



Department of Conservation
Te Papa Atawhai

Climate change impacts on braided rivers

Jenny Christie

Science & Policy Group, Department of Conservation



Photo: DOC: Astrid van Meeuwen-Dijkgraaf



Photo: DOC: Brian Dobbie

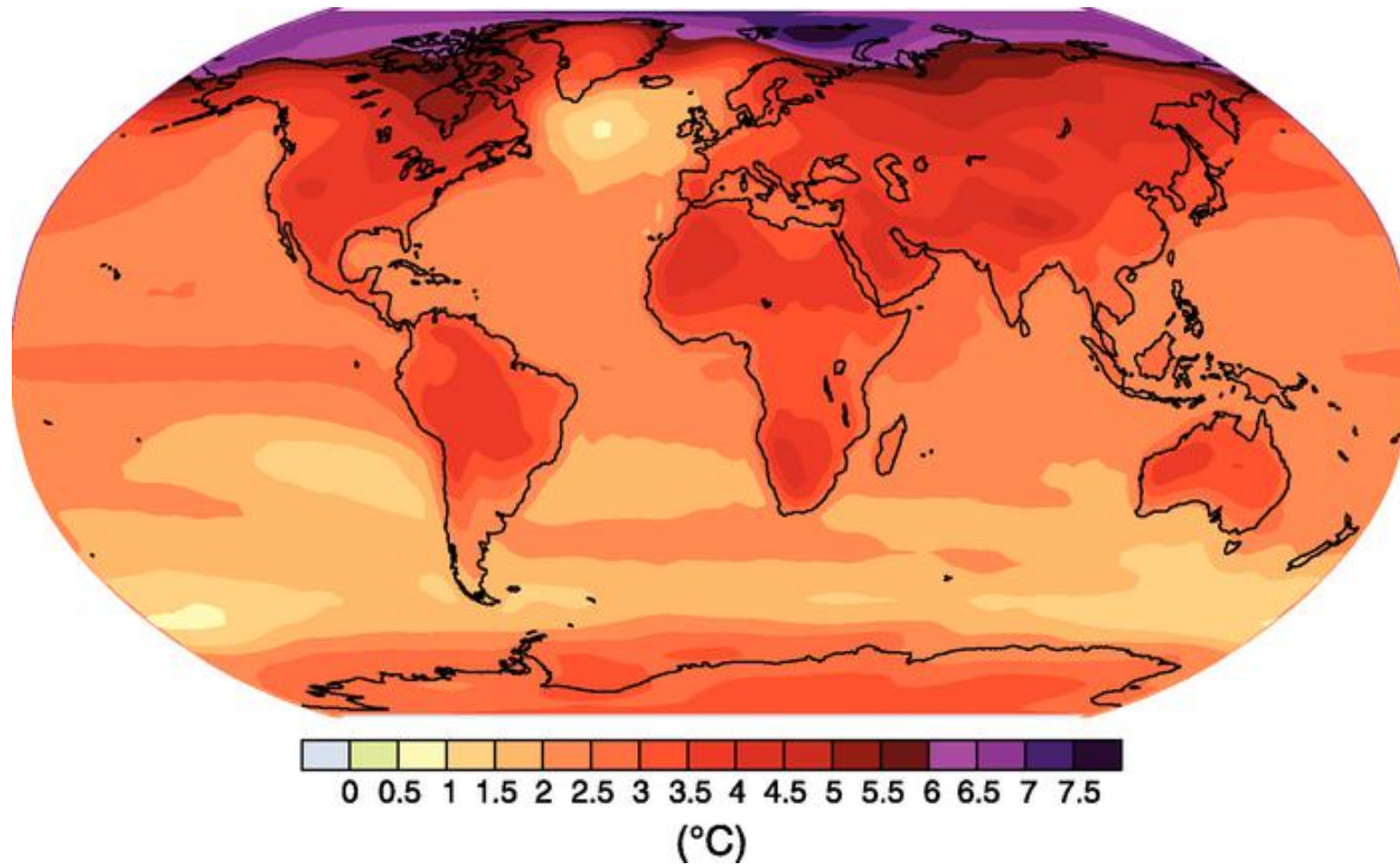
Climate change will affect New Zealand



Photo: Alan Cressler



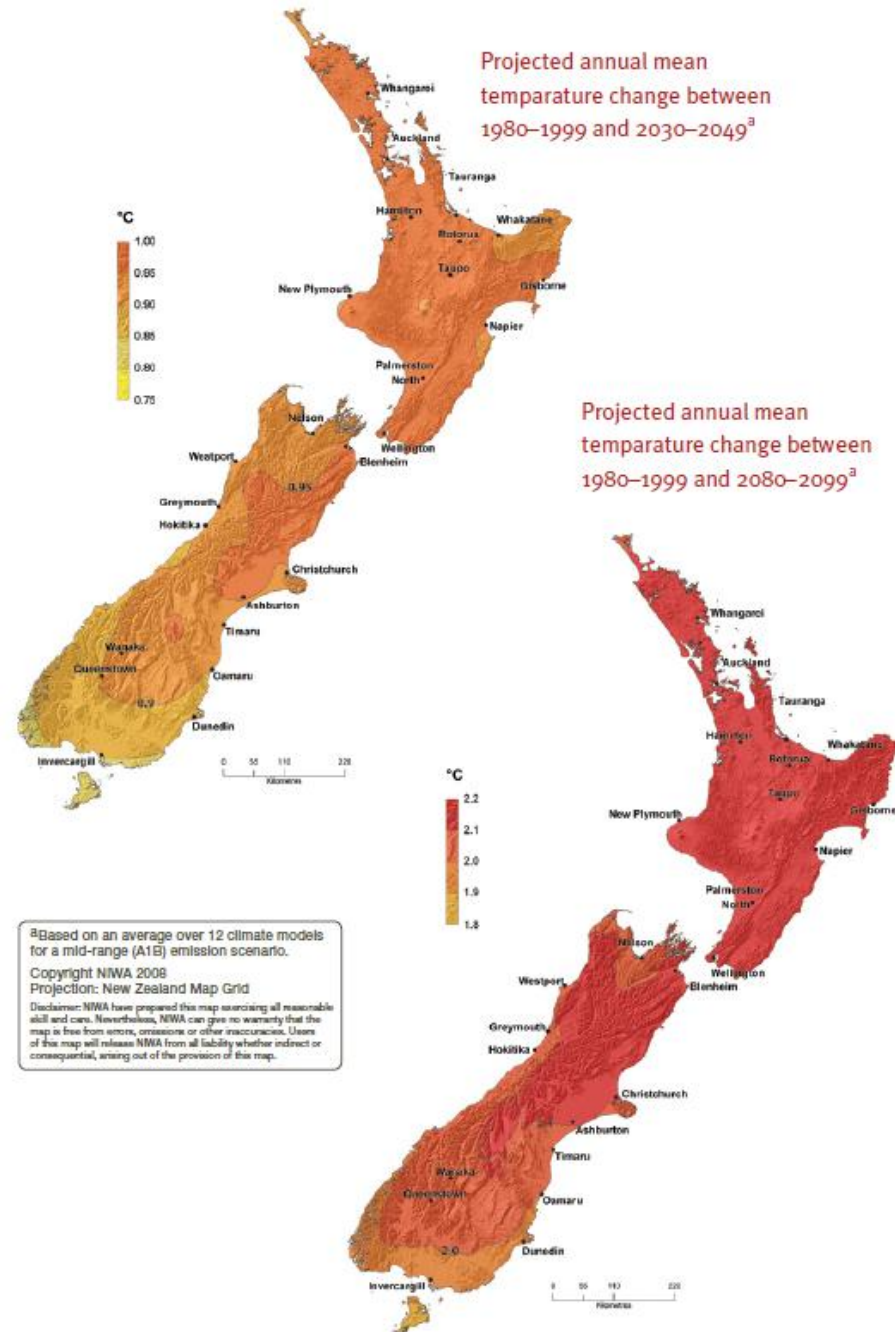
Climate change is a global phenomena



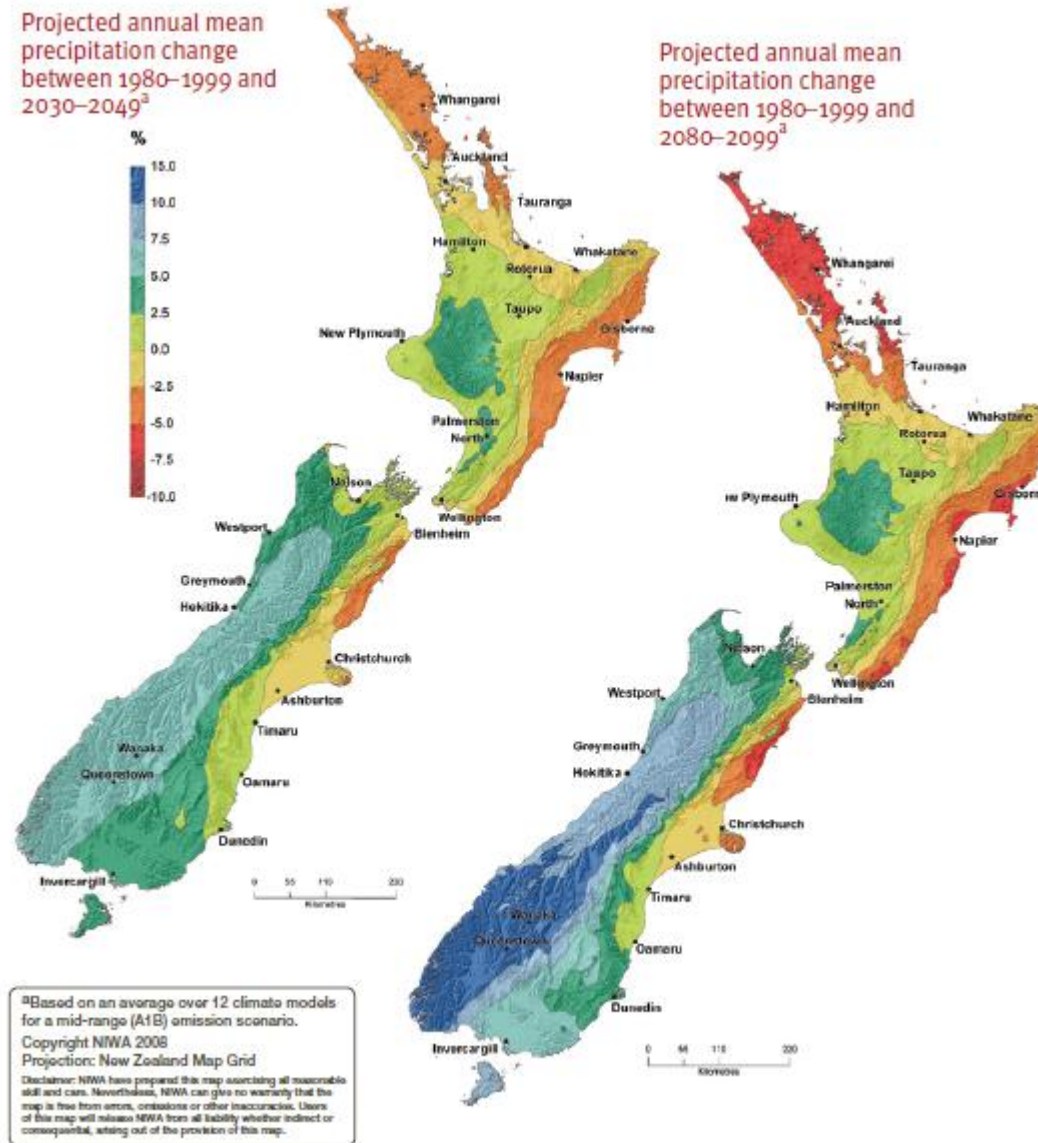
