

Cohen Stewart - Southland Fish and Game

Summary of evidence

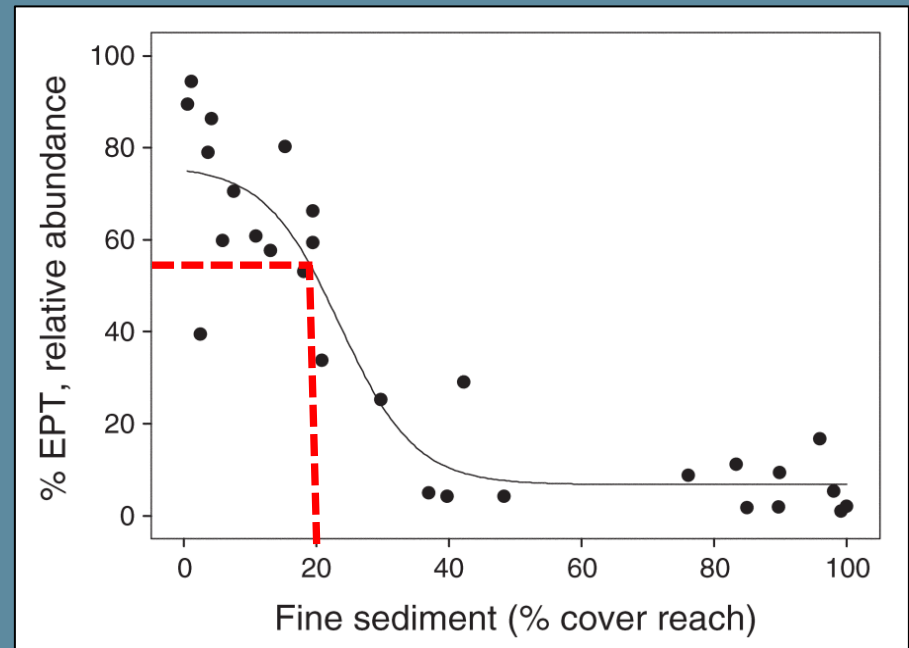
Discussion outline

- Sediment as a key stream stressor
- Otapiri Stream case study
 - Invertebrate community changes over time
 - Declining trout populations
 - Declining angler use
 - Deposited fine sediment in the Otapiri
- Recommendations



Sediment – a key stream stressor

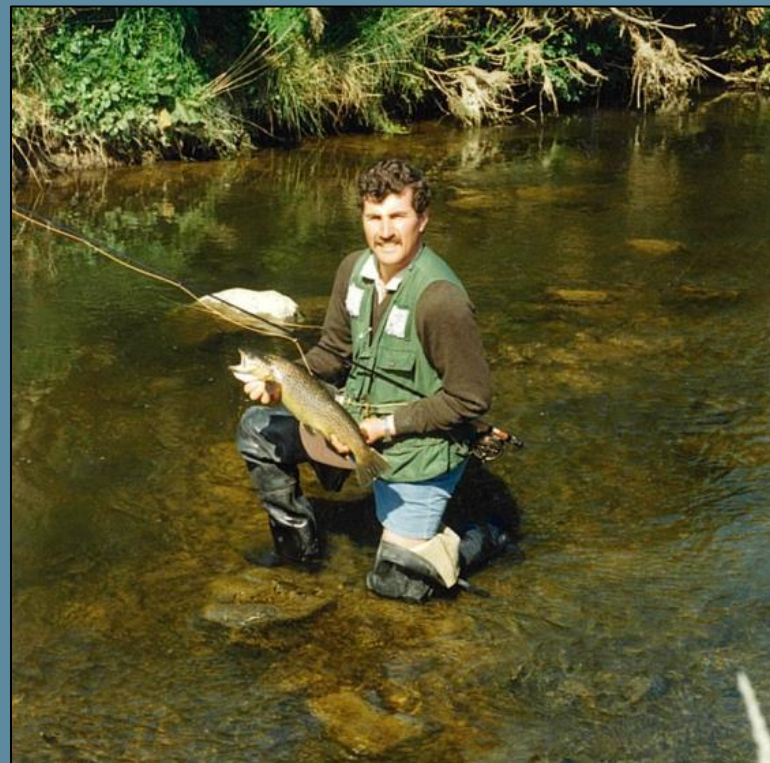
- Deposited fine sediment is often elevated in agricultural streams
- Forage crops are a significant source of sediment
- Negatively affects benthic invertebrates – threshold $\leq 20\%$
- Negatively affects trout populations – reduced egg and juvenile trout survival



Graph taken from Burdon et al. (2013).

