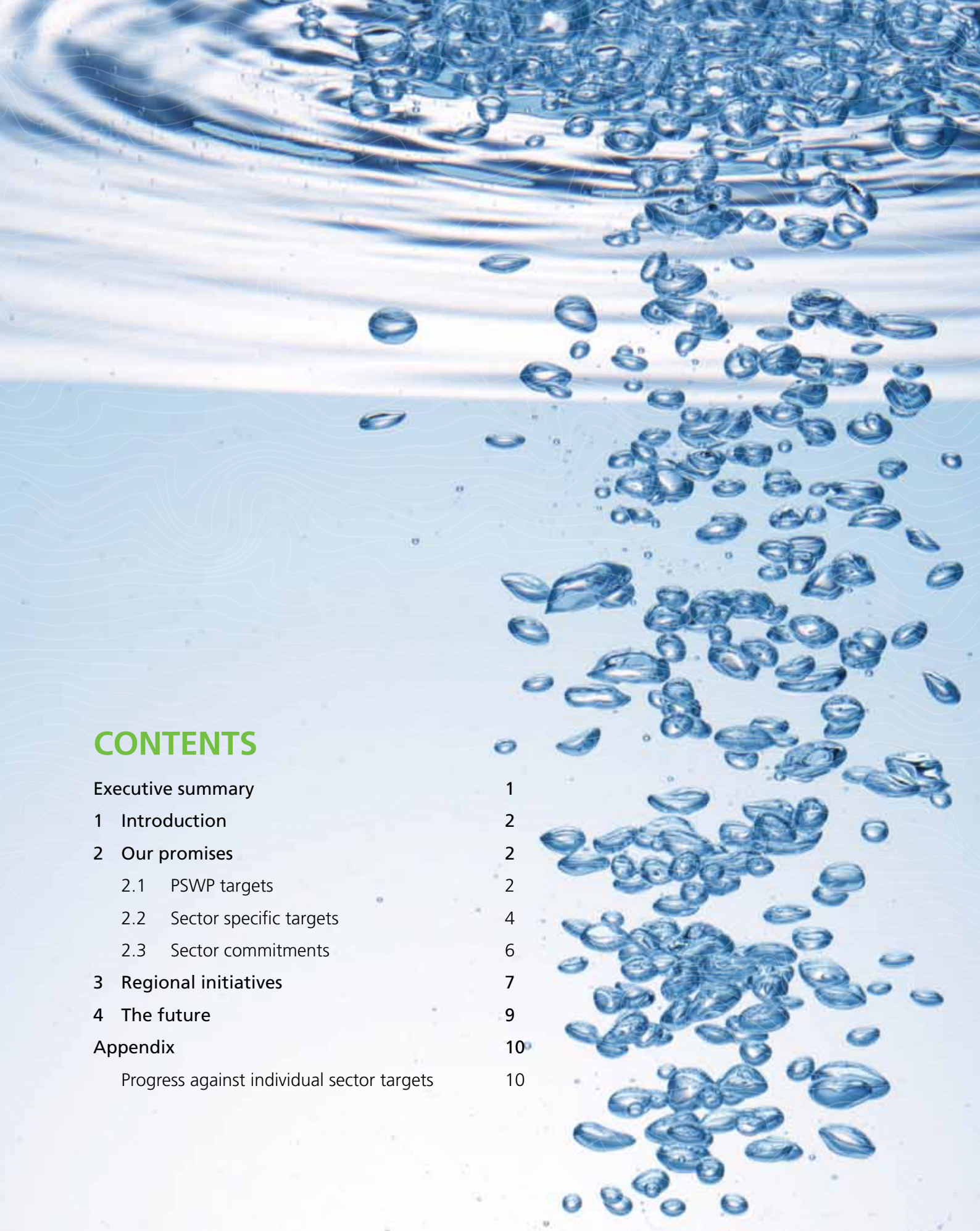
Primary Sector Water Partnership

Annual Report 2009-2010



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Executive summary

The Primary Sector Water Partnership (PSWP) is a group of major primary sector organisations who are committed to ensuring the sustainable use of freshwater resources in the primary sector. The Partnership was launched in June 2008 with the release of a discussion document entitled: '*Primary Sector Water Partnership Leadership Document*'[1]. The document is a collective action plan that builds on the individual environmental management programmes of the various partners. This second annual report provides an overview of PSWP activities and achievements for the period 1 July 2009 to 30 June 2010.

PSWP members are involved in a large number of initiatives both collectively and individually with regional councils around New Zealand. During the 2009 - 2010 year members of the PSWP have continued to actively engage with regional council staff. This has resulted in an improved awareness and understanding of each other's activities and a strengthening of links between the sectors and councils. PSWP members are keen to continue the associations with the councils on an on-going basis.

Collectively, PSWP members have continued their association with programmes in the Hoteo catchment (Auckland), Upper Karapiro catchment (Waikato) and the Balfour catchment (Southland). The PSWP is also playing a very active part in a project to develop a preferred approach to land use and water quality management within the Canterbury region.

As well as strengthening the links with regional councils, one of the key aims of the PSWP was to increase cross-sector collaboration. In this regard, the Partnership has been very successful with significant cross-sector initiatives in the water use efficiency and nutrient management areas.

The PSWP will continue to build on the progress made and lessons learnt over the past year. Members of the partnership will be working to strengthen existing partnerships between the sectors and at the same time will be looking for new opportunities for greater cross sector collaboration. The PSWP hopes to build on its already good relationships with regional councils. The sector partners will be working with a number of councils on a range of initiatives over the next 12 months. Through its efforts, the PSWP hopes to continue to make a significant contribution towards an improvement in the management of New Zealand's water resources.

1. *http://www.fedfarm.org.nz/f184,17642/17642_Water_Partnership.pdf*

1 Introduction

The Primary Sector Water Partnership (PSWP) is a group of major primary sector organisations who are committed to ensuring the sustainable use of freshwater resources in the primary sector. The PSWP was established under the umbrella of the Central Government initiated Sustainable Water Programme of Action (SWPoA). In June 2008, the PSWP released a discussion document entitled, '*Primary Sector Water Partnership Leadership Document*.' The document is a collective action plan that builds on the individual environmental management programmes of the various partners. The PSWP is committed to a work programme, which includes engagement with regional and central government and other stakeholders that will deliver on the targets as set out within the Leadership Document.

This annual report provides an overview of PSWP activities and achievements for the period 1 July 2009 to 30 June 2010.

