

DairyNZ¹ presentation to Local Government and Environment Committee, April 17, 2014

DairyNZ presenters

- **Dr Rick Pridmore**, DairyNZ Strategy and Investment Leader for Sustainability
- **Dr Mike Scarsbrook**, DairyNZ Environment Policy Manager

A bit about your presenters

- **Dr Rick Pridmore** - Rick joined DairyNZ in 2008. He is a former NIWA Chief Executive and has worked in the New Zealand environmental science sector for more than 30 years. Before NIWA he was a government scientist specialising in nutrient management of lakes, rivers and estuaries.
- **Dr Mike Scarsbrook** - Before joining DairyNZ in 2008, Mike worked for NIWA for 13 years as a freshwater biologist. As Leader of NIWA's National Centre for Water Resources, Mike provided expert advice to regional councils and the Ministry for Environment on water quality state and trends in our rivers. He is a member of the National Objectives Framework Reference Group.

In summary

1. Intensification of agriculture and water quality – a significant issue, but not a problem everywhere.
2. The National Policy Statement for Freshwater (NPS) is a powerful tool for setting limits.
3. Constraints already coming into effect are having an impact and a lot is being done by the industry to support the faster implementation of the NPS.

1. Intensification of agriculture and water quality – a significant issue, but not a problem everywhere

First and foremost, we need to put the problem in perspective for the New Zealand public. Intensification of agriculture is a national issue, but water quality problems are primarily in *some catchments, not all*. Our analysis of the national picture shows that intensification has not occurred everywhere and most NIWA water quality monitoring sites show stable or improving trends, not deterioration.

¹ DairyNZ is the industry organisation for New Zealand's dairy farmers. Funded by a levy on milk solids, our work includes research and development to create practical on-farm tools, leading on-farm adoption of good practice farming, promoting careers in dairying and advocating for farmers. For more information, visit www.dairynz.co.nz.

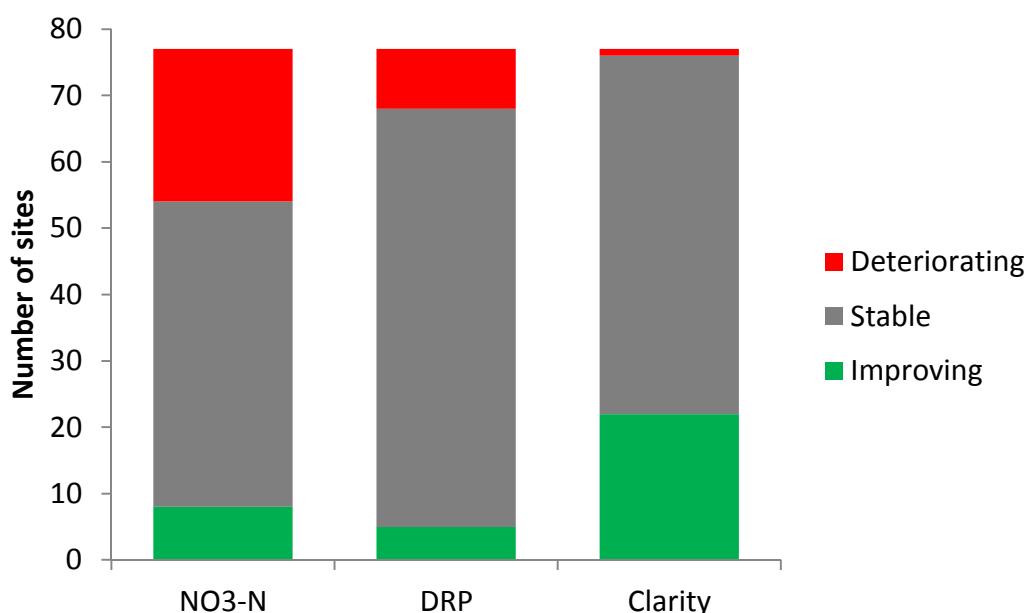
We present the results of a simple trend analysis that utilises actual pastoral animal numbers sourced from Statistics NZ (<http://www.stats.govt.nz/infoshare>), along with estimates of nitrogen excreted to land by those animals to provide a picture of agricultural intensification between 1990 and 2011². We also highlight trends for three important indicators of water quality in rivers (concentrations of plant-available nitrogen (N) and phosphorus (P), and water clarity) over the same period.

There were marked differences in intensification trends at the regional scale. We observed significant increasing trends in nitrogen load to land in Canterbury, West Coast, Waikato, Southland and Otago (1990-2011), but significant decreasing trends in Northland and Bay of Plenty (BoP) over the same period. Taranaki and Manawatu/Wanganui showed no significant change.

The National Rivers Water Quality Network, administered by NIWA, is New Zealand's premier, long-term water quality monitoring resource. The network covers 77 sites throughout New Zealand and has been monitored monthly using consistent methods since January 1989. We analysed monthly data for three water quality indicators; Nitrate (NO₃-N), dissolved reactive phosphorus (DRP) and water clarity (Clarity). We used standard methods³ to tests for trends in the data over the period 1990-2011 (i.e same period as above). See Appendix 2.