Source: <http://ipcc-wg2.gov/AR5>



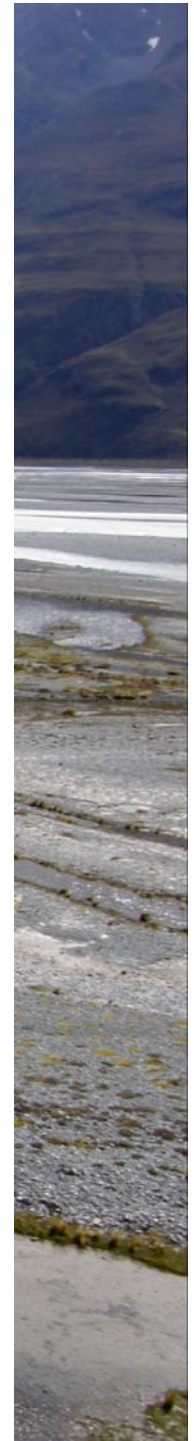
Annual temperatures will increase



Annual rainfall will change



Source: www.mfe.govt.nz/publications/climate/climate-change-effect-impacts-assessments-may08/index.html.

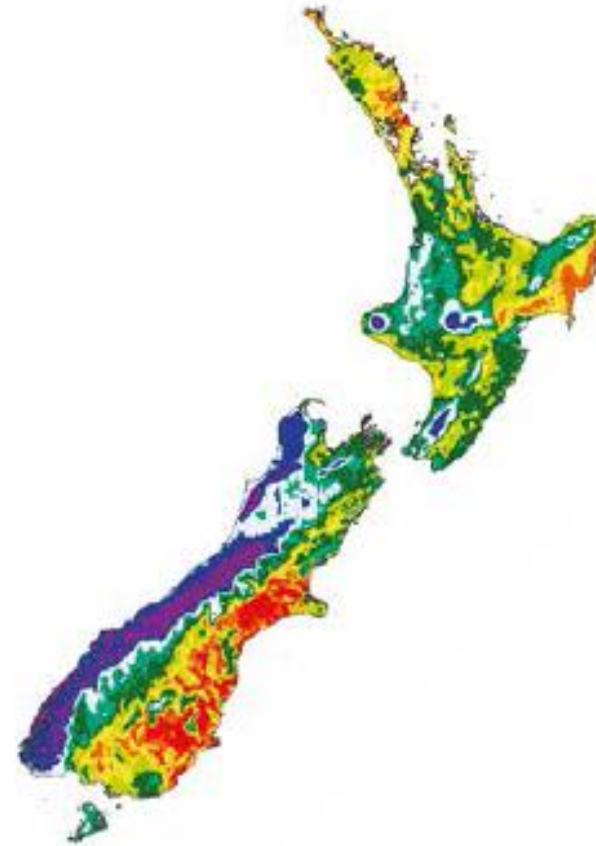


Drought frequency will increase

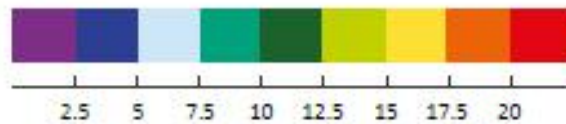
New Zealand historical drought frequency
or 1980–1990