Otapiri Stream case study

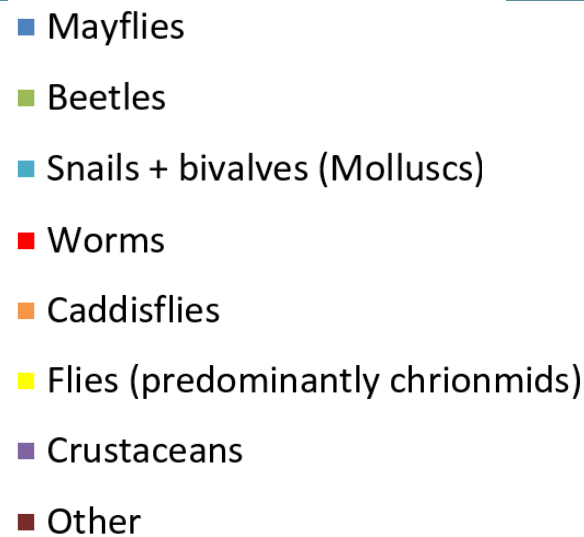
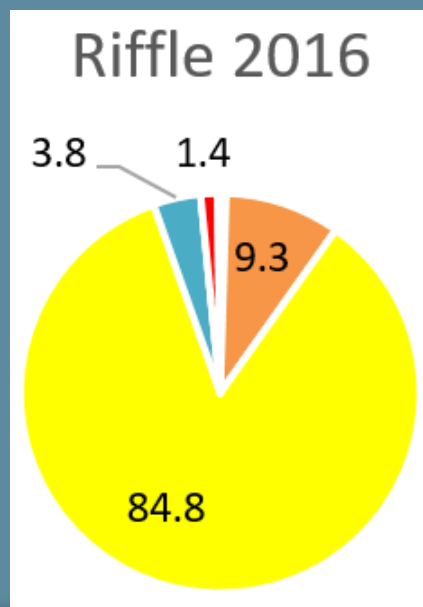
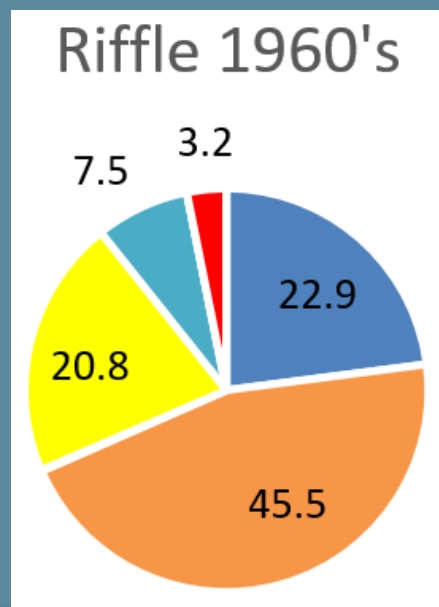
- Historically a very well utilised fishery
- In early 1960's the Otapiri had the highest catch rate of any Southland stream (Graynoth and Skrzynski 1974)
- 1960's - high numbers of mayflies and caddisflies. Low numbers of worms, chironomids, snails
- Fish & Game staff became concerned at the state of the stream, prompting a repeat of the invertebrate surveys
- Manuscript in preparation – New Zealand Journal of Marine and Freshwater Research



