Understanding land use impacts on water quality and river values

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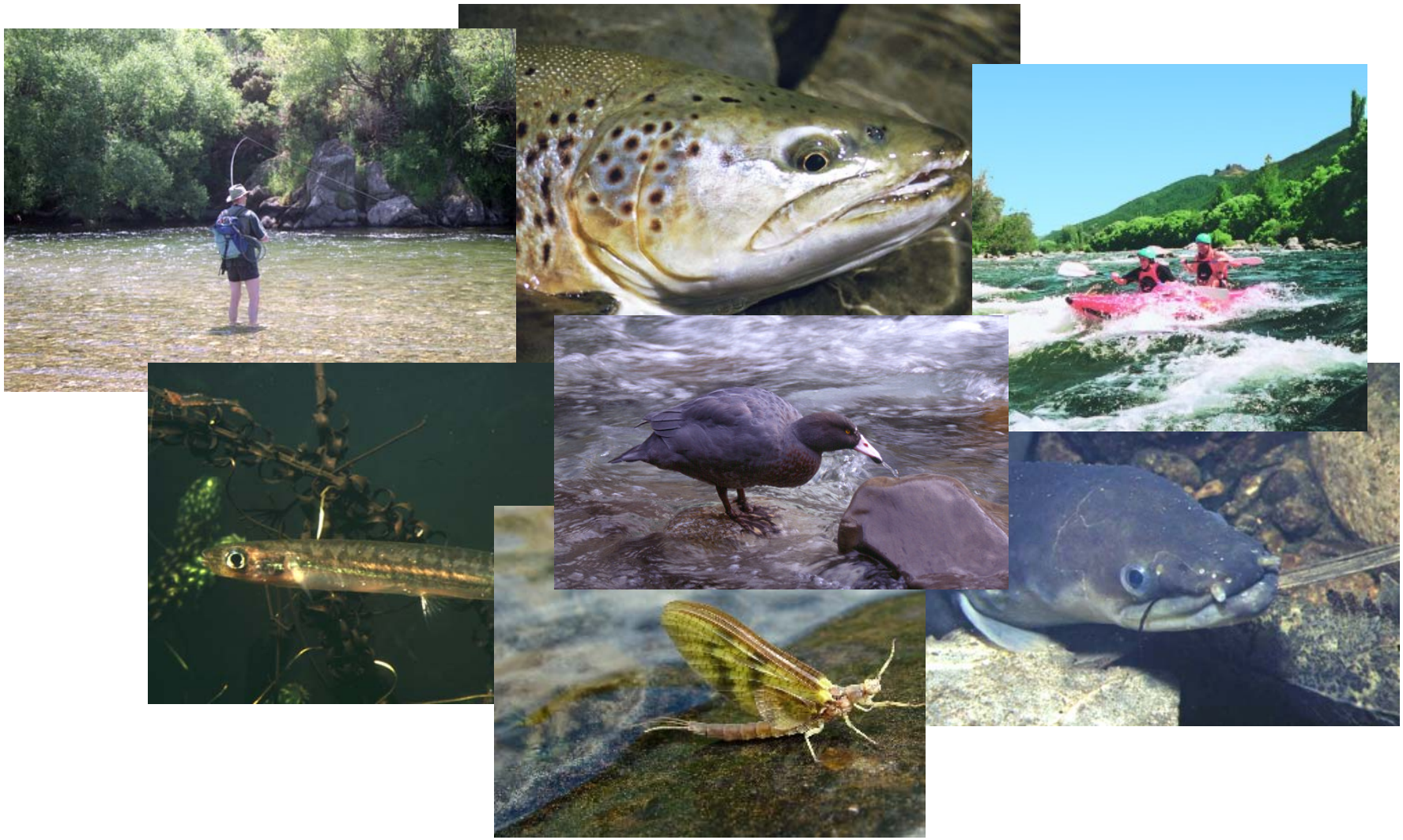
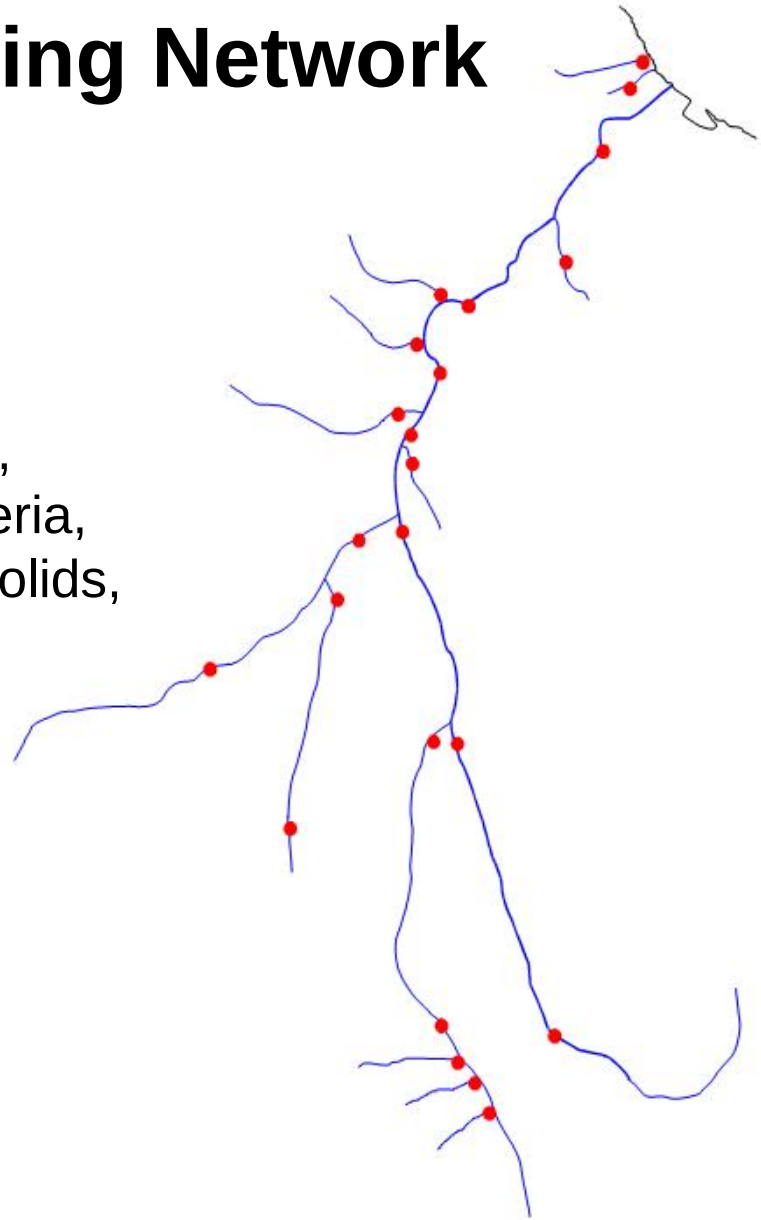
‘*In every respect the valley rules the stream*’ – Hynes (1975)