2 Our promises

Our goals are:

- To maintain and or enhance water quality from primary production land, with demonstrable and accelerated progress on the resolution of water quality issues from agricultural land within five years.
- To demonstrate improvements in water use efficiency by the primary sector within five years.

2.1 PSWP targets

Our targets for action are:

Leadership

- *Engage with regional councils individually and collectively to ensure collective responses to water management.*
- *Complete national and regional 'at risk' water body prioritisation by November 2008 with a complete plan of action by 2010.*
- *Commence at least 10 new catchment based community initiatives each year from 2008 to 2013 that address local water quality issues originating from productive land use.*

During the 2009-2010 year the members of the PSWP have continued to engage with regional councils. These meetings have resulted in an improved awareness of each other's activities and a strengthening of links between the sectors and councils. They have also resulted in a number of initiatives with different councils involving one or more sectors.

In the 2008-2009 annual report it was reported that in hindsight the PSWP believed the targets relating to the prioritisation of at risk waterbodies, and the subsequent development of 10 new catchment programmes per year, were unrealistic. The PSWP resolved that rather than having a set number of catchments, it would be better to assess potential catchment initiatives based on a set of agreed guiding principles, and commit to those where resources were available and where the Partnership could add value.

Nutrient Management.

- *80% of nutrients applied to land, managed through quality assured nutrient budgets and nutrient management plans by 2013.*
- *By 2016, 1.7 million ha of intensively farmed land[2] will have implemented nutrient management plans.*

Good progress has been made towards the achievement of the nutrient management targets. It is estimated that 60% of the nutrients applied to land nationally are managed through quality assured nutrient budgets and 15% through

[2] Land with dairy, arable and horticultural operations

nutrient management plans. In addition, it is estimated that the area of intensively farmed land that now has a nutrient management plan is approximately 862 000ha.

Currently there are a number of initiatives that require fertiliser industry input through the delivery of nutrient budgets and nutrient management plans. The fertiliser industry has been cast in the role of enabler (i.e. enabling the various farming sectors to deliver on nutrient management targets which have been agreed between the particular sector and central and local government.

Over 98% of all dairy farms now have a nutrient budget. Approximately 35% of these farms have taken the next step and now have a nutrient management plan. The arable and horticulture industries are developing their own approaches to nutrient management planning and are at the stage of being able to actively promote the concept amongst their growers. Nutrient budgets have been provided for all 22 Beef and Lamb NZ monitor farms and an increasing proportion of its survey farms.

Water Efficiency.

- *80% of extracted water used by the sectors will be under self management approach to meet benchmarks of water efficiency by 2016.*

Irrigation efficiency initiatives have been actively pursued through a number of cross sector collaborative projects. The concept of irrigation system audit has been actively promoted through seminars and conferences and industry journals such as the Irrigation NZ News. A number of irrigation management presentations and courses have been held, with discussions as to the benefits of soil moisture monitoring, efficient water use and optimal irrigation system design and installation. In addition, considerable background work has been undertaken to develop a cross sector irrigation efficiency initiative which is due to commence during the 2010-2011. This includes development of NZQA linked irrigation operator training courses, an irrigation efficiency benchmarking tool and a guide to the formation of user groups to better manage the resource.

Sediment and Microbial Management.

- *By 2010 all forestry land, and by 2016 1.7 million ha of intensively farmed land will have implemented a management programme to minimise microbial and sediment deposition in waterways*

In the area of sediment and microbial reduction, the main initiative has been through the forestry sector's sediment focused activities, principally the development of a national environmental standard (NES) for forestry and the release and promotion of an environmental code of practice (ECOP). In the past year 78% of forest owners undertook a

documented assessment of environmental effects, including a process to assess the risk that a particular operation might pose. Ninety-eight percent of contractors who undertook earthworks, harvesting or mechanical land preparation operations in the past year, undertook post-operation environmental audits using the industry agreed voluntary rules.

A survey of 1000 dairy farmers carried out by AgResearch in late 2008 indicated that around 85% of dairy farmers now irrigate effluent to land. This will have significantly reduced the microbial load reaching streams from two-pond systems.

Capability building, research and extension

- *Capability building. Develop the required capability to achieve the sector specific targets by 2011.*
- *Research and extension increase alignment of sector and public research investment to deliver the knowledge required to achieve the desired outcomes in priority water body catchments.*

The PSWP recognises that building capability is crucial to the sectors delivering on the targets as set out in the Leadership document. The dairy sector was successful in obtaining PGP funding, to amongst others things build capability across the whole water management area. Other PSWP sector members are also committed to playing their part to meet the capability building target.

With regards to the alignment of sector and public research investment, the PSWP partners have continued to align their activities in a number of areas, particularly in relation to water use efficiency and nutrient management. These areas of alignment are reported on through the various sector targets.

2.2 Sector specific targets

Achieving the targets outlined above requires action from each of the partners. Key sector achievements for the 2009-2010 year are summarised below. More detail on progress against the specific sector targets is provided in Appendix 1.

DairyNZ and Fonterra

- ✓ Further progress has been made towards the achievement of all of the Dairy and Clean Streams Accord targets except the target relating to dairy shed effluent compliance. The industry acknowledges that while some progress has been made, further action is required to reduce the rate of dairy shed effluent non-compliance.
- ✓ As at September 2010, 28% of dairy farms had nutrient management plans (NMPs) in place. Dairy NZ and Fonterra, in conjunction with the fertiliser industry, have initiated a programme of work which aims to provide nutrient management tools for all dairy farmers
- ✓ Dairy NZ and Fonterra, in conjunction with the fertiliser industry, are collating and analysing nutrient budget information from dairy farms across NZ to help inform the setting of benchmarks with the aim of improving nutrient use efficiency.
- ✓ A farm water use efficiency programme, developed by DairyNZ in conjunction with Environment Waikato, has been trialled in the Waikato region. Work to take this programme nationally is to be undertaken during 2010-11.
- ✓ The dairy industry has been active in commissioning research that progressively delivers by 2016 tools, technologies and management practices to address the key environmental issues facing the industry.

Foundation for Arable Research

- ✓ New horticultural and arable modules developed under the Nitrogen Managers for Environmental Accountability (NMEA) project have been fully incorporated into the nutrient budget model, Overseer. A training programme in the use of the modules has been developed for advisors.