Early 1980's Otapiri Stream brown trout
Photo credit: Len Prentice

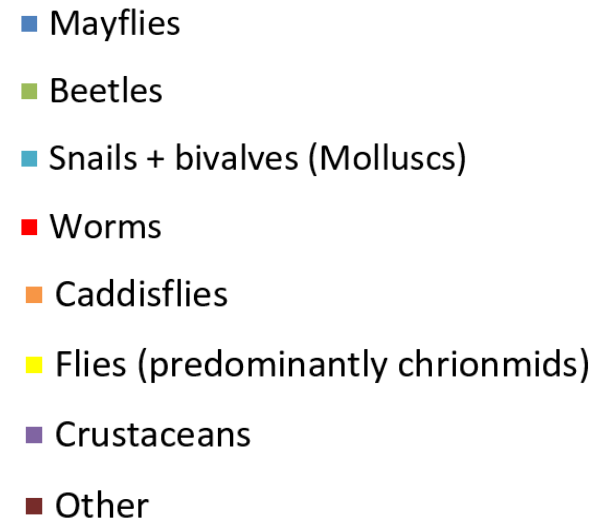
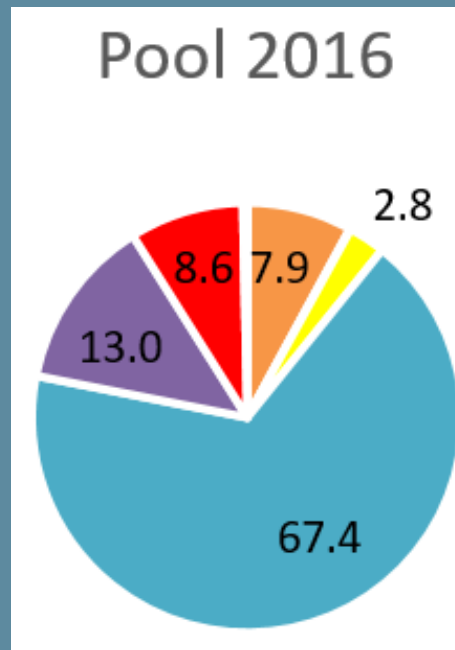
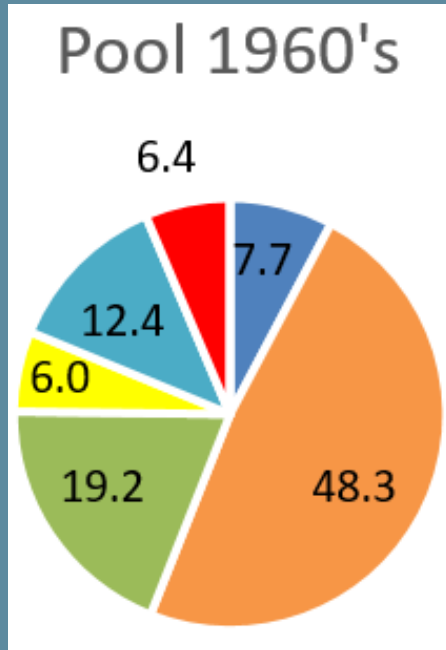
What did we find?

- Dramatic changes in invertebrate community composition
- MCI and QMCI scores are low – poor water quality