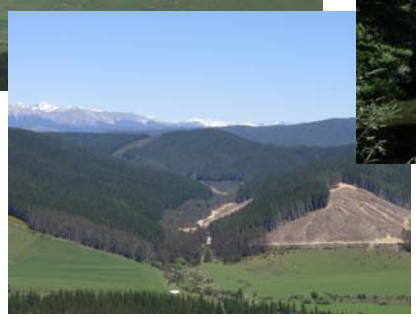
Motueka – a highly valued river



Water Quality Sampling Network

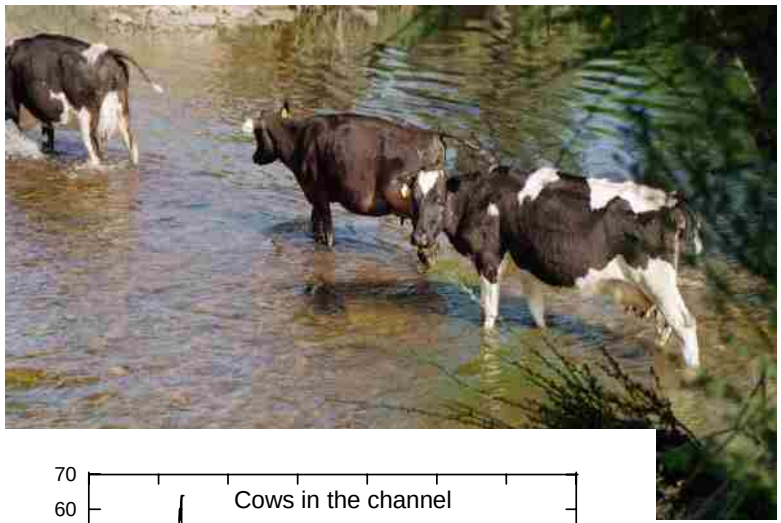
- 23 Sites throughout the catchment
- Contrasting land use
- Contrasting geology
- Patterns along the river
- Measured – oxygen, conductivity, pH, nutrients (NO_3, DRP), faecal bacteria, pathogens, turbidity, suspended solids, clarity



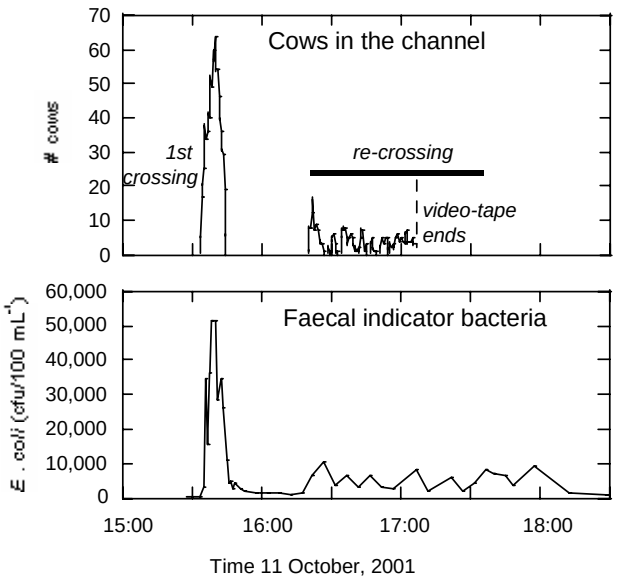


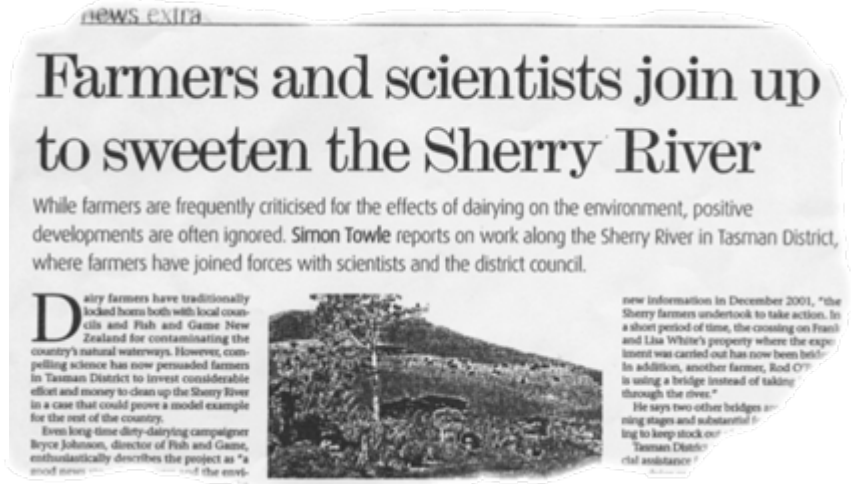
Young et al. 2005: New Zealand Journal of Marine & Freshwater Research 39: 803-825.

More detailed work in the Sherry



- Issues raised at community group
- Key people involved
- Faecal bacteria – major concern
- More detailed studies
- More farm house meetings
- Action
- Celebration!!
- Monitoring





news extra

Farmers and scientists join up to sweeten the Sherry River

While farmers are frequently criticised for the effects of dairying on the environment, positive developments are often ignored. Simon Towle reports on work along the Sherry River in Tasman District, where farmers have joined forces with scientists and the district council.

