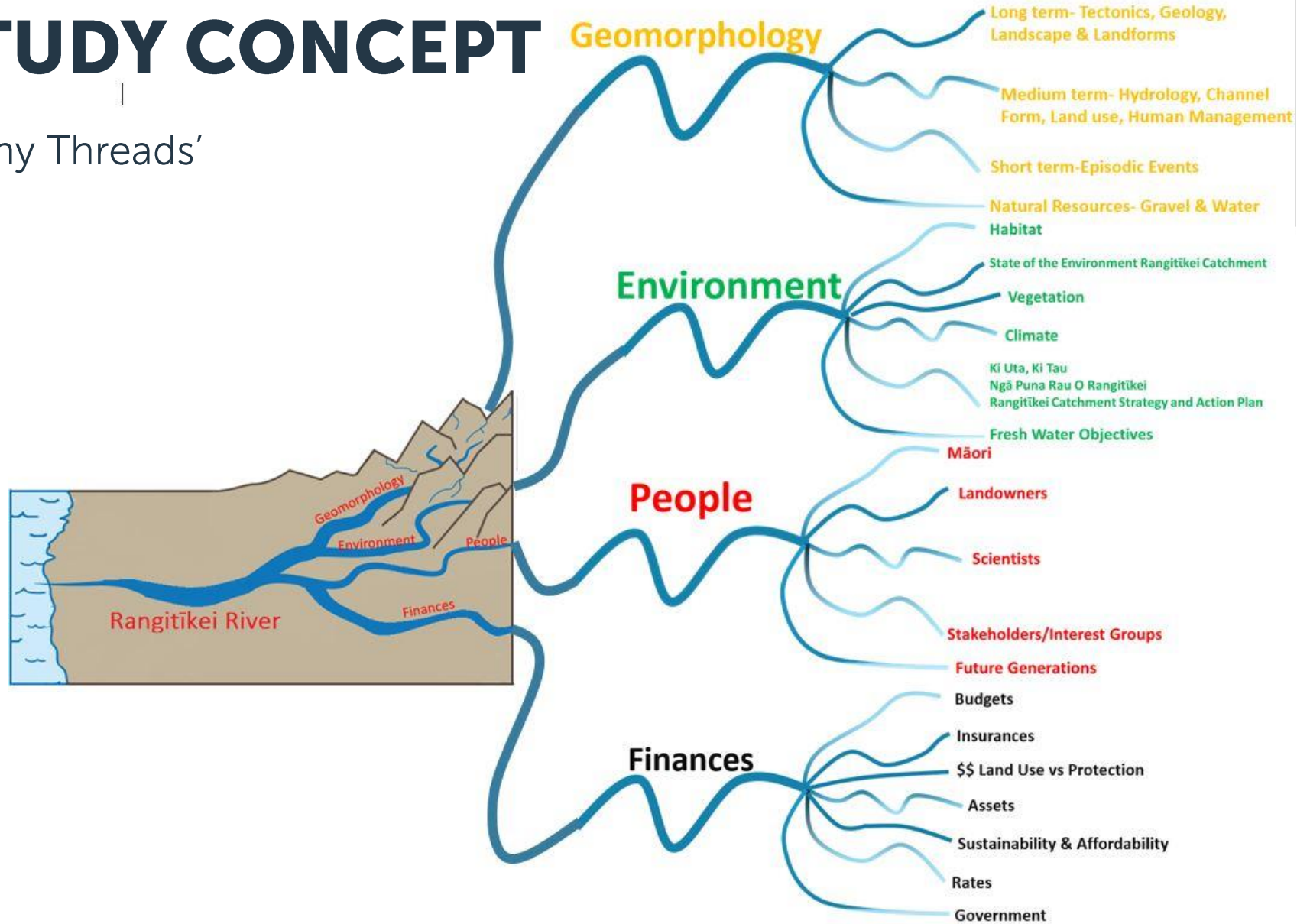
2010 No. 4 Review



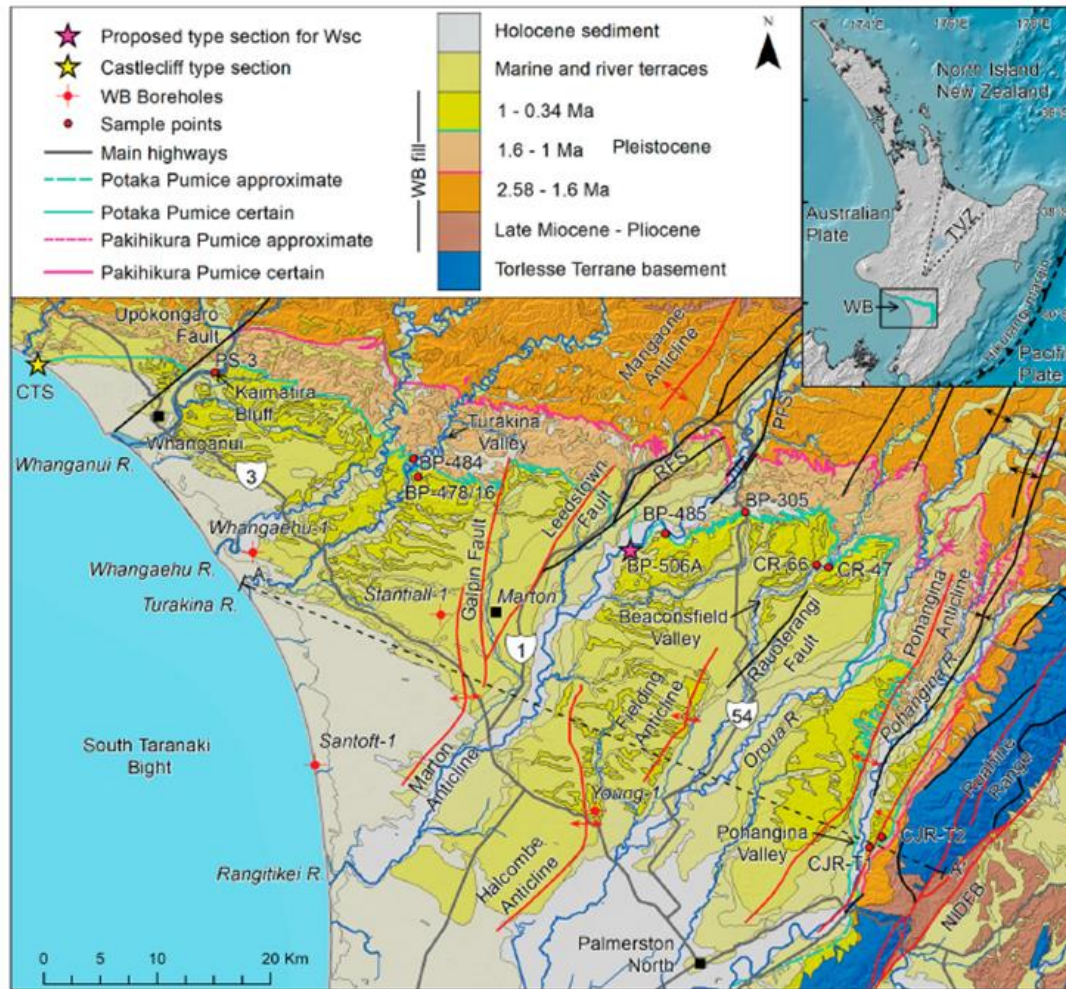
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STRATEGY STUDY CONCEPT

