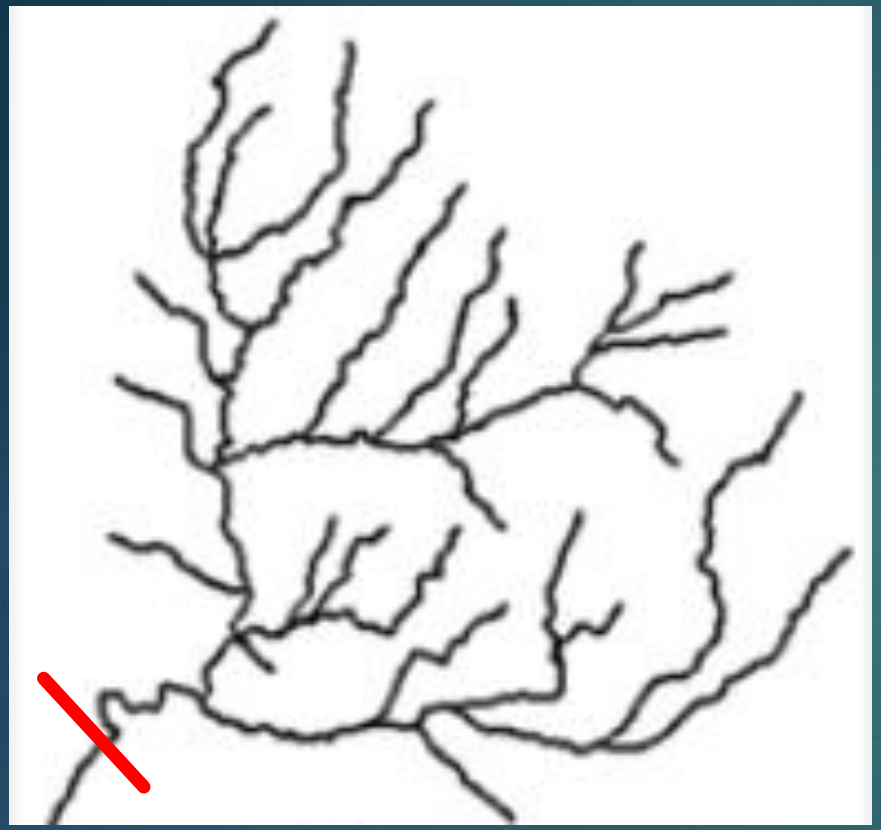
Long term + large scale remediation of a chemical barrier to fish migration

DATA COURTESY OF BT MINING



Eels

White bait

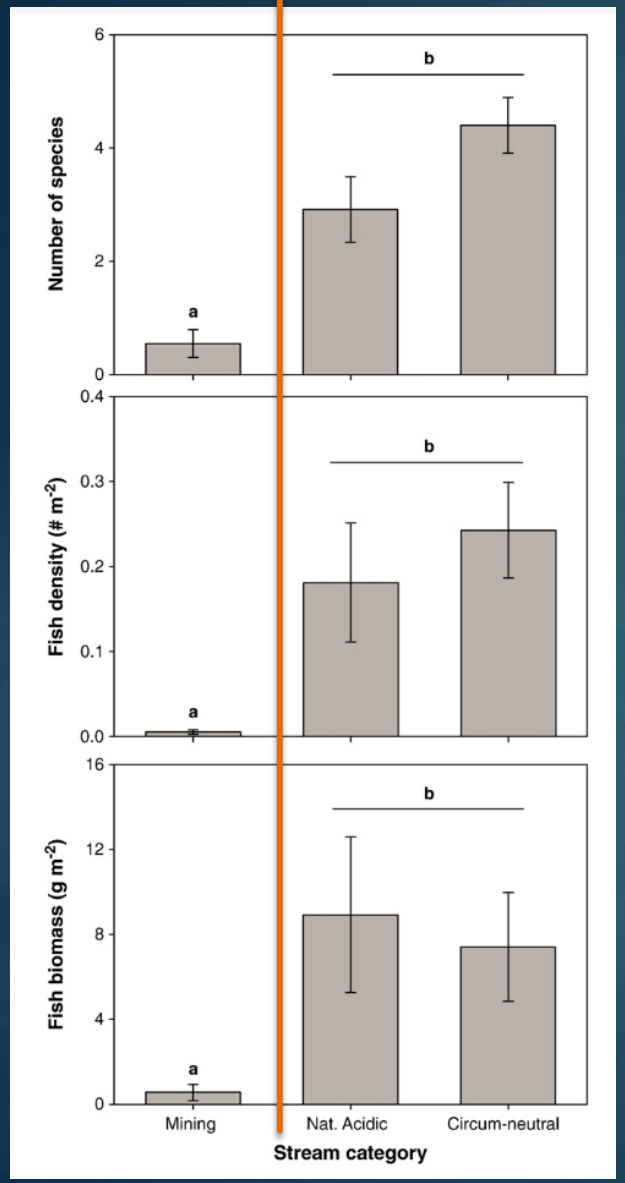
18 of 35

Acid Mine Drainage (AMD)