Dairy farmers have traditionally locked horns both with local councils and Fish and Game New Zealand for contaminating the country's natural waterways. However, compelling science has now persuaded farmers in Tasman District to invest considerable effort and money to clean up the Sherry River in a case that could prove a model example for the rest of the country.

Even long-time dirty-dairying campaigner Bryce Johnson, director of Fish and Game, enthusiastically describes the project as "a

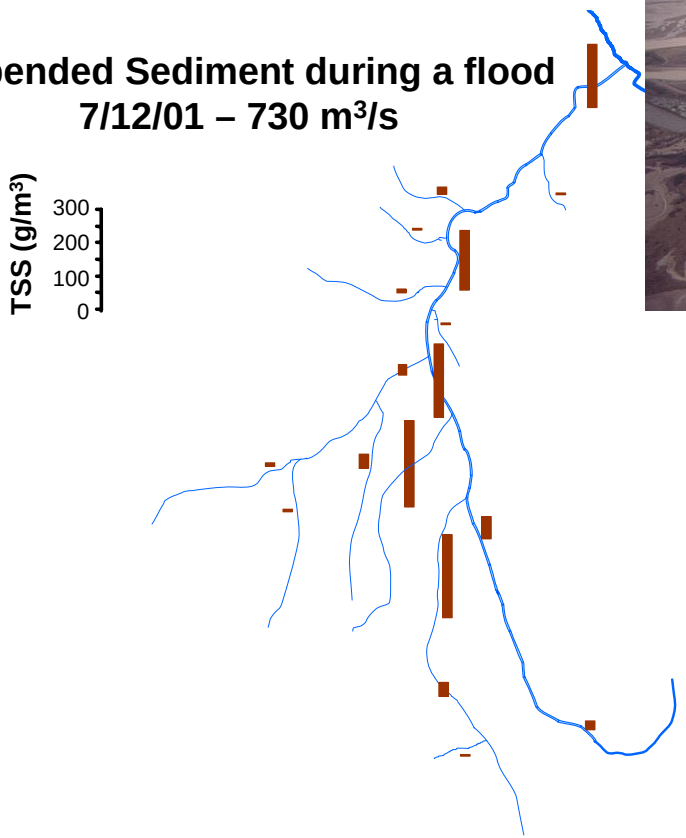
new information in December 2001, "the Sherry farmers undertook to take action. In a short period of time, the crossing on Franc and Lisa White's property where the exp ment was carried out has now been hel In addition, another farmer, Rod O' is using a bridge instead of taking through the river."

He says two other bridges ning stages and substantial ing to keep stock ou Tasman Distri cial assistance

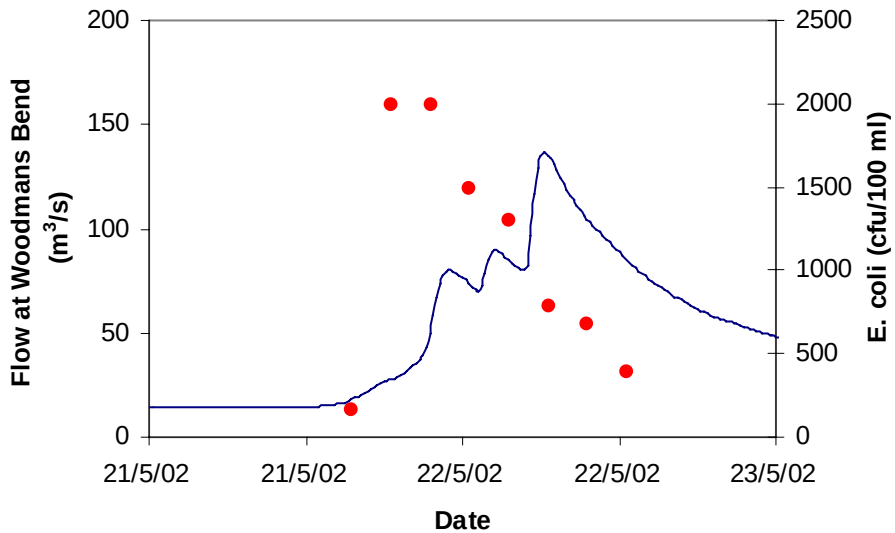
Davies-Colley et al. 2004: New Zealand Journal of Marine & Freshwater Research 38: 569-576.