- ✓ A maize calculator use during the 2009-2010 season is currently being reviewed prior to use by a broader group of farmers during the 2010-2011 season.
- ✓ There has been a significant increase in the use of reduced and no-tillage crop establishment practise over the last year. The rate of uptake is greater than forecast.
- ✓ A number of workshops have been run with Dairy NZ and Irrigation NZ to encourage farmers to improve irrigation use efficiency. Attendance at these workshops has generally been above expectations.

Horticulture NZ

- ✓ There is now high level recognition of an input model for nutrients in most of the approximately 110 horticultural crops.
- ✓ Nitrogen management work has progressed significantly over the last two years. Horticulture NZ is committed to completing this work and facilitating technology transfer to growers.
- ✓ An irrigation efficiency project is underway in partnership with Environment Waikato, Aqualinc and the Community Irrigation Fund (MAF) to investigate horticultural patterns of water use and irrigation management in the Waikato region.
- ✓ Horticulture NZ is partnering with Irrigation NZ on a Sustainable Farming Fund project investigating methods to improve allocative efficiency in water-short catchments through the use of water user groups.

Meat and Wool NZ

- ✓ All twenty-two B+LNZ Monitor Farms had nutrient budgets as at December 2009. B+LNZ is working with the fertiliser companies to encourage all B+LNZ monitor farms to take the next step and develop formal Nutrient Management Plans for their farms.
- ✓ There has been a significant increase in the use of nutrient budgets within the beef and lamb sector within the past 12 months from 16.7% to 23.3% of properties now using them.
- ✓ There is continued interest in the Land & Environment Plan (LEP) tool kit. Two meat processors and exporters have distributed LEP kits to farmer suppliers involved in particular supply programmes. This demonstrates that, not only is the use of LEPs of benefit to the environment but can also provide a basis for providing assurances to customers.
- ✓ B+LNZ has been active in commissioning research to address the key environmental issues facing the industry.

NZ Farm Forestry Association and NZ Forest Owners Association

- ✓ A survey of Forest Owners members was undertaken during the year. An excellent response from Forest Owner members to the survey was received. Survey results indicate that forest operations for the majority of operations are undertaken in a manner that utilises operational methods that minimise sediment deposition in waterways.
- ✓ Forest Owners have been actively engaged with MfE in scoping and developing a National Environmental Standard for forestry. A draft version of the NES was distributed to a wide range of parties for discussion in June 2010.
- ✓ The proposed NES has the potential to define permitted activity baselines for three generic rural activities. These are stream crossing installation and maintenance, quarrying, and earthworks (road and track construction).

Fertiliser Manufacture's Research Association (FMRA)

- ✓ $500 000 was invested in the ongoing development and upgrading of OVERSEER Nutrient Budget Model.
- ✓ Approximately 3200 nutrient management plans were completed.
- ✓ A total of $1.250 million was invested in an ongoing project to evaluate the performance of nitrification inhibitors. Use of results will include a review of the nitrification inhibitor component of OVERSEER. Investors in this project include NZFMRA, Fonterra, DairyNZ and MAF.
- ✓ An independent audit of on farm delivery of nutrient management plans by NZFMRA members (Ballance Agri-Nutrients and Ravensdown Fertiliser Co-operative) was undertaken.

Irrigation NZ

- ✓ Work has continued on the development of a 'Farmer Irrigation Toolkit' guide. This will be released in October 2010 through a series of nationwide workshops. The Irrigation NZ, Irrigation System Design Code of Practice, has formed the basis of a NZQA accredited qualification at Level 3. The approved training provider accepted the first intake of trainees in 2009.
- ✓ Irrigation NZ continues to run an industry education programme around the benefits of irrigation system evaluation. A number of industry market programmes are now beginning to incorporate irrigation evaluation aspects into their market compliance programmes.
- ✓ Work is well underway in both Canterbury and Otago for the implementation of Audited Self Management (ASM) for irrigation schemes. Three schemes now have successful ASM systems operating with a number of others being in the planning stage.

Federated Farmers

- ✓ Federated Farmers has undertaken the PSWP administrative functions, acting as the contracting authority, coordinating finances, and organising meetings in support of the Chair's role.
- ✓ Federated Farmers has continued to work with regional councils, other primary sector partners, landowners and key stakeholders to address key freshwater management issues.
- ✓ Over the last year, the Federation's policy advisors were involved in water planning and policy development processes with 14 regional authorities.

2.3 Sector commitments

During the 2009/2010 year, the sector partners committed approximately $45,000 between them to the operation of the Partnership. Individually each sector continues to make a significant financial contribution towards addressing the water management issue associated with their sector. The extent of this commitment is reflected in the progress made towards the achievement of the sector targets.

3 Regional initiatives

The PSWP has been actively involved with initiatives in a number of regions

Auckland region - Hoteo catchment

The Hoteo is the Auckland region's largest river with a catchment of 405 km2. This river drains into the Kaipara Harbour which is thought to be the largest estuary in the southern hemisphere. It is recognised as an area of international importance for coastal birds, has a high diversity of marine organisms, and contains ecologically significant marine communities that provide a wide variety of functions and services. The ecosystems of the harbour, and in particular the sea grass beds, have been identified as being highly significant in supporting the snapper populations, both within the harbour and the open coast. Specifically, significant issues have been identified around sediment and phosphorus. The PSWP has partnered with the Auckland Regional Council, and a number of local groups in a programme, with an initial focus on sediment reduction.

Initial effort in the Hoteo has focused on two sub-catchments, the Waiteitei and the Kourawhereo. Background information on landownership and key contacts has been gathered for these areas. The overall Hoteo programme was launched at a workshop held in April 2010. The workshop included presentations from a range of speakers on different aspects of the Hoteo and Kaipara Harbour system. Participants at the workshop also took the opportunity to view first hand the impacts of sedimentation on the sea grass beds of the Kaipara harbour, and discuss the options for reducing further sedimentation in the harbour.

Waikato region - Upper Waikato catchment

Environment Waikato's (EW's) ICM project has been working in the Upper Waikato over the past four years with pilot projects in the Little Waipa and Waipapa catchments. This work has greatly improved understanding of nutrient management issues, measured farmer uptake of messages and solutions, and identified why farmers will and won't undertake practice change on farm.

Environment Waikato commenced work with the dairy and fertiliser industries in January 2009 to further develop work on nutrient management, farm systems and costs / benefits of change on farm from earlier ICM learning. The work was co-funded by EW, DairyNZ, Ballance AgriNutrients and Fonterra ($75k plus in kind time) and named the Upper Waikato Nutrient Efficiency Study (UWNES). An agreement between agencies was documented prior to work commencing, and the on farm analysis was completed by AgFirst Waikato Ltd in Sept 2009 and reported to a farmer meeting of those in the study. In review of the project, Fonterra states that they *"have found working with Environment Waikato, DairyNZ and Fertiliser Industry very beneficial and look forward to continuing the working relationship into the future"* (Charlotte Rutherford – Fonterra.)