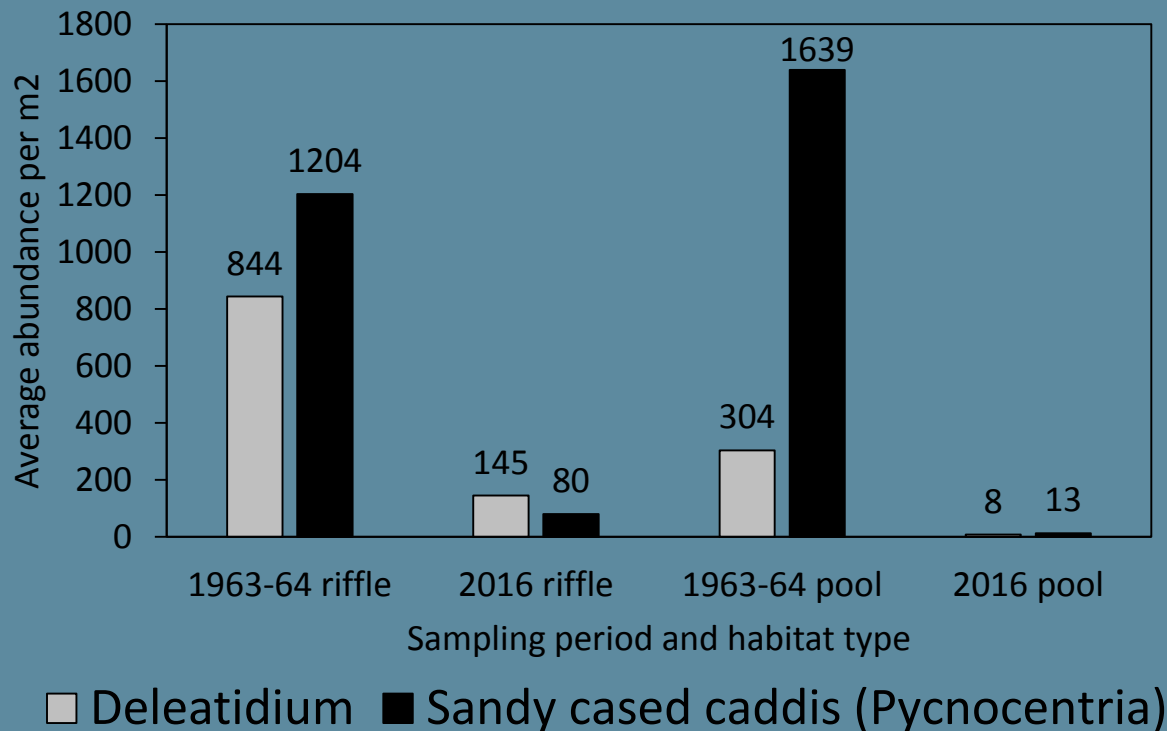
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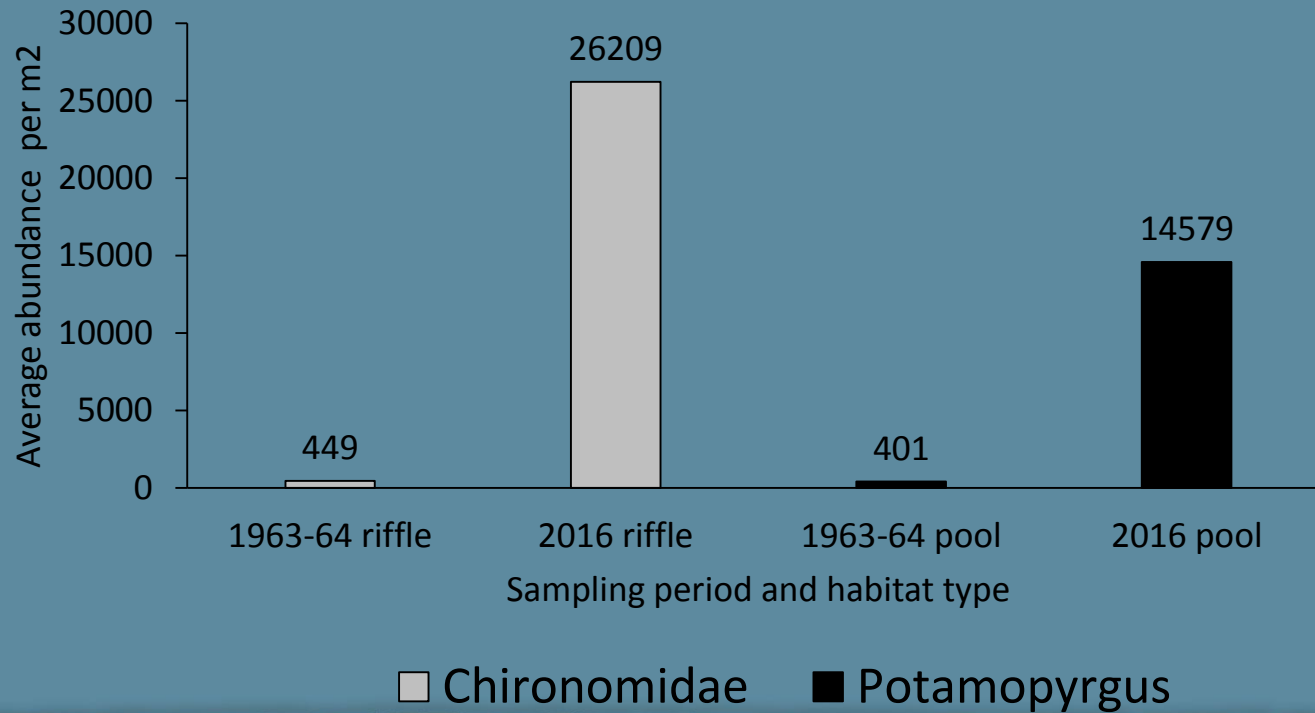
What did we find?

- Loss of sensitive invertebrate species – the best fish food



What did we find?