The majority of sites stable in terms of water quality trends

The majority of sites showed relatively stable levels of N, P and clarity. We found around 30% of all sites showed deteriorating trends for nitrate, 12% showed deteriorating trends for phosphorus and only one site showed a deteriorating trend in water clarity. Nearly 30% of all sites showed improving trends in water clarity.



² <http://www.mfe.govt.nz/publications/climate/new-zealand-greenhouse-gas-inventory>

³ Seasonal Kendall Trend Test on raw data carried out using TimeTrends v3 (<http://www.niwa.co.nz/our-science/freshwater/tools/time-trends>)

There are catchment-scale issues with nitrate, phosphorus and sediment levels, particularly in lowland areas with long histories of land use change and intensification. In catchments where these issues have been identified the dairy industry is already involved in major programmes of work to address these issues (e.g. Upper Waikato Sustainable Milk Project, Oturoa Agreement in Lake Rotorua, Waituna Lagoon in Southland, Ellesmere/Te Waihora in Canterbury).

2. The NPS is a powerful tool for setting limits

The National Policy Statement for Freshwater Management (NPS) is a massive step forward in resource management because it will drive decisions on water quality and quantity limits. The process of limit-setting will be as important as the result. It will not only build community understanding of what affects water quality but capture commitment across all the different sectors that need to take action. Community decision-making will operate within the constraints of environmental bottom lines and the requirement to maintain or improve water quality across regions.

- **Implementation is well under way**

Regional Councils are deep in the process of setting water quality and quantity objectives and limits ([See Appendix 1](#)). By 2020, key regions will already have finished plan changes. The dairy industry is actively involved in this implementation process. In every catchment where issues have been identified there are already significant programmes of work already underway to address effects of intensification (Appendix 4 for a map of activity).

We are spending \$11 million a year of dairy farmers' levy money working with councils to define water quality issues, develop limit-setting processes and integrated catchment plans, and improve monitoring and reporting. (See Appendix 3 for a list of studies and research we are helping to fund).

- **Speeding up implementation has benefits for everyone**

It is in the interest of all farmers and the wider community to progress these limit-setting processes as rapidly as possible to provide certainty around future opportunities. Once limits are set farmers will know what opportunities are available and where and how their farming systems will need to respond. Where limits are yet to be set, no one knows what the constraints or opportunities will be, so investment is risky. We need to look at ways to increase the pace of NPS implementation, without losing the value of strong community engagement and robust technical input.



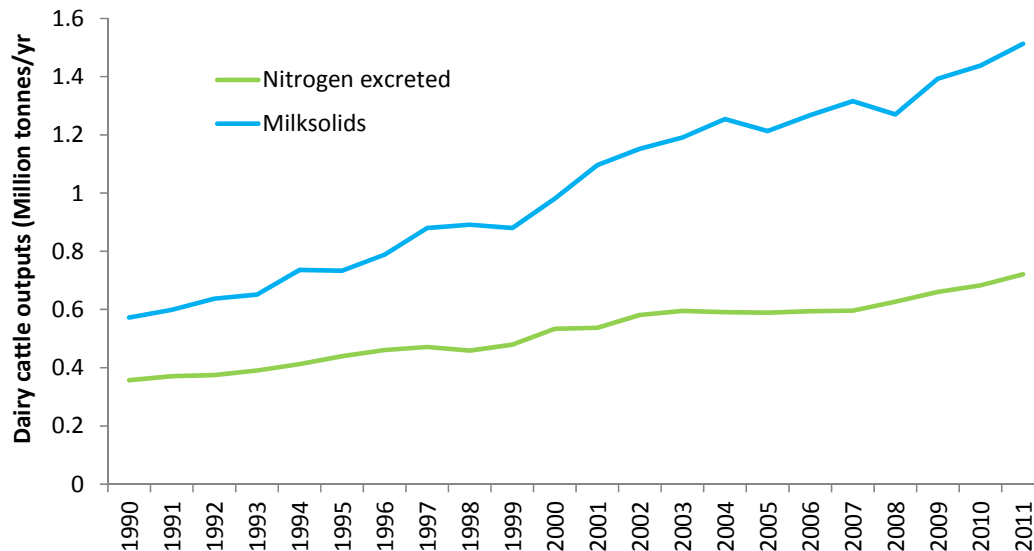
- **Why rapid implementation is critical to the dairy industry**

- 1 Agricultural intensification ([Appendix 2](#)) is being addressed through integrated catchment management plans and policies being rolled out by regionals councils in accordance with the NPS.
- 2 Improving management of agricultural intensification will require the setting of limits on the allocation of freshwater resources. On-farm uptake of new technologies and practices will be focused around limits.
- 3 We support the setting of limits to control the effects of land use on water quality.
- 4 We support an integrated catchment management approach that recognises the collective responsibility of all water resource users. A singular focus on dairy farming will not solve our problems.
- 5 Continued growth of dairy will occur within the constraints imposed through limit-setting processes.
- 6 In catchments identified as being fully allocated in terms of nutrient limits, the dairy industry has made a public commitment (Sustainable Dairying: Water Accord) to reducing nitrogen and phosphorus loss from farms and to engage in catchment programmes that seek to improve water quality outcomes.