'A River of Many Threads'



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HISTORY OF THE RIVER

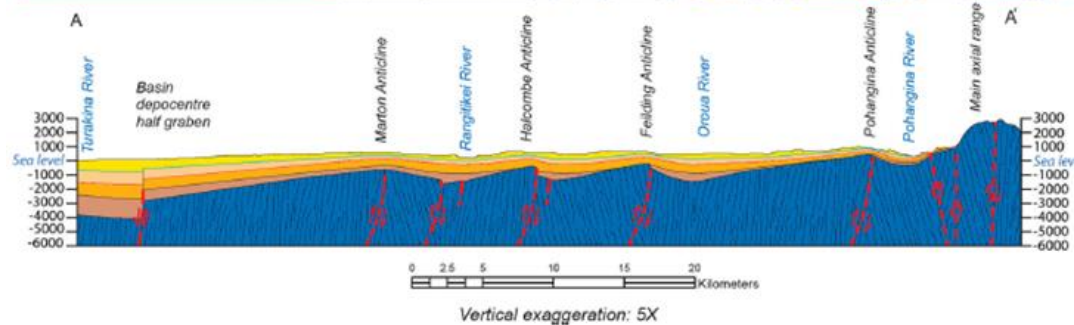
Uplifting, faulting & tilting

Glacial & interglacial climates

V-shaped valleys & terraces

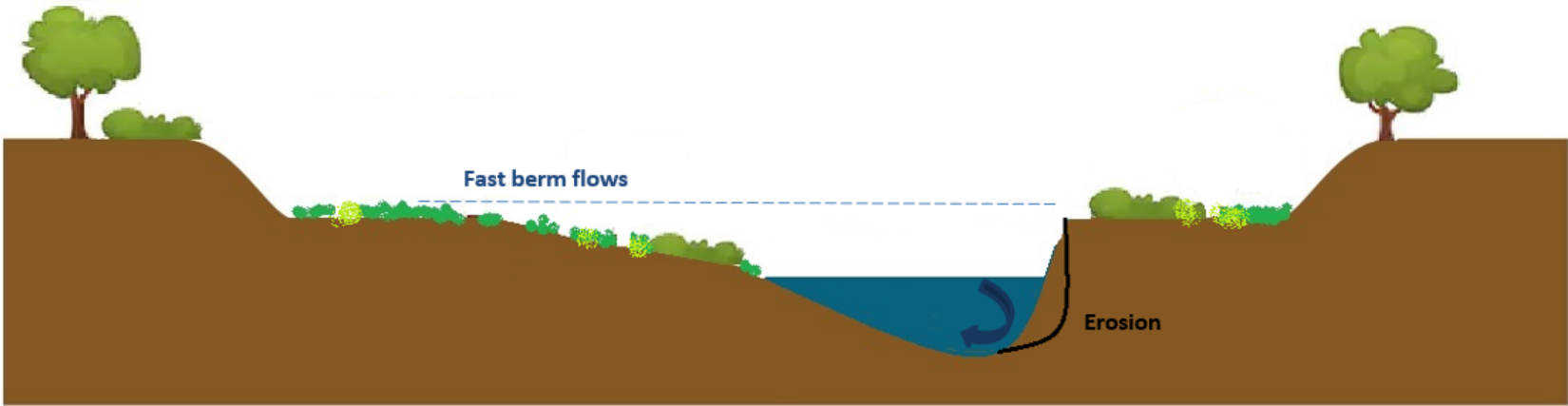
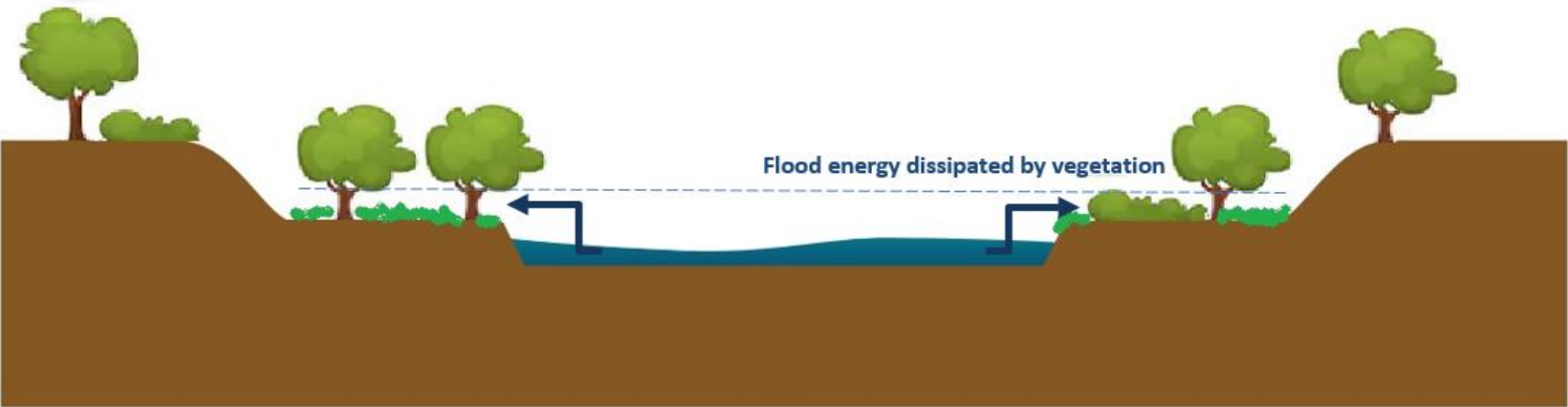
Eastward river migration

