

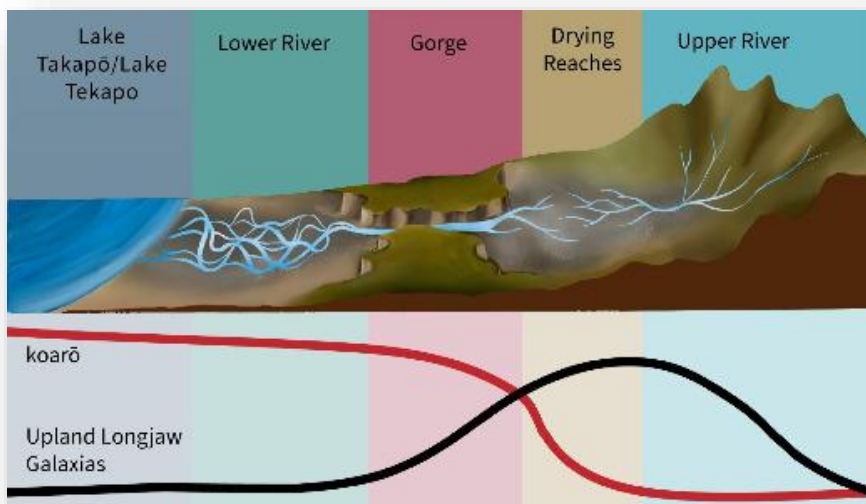
Kōaro and Upland Longjaw Galaxias: How braided river dynamics Buffer Against a Changing Climate

Kōaro (*Galaxias brevipinnis*) and Upland Longjaw Galaxias (*G. prognathus*) are native to Canterbury's alpine rivers. Although the species have evolved to coexist, **climate change is disrupting that balance** through more frequent floods and harsher droughts that reshape their habitats and threaten their survival.

To better understand how climate change affects the two species, and whether braided river systems can aide their survival, we studied Te-Awa-a-Takatamira | Cass River, a near-natural braided river system draining into Lake Takapō | Lake Tekapo.

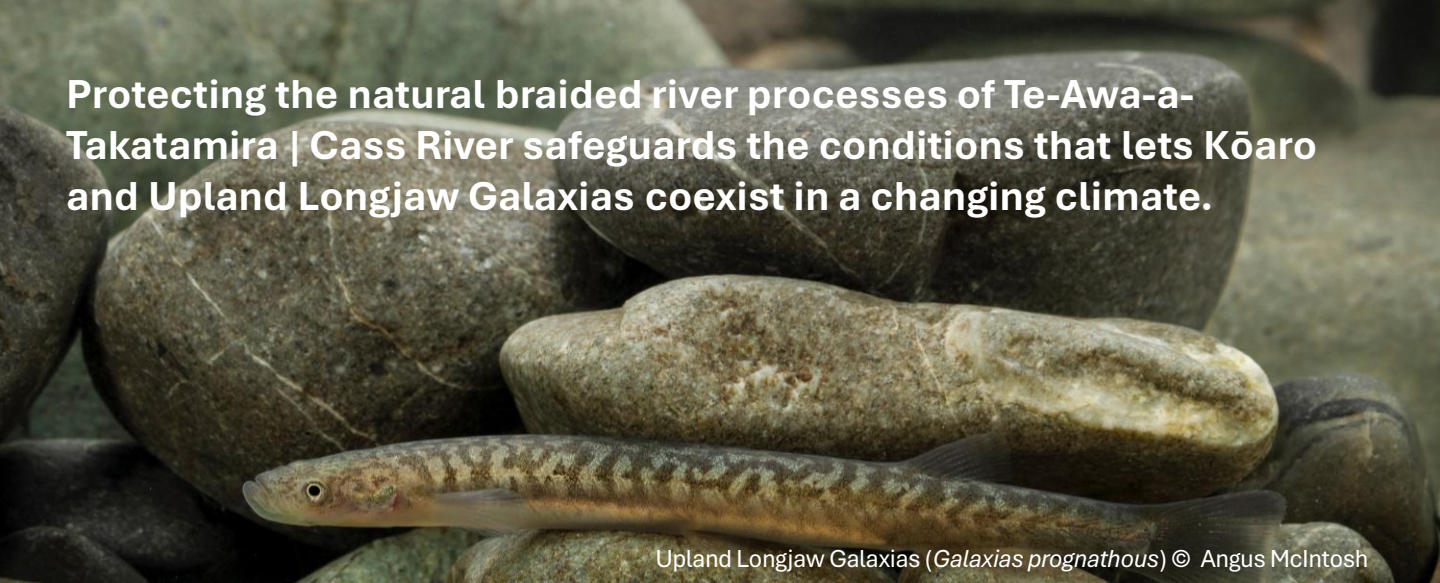
Key findings

- Kōaro have climate resilience. They can develop an **additional spawning cycle** if conditions are right.
- Upland Longjaw Galaxias **have lower climate resilience**. They have adapted to live in very specific habitats and are easily outcompeted by Kōaro.
- Braided river dynamics **are essential to sustain and protect** Kōaro and Upland Longjaw Galaxias.



Abundance of Kōaro and Upland Longjaw Galaxias along Te- Awa-a-Takatamira

Protecting the natural braided river processes of Te-Awa-a-Takatamira | Cass River safeguards the conditions that lets Kōaro and Upland Longjaw Galaxias coexist in a changing climate.



Upland Longjaw Galaxias (*Galaxias prognathous*) © Angus McIntosh

Three management recommendations to sustain native fish populations

1| Protect natural flow variability of braided rivers.

Maintain seasonal flow patterns and avoiding channelisation, stop-banking, and land-use changes that reduce habitat diversity, connectivity, sediment transport, and natural flow dynamics.

- Maintains barriers that limit kōaro and other predatory fish from moving upstream, reducing pressures on Upland Longjaw Galaxias.
- Creates diverse habitats for Kōaro downstream, and for Upland Longjaw Galaxias upstream of the gorge.

2| Focus monitoring on three parts of the catchment:

- 1) Lower river
- 2) Between gorge & drying reach
- 3) Upper river

This enables early detection of climate change impacts and enables adaptive management.

3| Integrate science and mātauranga Māori in management decisions

- This will safeguard the health of Te-Awa-a-Takatamira ecosystem.
- Strengthens outcomes for native fish and upholds the values of the awa | river.