Land-Sea linkages

Suspended Sediment during a flood
7/12/01 – 730 m³/s



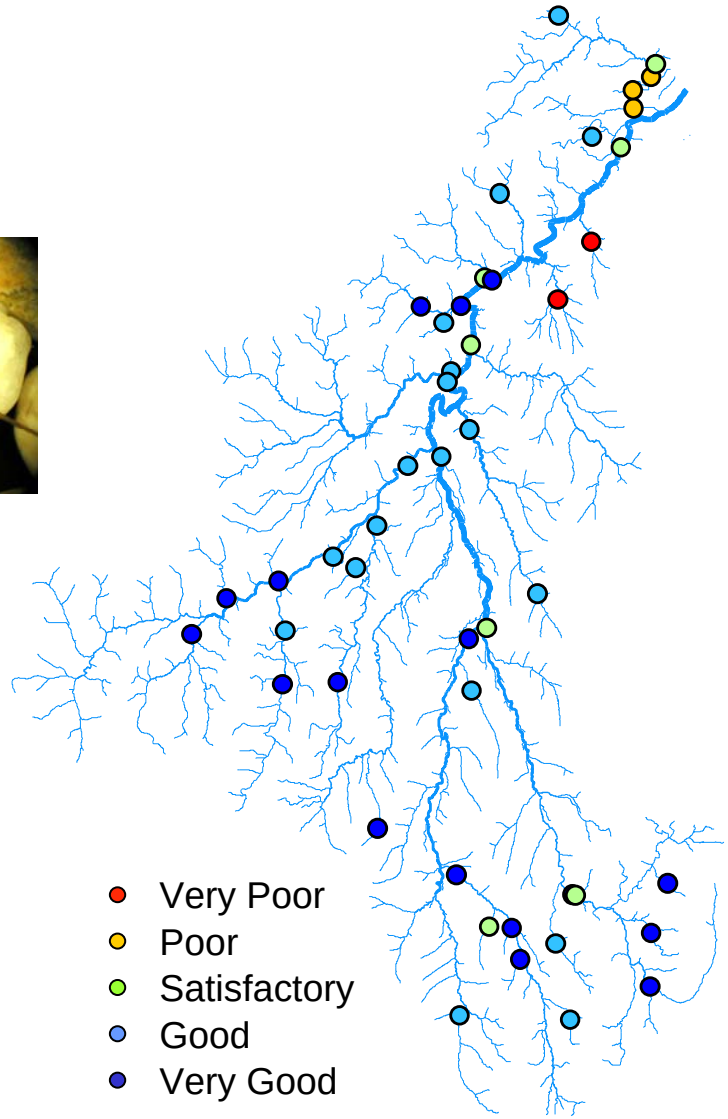
Changes in concentration with flow



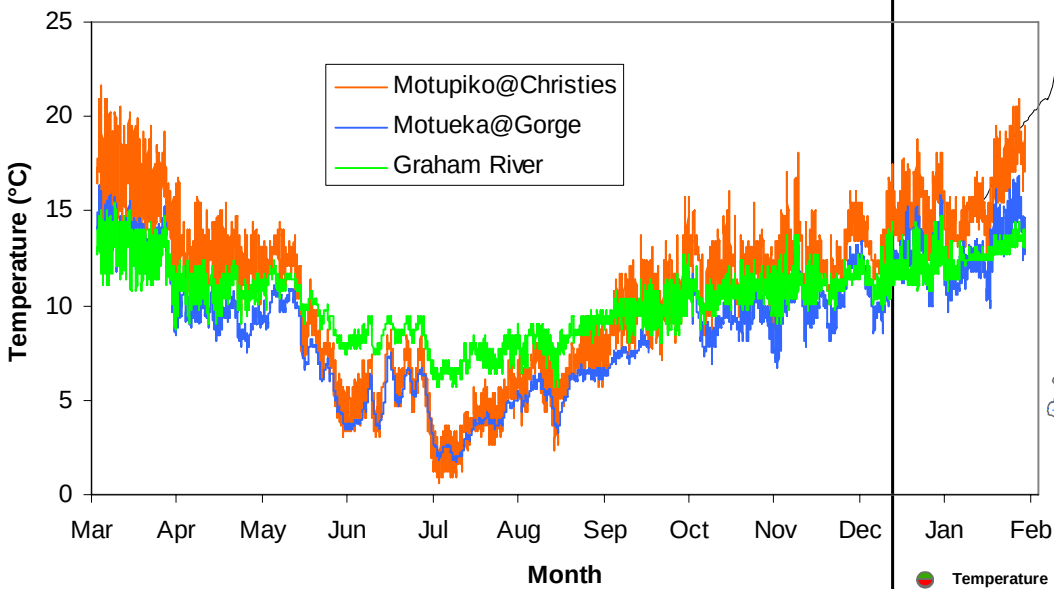