Low pH, metals, sometimes elevated turbidity
Sulphide mineral oxidation in the presence of oxygen and water

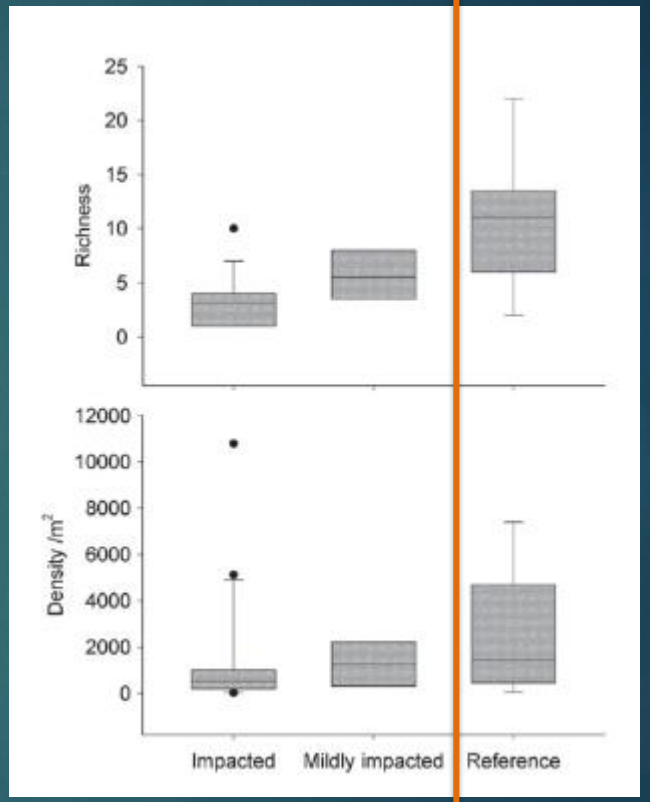
Effects on critters

Mining | No mining



Greig et al. 2010

