

BEST PRACTICE DAIRYING CATCHMENTS – WHAT WORKED, WHAT DIDN'T AND WHERE TO FROM HERE?

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Abstract

The dairy industry initiated the Best Practice Dairy Catchments programme in 2001 to help improve our understanding of the link between dairying and environmental outcomes and provide farmers with mitigation options. Since 1995 the industry has committed to long-term monitoring and research in Toenepi Stream (Waikato), but assistance from Sustainable Farming Fund, Regional Councils and FRST allowed expansion to four catchments in 2001, with a fifth added in 2004. Amongst the range of benefits provided by the catchments, perhaps the greatest value has been in providing evidence linking farmer practice change to water quality outcomes at the catchment scale. This evidence gives the dairy industry and regulators confidence that policies and plans aimed at increasing adoption of good practice on farm will contribute to the water quality outcomes the wider community is asking for. Increasingly, development of policies for farmer practice change are being based on outputs from farm and catchment-scale models and the regions where these requirements are being implemented do not overlap with the Best Practice Dairy Catchments. This leaves us with a dilemma regarding the future of the Catchments. On one hand we have a highly valuable knowledge base that is used extensively for research and industry State of the Environment reporting, but on the other hand, we have priority regions for driving farmer adoption of good practice that don't overlap with most of the existing catchments.

Background

The growth of the dairy industry over the last 20 years (Fig. 1) has been a great success story for New Zealand, but this growth has been associated with growing concerns over increasing nutrient levels (particularly nitrogen) in waterways draining agricultural land (Scarsbrook 2006; Ballantine & Davies-Colley 2009). At the national scale, dairying accounts for 7-8% of land area, but contributes nearly 40% of all the nitrogen in our rivers (Elliott et al. 2005). The challenge for the dairy industry and resource managers is to identify how to better manage the environmental effects of dairy farming at a range of spatial scales, while maintaining and enhancing the economic gains that dairy farming provides New Zealand.

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Of the four catchments originally selected, two are in traditional dairy farming areas in the North Island (Toenepi in Waikato and Waiokura in Taranaki) and two catchments in the South Island that have undergone more recent conversion to dairy farming (Waikakahi in Canterbury and Bog Burn in Southland). Monitoring of a fifth catchment (Inchbonnie) located on the West Coast commenced in 2004.

