

Upper Waikato Sustainable Milk Project



The purpose of this report is to provide documented evidence of the progress that farmers in the Upper Waikato Catchment have made through their collective actions to demonstrably reduce dairy farm-sourced nutrients, sediments and faecal contaminants going into the Waikato River, and improve water use efficiency on farms.

The Upper Waikato Sustainable Milk Project has achieved this through working with catchment farmers to develop Sustainable Milk Plans and providing support to implement farmer agreed actions. This was made possible with co-funding by the Waikato River Authority (WRA), PGP and DairyNZ, and is the largest environmental good-practice catchment project ever undertaken by the New Zealand dairy industry.

Catchment Targets

To guide the project, a suite of narrative objectives for the Upper Waikato Sustainable Milk Project were developed through robust debate at Steering Group meetings and a range of stakeholder discussions over a four-month period. These objectives have been captured as targets within the Sustainable Milk Plan template. They form a critical element of the initial discussions between farmers and their project consultant.

Nutrient Management Targets

- Catchment farmers have an up-to-date nutrient budget (Overseer v. 6) and are implementing appropriate actions to improve nitrogen use efficiency within their current system.
- Catchment farmers understand current N-loss in the context of their farm system and the potential options for reducing losses if required in future. In recognition of potential business risk associated with "High" levels of N-loss (i.e., > 43 kg N/ha/yr), farms in this category are implementing appropriate actions to reduce N-loss.
- Catchment farmers have identified current P-loss risk (e.g. Overseer; Critical Source Areas) and are implementing appropriate actions to minimise this risk for their farm

Waterway management Target

- Catchment farmers have identified stream, lake and wetland areas on their properties and are implementing appropriate actions to improve biodiversity and water quality outcomes

Land management Target

- Catchment farmers have identified areas of soil loss risk on their properties and are implementing appropriate actions to reduce erosion and sediment & faecal run-off to waterways

Water Use target

- Catchment farmers understand their obligations and associated business risks under the Variation 6 (Water Allocation) rules of Waikato Regional Council's Regional Plan and have applied for required consents before 1 January 2014
- Catchment farmers have identified opportunities for improving water use efficiency and are implementing appropriate actions.

In addition, there are a number of industry expectations around minimum standards to meet regional council, the Sustainable Dairy: Water accord requirements.

Key results all recorded actions

A total of 5921 individual actions were recorded across all 642 farms taking part in the study. This reflects an average of 9.2 actions per farm across the five management target areas (effluent, waterways, nutrients, land and water use).

The majority of all actions were focused on nutrient (31%) and effluent management (27%), followed by water use (19%), land (12%) and waterways (11%) management (Fig. 1). While waterways management had the least number of actions recorded, this target area is only applicable to farms with surface waters present, either within or adjacent to the farm boundary.