Stream Invertebrate Sampling

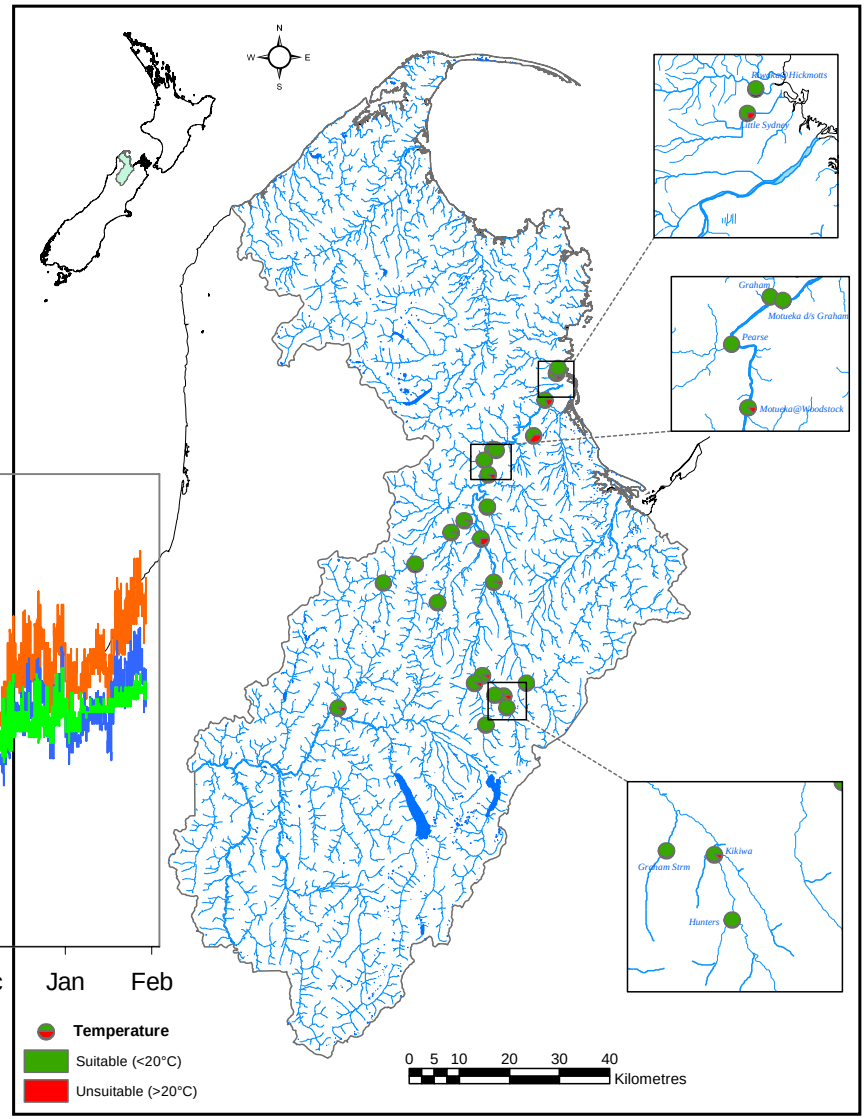
- Common indicator of river health
- 46 Sites throughout the catchment
- Contrasting land use
- Contrasting geology