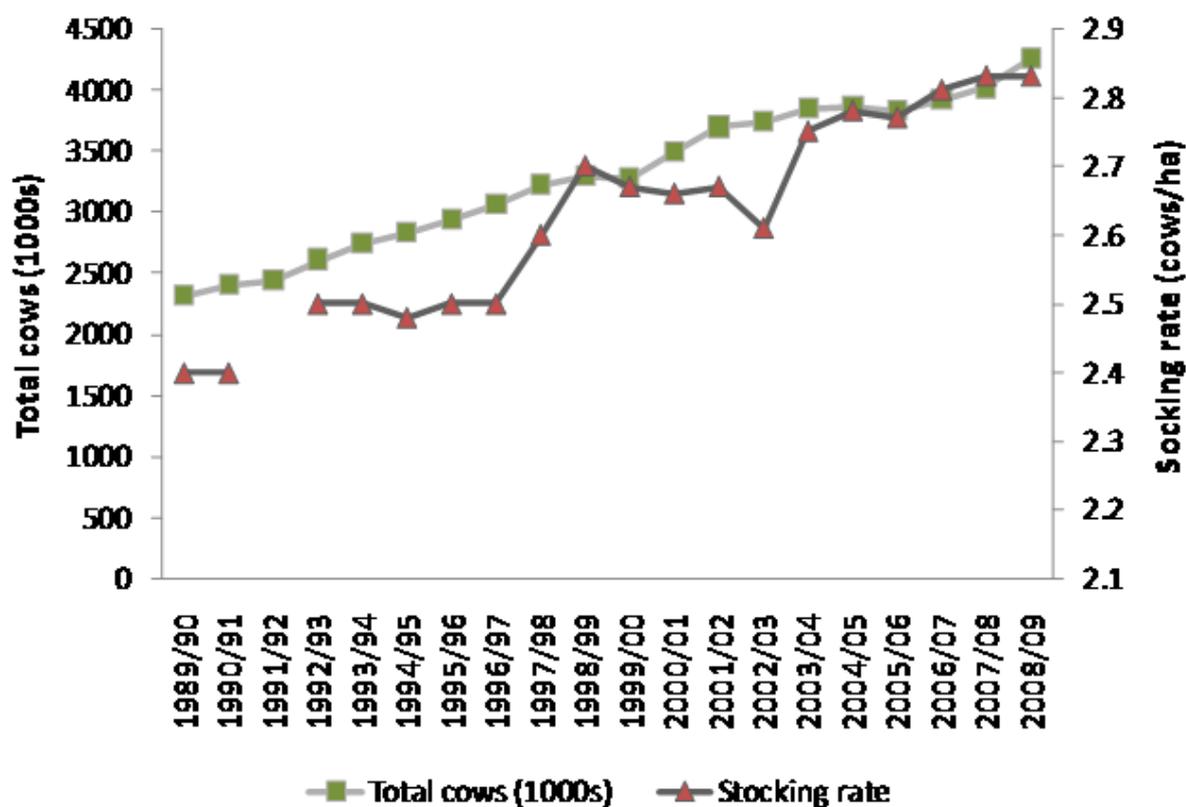


Figure 1: Increases in total cow numbers and stocking rate in New Zealand from 1989-2009. (Data source: New Zealand Dairy Statistic; www.dairynz.co.nz)

The broad aims of the BPDC programme were:

- (i) to identify key local environmental and productivity issues surrounding land use within the catchments,
- (ii) where necessary, identify and develop improved practice to address these key issues, and
- (iii) encourage the adoption of these practices.

Strong linkages with environmental research were provided through a number of research programmes, with the Pastoral 21 Environment programme being the principal one (de Klein et al. 2010). Under the P21 partnership, FRST (now MSI), DairyNZ, Fonterra and Meat & Wool NZ (now Beef & Lamb NZ) jointly funded the programme, which aimed to provide farmer-friendly tools and technologies for reducing nitrogen, phosphorus, sediment and faecal indicators losses to waterways and aid the uptake of this knowledge by farmers.

Funding for the P21 Environment Programme ended in February 2011 and with it went the bulk of resources for on-going monitoring and science research in the catchments. As a result the BPDC project is at a cross-roads. It is timely to assess the key values provided by the BPDC project and highlight options for its future.