New Zealand median drought frequency
or 2030–2050



% of time



Note: The changes are based on a mid-range scenario of climate change and global greenhouse gas emissions.

Source: Clark et al. 2011⁴⁶.





Photo: DOC, Herb Christophers



Photo: DOC, D P Murray

BUT climate change
will increase
competition for water



Photo: stuff.co.nz



Photo: DOC, Neville Peat



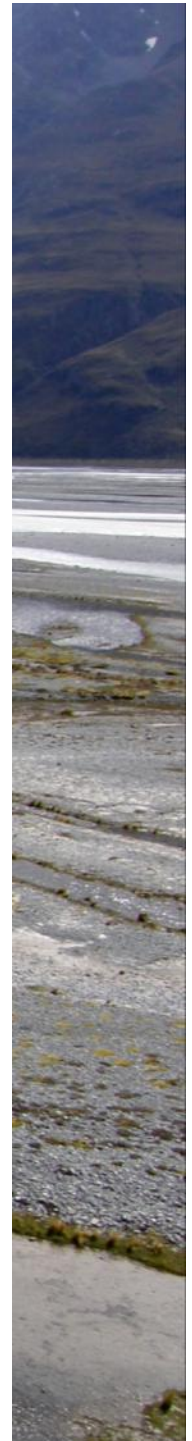
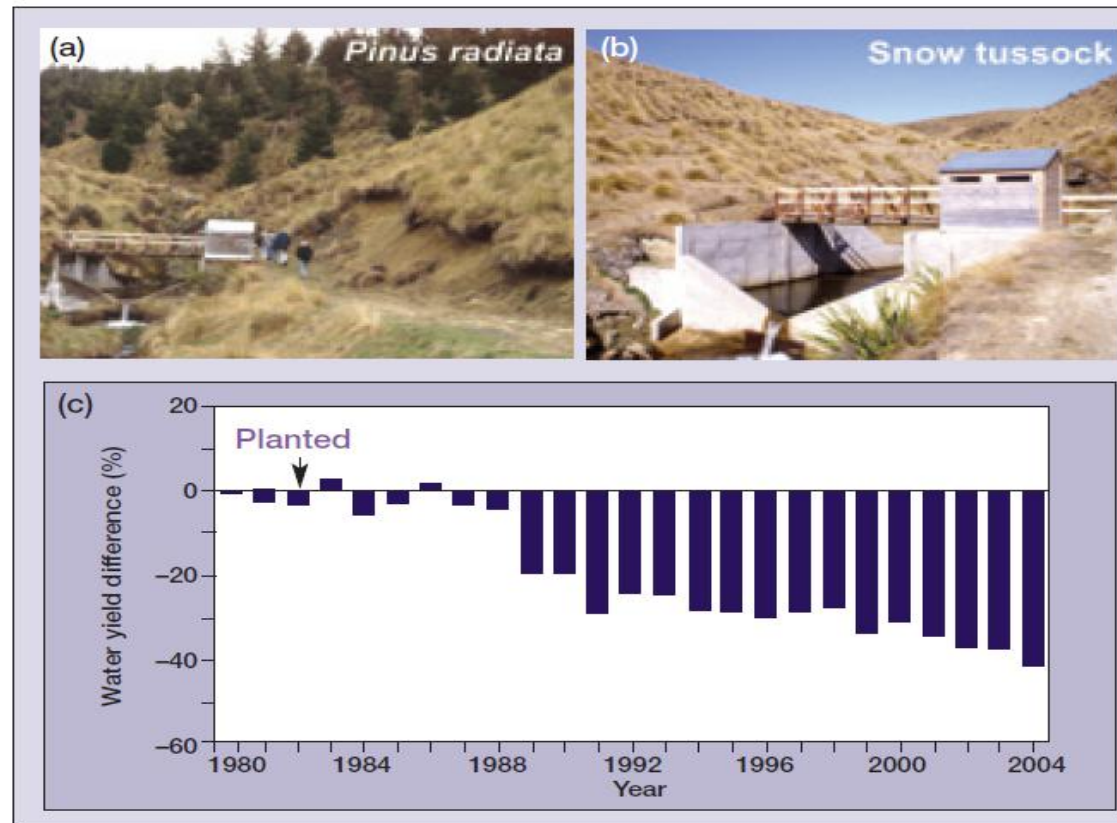
ARTICLES