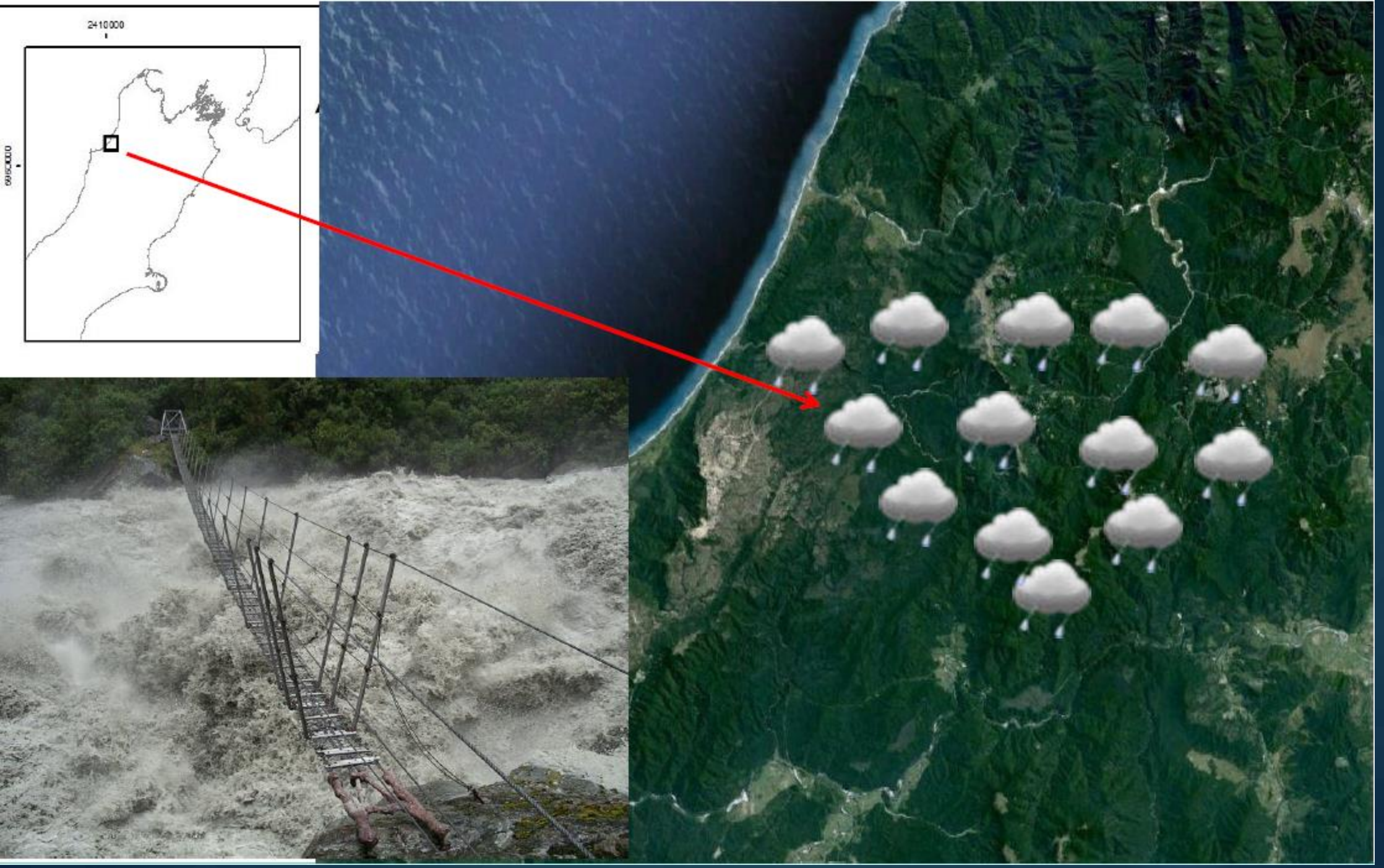
Mining | No mining



Kitto et al. 2015

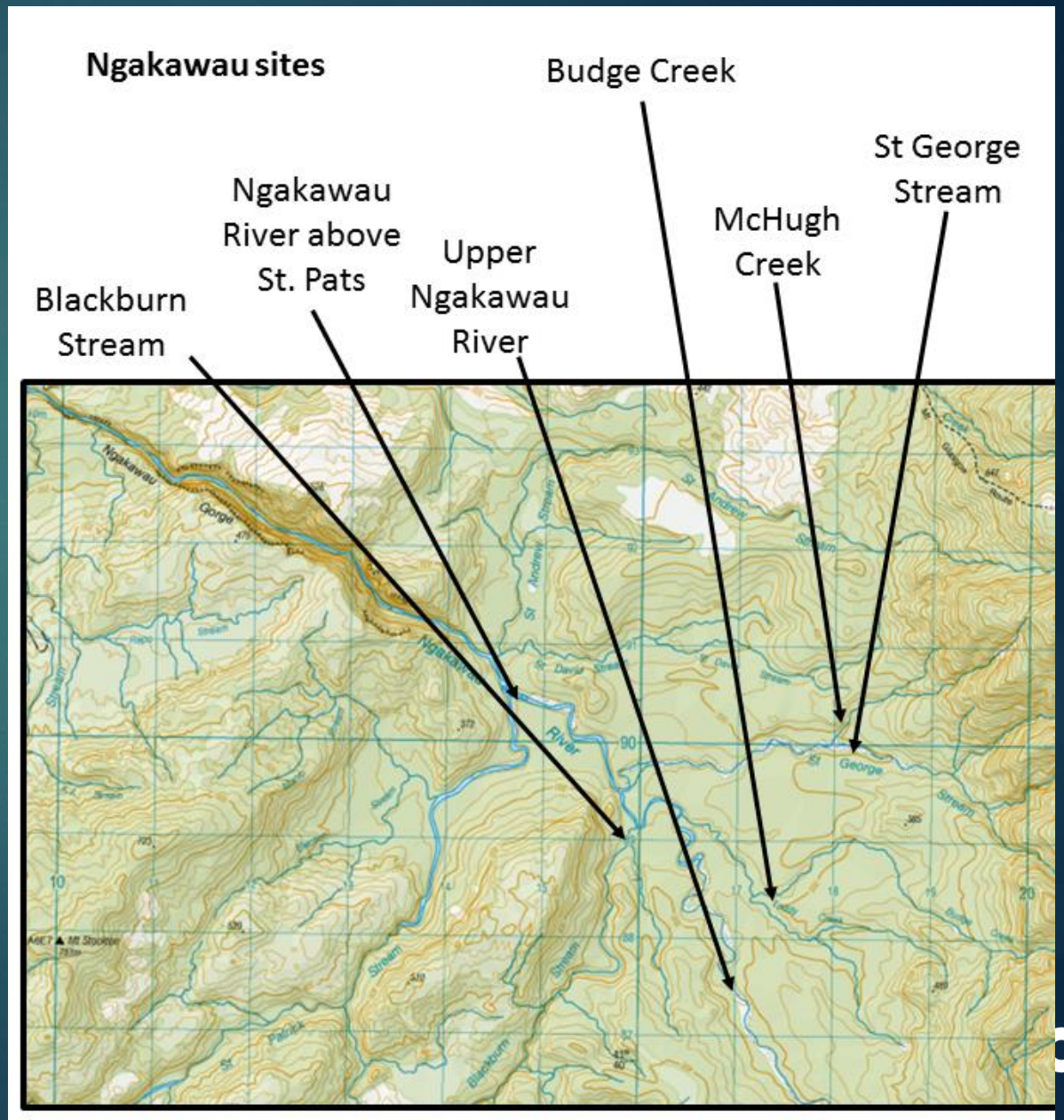
Steep gorge

Fish of the day


2410000
6915000

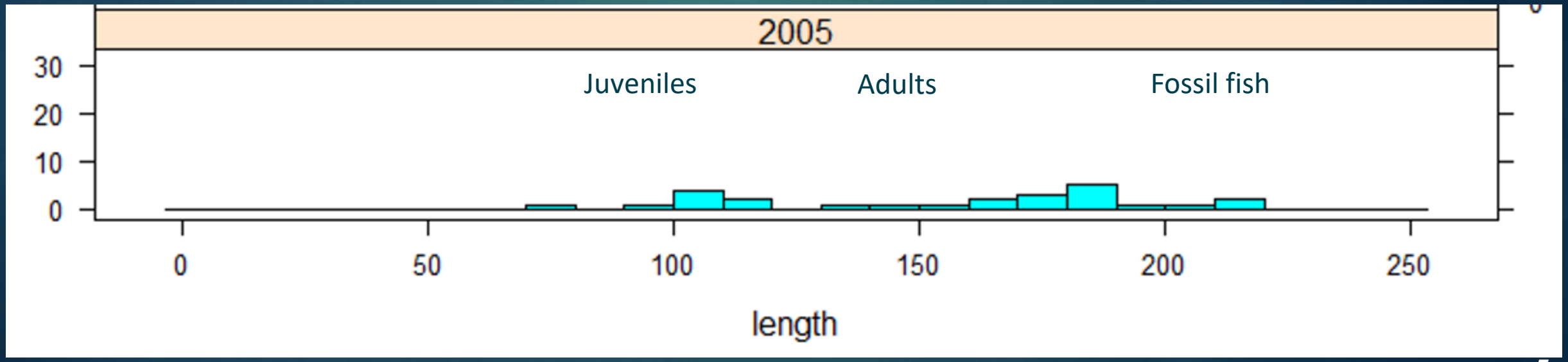
Mangatini Creek confluence

2005 fish survey



Chemical barrier confirmed

Low numbers of mostly mature fish indicate the population is likely recruitment limited due to chemical barrier