- **Dairy farmers are becoming more efficient nitrogen users**

There is already good evidence that New Zealand dairy farmers are improving their efficiency of nitrogen use (kg MS/kg N load to land).

The graph on page 5 shows a 22-year trend in milk solid production (data sourced from LIC/DairyNZ 2012) and Nitrogen load to land. Over the 22-year period efficiency has increased by 30%.



Through the Sustainable Dairying: Water Accord, the dairy industry is committing to continual improvement in nutrient management on-farm. Benchmarking farmer performance and providing support systems for farmers are important elements of this push for continual improvement and this work is already underway. Continued improvements in efficiency will be critical to farmers maintaining and growing profitability under catchment limits.

Limit-setting will be an important part of driving even more efficiency gains on farms and managing land use and catchment issues around nitrogen loads. For instance, in Canterbury the limit-setting process has already resulted in some 'no grow' areas (see page 11).

- **Look at all land uses to keep Nitrogen (N) under control**

Nationally, the total N load to land from farmed animals increased from 1.45 million tonnes/yr in 1990 to 1.56 million tonnes/yr in 2011 (7% increase over 22 years).

There have been significant shifts in the relative contributions from dairy cattle and sheep over the 22 year period to the total N load to land. The load from dairy cows has more than doubled (102% increase), while the load from sheep has decreased by 33%. However, dairy cattle still make up less than half of the total N load to land (See graph page 9).

Given the observed trends in Total N load to land (1990-2011) regional councils, particularly in Canterbury, Southland, Waikato and Otago should continue to review the effectiveness of their objectives, policies and rules in relation to managing contributions of nitrogen. However, we would urge councils to consider the contributions of nitrogen coming from all land uses.

Managing losses from dairy alone are likely to be ineffective and inefficient in managing agriculture's effects on the environment.

3 Smarter dairy farming is making a difference already and dairy farmers are supporting the faster implementation of the NPS

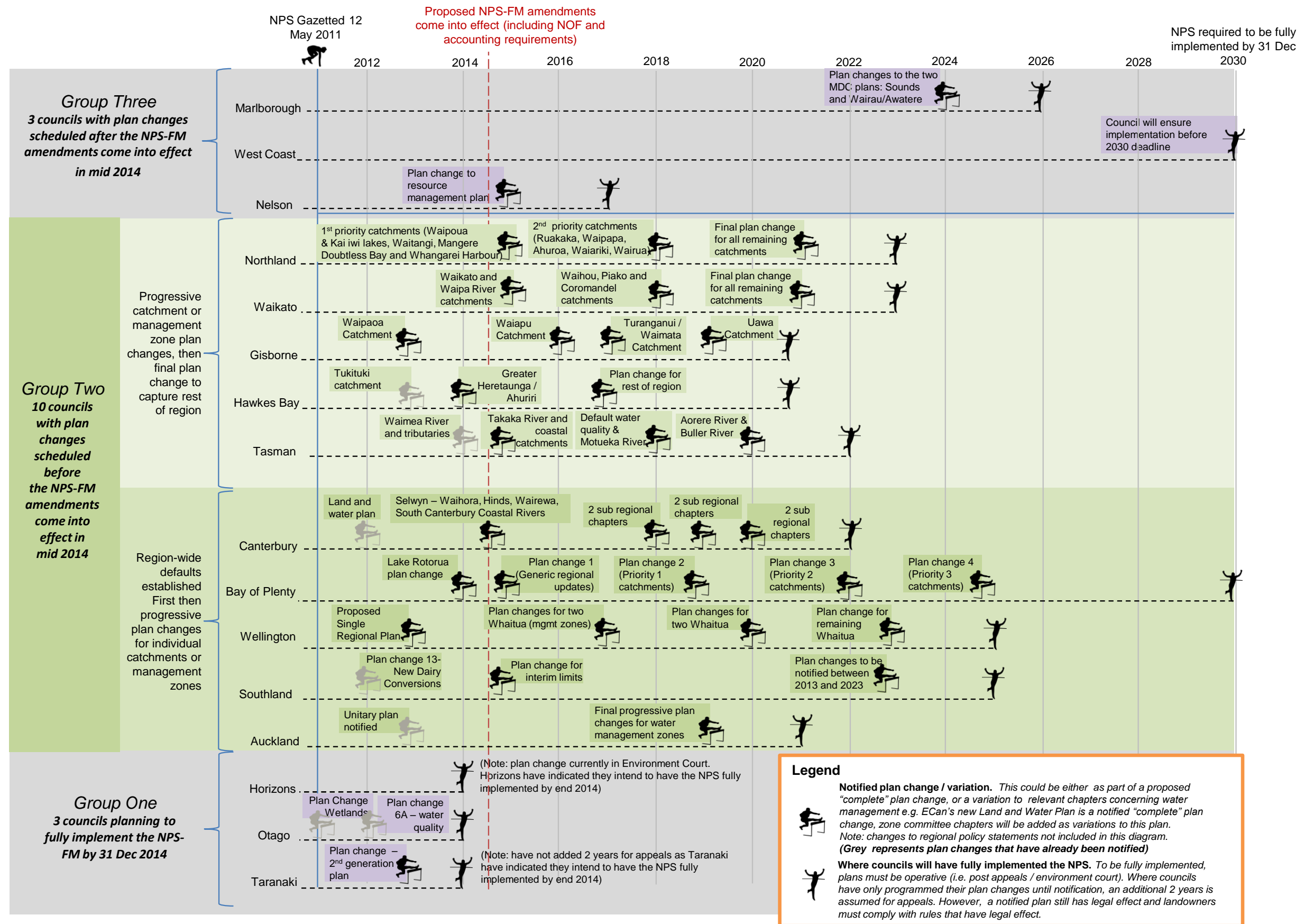
Appendix 4 illustrates the significant water quality issues that have been identified by regional councils and where the dairy industry is already providing resources, expertise and industry support to address them.