Geological confinement & bed control

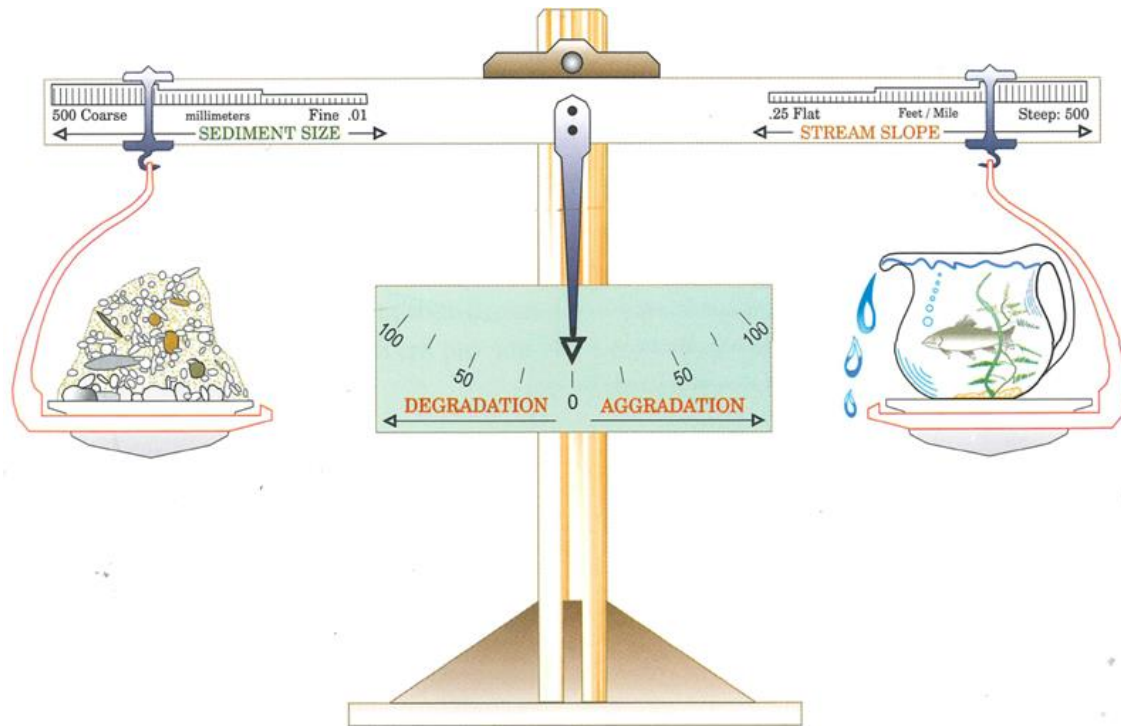


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CHANNEL SHAPE CHANGE



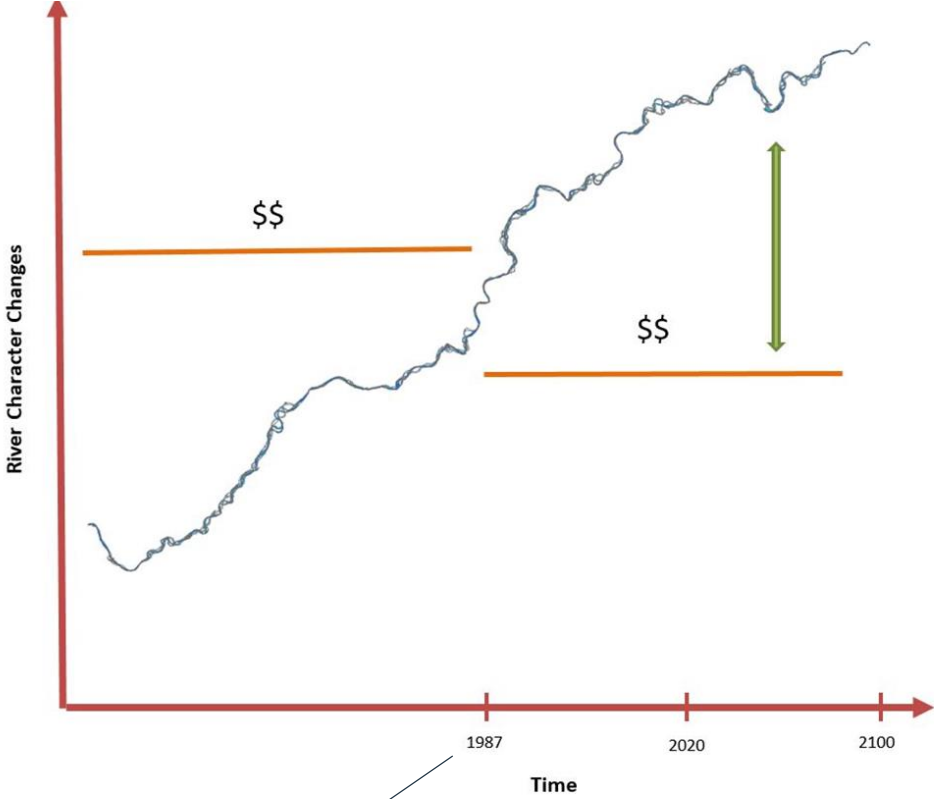
FINDING DYNAMIC EQUILIBRIUM



$$(\text{Sediment LOAD}) \times (\text{Sediment SIZE}) \neq (\text{Stream SLOPE}) \times (\text{Stream DISCHARGE})$$