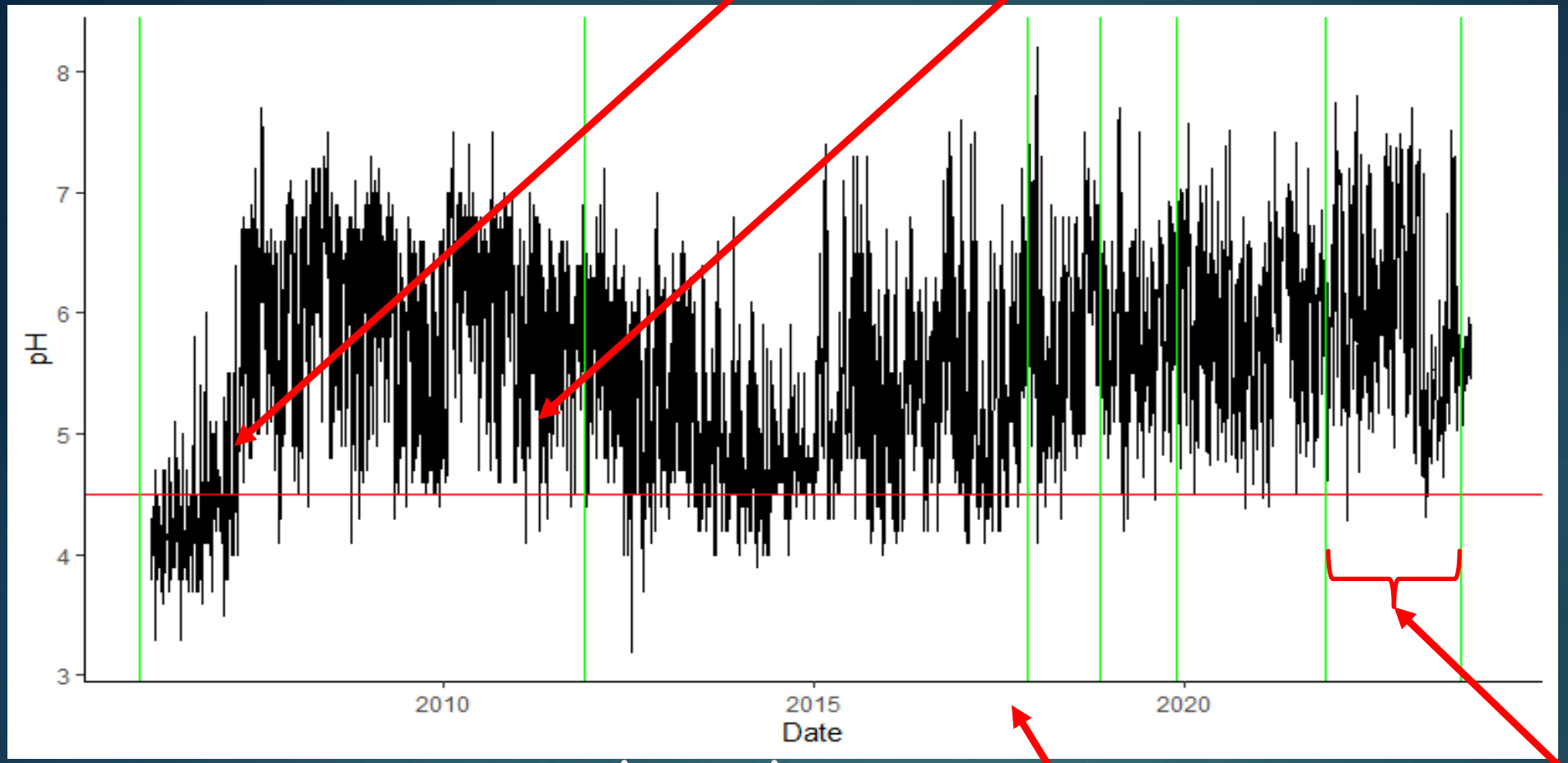
Water Quality Remediation

Remediation focussed on Mangatini Stream - starting 2007

Ngakawau River dwnst Mangatini

Lime dosing