Examples are Waituna Lagoon, Ellesmere/Te Waihora, Lake Rotorua, Upper Waikato River, Mangatainoka (Manawatu), Mangere catchment (Northland). See map of activity (Appendix 4).

Through the Sustainable Dairying: Water Accord (Appendix 5), the industry has made a series of commitments that will improve water quality, as well as provide robust accounting systems to assist resource managers in decision-making. These commitments will see every dairy farmer working to continually improve their performance to meet community-agreed objectives and dairy company supply agreements.

We have also attached a list of some of the studies and research (Appendix 3) that the industry is contributing to in partnership with regional councils to assist with speeding up the limit-setting process.

NPS-FM implementation diagram (based on published progressive implementation plans)



Appendix 2: Trends in agricultural intensification and water quality (1990-2011)

- We present results of a simple trend analysis that utilises actual pastoral animals numbers sourced from StatisticsNZ (<http://www.stats.govt.nz/infoshare>) to provide a picture of agricultural intensification. We also highlight trends three important indicators of water quality in rivers (concentrations of total N & P and water clarity) over the same period.

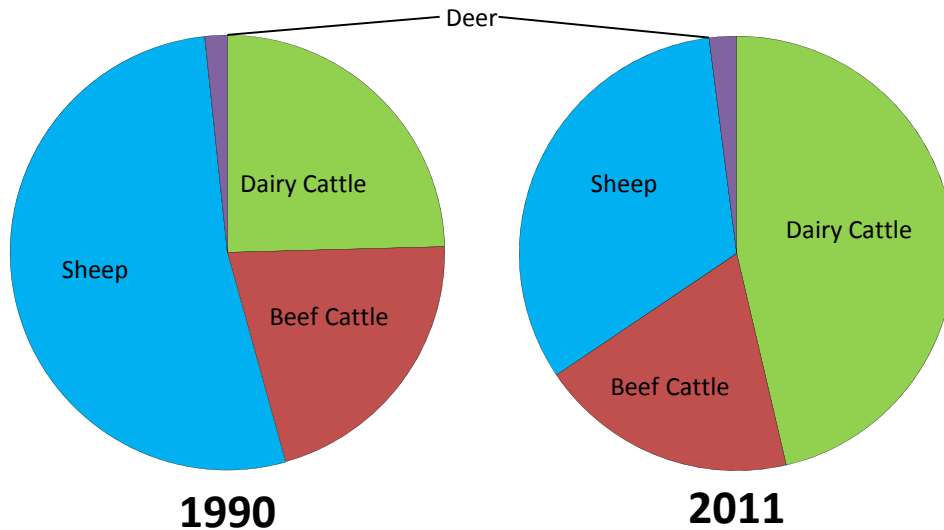
Trends in intensification

- Data on Total Beef Cattle, Total Dairy Cattle, Total Sheep and Total Deer were downloaded for both national and regional (1990-2012) datasets. There were some gaps in the StatisticsNZ data set (1997-98 and 2000-2001).
- Animal numbers alone do not provide a good indicator of potential environmental pressures, because we know that different stock types vary in their environmental footprint. Therefore, we have used estimates of the excreted nitrogen load (Nex) by each stock type as an indicator and multiplied this by the estimated animal numbers to derive a 'total N load to land' nationally, by region and by stock type. The Nex estimates for each stock type come directly from the New Zealand Greenhouse Gas Inventory (1990-2011) (Table 6.3.3 in MfE 2013⁴). These estimates take into account the changes in Nex that have resulted from improving animal productivity (e.g. increasing feed intake by cows or increased lambing percentages in sheep). It is interesting to note that over the period from 1990 to 2011 these productivity increases have driven a 13% increase in Nex per dairy cow and a 22% increase in Nex per sheep.
- The main source of nitrogen in New Zealand's waterways (in agricultural catchments) is urine from farm animals. Therefore, we believe that Nex provides a good indicator of land use pressure. Of course, the nitrogen excreted by animals does not all end up in waterways (losses can be reduced through on-farm mitigation and attenuation through natural processes) and, more importantly, the nitrogen that does end up in waterways won't necessarily cause water quality problems (e.g. impacts on ecosystem health through excessive growth of plants and algae).
- Nationally, the total N load to land from farmed animals increased from 1.45 million tonnes/yr in 1990 to 1.56 million tonnes/yr in 2011 (7% increase over 22 years).
- There have been significant shifts in the relative contributions from dairy cattle and sheep over the 22 year period to the total N load to land. The load from dairy cows has more than doubled (102% increase), while the load from sheep has decreased by 33%. However, dairy cattle still make up less than