Following this study, Environment Waikato engaged AgFirst to re-survey the UWNES farmers to identify uptake of the study's findings, to seek feedback on low leaching scenarios, feedback on future extension of the project and any other feedback. This has just been completed and offers many insights into challenges ahead in policy development in these farming districts of the Waikato hydro lakes.

Canterbury region – Land use and water quality project

The PSWP has been working closely with Environment Canterbury, and other key stakeholders, to develop a preferred approach to the management of the cumulative effects of nutrients from land use on water quality within the Canterbury region. This is a significant project which involves a number of PSWP partners including; DairyNZ, Fonterra, Federated Farmers, Horticulture NZ, Irrigation NZ, Foundation for Arable Research, Beef and Lamb NZ, and Fert Research. AgResearch, through the industry, and FORST funded Pastoral 21 (P21) programme is also a significant contributor.

The project has a number of work strands including; science, economic, farm systems, communications, adoption plan, deliberations and policy development. PSWP members are actively involved in all of these work strands and are also represented on a multi-stakeholder project, Governance Group.

A final report, setting out recommendations on a preferred approach to the management of the cumulative effects of nutrients from land use on water quality, is due to be presented to Environment Canterbury's Commissioners by March 2011.

Southland region - Balfour catchment

The work in the Balfour catchment has proceeded with significant input from Environment Southland, the local community and the PSWP. The work has shown that:

- The characteristics of the Balfour catchment mean it is very susceptible to nitrate contamination of the groundwater. Land management practices considered good practice in other catchments could potentially be exacerbating the problem in the Balfour catchment.
- There are no obvious farm management practices or point source discharges that are contributing to higher nitrate levels in the groundwater. Nutrient budgets and assessment of management practices in relation to risk has been completed for all farms in the catchment.
- Monitoring of all bores in the catchment have identified that the middle to lower end of the catchment have higher levels of nitrates in the groundwater.
- A peziometric survey has demonstrated the water flows in the aquifer in the catchment and these relate well to bores with higher nitrate levels.
- Surface water nitrate levels are elevated and increase in both major streams with increased inflows from the catchment.
- Further activity is planned the 2010-2011 year to develop farm management practices to try and reduce the level and risk of nitrate contamination of groundwater.

A report on the project was presented to Environment Southland in August 2010. According to Rachael Miller, Principal Planner with the Council, "*The Councillors were pleased with progress and about the collaborative approach being taken. It was felt that the partnership was important to facilitate involvement by landowners and the relevant sectors and achieve 'buy-in' to the process.*"

4 The future

The PSWP will continue to build on the progress made and lessons learnt over the past year. Members of the partnership will be working to strengthen existing partnerships between the sectors and at the same time will be looking for new opportunities for greater cross sector collaboration. The PSWP hopes to build on its already good relationships with regional councils. The sector partners will be working with a number of councils on a range of initiatives over the next 12 months. Through its efforts, the PSWP hopes to continue to make a significant contribution towards an improvement in the management of New Zealand's water resources.

APPENDIX

Progress against individual sector targets

This section outlines the targets, and actions that individual sectors and organisations have committed to in order to achieve the collective targets as set out within the Leadership document. It also sets out the achievements for the 2009-2010 year