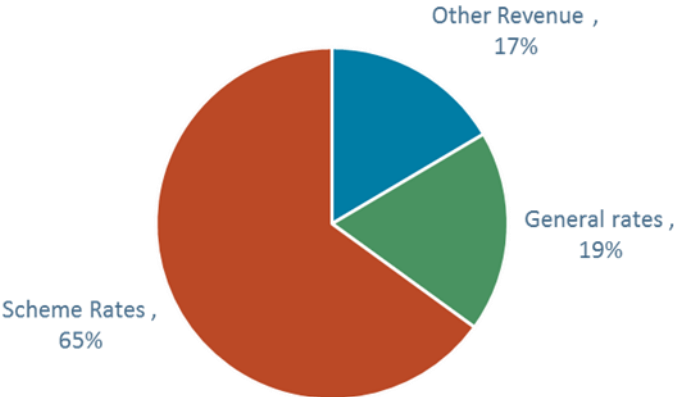
STAYING AFLOAT- FINANCIAL IMPACT

Mind the Gap

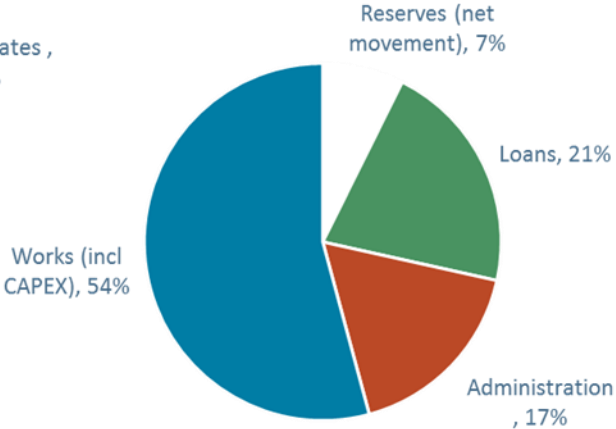


End of Central Government Funding

Income (\$1,256,813)

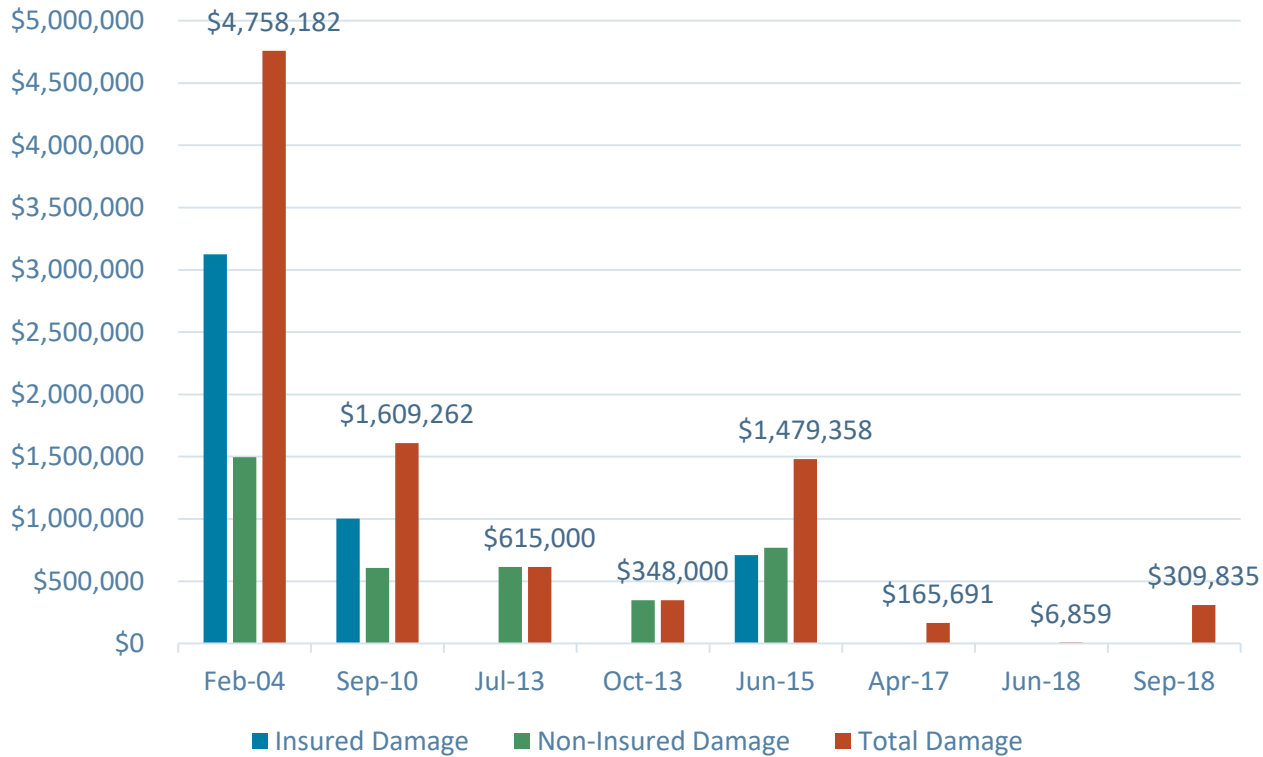


Expenditure (\$1,685,984)