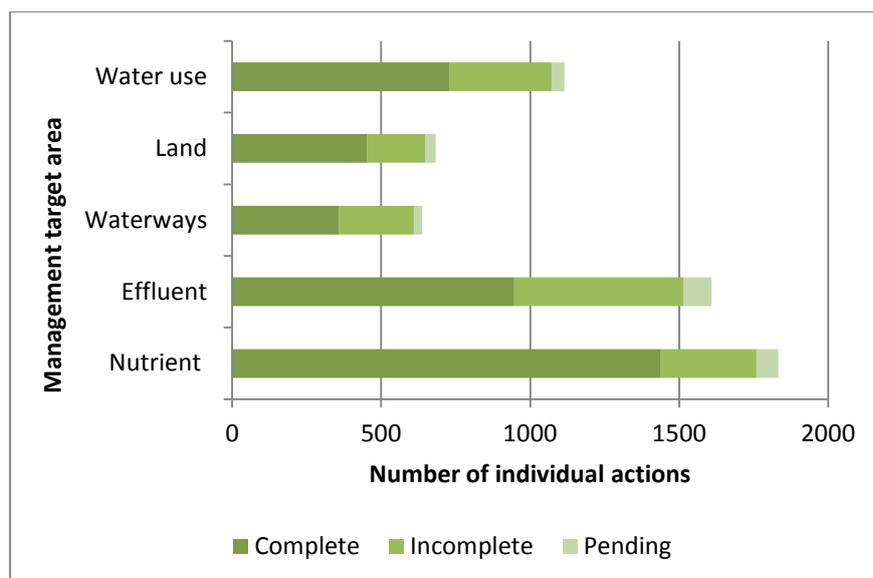


Figure 1. Total number of on-farm actions within each management target area for the 642 farms with completed SMPs analysed for this report. Complete and incomplete relate to the actions on the 594 farms which have completed the final call process. Pending relates to the remaining farms which have not yet completed a final call.

On farm improvements can be summarised into 5 key areas, those being planning & understanding, infrastructure, operation and maintenance, monitoring, training and education

Farmer commitment remains strong in the following key areas:

- Using nutrient budgets and management scenarios to understand nutrient loss drivers, optimal nutrient requirements and strategies to manage nutrient losses is a major focus area (65% of farms), which should have

significant impacts on improving nutrient use efficiency and reducing N losses.

- Updating nutrient budgets is also a major focus for most (60%) farms.
- Assess current and/or future effluent storage requirements (Dairy Effluent Storage calculator) (33%)
- Review and investigate effluent infrastructure upgrade (pond size, additional travellers, increase sprinklers, irrigator line, hydrants, pipeline leaks, filtration systems, solids separator, underground network, increased pump capacity, K-Line pods on slopes). (22%)
- Carry out/re-establish Riparian planting (21%)
- Commitment to waterways management actions over and above the Sustainable Dairying: Water Accord, for example by fencing of small, ephemeral streams (10%).
- Land management actions focused on erosion control, managing runoff from critical source areas such as tracks and races (18%) and the improvement of crop cultivation practices (15%).
- Investigating water use efficiency options (43%), installing water meters (27%) and monitoring water use (25%).

Potential reductions in nutrient losses following the successful implementation of all recorded on-farm actions were estimated for 594 farms which have completed the full Sustainable Milk Plan (SMP) process in the Upper Waikato catchment. For each farm nitrogen (N) and phosphorus (P) reductions were calculated based on individual farm Overseer® Nutrient Budget information and nutrient reduction efficacy rates assigned to each specific mitigation strategy. Given the uncertainties and variability associated with quantifying efficacy rates attributable to different mitigation strategies, several approaches were trialled using a combination of existing studies published in the scientific literature as well as Overseer modelling. It is important to note that the analysis only includes those actions where direct contaminant loss reductions could be attributed, but many other actions are likely to have indirect or long-term benefits

Mean reductions in farm N and P losses

Current modelling estimates that potential reductions in farm nutrient losses following the successful completion of 70% of all intended SMP actions across all farms are estimated to be 5% for N (based on 598 farms) and 12% for P (594 farms). These values are expected to increase to 8% for N and 21% for P should all actions across all 642 SMP farms become complete (currently estimated to be up to 8% for N and 17% for P (fig 1 & 2)