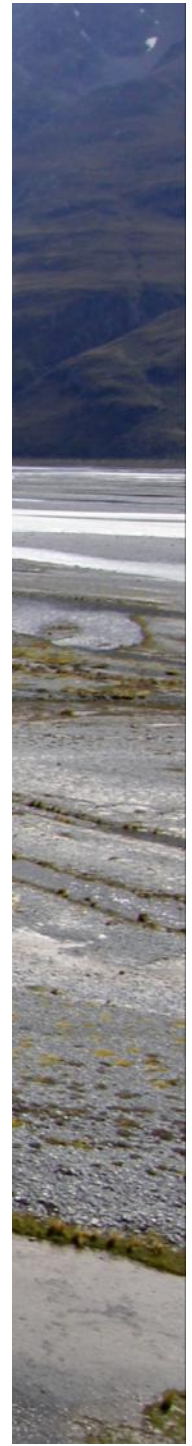
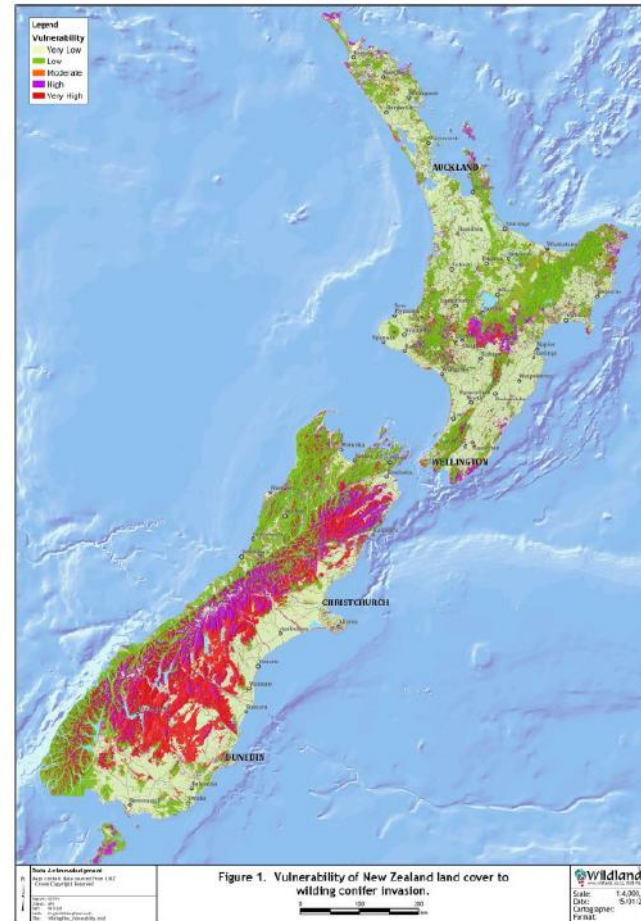
The effect of plantation forestry on water yield in New Zealand†