- Interesting geol/landuse interactions
- Small pastoral streams in poor health
- Headwaters and mainstem healthy



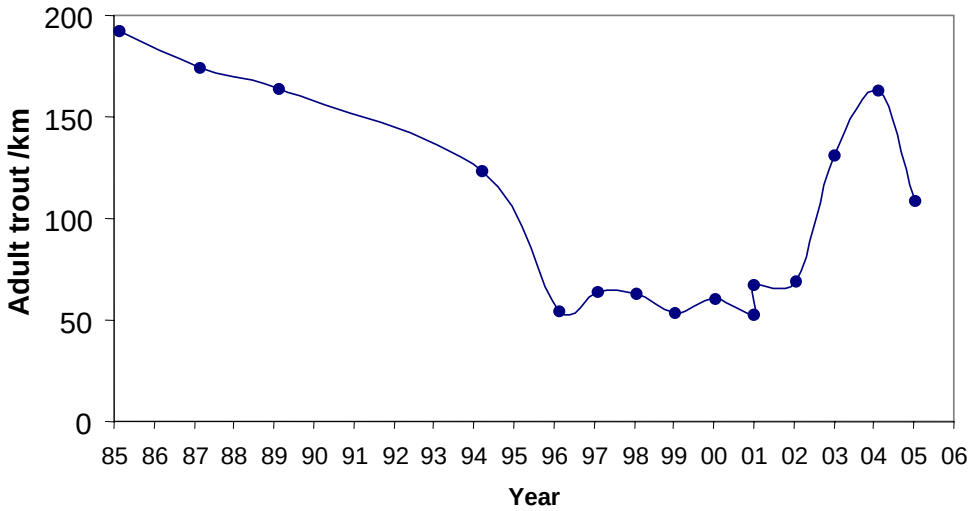
Intensive water temperature monitoring



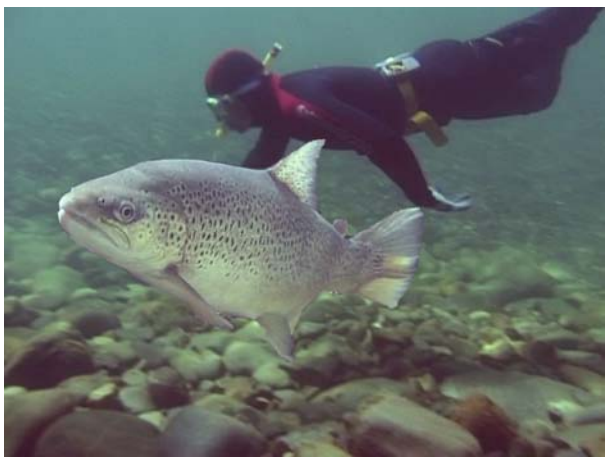


Fish Surveys – Drift Diving

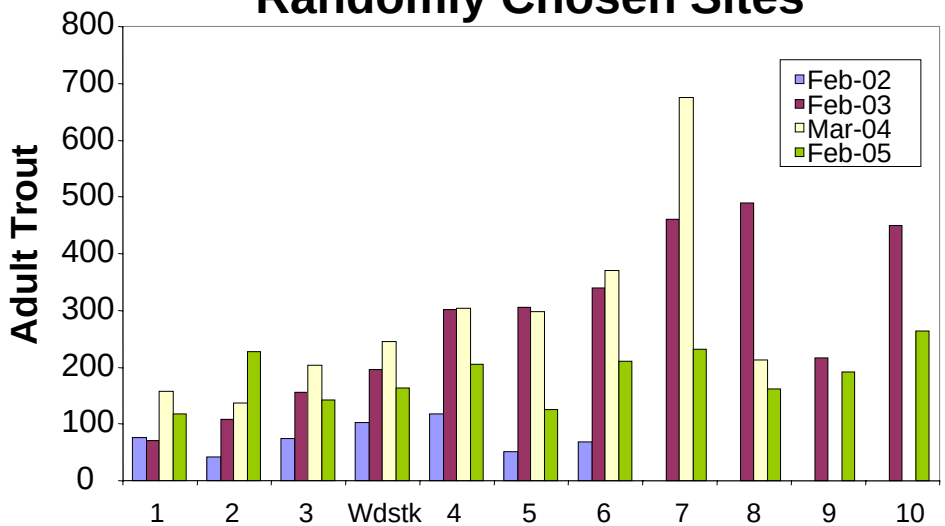
Brown trout abundance at Woodstock 1985-2005