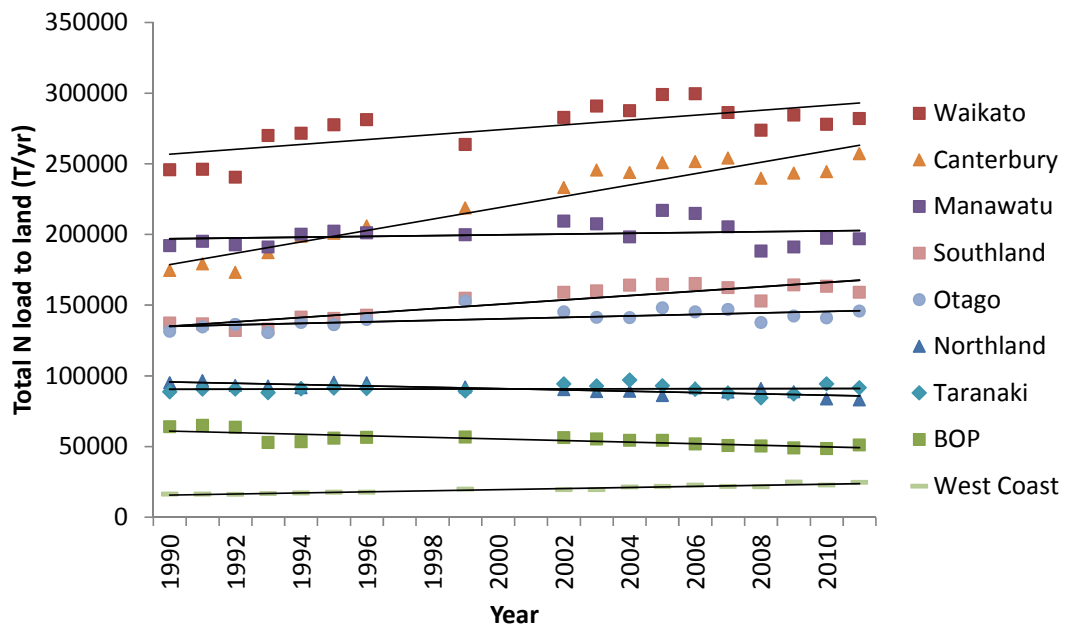
⁴ <http://www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2013/>

half of the total N load to land. These changes are summarised in the following pie charts:

Total N load to land



- There were marked differences in intensification trends at the regional scale. We observed significant increasing trends in Canterbury, West Coast, Waikato, Southland and Otago (1990-2011), but significant decreasing trends in Northland and Bay of Plenty (BoP) over the same period. Taranaki and Manawatu/Wanganui showed no significant trends.