DairyNZ and Fonterra

The dairy industry is committed to sound environmental management. The industry is actively working with researchers and farmers to develop and implement effective solutions to the environmental issues faced by the industry. The industry has also been active in promoting and developing collaborative arrangements with regional councils. A number of the initiatives that the dairy industry is involved with involve other PSWP partners. These include initiatives aimed at improved water use efficiency and the adoption of nutrient management planning as standard practice on dairy farms.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Full adoption of the Dairying and Clean Streams Accord – *Dairy cattle excluded from 50% of streams, rivers and lakes by 2007; 90% by 2012* – *Half of regular crossing points to have bridges or culverts by 2007;90% by 2012* – *All farm dairy effluent discharges to comply with resource consents and regional plans.* – *All dairy farms to have systems in place to manage their nutrient inputs and outputs by 2007* – *Half of regionally significant wetlands on farms to be fenced by 2005; 90% by 2007.*	Nationally, stock are now excluded from nearly 80 percent of waterways on farms with Accord type waterways. The 2007 target for stock exclusion has been exceeded in all regions where the Accord applies, while in Northland, Otago, and Southland the 2012 targets have already been achieved. The 2012 crossing point target has already been exceeded in all regions except Tasman where 89 percent have a bridge or crossing in place The level of full compliance with regional council dairy effluent rules and conditions varies widely between regions. Overall, the level of full compliance was 60 percent. The overall level of significant non-compliance recorded in 2009/2010 was 15 percent. The current level of non-compliance is unacceptable. Fonterra has in the past year introduced new measures to assist poorly performing farmers. DairyNZ is supporting this programme by funding development of design standards for effluent systems and an associated Code of Practice. Nearly 99 percent of Fonterra dairy farms now have a nutrient budget, the first step towards the adoption of comprehensive nutrient management practices on farm. In addition, in the past year approximately 3500 nutrient management plans have been prepared for dairy farmers across the country. Progress against the wetland target is not included because only five of the thirteen regional or unitary councils covered by the Accord have identified regionally significant wetlands. While the significant wetlands have not been identified in the other regions, Fonterra is continuing to communicate to affected suppliers that all stock should be excluded from all wetlands that are likely to be deemed significant. Full details of the latest Accord Report can be found on the Ministry of Agriculture's website.
Nutrient management – provide programmes to have 50% of dairy farms implementing a nutrient management plan by 2012 and 100% by 2016.	As at September 2010, 28% of dairy farms had Nutrient Management Plans (NMPs) in place. Dairy NZ and Fonterra, in conjunction with the fertiliser industry, have initiated a programme of work which aims to provide tools and information for farmers, increase demand for NMPs and increase capability to provide one-on-one advice to ensure effective implementation of NMPs to improve nutrient use efficiency. Priority delivery of NMPs is being focussed in specific regions including the Horizons region. Dairy NZ and Fonterra, in conjunction with the fertiliser industry, are collating and analysing nutrient budget information from dairy farms across NZ to help inform the setting of benchmarks which aim to improve nutrient use efficiency. The aim is to have improved benchmark information incorporated into NMPs being delivered to farmers in the 2010/11 season.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Set benchmarks and targets for increasing resource use efficiency by 2010.	Fonterra is collecting data on dairy shed water use to develop water use benchmarks.
Demonstrate a significant reduction (30% as an interim stretch target) in nutrient losses at catchment scale in areas where water quality is identified as being at risk, by 2016.	Evidence presented by Fonterra at the Horizons (Manawatu-Wanganui Regional Council) One Plan Water & Land Hearings highlights improving water quality trends in the lower Manawatu River over the 10-year period 1999-2008 (see excerpt below). There were statistically significant improving trends in dissolved P, nitrate and Total N concentrations at two sites monitored by NIWA. Both Regional Council and Fonterra expert evidence suggest these improving trends may be driven by significant changes in effluent management practices, namely a dramatic shift from discharge of treated effluent to water, to discharge to land. Evidence of improving water quality trends has also been provided within specific catchment studies around New Zealand. These include Waiokura Stream in Taranaki[3], which is part of the Best Practice Dairy Catchments Programme, and the Hurunui River (Ecan-Primary Sector partnership project). In Waiokura Stream, on-farm actions to fence and plant streams and optimise fertiliser use have lead to significant reductions in sediment, faecal bacteria and phosphorus levels in the stream. Within the Hurunui catchment, farmer action to improve irrigation efficiency has led to significant reductions in P and E. coli in the Pahau river, a lowland tributary of the Hurunui. Despite isolated examples of improving water quality as a result of farmer action, there are growing concerns over increasing nitrate trends in surface and groundwater in agricultural catchments around New Zealand. Addressing these trends is perhaps the greatest challenge facing the Primary Sector in general, and dairying in particular.
Commission research that progressively delivers by 2016 tools, technologies and management practices capable of delivering: – *Off farm losses – 50% less nitrogen, 50-80% less phosphorus, microbial levels at contact recreational standard* – *Efficiency use gains, 40% increase in water use efficiency by development of improved pasture and forage species* – *Irrigation use efficiency. In partnership with Irrigation NZ, development of tools and encouragement of uptake so that 80% of water in dairy industry will be under self management to meet industry good practice benchmarks.*	DairyNZ is involved in a wide range of research programmes designed to address this target. For example, DairyNZ and FRST are co-funding the Dairy Systems for Environmental Protection Programme. Through advances in animal selection, pasture and nutritional management and information, technology, redesigned farm systems will feature fewer, but more nitrogen (N) efficient cows, higher milk yields from more diverse, higher quality pastures and decreased environmental impact. The benefits from this programme are estimated to be: 1. On-farm gains in profitability of $222M by 2023, through greater N efficiency, an increased area in dairying and price premiums in the international market. 2. National gains of $504M in export values by 2023 through continued growth in dairy production. 3. Reduced environmental footprint totalling 9,800t N leached annually by 2023, leading to a reduction in GHG emissions of 3,330t of nitrous oxide.

3 Wilcock, R., Betteridge, K., Shearman, D.,Fowles, C., Scarsbrook, M., Thorrold, B., Costall, D. "Riparian protection and on-farm best management practices for restoration of a lowland stream in an intensive dairy farming catchment: a case study" New Zealand Journal of Marine and Freshwater Research. 43: 803-818. (Abstract attached below)

Looking ahead

Managing water is both a challenge and an opportunity for the dairy sector. The sector knows that if it can be smarter in its management of water use it can unlock wealth-generating potential for the nation and capitalise on one of New Zealand's few natural competitive advantages. Smarter implies storing and allocating water more efficiently but also using water more responsibly. The dairy sector understands, for example, that it needs to do better in managing its impact on water quality. The key to delivery of smarter water will be the sector adopting and promoting a culture of continuous improvement across all aspects of sustainable water use and management.

The basic model adopted by the sector involves four steps

1. Providing leadership and embedding the strategic direction into the industry organisations.
2. Enabling behavioural change to occur by providing the research and by developing and building human and technical capacity.
3. Promoting behaviours and practices that are known to be effective through extension, demonstration and reporting of monitoring results.
4. Driving compliance with desired behaviours, if earlier steps are not sufficiently effective, through carefully designed incentives and sanctions.

Leadership

The sustainability and water management message is clearly embedded within the *2009 Strategy for NZ Dairy Farming*. The sector has developed annual milestones and multi-year targets to ensure this Strategy succeeds[4].

Environmental sustainability is a key agenda item on Fonterra, DairyNZ, Dairy Companies of New Zealand (DCANZ) and Federated Farmers Board meetings. Driving industry environmental sustainability is a central objective of each organisation.

A Dairy and Environment Leadership Group (made up of representatives from Fonterra, DairyNZ, DCANZ, Government, Maori, Federated Farmers, regional councils and others) meets three times a year to influence dairy industry sustainability priorities and monitor progress.

Enabling behavioural change

DairyNZ, supported by others in the industry, has completed a Farm Dairy Effluent (FDE) Design Code of Practice and Design Standards. This promotes effluent good management practice by ensuring effluent management systems, and the advice provided by equipment sales firms and rural professionals, are fit-for-purpose. DairyNZ is also supporting development of a Pond Construction Practice Note being prepared by IPENZ.

Dairy NZ and Fonterra are committed to a "*Smart Water on Dairy Farms*" project. This will initially involve the roll out of tools and resources ("*Short Form Action Plan*" and a "*Smart Water Use Kit*" – with assessment workbook checklist) to assist farmers to appraise their water systems and operations, identify opportunities for improvement and make desired changes.

A separate irrigation efficiency project is also in place. This is being led by Irrigation NZ, DairyNZ and others, to deliver on the target set by the Primary Sector Water Partnership. That is '*to have 80% of water used by the dairy sector meet industry good practice benchmarks by 2016.'*

4 The industry has set aggressive targets to drive reductions in contaminant losses. The targets established under the Strategy for New Zealand Dairy Farming are that by the end of 2011, 50% of dairy farms have, and are implementing through an auditable process, Nutrient Management Plans that reduce their nutrient footprint either to established benchmarks of high resource use efficiency or agreed partnership targets; 90% of farms are doing so by end of 2012.

Fonterra will deliver the "*Farm-Enviro-Walk*" (FEW) effluent triage tool, developed by DairyNZ, to every supplier by the end of the 2011 season. Over 3000 had been delivered by August 2010 with 10% of these resulting in a referral being made to Fonterra's team of Sustainable Dairy Specialists for advice on what to include in an "*Effluent Improvement Plan*".