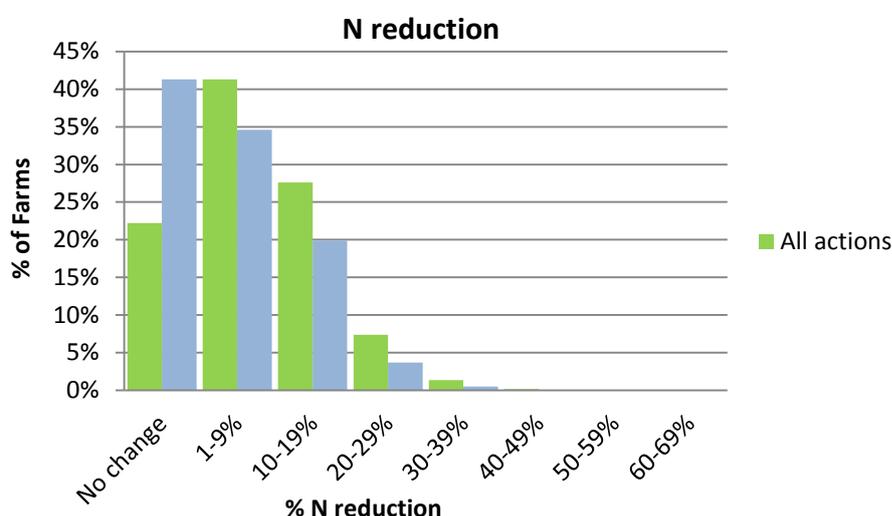


Figure2: Distribution of farm nitrogen (N) reductions across individual farms for all actions (642 farms) and completed actions only (598 farms for N). No change reflects farms where recorded actions are not likely to impact N loading directly, although all actions will ultimately lead to improved environmental performance and load reductions over the long term.

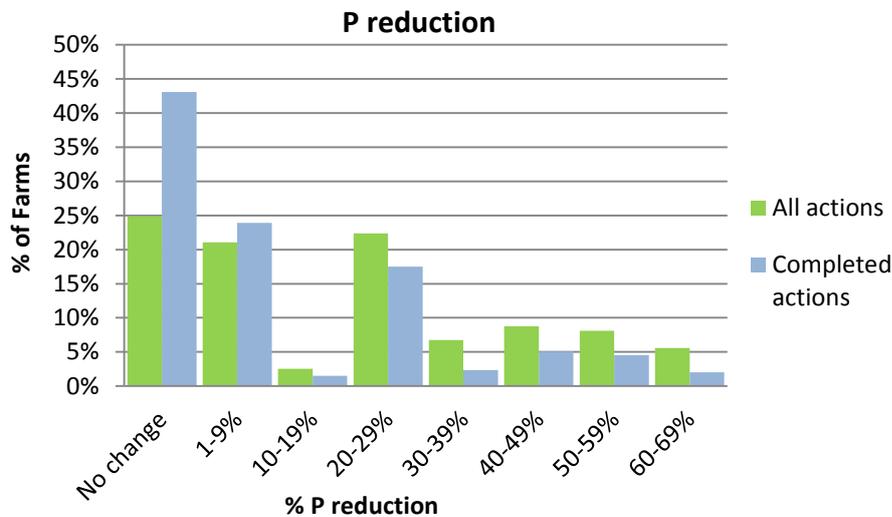


Figure3: Distribution of farm phosphorus (P) % reductions across individual farms for all actions (642 farms) and completed actions only (594 farms for P). No change reflects farms where recorded actions are not likely to impact on P loading directly, although all actions will ultimately lead to improved environmental performance and load reductions over the long term.

Potential load reductions on individual farms ranged from 0 to 35% for N and 0 to 73% for P, depending on the number and combination of actions being implemented. The greatest N reductions were observed for farms implementing multiple strategies involving stock exclusion from streams and optimised effluent/fertiliser application. Riparian and critical sources area management, stock exclusion and optimised effluent applications were the most effective measures for reducing P losses to water. These estimates reflect the potential reduction in farm nutrient losses as calculated from Overseer nutrient budget outputs and other methods, and therefore do not reflect attenuation processes prior to discharge direct to surface waters. Not all farms recorded actions with a direct impact on nutrient losses, however, all action types recorded through the SMP process will ultimately lead to improvements in farm environmental performance over the long-term.

Summary

All actions agreed and implemented to date have contributed to meeting catchment targets for nutrient management, waterway management, land management and water use while confirming industry minimum expectations. The project has provided farmers the opportunity to assess risks, benchmark their farms and then provide support to implement agreed actions.

Through the SMP project, dairy farmers are making a significant and demonstrable contribution to achieving the Vision and Strategy for the Waikato River.