- Increase in pollution tolerant invertebrate species – poor trout food

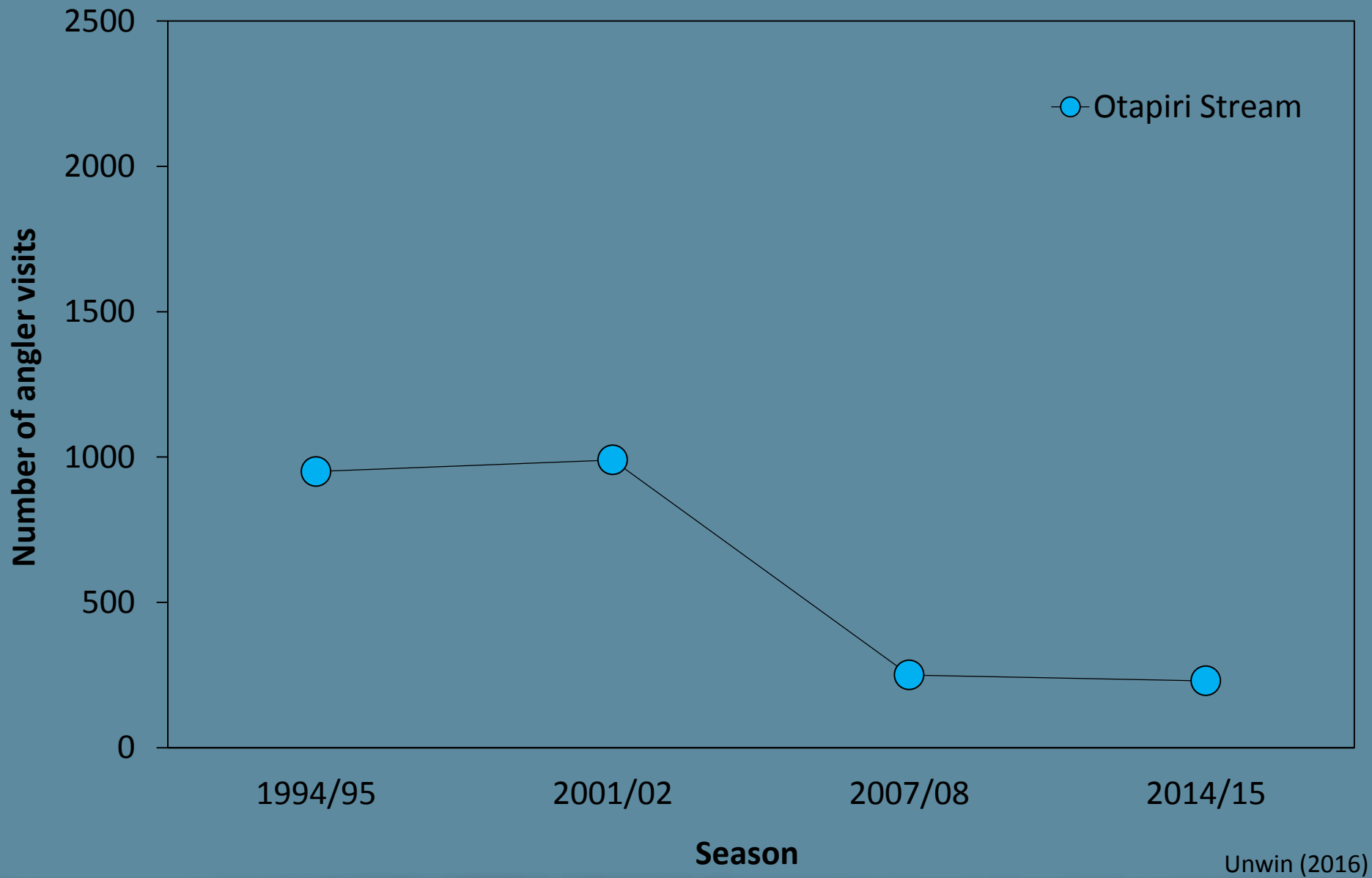


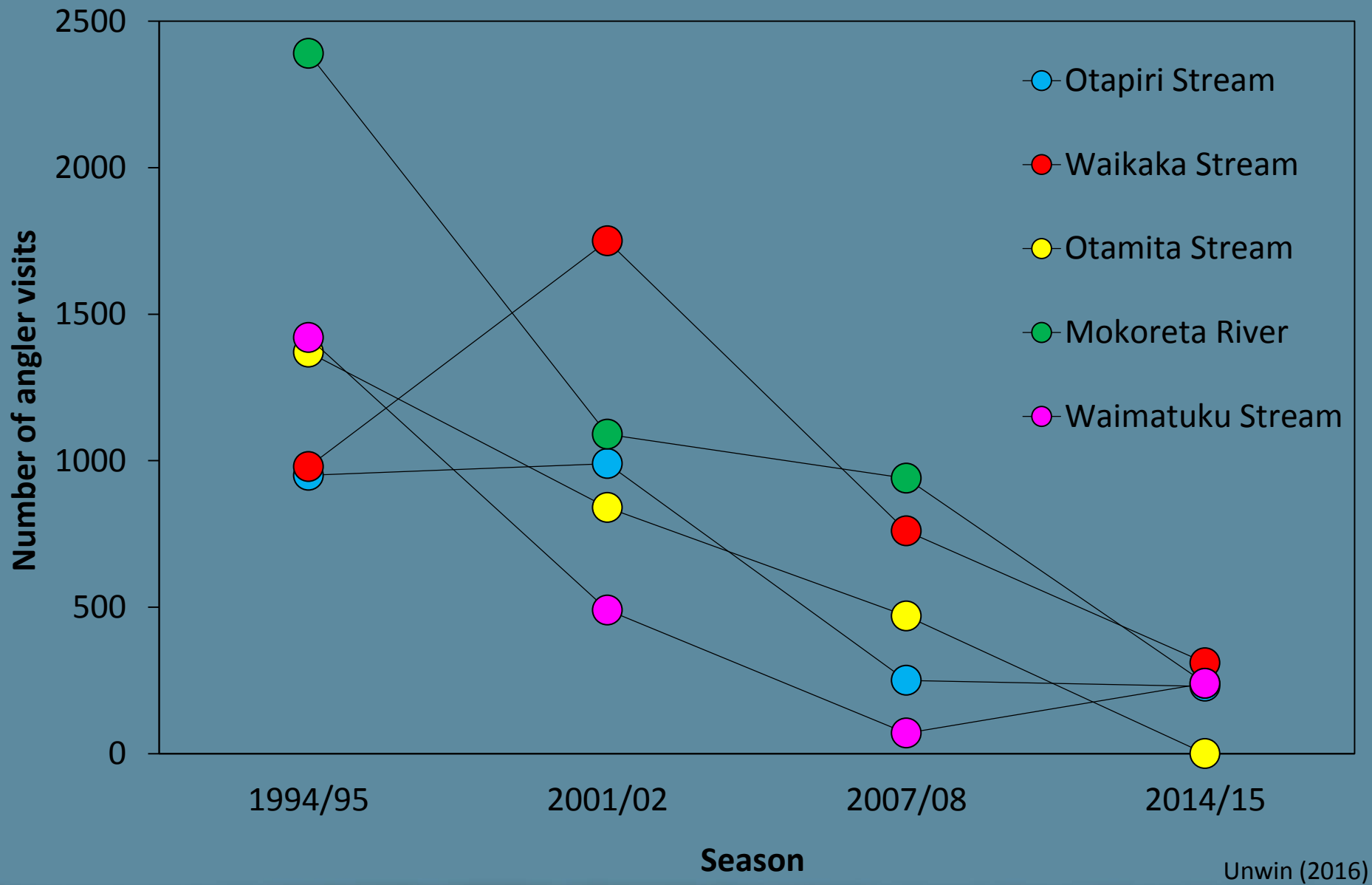
What about the trout and anglers?

- Electric fishing surveys have shown that trout density has **declined by 89%**
- In response, angler use of the Otapiri fishery has declined by 76%

Season	Number of angler days
1994/95	950 ± 220
2001/02	990 ± 260
2007/08	250 ± 110
2015/16	230 ± 110

The number of angler days spent on the Otapiri Stream during four angler survey periods (Unwin 2016).





What is causing the declines?