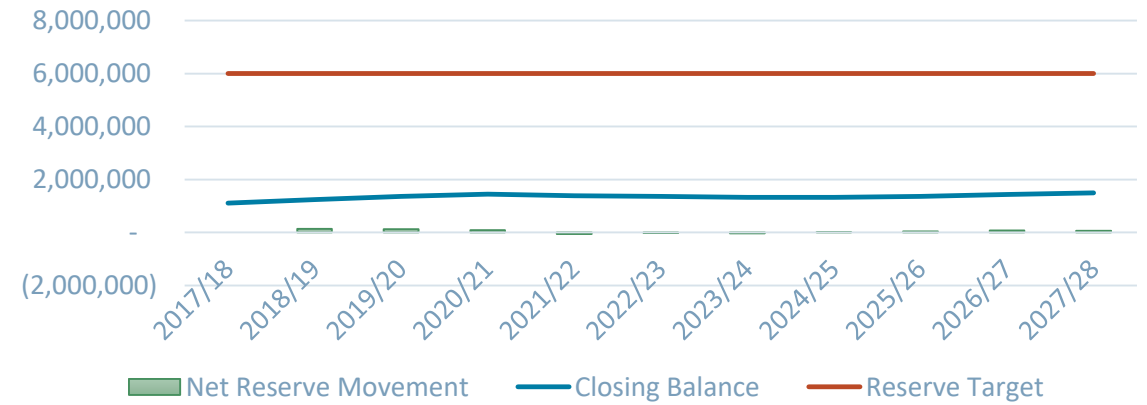


FLOOD HISTORY

Flood Damage



Emergency Reserve



MIDDLE & UPPER RIVER FEATURES

A highly dynamic large gravel bed wandering form around alternating bars.



Terrace Landscape

Geological Lateral
Confinement including
Natural Bottlenecks

Geological Bed Control

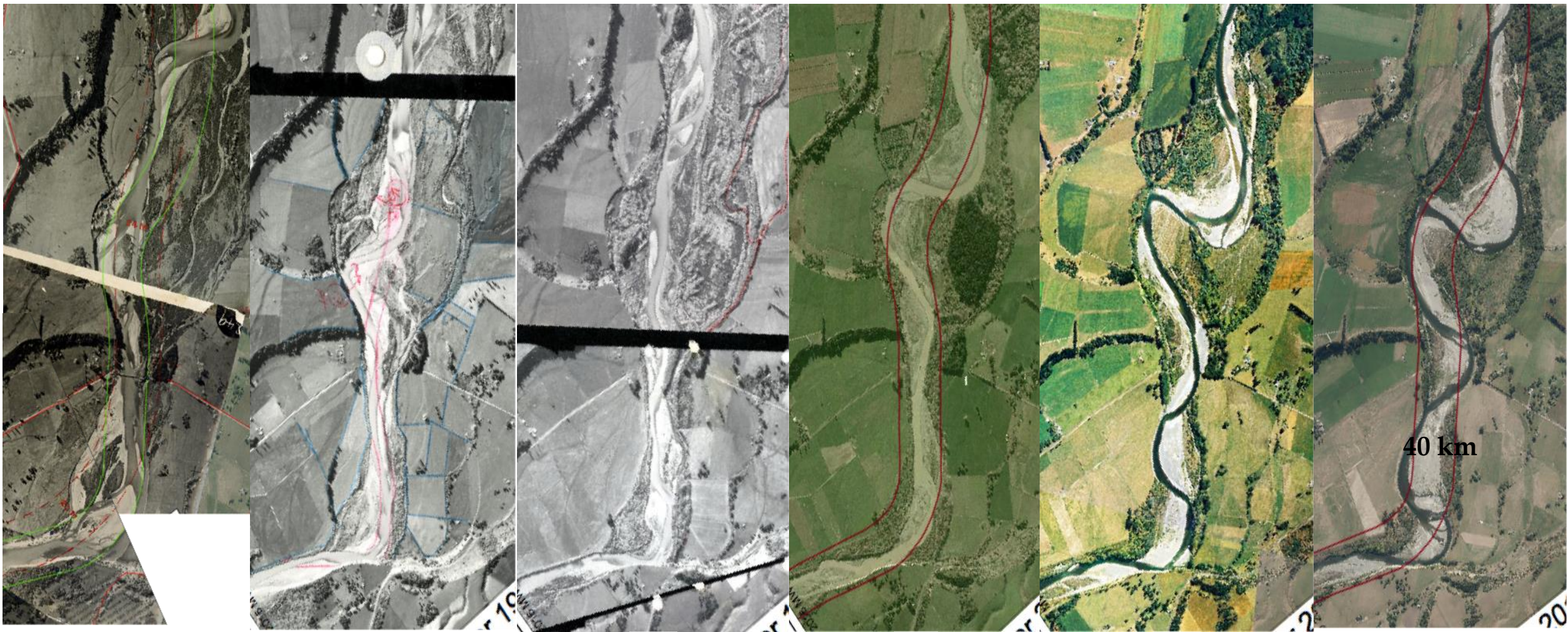
Faults

Progressive narrowing of
active channel

Geomorphic character
Changes



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1940s

1973

1983

2005

2013

2016

40 km

Catchment Land use change



1952 scheme, wide & braided to narrower



Control & keep narrow, 2004 flood accentuated single channel meander



Sinuosity change 'larger meanders'



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MIDDLE & UPPER RIVER CHALLENGES

What might the future entail?

- Erosion of unconsolidated bank material
- Increasing demand for aggregate
- Spread of (rapid-colonising introduced) vegetation
- Degradation Zone
- Future Climate or land use changes may have hydrological implications which could affect erosion rates and/or flood frequency and Intensity
- Sedimentation and sediment supply
- Increased demand for recreational use
- Co-management of the awa