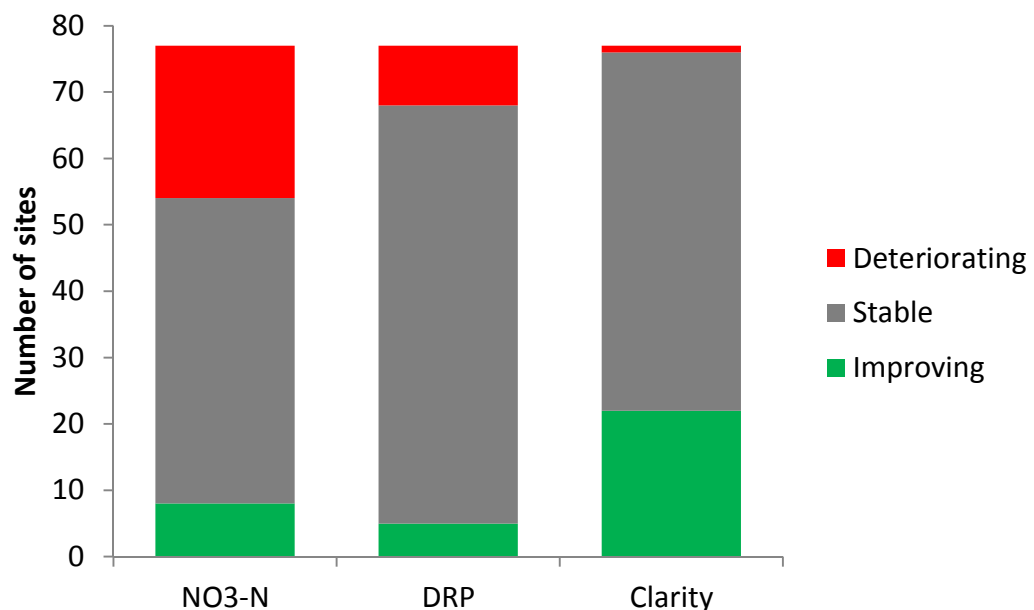


- The greatest level of change over the 22 year period was in Canterbury (37% increase), followed by Bay of Plenty (23% decrease), Southland (22% increase), Waikato (14% increase) and Northland (11% decrease).

- If we look only at the last 10 years (2002-2011) there have been relatively minor shifts in Total N load to land. There was a significant decreasing trend nationally and in BOP over that time period, but other regions showed no significant trends.
- Please note, our analysis has focussed only on regional and national scale trends in excreted nitrogen loads and ignores significant local water quality issues resulting from catchment-scale changes in land use.

Changes in water quality indicators

- The National Rivers Water Quality Network, administered by NIWA, is New Zealand's premier, long-term water quality monitoring resource. The network covers 77 sites throughout New Zealand and has been monitored monthly using consistent methods since January 1989.
- We analysed monthly data for three water quality indicators; Nitrate (NO₃-N), dissolved reactive phosphorus (DRP) and water clarity (Clarity). We used standard methods⁵ to tests for trends in the data over the period 1990-2011 (i.e same period as above).
- Nearly 30% of all sites showed deteriorating trends for NO₃-N, 12% showed deteriorating trends for DRP and only 1 site showed a deteriorating trend in water clarity. Nearly 30% of sites showed improving trends in water clarity.



- The 23 sites showing deteriorating trends in nitrate concentrations were spread throughout New Zealand. The Grey River (West Coast) showed the largest trend (4.7% per annum), followed by the Oreti River in Southland (4.5% per annum) and the lower Waimakariri in Canterbury (4.3% per annum)
- The strongest trends for phosphorus were all improving trends (Ohinemuri - 6.4% per annum; lower Manawatu -4.9% per annum and Hutt River - 4.2%pa)

⁵ Seasonal Kendall Trend Test on raw data carried out using TimeTrends v3. Adjusted P-values used to account for possible autocorrelation due to length of record. (<http://www.niwa.co.nz/our-science/freshwater/tools/time-trends>)

- The strongest improving trends for clarity were in the Waitaki, Hurunui, Mohaka and Ruamahanga rivers.
- Our challenge is to translate information on current state and trends observed across multiple indicators and interpret this in relation to achieving desired water quality outcomes. Do increasing trends in nitrate mean aquatic ecosystem health is deteriorating? Do the trends in water clarity actually represent noticeable improvements for people wanting to swim in a river, or fish wanting to migrate? The proposed National Objectives Framework is a significant step forward in clarifying the link between attributes and values at the national scale.

Specific examples of instruments in regional plans that improve the management of the effects of agricultural intensification

- **Canterbury** - Environment Canterbury's Land and Water Plan has defined nutrient allocation zones for the entire region and sets out clear rules around intensification. 'Red zones' (e.g. Selwyn/Te Waihora), where water quality outcomes are not being met, have specific provisions that classify increases to baseline nitrogen losses for a property as 'prohibited activities'. Rules for 'Orange zones' (e.g. Pareora River), where water quality is at risk, make increases to N loss at the property scale a 'discretionary activity'. Development in 'green zones' (e.g. Lower Waitaki) requires preparation of a Farm Environment Plan that meets Ecan standards.
- **Waikato**: Waikato Regional Council's Variation 6 to their Regional Plan sets allocation limits for all regional waterbodies. This constrains the potential to grow dairying in the region and will potentially lead to reduced dairy production as over-allocation is clawed back and new, higher priority water takes (e.g. municipal supply) are processed. More than 2500 dairy farms in the Waikato region are in the process of obtaining consent for their dairy shed takes.
- **Southland**: Plan Change 13 places significant controls on new dairy conversions, requiring a full Assessment of Environmental Effects to be completed as part of the consenting process. This rule has coincided with a significant reduction in the numbers of new consents.
- **Otago**: Plan change 6A imposes a very strict set of rules on intensive land use to protect water quality in high value areas.
- **Manawatu-Wanganui**: The One Plan requires around 400 dairy farmers to obtain a consent that will reduce nitrogen losses from dairy farms.
- **Bay of Plenty**: Rule 11(2005) imposes a cap on nitrogen and phosphorus losses from all properties >4ha in the catchments of the Rotorua lakes.