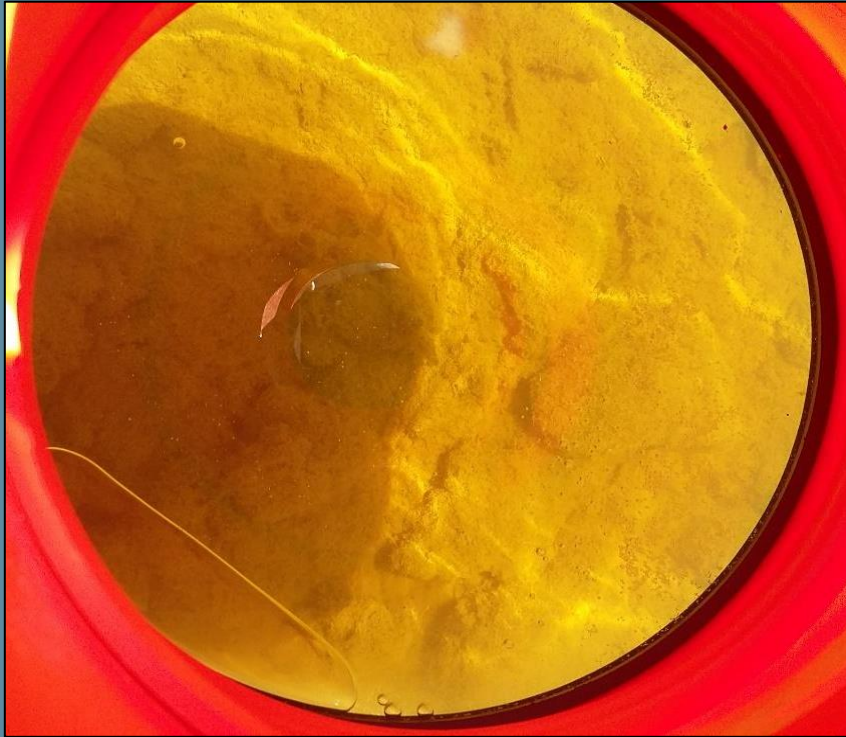
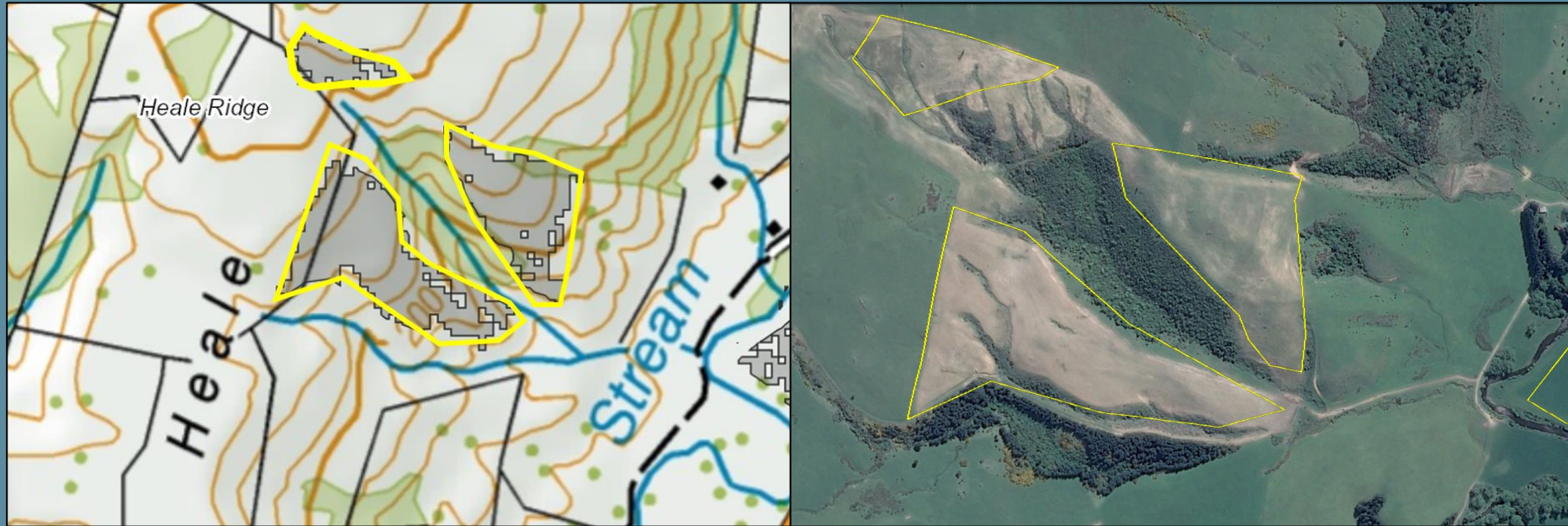




Photo taken by George Bell in 1992, Otapiri Gorge ~1.1km from our study site

Where is the sediment coming from?



Recommendations

- Action needs to be taken to reverse the damage that has been done and prevent further degradation
- We recommend a deposited fine sediment limit for streams $\leq 20\%$ is included in the Proposed Plan
- **Cultivating and winter grazing practices** - We support variable width setbacks which require the maintenance of a vegetated strip at specified distances relative to slope