Promoting behavioural change

Fonterra introduced the "*Every Farm Every Year*" independent appraisal of Fonterra suppliers' effluent infrastructure on 1 August 2010. Where change is needed, farmers will be referred to Fonterra's expanded team of Sustainable Dairy Specialists and an Effluent Improvement Plan (EIP) will be prepared. There will be sanctions (including non pick up of milk) for failure to comply with an EIP.

Industry partners will also engage with regional councils in key dairying regions to establish a '*warrant-of-fitness*' approach to effluent management systems. This will focus on the design specifications of the effluent management infrastructure that are likely to satisfy regional council requirements in each location.

The sector is supporting the concept of "*N Efficiency*" as a key metric for farm management and sustainability, building on approaches adopted in Europe and elsewhere.

Fonterra estimates its current annual spend on on-farm sustainability initiatives tops five million dollars. It has now doubled its team of Sustainable Dairy Specialists / Advisors to a total of 11 with leadership and support from a Field Team Manager and an Environment Programme Manager. Other dairy companies are similarly providing resources and working with suppliers to drive improvements in sustainability practice.

Driving behavioural change

As awareness of the risk posed by diffuse discharges has increased (in both absolute and relative terms), dairy farmers are moving to adopt techniques and systems recognised as being part of good agricultural management practice.

An important new initiative by the dairy sector comes in the form of the "Supply Fonterra" proposal to create incentives for enhanced environmental performance by suppliers. The initiative under development, but yet to be fully assessed or socialised with suppliers, would provide a "merit" payment for the adoption of expected management practices on-farm across the full suite of on-farm water issues (i.e. effluent management, nutrient management and water efficiency).

The sector has already achieved very high levels of compliance with *Dairying and Clean Streams Accord* targets related to the exclusion of stock from water ways[5]. The industry will reinforce new communications efforts to drive achievement of the Clean Stream Accord target of 90 percent stock exclusion from waterways by 2012.

Fonterra has established a $1.5 million dollar "*Catchment Care*" programme, in partnership with "*Conservation Volunteers*," to lead the planting of the riparian margins of iconic water ways throughout New Zealand.

Good effluent management practice is encouraged by Fonterra's "*Effluent Improvement Programme*" which provides for milk pay-out deductions of $1500 / $3000 during the 2010 seasons and the provision of one-one-one advice to any supplier requiring it.

5 The 2008/09 report on progress in meeting Accord targets recorded 80% exclusion of stock from water ways on dairy farms supplying Fonterra

Future-proofing

Alongside all these initiatives, the dairy sector is keeping a keen eye to the future. Expectations of on-going improvements in environmental performance are high.

Future proofing is reflected, in particular, in two initiatives:

- Pastoral 21 – This is a collection of industry organisations established to co-fund, in partnership with government, research into environmental mitigation technologies and knowledge transfer to farmers
- The dairy sector's Primary Growth Partnership (PGP) project – This has been developed to position the dairy sector to respond to the full range of sustainability challenges that lie ahead, with the overall aim of reducing the industry's total environmental footprint.

Arable

The arable sector is actively working with farmers, researchers and regulators to ensure farmers have the skills and knowledge to manage water and nutrients using the current best management practices. The Foundation for Arable Research's (FAR's) involvement in the PSWP cross sector initiatives is part of the commitment to ensuring farmers have the knowledge and skills to make a difference on their farms and in their catchments. The targets set in some instances are very ambitious and reflect the need for technical information to be distributed by competent and committed sector personnel. In other cases, particularly where the base information is lacking, the targets are less ambitious. Nevertheless, as new knowledge comes to hand it is envisaged that this will result in significant on-ground changes. FAR are pleased with the progress that continues to be made towards addressing some of the key water management issues facing arable farmers.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Nitrogen Managers for Environmental Accountability (NMEA) completed by January 2009. – *By end 2009 arable industry recognition of nutrient budgeting for high risk activities.* – *NMEA developed into Overseer by February 2009.*	NMEA was completed in early 2009 following workshops with farmers and regional councillors. NMEA has now been fully incorporated into Overseer. The arable and horticulture industries have been working with trainers at Massey University to develop training modules for Overseer for arable and horticulture.
Increased use of FAR crop management guidelines. – *Increase use of wheat calculator or principles of the wheat calculator from 60 -80% by 2010.* – *Expand principles of wheat calculator to barley and achieve 15% uptake by 2015.* – *Release the new maize calculator for widespread use in 2008 and 5% uptake in 2009.*	While no detailed surveys have been undertaken of wheat calculator use, antidotal evidence suggests that the calculator continues to be widely used by growers. Efforts have been made to expand the principles of the wheat calculator to cover barley. Unfortunately, only limited progress has been made due to the unavailability of capable modelling staff. The Amaize N maize calculator was released in 2008. CD's were distributed to a selected group of growers and industry prior to the 2009-2010 maize season. Calculator use during the 2009-2010 season is currently being reviewed prior to use by a broader group of farmers during the 2010-2011 season.
Clear guidelines provided to growers on how and when to use reduced or no-tillage techniques by 2012.	A booklet (FAR Focus) "Non-inversion agronomy guidelines for successful reduced tillage" has been distributed to all arable farmers. There has been a significant increase in the use of reduced and no-tillage crop establishment practise over the last year. The rate of uptake is greater than was forecast.
Improve irrigation efficiency and plant water use efficiency by: – *Extension of irrigation use efficiency with 80% new irrigators on arable farms tested prior to commissioning in 2010 and 15% of existing irrigators tested prior to 2010.* – *Soil moisture monitoring and best management practices for irrigation management used on 15% of irrigated area by 2010.* – *Irrigation use efficiency – In partnership with Irrigation NZ development of tools, encouragement of uptake so 80% of water used in arable industry will be under self management.*	The uptake of irrigator efficiency testing has not been as great as expected. A number of factors impact on the opportunity for farmers to have irrigators tested and the well below average returns for products in the last year means many farmers have curtailed what is seen as any unnecessary expenditure. There has been very limited effort to increase use of soil moisture monitoring over the past year as the Whole Farm Irrigation Model may fulfil a similar role. A Whole Farm Irrigation Model for arable farms will be ready for launching for trial use by farmers in the 2010/11 growing season. A number of workshops have been run with Dairy NZ and Irrigation NZ to encourage farmers to improve irrigation use efficiency. Attendance at these workshops has generally been above expectations. Only a limited number of new irrigators have been installed on arable farms in the past season and generally these are not efficiency tested when commissioned. More effort is needed to ensure companies are providing this service.
Continue to promote the uptake of GROWSAFE.	Growsafe is promoted at FAR events as a suitable tool for managing Agrichemicals.