Barry Fahey*

Decreasing
water yield
with pine
forest



Inland basins
vulnerable to
wilding pine
spread



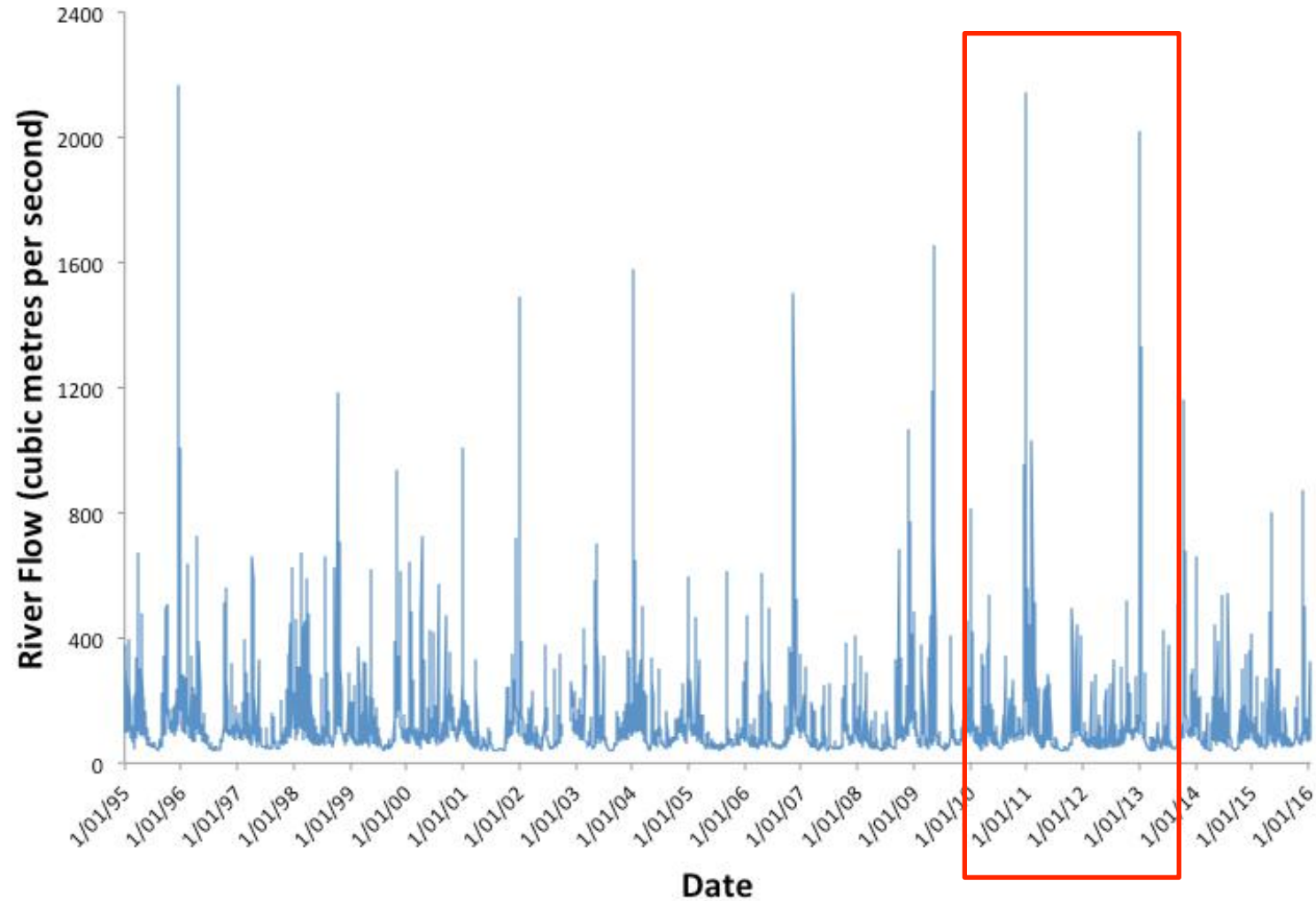


Dependent on river
catchment type



Southern Alps rivers

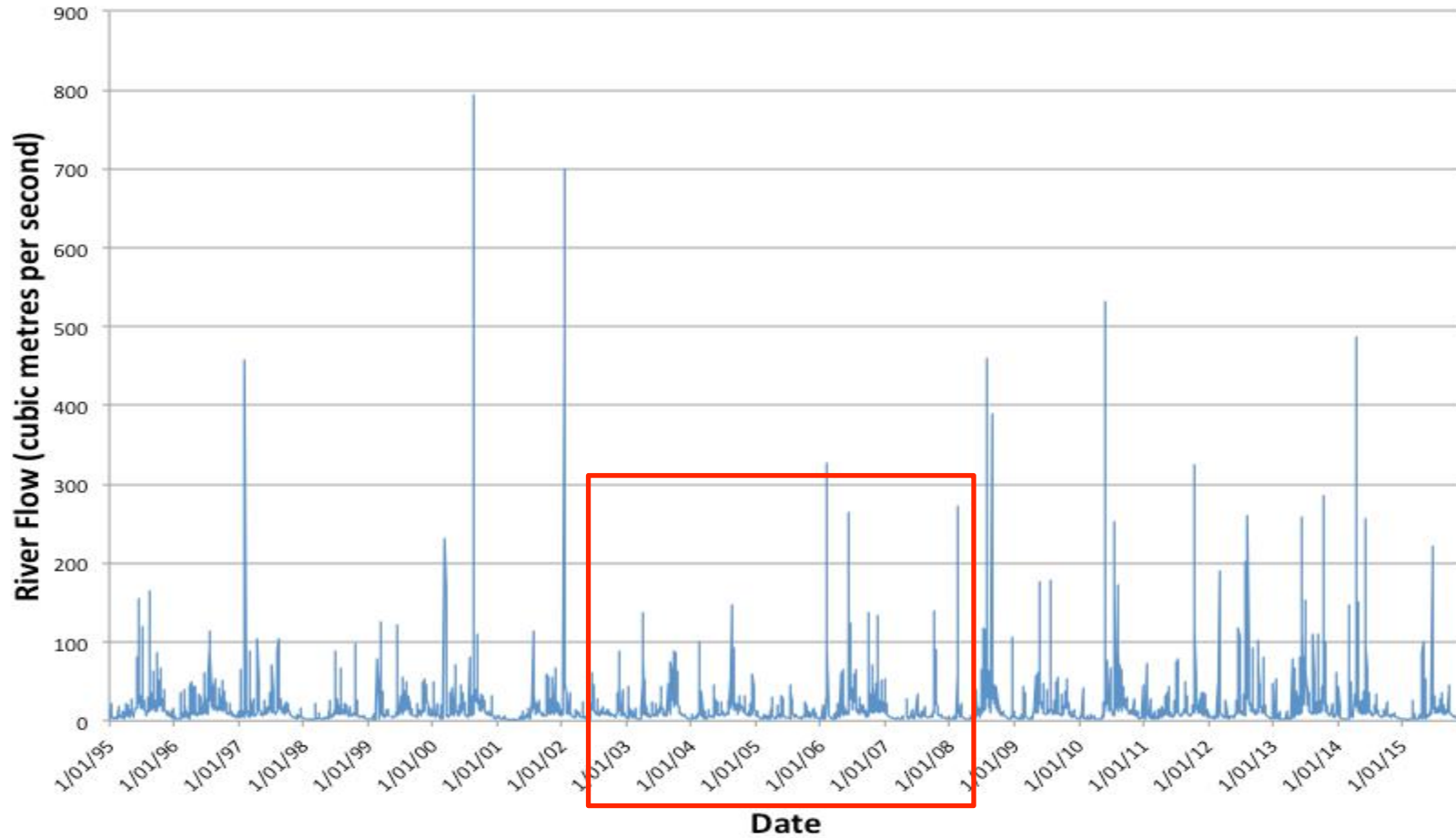
-> more frequent floods



Data source – Environment Canterbury



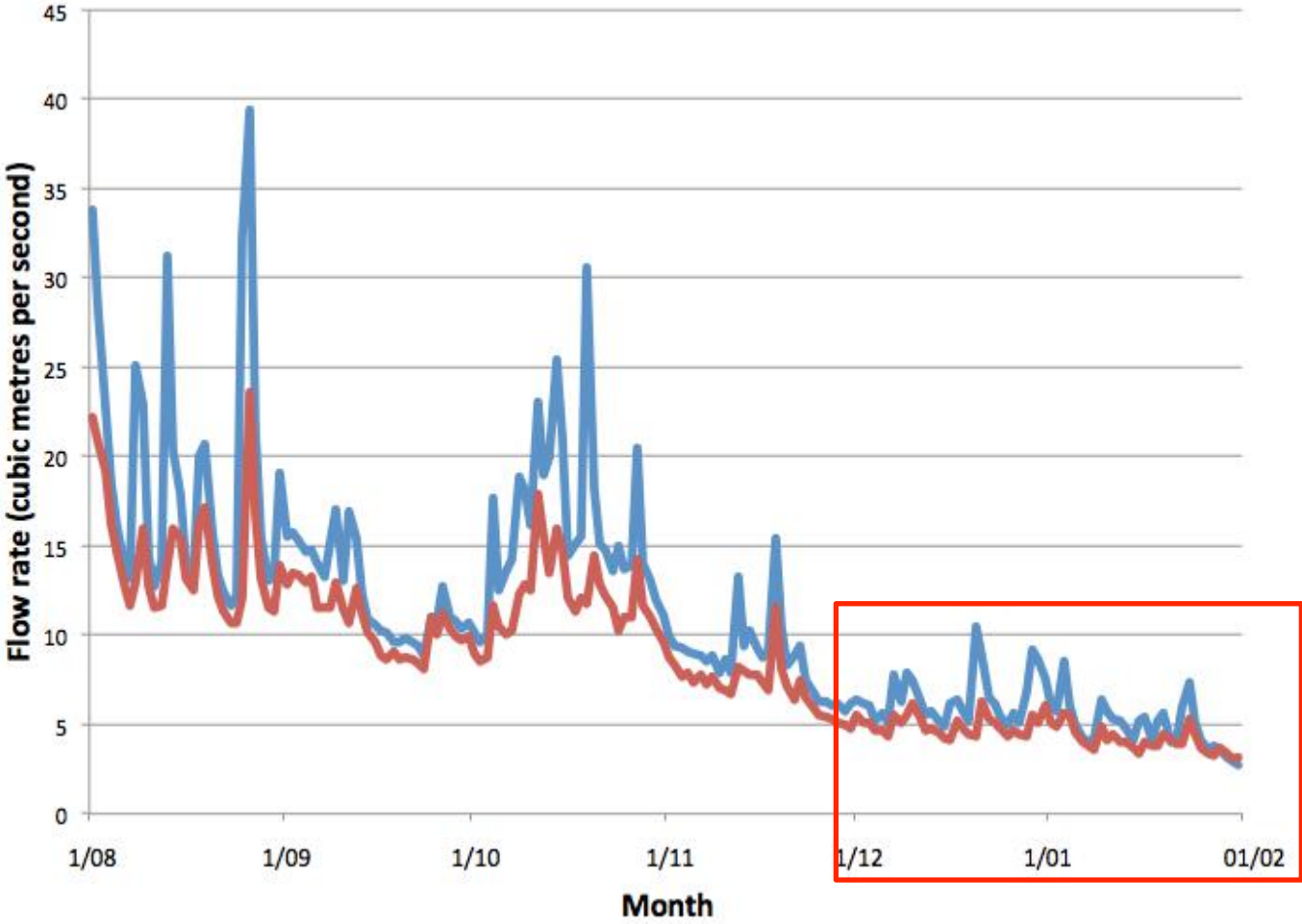
Foothill rivers → increased low flows



Data source – Environment Canterbury



Foothill rivers → increased dry episodes



Data source – Environment Canterbury





Adaptable to climate change?





Photo: DOC, Nicola Toki



Photo: Julia Nicholls

Climate change will increase pest pressure



Photo: DOC, Scott Nicol



Alien and native plant richness and abundance respond to different environmental drivers across multiple gravel floodplain ecosystems