- Long-term data set
- Only at 1 site
- Is it representative?
- 10 random sites
- Trends consistent

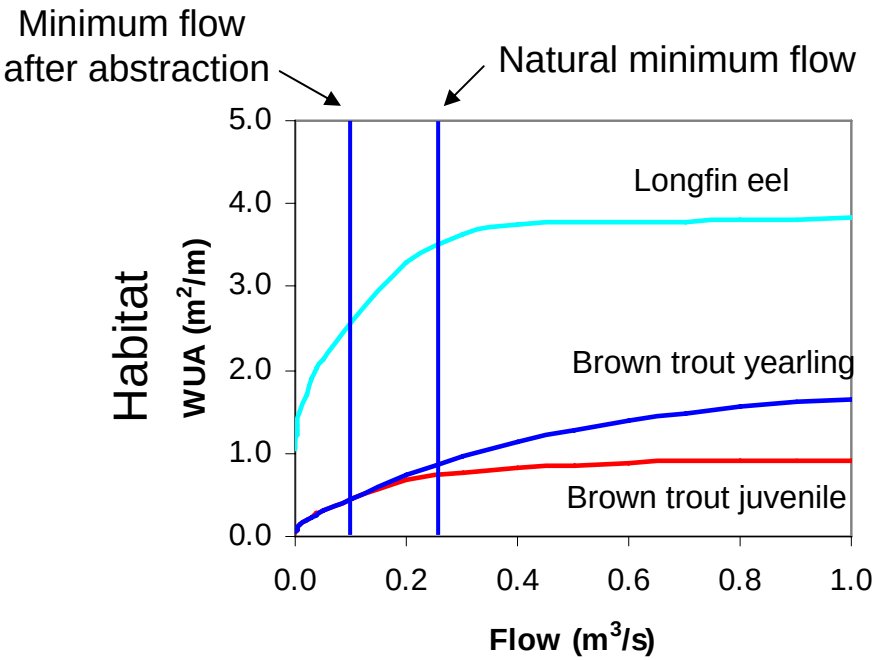


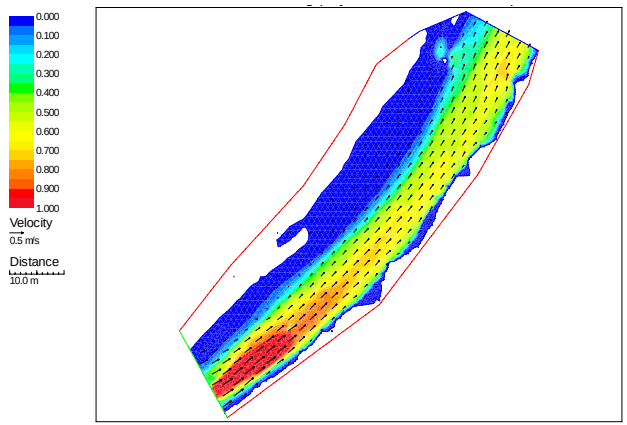
Randomly Chosen Sites



Flow-Habitat linkages

- Flow-habitat modelling
- Tested quick-smart method for small streams
- Utility of 1-D and 2-D modelling
- Tracking fish movement around catchment
- Groundwater connections
- Flow versus juvenile trout production study





Summary

- River health a good indicator of catchment health
- Maintaining river values – central to ICM
- A variety of studies conducted
- Many lessons that may be applicable elsewhere
  - -Importance of working with the community
  - -Getting information out there is vital
  - -Site selection and spatial coverage important
  - -Some indicators more effective than others
  - -Effects of land use influenced by geology
  - -The value of integration