

COWS & creeks

Water quality impact of cows crossing the Sherry River, Tasman District

Rob Davies-Colley & John Nagels, NIWA
 Rob Smith, Tasman District Council
 Roger Young, Cawthron Institute
 Chris Phillips, Landcare Research



problem

- n Cattle access to streams - a major source of water pollution in NZ?
- n Water quality impact of sporadic cattle access to waterways is difficult to define.

approach

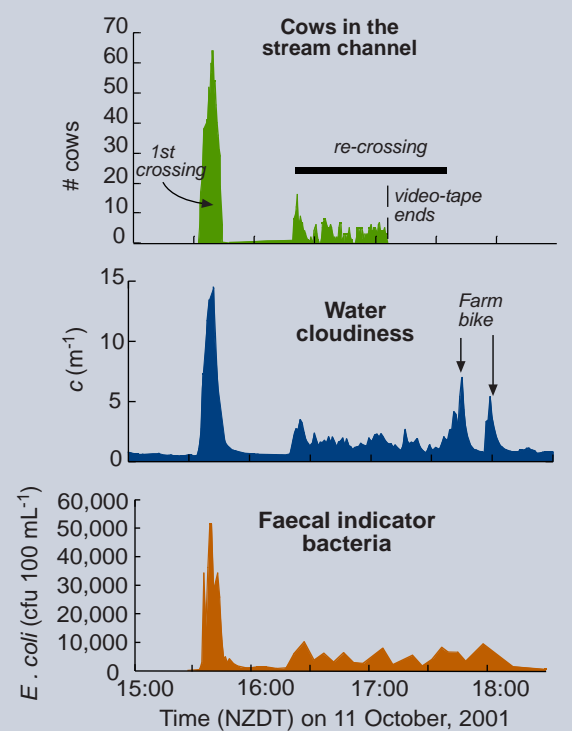
- n Studied dairy cow herd (246 animals) crossing a stream to and from the milking shed.

methods

- n Video tape used to count cows crossing the stream channel (on a ford).
- n Observers counted defaecation "events" and other disturbances (farmbikes).
- n A transmissometer monitored water cloudiness downstream.
- n Water samples analysed for: suspended sediment, faecal indicator bacteria (*E. coli*), and nitrogen.

results

The figure shows correlation of faecal bacteria and water cloudiness with the number of cows in the stream channel.



Contaminant yield from crossing of the 246 cow herd

	Susp. sediment (kg)	<i>E. coli</i> (Billion cfu)	Total nitrogen (g)
First crossing	16.2	207	735
Re-crossing	19	240	713
Total	35.2	447	1448
Increase over daily background	50%	400%	10%



Cows recrossing the Sherry River on their return from the afternoon milking.



Dye test, Sherry River. The non-toxic dye rhodamine WT was used to measure travel time (2.21 min) from ford to monitoring site (60 m downstream) and to ensure full mixing at the monitoring point.

findings

- n Cattle access to streams can cause appreciable water pollution. (The 246 cows deposited about 37 Kg of faeces on 2 crossings of the stream).
- n Cows are much more likely to defaecate in streamwater than on adjacent raceways (50x in this case).
- n Cattle also pollute streams by wash-off of contaminants from their legs and by hoof disturbance of streambed sediments (and banks).
- n Preventing cattle access to streams should yield major water quality benefits.