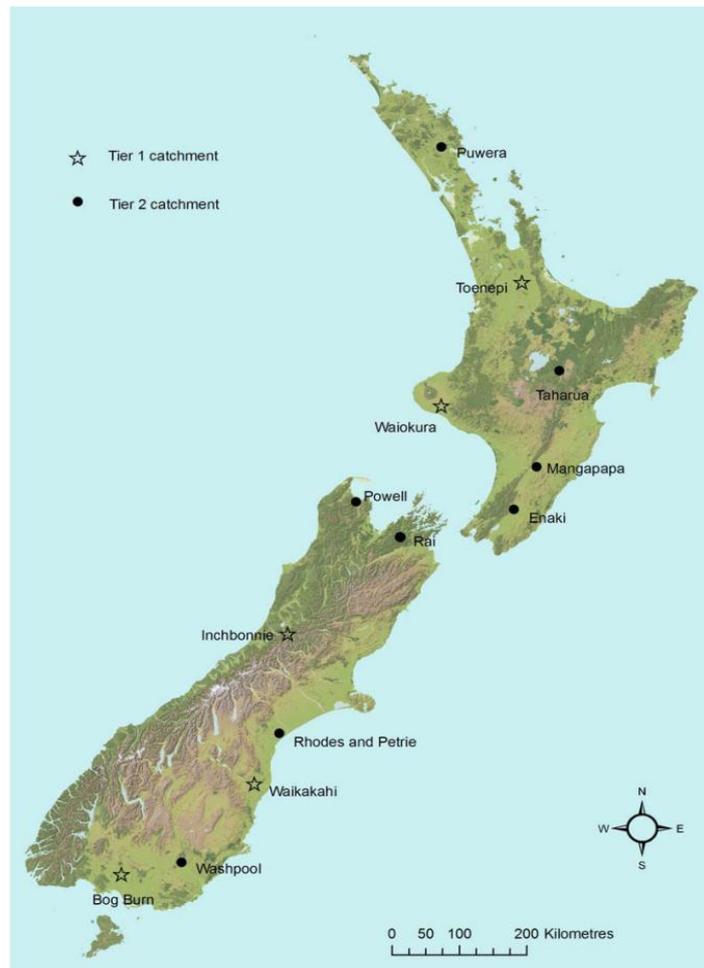


Figure 2. Location of five Best Practice Dairy Catchments (shown as stars), within a broader network of monitored dairy catchments (MfE 2009).

Value of the Best Practice Dairy Catchments

The long-term funding provided for the BPDC project by the dairy industry, regional councils and central government (e.g. MAF Sustainable Farming Fund) highlights the significant value the catchment study has provided over the last 10 years. In particular, the following values need to be highlighted:

1. Demonstration of links between farmer practice and water quality
2. Improved understanding of land-water interactions
3. Improved understanding of farmer adoption under voluntary regimes
4. Long-term water quality monitoring
5. Providing a barometer of dairying

The demonstration of links between farmer practice and water quality are critical to engagement of farmers in environmental issues, because farmers need to understand the cause and effect linkages between their activities, both current and best practice, and the environmental outcomes that their communities are asking for. Monaghan et al. (2009) provided a good summary of research activities in the BPDC catchments and highlighted the planning approach used in the catchments. Within each catchment the process followed has

been: (i) assess water quality status (of both the stream and downstream receiving waters that might be affected), (ii) identify key linkages between land management activities and water quality, (iii) define the key values associated with each catchment, which in turn define a set of catchment-specific water quality targets, (iv) determine the most appropriate land management guidelines required to deliver these targets, and (v) develop and implement farm plans of varying complexity that address the key environmental performance indicators identified. In all catchments, this process has involved strong stakeholder consultation processes.

This catchment planning process is being adopted in other focus catchments throughout New Zealand (e.g. Hurunui, Canterbury) and is, from a dairy industry perspective, arguably the most valuable outcome from the BPDC programme to date.

The BPDC project has also provided opportunities for monitoring farmer uptake of the latest science information provided through regular interactions between farmers and researchers. BPDC farmers are arguably the most environmentally aware farmers in New Zealand. For this reason, results of a recent perception survey by Mackay & Smith (2010) are particularly interesting. They surveyed 32 BPDC farmers in May 2010 to i) identify what the current environmental issues are for dairy farmers operating in the Best Practice Dairying Catchments, ii) benchmark dairy farmers' general environmental attitudes and iii) gauge understanding of the links between dairying and water quality.

Over 40% of the farmers surveyed (by far the largest group) believed that effluent management and disposal posed the greatest risk to water quality in their catchment (Fig. 3). This is somewhat at odds with signals from regional councils in most parts of the country, where increasing trends in nitrogen in waterways is driving increasing controls on land use intensification. Nitrogen losses from farms, in particular, are central to proposed regional policy changes (e.g. Horizons One Plan; <http://www.horizons.govt.nz/about-us/one-plan/>). It appears that farmers, even those in the BPDC project remain relatively uneducated about land use intensity and nitrogen loss from farms being the most significant environmental issue. Either, we have failed to educate farmers sufficiently on the environmental issues associated with nitrogen losses, or farmers recognise that there are higher priority environmental concerns on their farms. Mackay & Smith (2010) found that farmers thought that controlling access of stock to water courses, improving effluent spreading techniques, riparian planting and changes in fertiliser application would give the greatest environmental benefits. It is worth noting that these practices are the focus of the Dairying & Clean Stream Accord, which has been a feature of the industry since 2003.