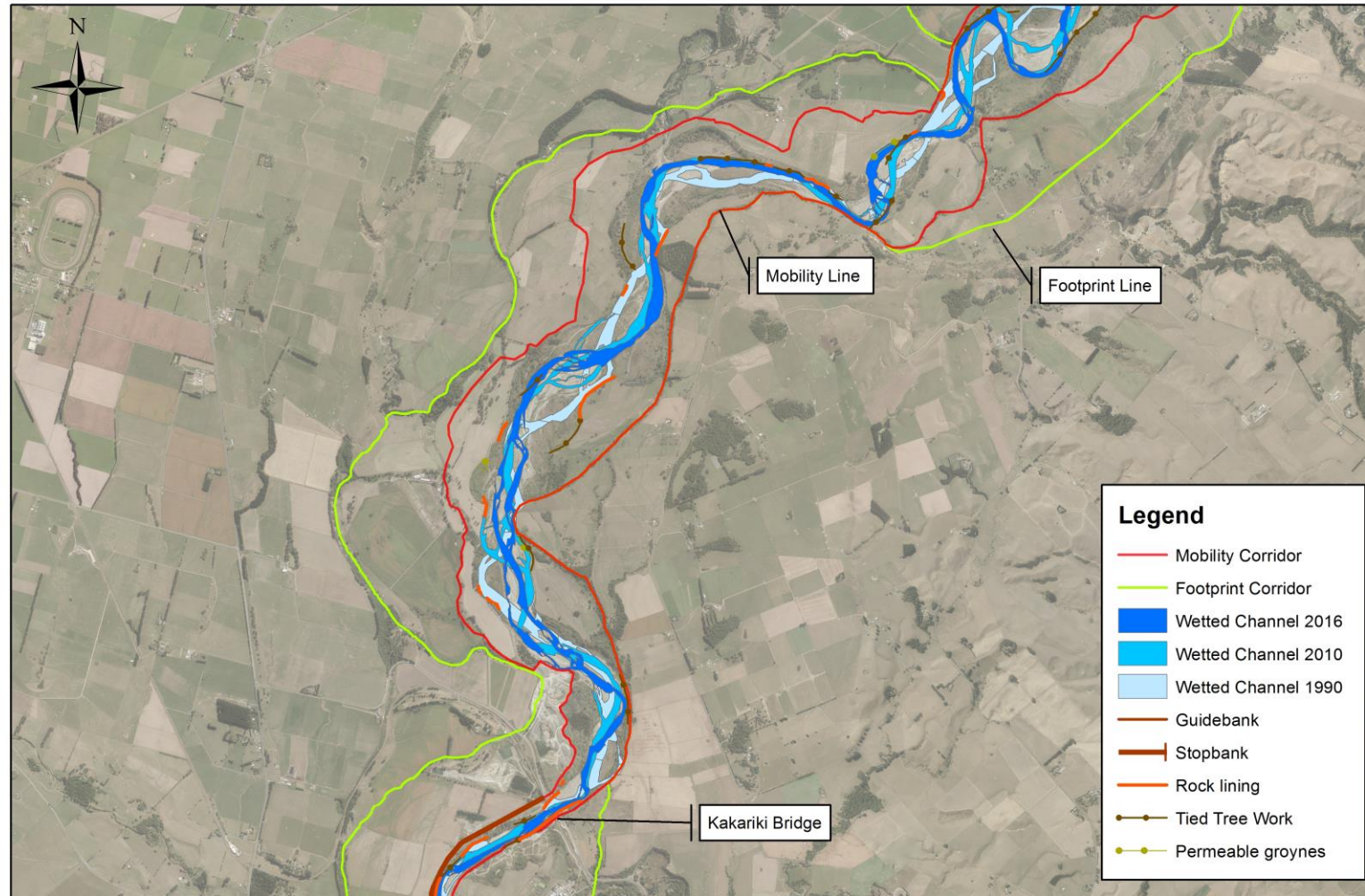


Out flanked bank protection



High and dry tree roots

MOBILITY CORRIDOR CONCEPT & PRINCIPLES



Rangitikei River
Footprint & Mobility Corridor

Provide necessary space for the river to find its innate dynamic equilibrium.

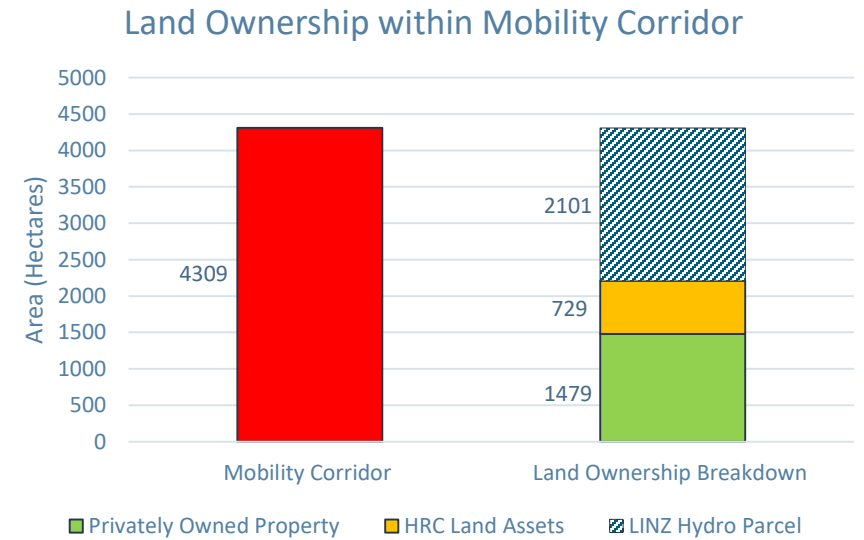
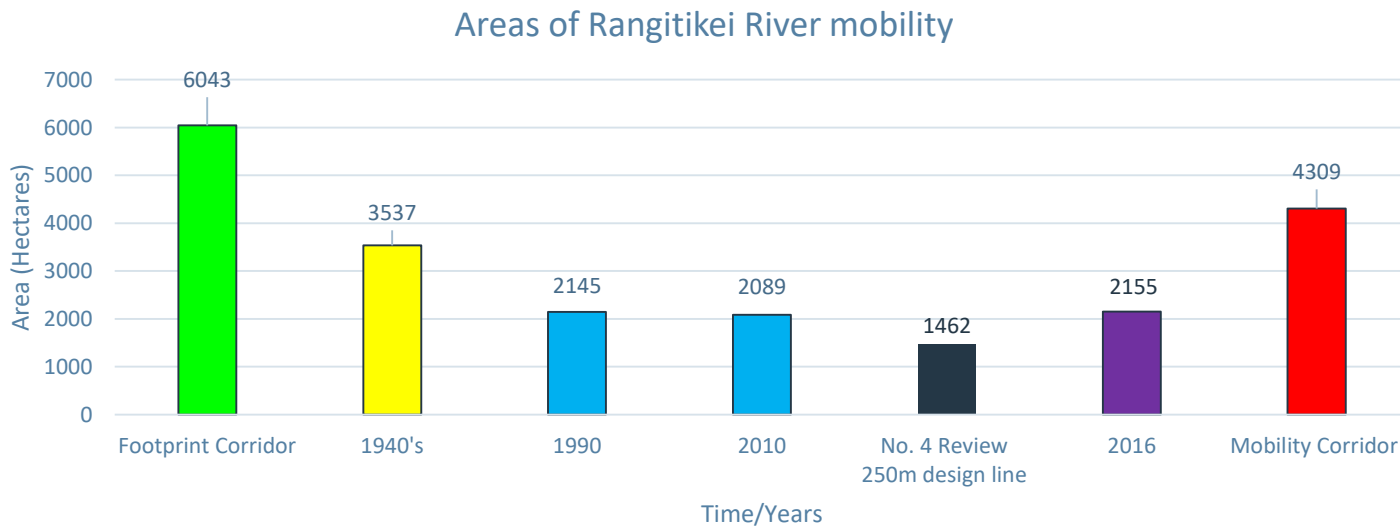
- Facilitate normal dynamic river channel change
- Hour Glassed Shaped (Below Bulls straighter shape)
- Floodplain Connection
- Minimal interference
- Promote self-river recovery