T. J. Brummer^{1*}, A. E. Byrom², J. J. Sullivan³ and P. E. Hulme¹

Weed cover partially influenced by river flow

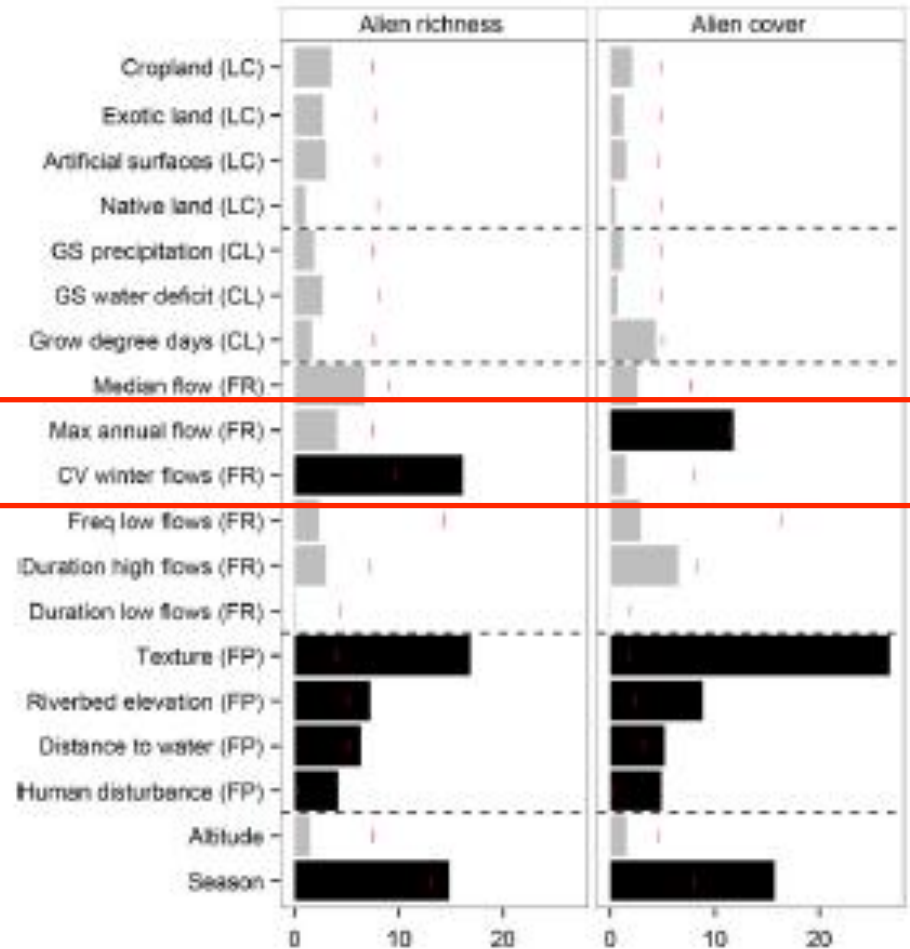




Photo: andrewwalmsleyphotography.com



Photo: DOC, Grant Harper

Invasive animal pests could benefit



Photo: DOC, David Mudge



Photo: andrewwalmsleyphotography.com



Photo: DOC, Grant Harper

Dual impacts on native species

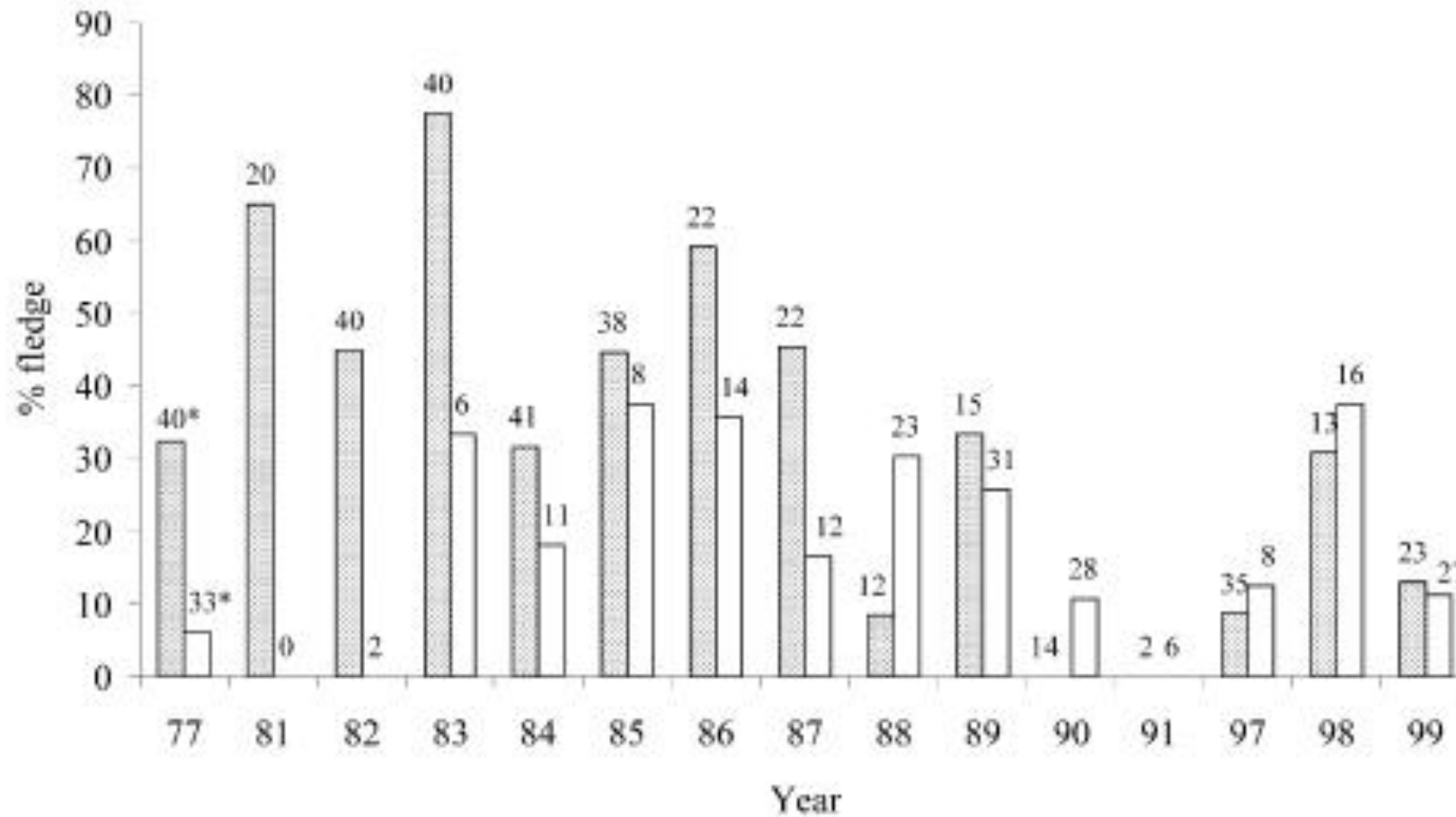


Photo: Alan Cressler



Predator control for protecting kaki (*Himantopus novaezelandiae*)— lessons from 20 years of management