Horticulture New Zealand

The horticulture sector continues to work closely with growers, science organisations and regional councils to ensure that the key water management issues facing the sector are identified and addressed. In the past year work has progressed in a number of areas. Work around nitrogen management has progressed significantly this year. Further work is required to ensure that this tool reflects practice in all horticultural situations. Horticulture NZ is committed to completing this work and facilitating technology transfer to growers. A collaborative partnership was established in 2008-2009 with the Auckland Regional Council rural compliance team to develop and refine methods that promote sustainable growing practices in the Auckland half of Pukekohe growing region. Work in this area has continued through the 2009-2010 year. An irrigation efficiency project is continuing in partnership with Environment Waikato, Aqualinc and the Community Irrigation Fund (MAF) to investigate horticultural patterns of water use and irrigation management in the Waikato Region. Horticulture NZ has continued to advocate for growers in the Hawke's Bay region on issues relating to water use efficiency and allocation in the Ngaruroro River catchment. In the south, Horticulture NZ has been an active partner in the collaborative programme to develop a preferred approach to the management of the cumulative effects of nutrients from land use on water quality within the Canterbury region. RMA advocacy at the regional level has continued promotion of GROWSAFE™ tools and training for all rural and other users of agrichemicals; particularly in Canterbury, Auckland and Horizons regions. The focus of advocacy has been on encouraging the responsible, sustainable, and safe use of agrichemicals.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Achieve the objectives of the MAF SFF / Horticulture & Arable Industries / Regional Government Project: Nitrogen Managers for Environmental Accountability (NMEA) by January 2009.	NMEA was completed in early 2009 following workshops with farmers and regional councillors. NMEA has now been fully incorporated into Overseer as Arable and Horticulture modules.
By end-2009 Hort Industry product group recognition of nutrient budgeting for all high risk activities; i.e. leaching from certain crops on different soil types.	There is now high level recognition of an input model for nutrients in most of the approximately 110 horticultural crops. Development is more sophisticated in some crop models; for example the Potato calculator that has been commercialised in NZ and is being developed internationally.
February 2009 - NMEA developed 'Overseer (Hort)', based on HortResearch's SPASMO and Crop & Food's Soil and Plant Growth Models (ex LUCI), completed and rolled out.	The initial work to establish the model has been completed for between 20 and 30 crops. This represents a significant proportion of the work required to cover the major horticultural crops.
2009 onwards – advocate with regional councils for the voluntary uptake of 'Overseer (Hort)' by growers to be recognised in land and water plans, through permitted activity rules for fertiliser application via nutrient budgeting.	Nitrogen management work has progressed significantly over the last two years. Further work is required to ensure the tools developed reflect practice in all horticultural situations. HortNZ is committed to completing this work and facilitating technology transfer to growers. Issues exist due to the cost and time required to validate the tool across a range of regions and crops, the timeframes for the policy development programmes of regional government and the resources other than time and cost involved with providing extension and technology transfer onto the farm.
March 2009 - Commence six months extension work with Overseer (Hort).	HortNZ is still seeking an appropriate verification tool to report uptake of Overseer. The uptake of Overseer was also hindered by the progression of the Horizons One Plan between 2009 and 2010. However, considerable work has and is being done particularly in the Horizons region, Canterbury, and to a lesser extent the Waikato on use of Overseer.. As at April 2010, 25% of vegetable and relevant fruit growers were using Overseer (Hort). The targets for April 2010 and April 2014 are 50% and 75% grower usage respectively.
Late 2009 – 'Overseer (Hort)' incorporated into New Zealand GAP	In Progress.

Horticulture NZ has also set a number of additional targets that weren't included in the original PSWP Leadership document.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Crop production tools, for high-risk activities, optimising efficient use of nutrients and water inputs under continuing development including: End of 2009/10 season – 25 per cent uptake by growers, end 2012 – 60 per cent uptake and end 2013 – 75 per cent uptake	Larger growers in South Island, supported by Watties, are using the Carrot calculator to minimise nutrient inputs while maintaining optimum yields. Uptake and use
2015 – Potato Crop Calculator fully developed – 90 per cent taken up by industry	This web-based tool has now been developed and commercialised with good uptake from industry.
Continue extension work on irrigation efficiency including irrigation distribution performance and advocating soil moisture monitoring and best management practices for irrigation management (NZ Code of Practice linkage).	An irrigation efficiency project is underway in partnership with Environment Waikato, Aqualinc and the Community Irrigation Fund (MAF) to investigate horticultural patterns of water use and irrigation management in the Waikato region. Work is also underway in the Hawke's Bay to advocate for adoption of a soil/water balance approach to allocation. The model for trees and vines (fruit crops) is well developed. Further work is required to improve the vegetable crop factors. More growers are adopting use of moisture probes and similar devices to improve irrigation practice. As horticultural land is limited and scarce, adding value is a key driver and the industry is continually developing market advantage. Showing improved environmental performance is a key way to add value. Benchmarking environmental performance has become more of a focus. Zespri and the Pipfruit sectors, for example are now involved in developing virtual water footprints for export crops.
Partner with other sectors to improve irrigation use efficiency amongst growers.	Partnering with Irrigation NZ on a SFF funded project investigating methods to improve allocative efficiency in water-short catchments through the use of water user groups.
Continue to promote the uptake of the GROWSAFE® calculator to all affiliated product groups and growers.	RMA advocacy at the regional level has continued promotion of GROWSAFE® tools and training for all rural and other users of agrichemicals; particularly in Canterbury, Auckland and Horizons regions. The focus of advocacy has been on encouraging the responsible, sustainable and safe use of agrichemicals. Advocacy has resulted in plan recognitions of these GAPs. As a trustee to the Agrecovery Chemicals Recovery Programme (contributing governance and guidance) HortNZ is part of the now developed and functioning network to recover unwanted and unused agrichemicals from farms.
Collaborate with other primary sectors and Environment Canterbury to develop a new method to limit the effects of land use intensification on water quality in the Environment Canterbury region by 2012.	Horticulture NZ is working closely with Environment Canterbury and other partners to develop crop factors and management practices that typify horticultural rotations and land use in Canterbury. Presently HortNZ is seeking funding to build a carrot and onion model for use in this work and will be progressing this work over the next year if funding partners can be found. HortNZ will be looking to model nutrient use in the APSIM nutrient modelling tool.