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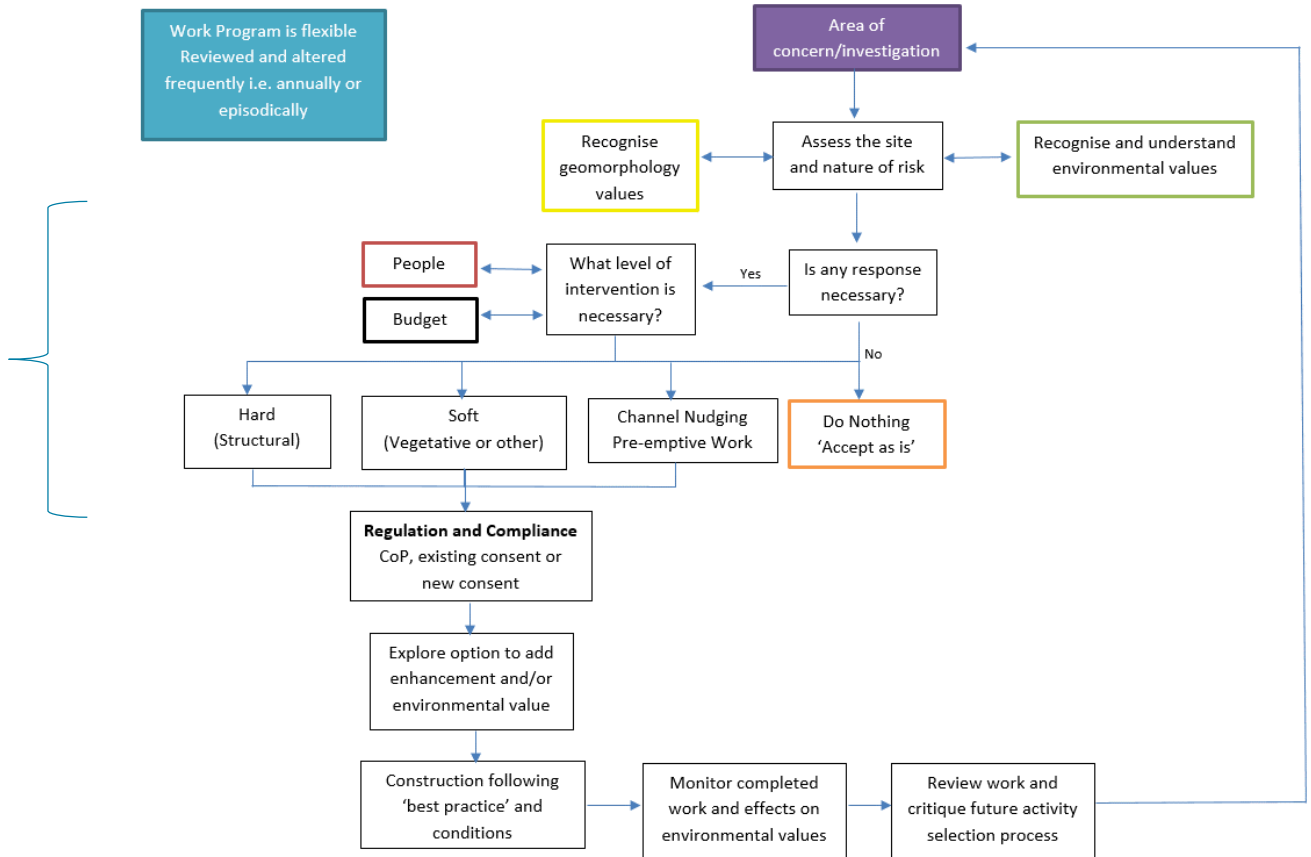
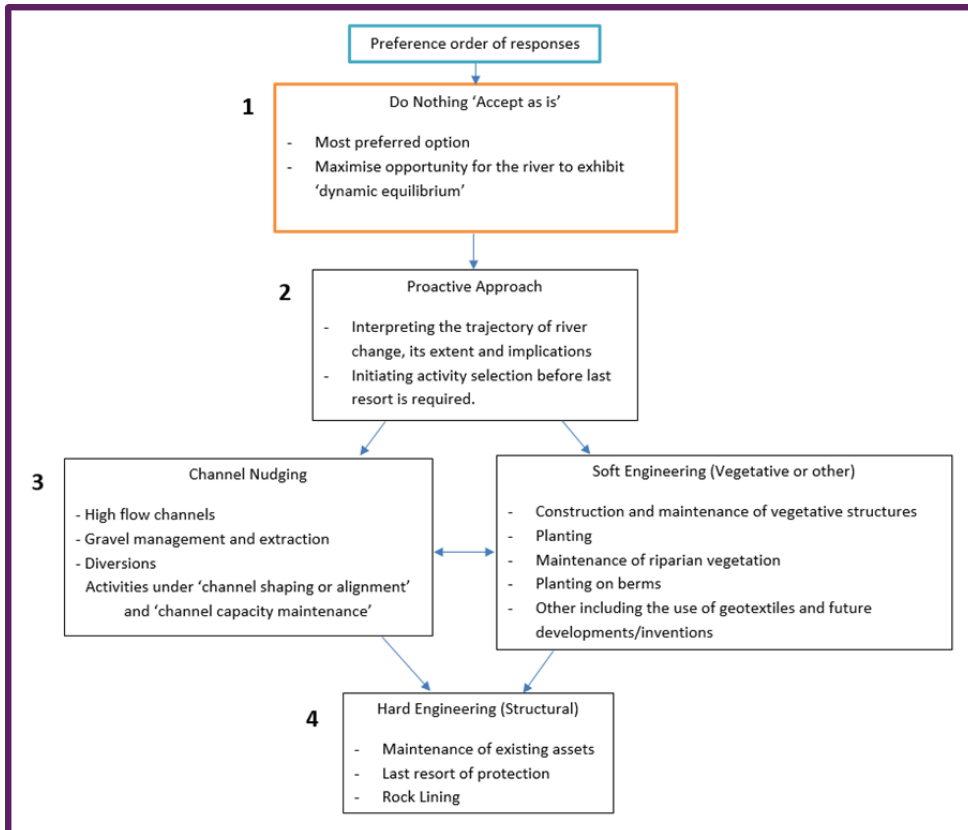
WHAT IS IN THE MOBILITY CORRIDOR?