Rachel J. Keedwell¹, Richard F. Maloney*, Dave P. Murray

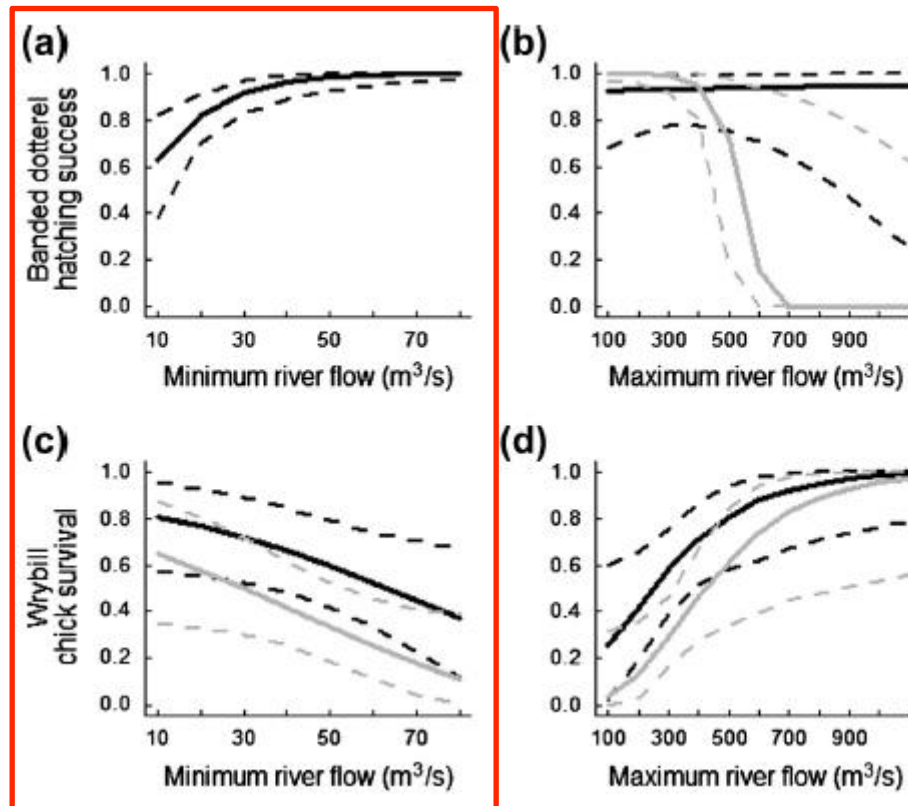


Species-specific responses by ground-nesting Charadriiformes to invasive predators and river flows in the braided Tasman River of New Zealand



Jennyffer Cruz^{a,*}, Roger P. Pech^{a,b}, Philip J. Seddon^c, Simone Cleland^d, Dean Nelson^d, Mark D. Sanders^e, Richard F. Maloney^d

River flow
effect bird
species
differently

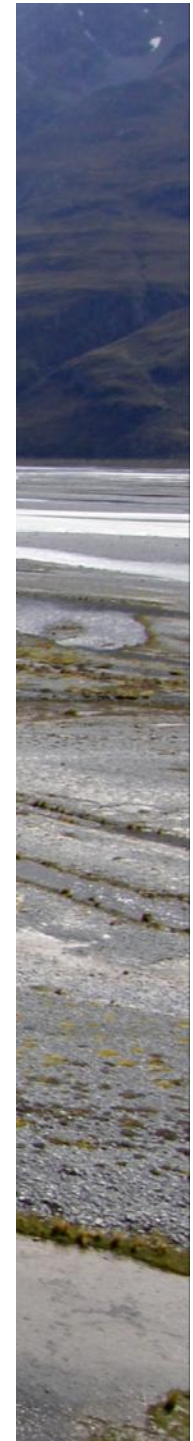
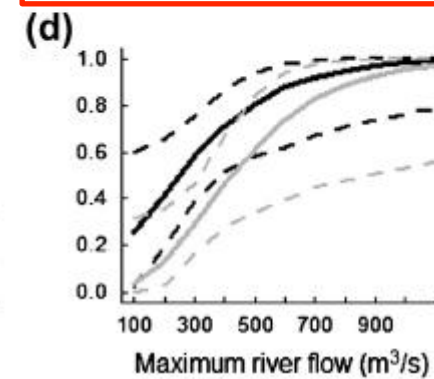
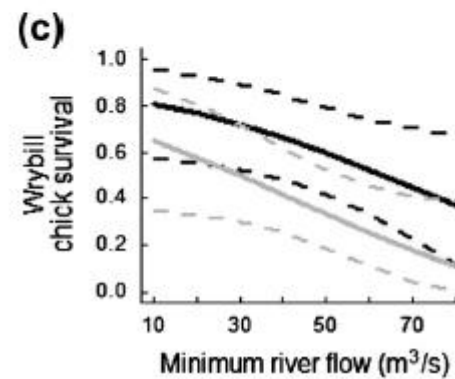
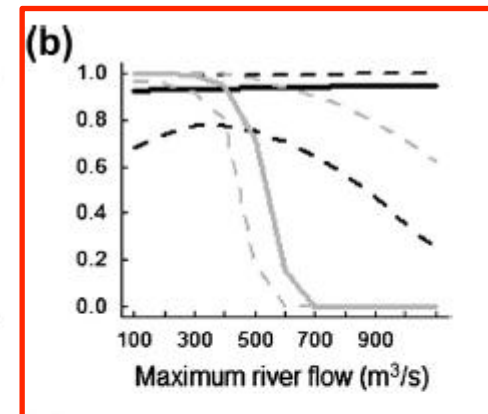
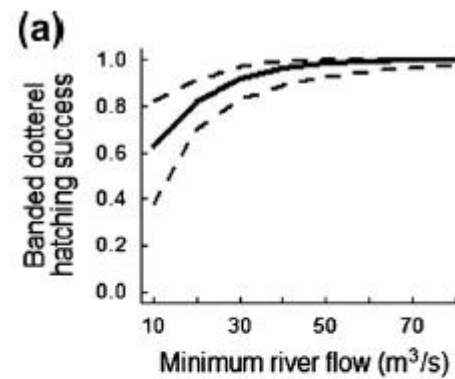


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Interaction between high river flow & predators





Climate change will compound
current pressures on native
species



Need clever management
solutions



Department of Conservation
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