Mangatini sump



pH threshold 4.5
Greig et al. 2010

Good

Bad

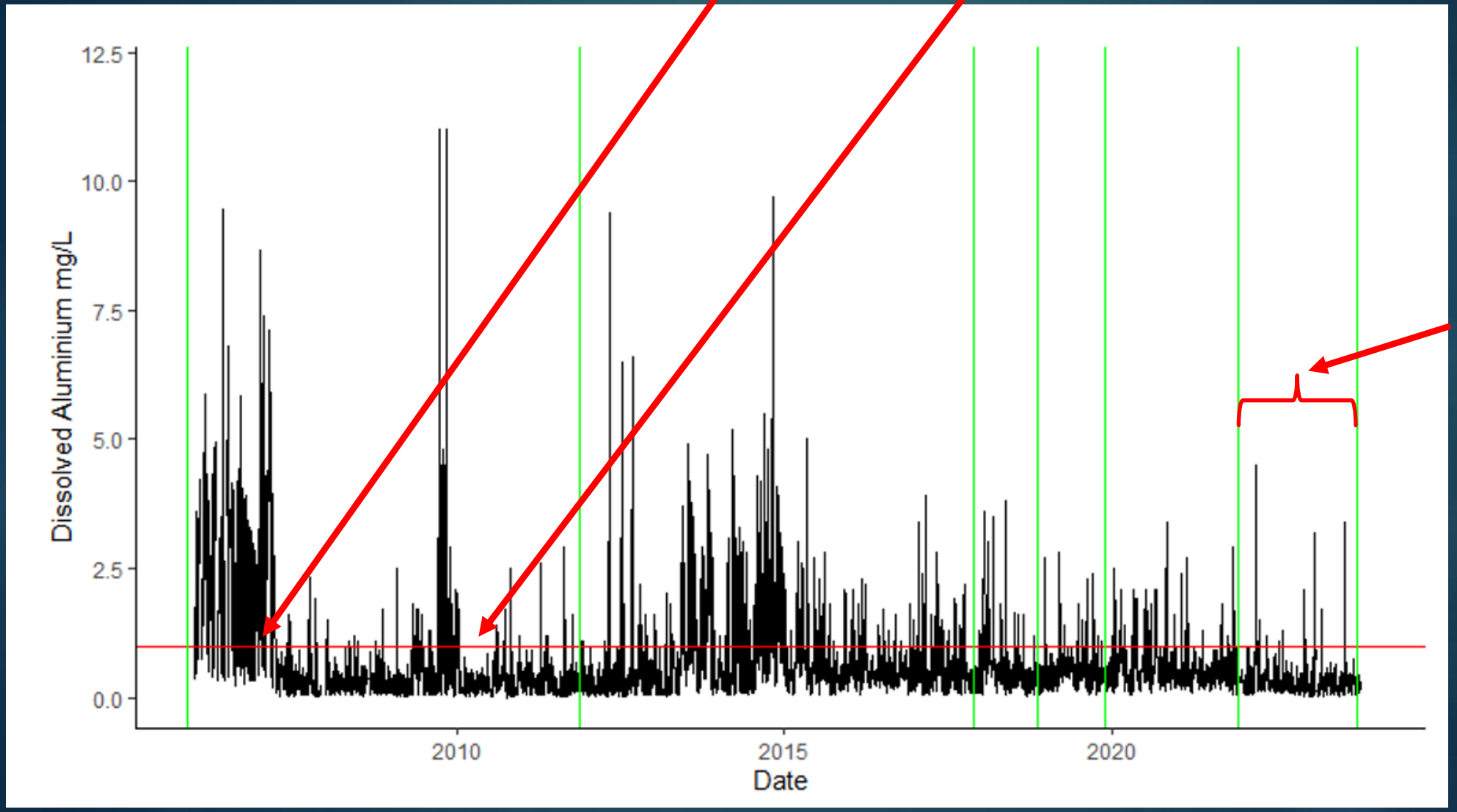
Transition from lime to calcium oxide
+
SENZ in receivership