*63km of River Scheme

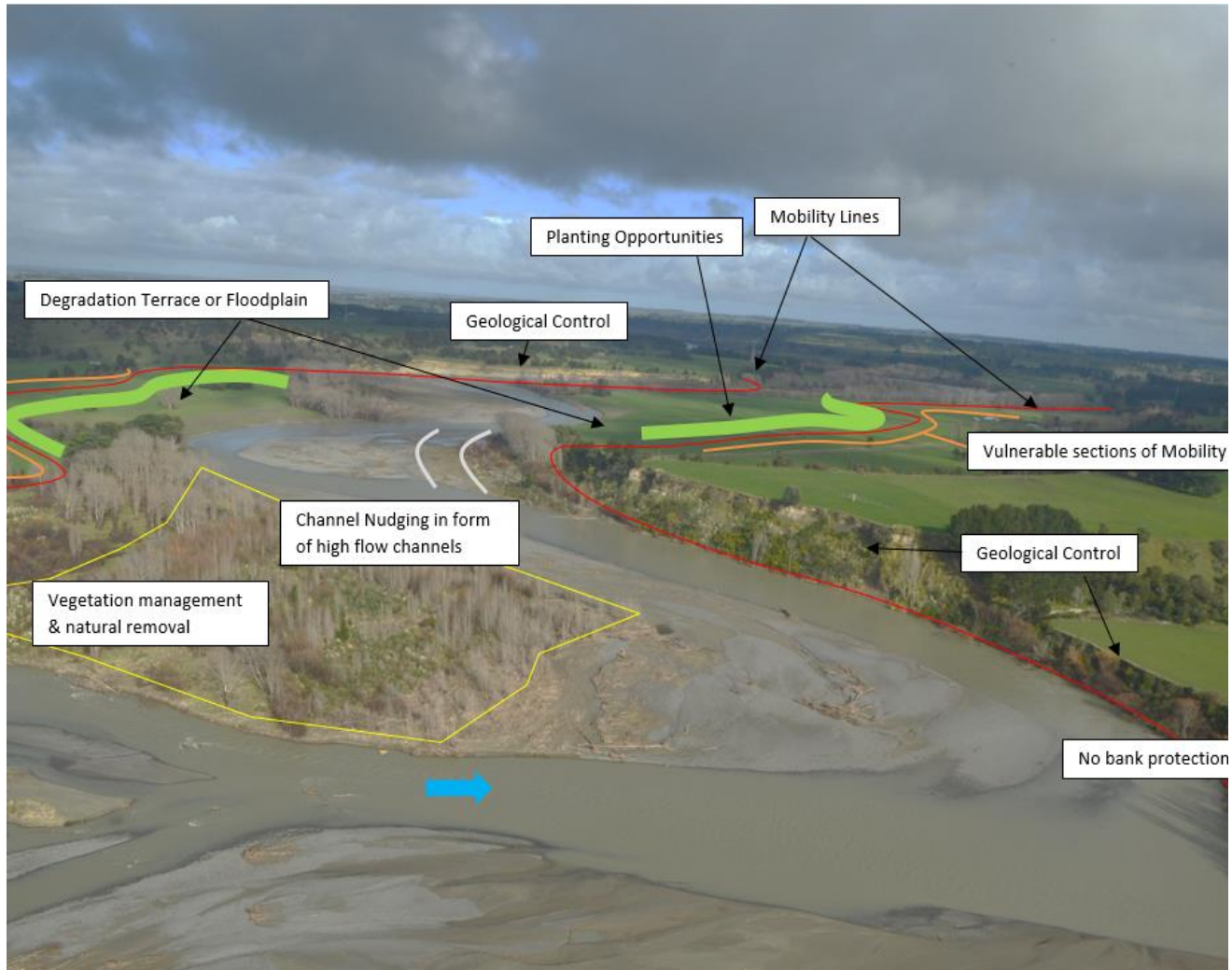


ESTABLISHING THE MOBILITY CORRIDOR

- Incentivised protection planting at mobility corridor
- Protection least preferred



EXAMPLE



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ECAN VISIT



Cheverons



Deep Pole Planting



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Ashley River, Canterbury (October 2020)



Rangitikei River (Google Earth July 2020)

FEEDBACK

Melissa Churchouse- Engineering Officer, Northern River Management

Melissa.Churchouse@horizons.govt.nz

021 2277127



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REGIONAL COUNCIL



For more information visit www.horizons.govt.nz
or freephone Horizons on **0508 800 800**