Appendix 3: Environmental studies supported by the dairy farmer milksolids levy

- Upper Waikato sheep and beef nutrient loss and mitigation
- Municipal and Industrial Water Value in the Waikato River Catchments
- Waikato Economic Model Development
- Factors controlling phytoplankton growth in the Waikato River
- Age of Surface Water in Upper Waikato
- Catchment modelling of nutrients and microbial indicators – Upper Waikato
- Evaluation of policies for water quality improvement in the Upper Waikato catchment
- Production of 700 voluntary Sustainable Milk Plans in the upper Waikato Catchment
- Catchment modelling and loads – Waituna Catchment
- Nutrient leaching from organic soils – Waituna Catchment
- Wetland feasibility study – Waituna Catchment
- Tile drain treatment – Waituna Catchment
- Socio-economic impact analysis – Waituna Catchment
- Farm systems modelling and economic impact assessment – Waituna Catchment
- Environmental perceptions survey – Lincoln University
- Winter management strategies – Southland/Otago
- Socio-economic impact assessments of various implementation pathways for Horizons' One Plan
- Training of rural professionals to assess and advise on farm systems so they are compliant with Horizons' One Plan implementation pathway
- Economic impact assessments – Selwyn Waihora
- Development of Matrix Good Management scenarios for dairy sector – Canterbury
- Nutrient and effluent studies to assist in management of Lake Brunner
- Production of land management manuals for selected west coast catchments
- Development of programme for certifying Nutrient Management Advisors
- Development of Code of Practice and accreditation programme for rural professionals advising on effluent management
- Impact of reducing and removing nitrogen fertiliser from Rotorua pastures
- Technical and policy support for the Stakeholder Advisory Group charged with developing nutrient management rules to achieve 270 tonnes of nitrogen reduction from the Rotorua catchment
- Two Master's research projects assessing the effectiveness of sediment detainment bunds
- Trend analyses of Lake Rotorua water quality
- Production of voluntary sustainable milk plans for farms in two Northland catchments

Catchments reduce their impact

Dairy farmers nationwide are fine-tuning their farm management practices to reduce impacts on local waterways.

DairyNZ is supporting farmers in a number of catchments because we believe coordinated catchment action by farmers is the solution to achieving limits and targets.

One of the first was the Best Practice Dairying Catchments (BPDC) initiative which ran for over 10 years and focused on five dairying catchments.

Through those catchment farmers' actions and associated research activity, DairyNZ has learnt a lot about how to maximise success from catchment action.

DairyNZ now supports catchment action programmes in more than a dozen areas nationwide, including the largest catchment project ever undertaken, with 700 farms in the upper Waikato.



Lake Rotorua Dairy Collective
Twenty-two farmers are working through a range of actions to reduce N and P losses from their farms, as part of a community response to help return Lake Rotorua to desired water quality levels.

Dairy Push I & II
This South Waikato project run by AgFirst, with DairyNZ funding, initially focused on lifting profits, however phase II looks at maintaining profitability while reducing N-loss. Fifty farms are involved. (See *Inside Dairy*, September 2012).

Taranaki DairyLink farms project
This three-year DairyNZ project involves three farms in the Upper Manawatu catchment. Initially focused on reducing environmental impact, while maintaining profitability, the three farms are now being supported as they get to grips with the One Plan.

Waiokura Stream (BPDC)
Taranaki's Waiokura Stream catchment is almost entirely dairy farms. In 2003, all Waiokura farmers were approached by Taranaki Regional Council to have property riparian plans prepared and native plants supplied at cost, to improve water quality and biodiversity. Fencing of streams and tributaries, more deferred irrigation for farm effluent and reducing soil Olsen P levels was suggested, along with minor earthworks to divert runoff from the stream to small dams. Runoff from 107 culverts and bridge crossings on Waiokura Stream was identified as a source of P and faecal matter. Over a 10-year period (2001-2011), Waiokura Stream has shown improving trends in water quality, as a result of the changes made by farmers. Nitrogen, sediment and faecal bacteria levels have all improved.

Toenepi catchment (BPDC)
This Waikato stream, near Morrinsville, had water clarity of 0.5m deep in 1995. After fencing, planting and other initiatives, by 2006 it had a clarity of 1.5m.

Lake Rerewhakaaitu
This project's third phase launched in 2001. Currently, 24 dairy farmers are adopting farm nutrient management plans to minimise (N) leaching and (P) run-off into the lake.

Tomorrow's Farms Today (upper Waikato)
Twenty-five farms around Reporoa are part of a three-year study run by Headlands Consultancy, looking at different farm systems, environmental risk and management styles. DairyNZ and the MPI Sustainable Farming Fund are co-funders.

Lake Brunner/Inchbonnie (BPDC)

Farmers have sustainable farm plans to improve nutrient management through fencing, planting and good practice fertiliser application. Between 2004-2011 changes on-farm and in the catchment have resulted in decreased concentrations of N, P and sediment in streams running down to Lake Brunner.

Hurunui-Waiiau

A zone committee has informed the council's regional plan, around limit setting. Already, major improvements in irrigation practices have been made in the catchment. See story pg2-4.