Long-term monitoring of soil health (e.g. Houlbrooke et al. 2011) and water quality (e.g. Wilcock et al. (2009) have shown that changing farmer practices in the catchments has led to improving environmental outcomes. This evidence gives the dairy industry and regulators confidence that policies and plans aimed at increasing adoption of good practice on farm will contribute to the water quality outcomes the wider community is asking for. Increasingly, development of policies for farmer practice change are being based on outputs from farm and catchment-scale models and the regions where these requirements are being implemented do not overlap with the Best Practice Dairy Catchments.

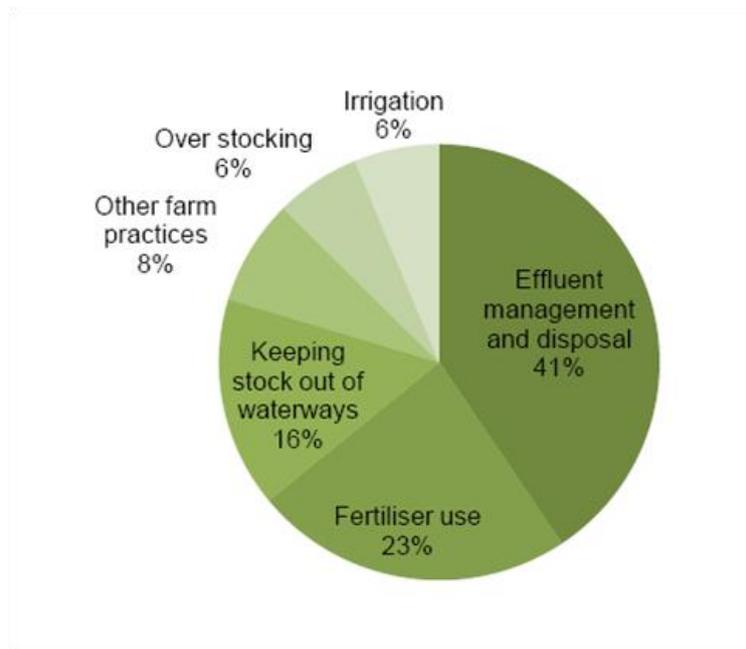


Figure 3. Percentage of farmers identifying which farm-based activities they consider to pose the greatest risk to water quality in their catchment (n=32). Sourced from Mackay & Smith (2010).

Role of Best Practice Dairy Catchments in the Future

Dairy farmers throughout New Zealand are coming under increasing scrutiny from regulators, who are responding to community concerns about water quality. Farmers in the Upper Manawatu, Upper Waikato, Rotorua, Hurunui, Lake Brunner (including Inchbonnie) and Waituna Lagoon catchments are all facing pressure to significantly reduce nutrient losses. We have very clearly moved from a phase of demonstrating what farmers could do to mitigate losses of N, P, sediment and faecal microbes (c.f. aims of BPDC), to a phase where farmers will need to demonstrate changing practice to meet clearly defined community targets. The dairy industry will need to work alongside these farmers in priority catchments to support them to make required changes.

The continuation of research, monitoring, consultation and extension work in the BPDC project is dependent on funding. Funding through the P21 programme ended in February 2011, whereas funding from MAF's Sustainable Farming Fund and DairyNZ will continue until June 2012. The SFF/DairyNZ funding is focussed on improving farmer uptake of improved farm planning processes that incorporate much of the farm system and environmental mitigation knowledge that the BPDC study has delivered (Monaghan et al. 2009).

A review of long-term objectives and priorities is required for the Best Practice Dairy Catchments. They have a central role to play in long-term monitoring of dairy catchments (MfE 2009), but the question of "who pays" has not yet been addressed.

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