BT mining take over

Threshold exceeded 0.8 % days

Water Quality Remediation

Ngakawau River



Aluminium threshold
1 mg/L
Greig et al. 2010

Diss. Al = non-toxic colloidal + toxic $AL3^{+}$

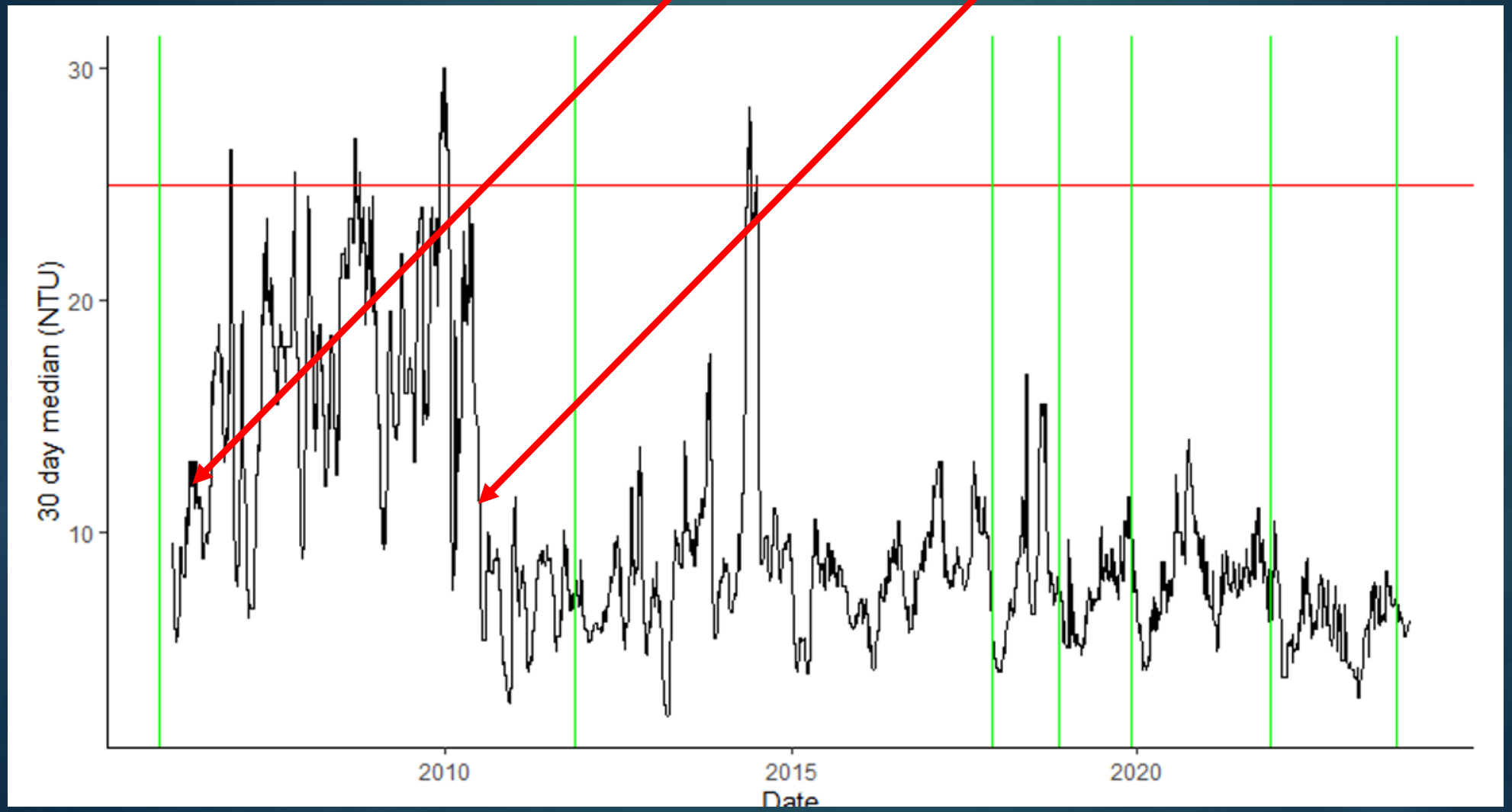
Threshold exceeded 2% of days

Bad

Good

Water Quality Remediation

Ngakawau River

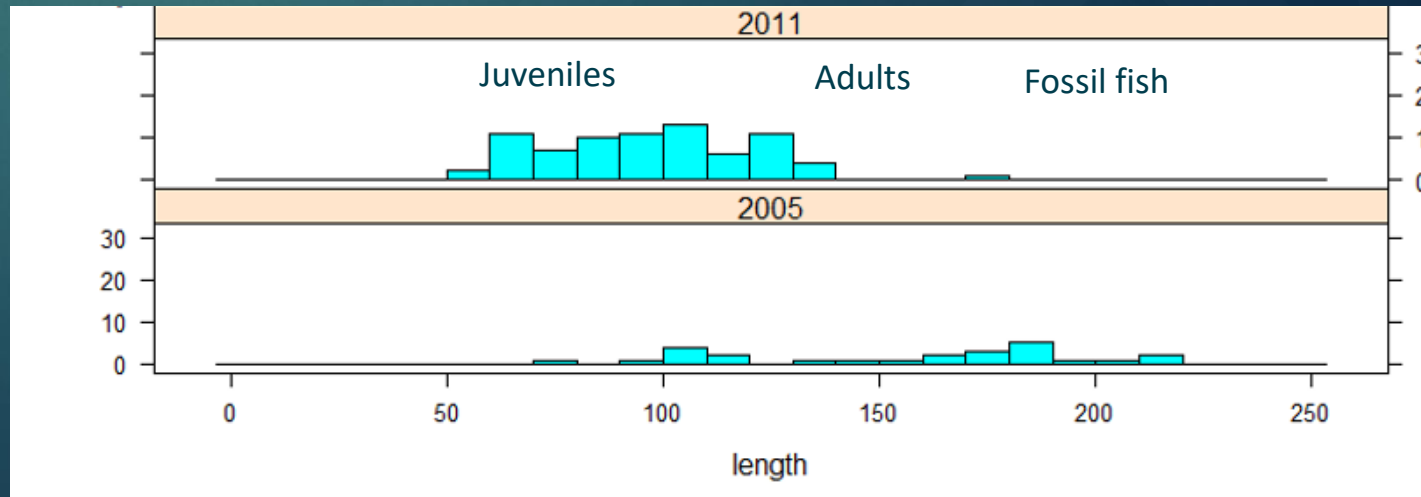


Bad

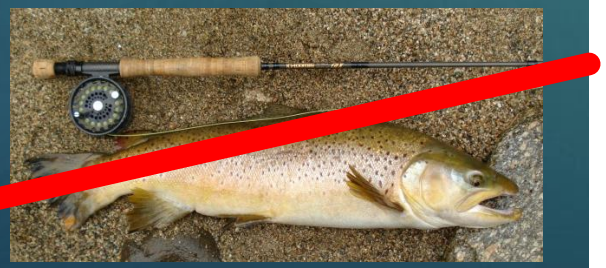
Good

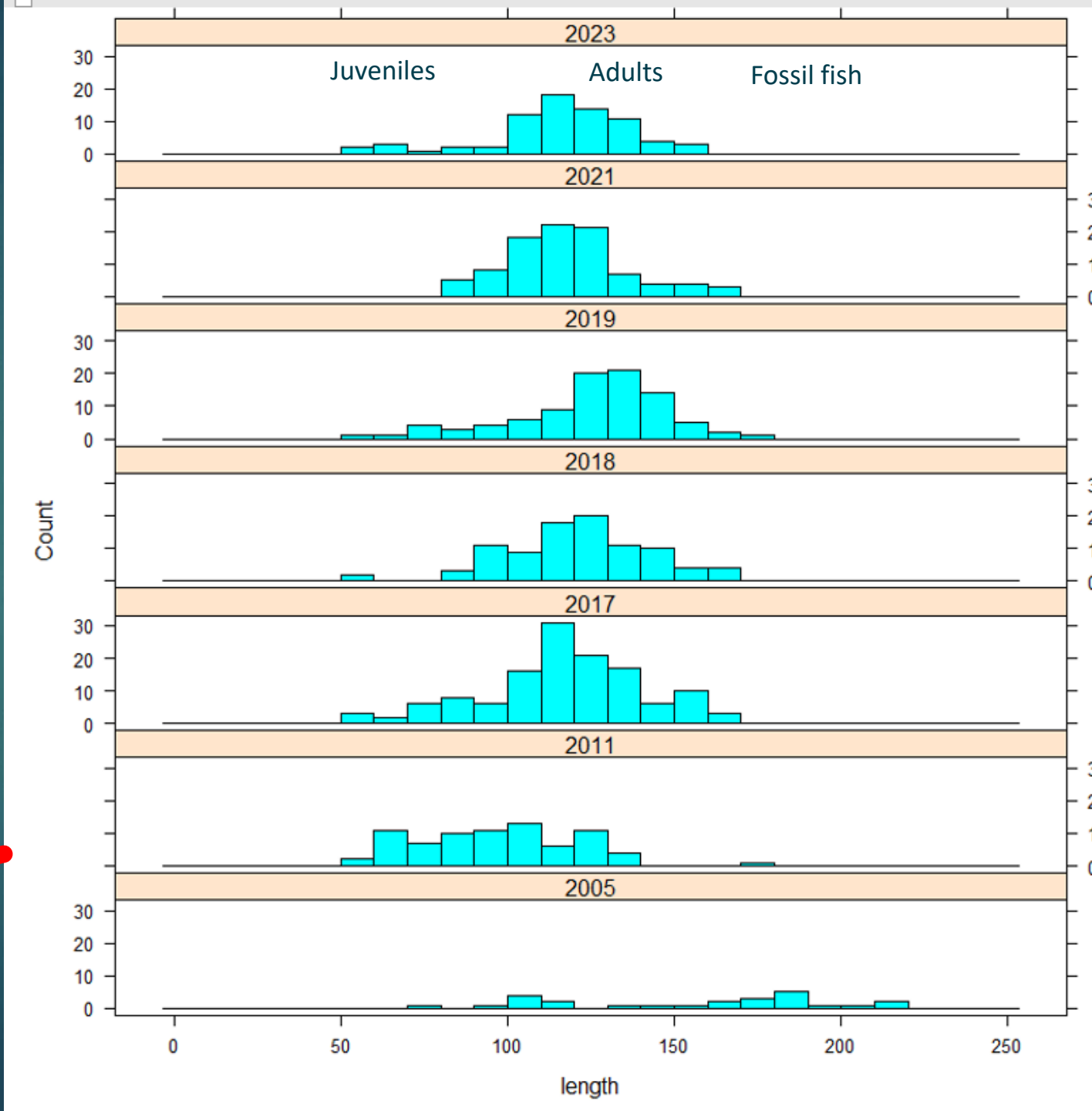
Turbidity threshold
25 (NTU)
WCRC consent

Fish recovery



Fish recovery





Long term remediation - achieved

- Water quality is being maintained within ecological thresholds.
- Kōaro have formed a stable population that shows no evidence of recruitment limitation
- Trout remain absent providing a rare opportunity to study population dynamics in the absence of that predator
- Everybody is happy!

Long term remediation - achieved

- Water quality is being maintained within ecological thresholds
- Kōaro have formed a stable population that shows no evidence of a migration barrier
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