Waikakahi (BPDC)

Farmer action has reduced the impacts on trout spawning and adult fish habitat. Farm changes included stream fencing and planting, re-bordering and laser levelling of irrigation borders, for improved water use efficiency and less runoff. 1996-2011 saw major reductions in suspended sediment in the stream. A recent survey by Cawthron Institute found adult trout habitat had improved considerably since the stream's fencing.

Selwyn/Te Waihora

This catchment is going through a limit setting process. Farmers are looking at ways to minimise their impact and are being supported by Fonterra and DairyNZ. See story pg12-13.

Bog Burn (BPDC)

Water quality in Southland's Bog Burn has benefited from farmer actions such as upgrading effluent systems, fencing or planting.

Waituna Lagoon

Southland's Waituna Lagoon has 40 dairy farmers and 10 graziers.

Farmers formed 'Waituna Farmers United' and in December 2011 they launched a catchment action plan, outlining their aspirations for the lagoon and catchment, and their approach to making it better.

With DairyNZ and industry support, farmers are working through 584 tasks identified to safeguard their farms and manage risks to the lagoon. One year on, they have invested over \$1 million in farm improvements and countless hours carrying out the catchment action plan.

There are a number of other catchment groups active around the country, where farmers are taking action. Some of these have been showcased in previous issues of Inside Dairy. Highlighting the many achievements of farmers in catchments throughout New Zealand is critically important, now more than ever.

Catchment leadership

DairyNZ has appointed three catchment engagement leaders in Canterbury, Southland and Waikato, to support farmers involved in catchment projects.

For more information on DairyNZ's support for catchment work, or to get involved in a catchment project, contact Mike Scarsbrook ph (07) 858 3883 or Theresa Wilson ph (07) 858 3837.

Sustainable Dairying: Water Accord

A commitment to New Zealand to enhance the overall performance of dairy farming as it affects freshwater.

Who are the Accord's partners?

– committed to actions and targets in the Accord

- Industry body DairyNZ
- Dairy Companies Association of New Zealand
- New Zealand dairy companies
 - Fonterra
 - Open Country
 - Miraka
 - Synlait
 - Tatua
- Fertiliser Association of New Zealand
- Ballance Agri-Nutrients
- Ravensdown Fertiliser Co-operative
- Federated Farmers Dairy Section
- Irrigation New Zealand
- NZ Institute of Primary Industry Management

Who are the Accord's 'friends'?

– supportive of the purpose of the Accord and committed to contribute to its success

- Westland Milk Products
- Regional/Unitary Councils
 - Northland Regional Council; Auckland Council; Waikato Regional Council; Bay of Plenty Regional Council; Hawke's Bay Regional Council; Gisborne District Council; Taranaki Regional Council; Horizons Regional Council; Greater Wellington Regional Council; Environment Canterbury; West Coast Regional Council; Marlborough District Council; Southland Regional Council; Tasman District Council; Otago Regional Council; Environment Southland
- The Federation of Māori Authorities
- Ministry for Primary Industries
- Ministry for the Environment

Who oversees the Accord and how is progress monitored?

The Sustainable Dairying: Water Accord has been developed under the oversight of the Dairy Environment Leadership Group (DELG). DELG includes representatives from farmers, dairy companies, central government, regional councils and the Federation of Māori Authorities.

DairyNZ and the Dairy Companies Association of New Zealand report to DELG annually on progress against Accord commitments. The report will be audited by an independent third party.

Key commitments and targets

Stock excluded from waterways

- Rivers, streams, drains and springs over one metre wide and 30cms deep that permanently contain water
- All lakes
- Wetlands (if they are identified by a regional council in its regional plan as being significant)

Target: 90% exclusion by 31 May 2014; 100% exclusion by 31 May 2017; 100% exclusion from significant wetlands by 31 May 2014.

Stock crossings bridged or culverted

All points on a waterway where cows cross and return more than once per month must be either bridged or culverted.

Target: 100% of regular stock crossing points bridged or culverted by 31 May 2018.

Riparian management plans

All dairy farms with waterways must prepare a riparian management plan that sets out where riparian planting is to occur.

Target: 100% of farms with Accord waterways will have a riparian management plan by 31 May 2020. Planting is to be completed by 2030.

Nutrient management

Farms must supply their dairy company with information that will allow for the modelling of Nitrogen loss and Nitrogen conversion efficiency. Companies will report comparative performance back to farmers to drive continuous improvement in nutrient management.

Target: Data collected and performance benchmarked for 85% of dairy farms by 30 November 2014; 100% of dairy farms by 30 November 2015.

Effluent management and compliance

All dairy farm effluent systems must be capable of being compliant with the relevant regional council rules and/or their resource consent 365 days per year.

Target: 100% of farms assessed by 31 May 2014.

Water use managed and monitored

All farms must comply with all regional rules controlling water takes.

Target: 85% of farms must install water meters by 2020.

Compliance standards for conversions

New dairy farms establish and comply with an agreed set of standards before milk collection starts.

Target: Compliance with standards from 2013/14 season; Good practice obligations published by 31 May 2014.