Beef & Lamb

Beef and Lamb NZ (B+LNZ) recognises the growing importance of appropriate water and nutrient management. Along with other primary sector organisations B+LNZ have been active participants in the Land and Water Forum. The sheep and beef sectors are starting from a low base and the targets presented reflect that. The past few years have been challenging ones for sheep and beef farmers, and during challenging years farm development may not progress at the usual rate. Beef and Lamb NZ recognises the need to do more to increase sheep and beef farmers' awareness of the importance of improved water management.

COMMITMENTS	2009-2010 ACHIEVEMENTS
To work with the fertiliser industry to encourage the uptake of nutrient budgeting through the use of Overseer by sheep and beef farmers - all B&LNZ Monitor Farms to be operating Overseer based nutrient budgets by the end of the 07/08 year.	Nutrient budgets are mandatory for B+LNZ Monitor Farms and so all have a nutrient budget. In addition, B+LNZ has also used its farm survey information to obtain some idea of overall use of nutrient budgets within the sector. This information shows a significant increase over the previous year albeit from a low base (16.7% to 23.3%), showing that uptake of nutrient budgets is making steady progress.
For sheep and beef farmers to be given an opportunity to obtain a copy of Level 1, Level 2 & Level 3 Land Environmental Plans in the 07/08 year. Goal to achieve 3000 requests from farmers for these during the 07/08 year.	In the 2009-2010 year some hundreds of Land Environment Plans (LEPS) were distributed to farmers to add to more than 700 requests received last year. Promoting uptake of the kit has been hampered by a number of factors not least of which was the loss of the wool levy in the 2009 referendum and the resulting effects on the activities of B+LNZ. There is growing recognition that the development of Land and Environment Plans can be connected to the market. Two meat processors and exporters have distributed LEP kits to farmers suppliers involved in particular supply programmes. This demonstrates that, not only is the use of LEPs of benefit to the environment, but it can also provide a basis for providing assurances to customers.
To work with the Fertiliser Industry to increase the uptake and use of the "Fertiliser Code of Practice".	The uptake of nutrient budgeting is being encouraged by B+LNZ in several ways: 1. Copies of the FCoP are available on request from B+LNZ. 2. Nutrient budgeting is required when developing a LEP Level 2 or better using the B+LNZ toolkit. This is also audited and the Overseer result recorded as part of the Asure Quality checklist. B+LNZ Monitor Farms are required to have formal nutrient budgets and management plans in place.

For 2010-2011, Beef +Lamb NZ will see the continuation of efforts to increase the uptake of LEPS. It will also initiate new initiatives aimed at providing a better knowledge base from which to more accurately target effective measures. To further support the uptake of LEPs there will be a minimum of seven regional workshops designed to give farmers an insight into their use and to discover how a Land Environment Plan can not only improve the environment but also help more efficient use of resources. In order to also raise awareness of the importance of water quality and to add further to the database of farmer knowledge water quality monitoring will now also be made mandatory on our B+LNZ Monitor Farms. There will also be two projects aimed at looking at the macro and micro effects of sheep and beef farming on quality. The first will be an analysis of water quality data that has been collected in predominantly sheep and beef farming areas. On the micro level, B+LNZ will initiate a water life cycle analysis for an average sheep and beef farm.

NZ Forest Owners Association & NZ Farm Forestry Association

The NZFOA and the NZFFA recognise the importance of sound environmental management. The forestry industry has been active over many years taking the initiative to develop improved methods of environmental management. The industry was a trend setter amongst the primary sector back in the 1990s with the release of an environmental code of practice. It has continued this innovation with the release of an updated code in 2007 and advocating for a national environmental standard for forestry which is due for release during the 2010-2011 year. The forestry industry has been active in ensuring that all members not only have a copy of the Code but are active in implementing the industry best practices that are contained within. Forest Owners are also reviewing and updating the LIRO Forest Roading Manual 1999. This should be released early in 2011, in conjunction with a handbook designed for in-field use. In addition to incorporating the latest standards in forestry road and earthwork design, greater emphasis will be placed upon control and management of sedimentation.

The NZFOA and the NZFFA are pleased with the progress made during 2009-2010 towards the achievement of the targets as set out within the PSWP Leadership document.

COMMITMENTS	2009-2010 ACHIEVEMENTS
NZ Forest Owners Association members will, within one year (December 2008), ensure that all forestry contractors operating on members' land have a field copy of the relevant Best Environmental Management Practices section of NZFOA Environmental Code of Practice (Part 1, 2007), and be cognoscente of the Compulsory Rules defined therein.	Over a period of three years the NZ Forest Owners Association, with input from its members, developed the "NZFOA Environmental Code of Practice", which replaced the NZ Forestry Code of Practice. The Code is a key environmental management reference tool for forest managers. A field guide containing the best environmental practices (BEPs) has been designed for operational practitioners. In 2008,the NZFOA undertook a survey of members to ascertain the uptake of the Code. The survey differentiated contractors into five groups. Forestry (planting, silviculture), harvesting, roading and earthworks, agrichemical and fertiliser, and others (security, mensuration). Respondents were asked to confirm if contractors had a copy of the ECoP, or a copy of the appropriate BEP's, or a copy of appropriate company rules and guidelines. The results of this survey were reported in the 2008-2009 annual report.
NZ Forest Owners Association members will, within two years (December 2009), ensure that all forestry contractors operating on members' land are in compliance with all the compulsory rules defined in Part 1 of the NZFOA Environmental Code of Practice (2007).	A survey of Forest Owners members was undertaken during the year. An excellent response from Forest Owner members to the survey was received with responses covering over 70% of New Zealand's plantation forest estate and nearly 100% of Forest Owner Association members land, or land they manage. Area of Forest Estate Reported : 1,246,129 ha Respondent Nos. = 33 Survey results indicate that forest operations for the majority of operations are undertaken in a manner that utilises operational methods that minimise microbial and sediment deposition in waterways. Of particular relevance is confirmation that 100% of new planting and replanting programmes adhere to a minimum 5 metre setback either side of permanently flowing streams. Although other measures did not show 100% achievement, this reflects the difficulty experienced in heavy machinery operation on a range of diverse landscapes and soils. While there is room for improvement on some measures, overall operation procedures are generally of a very high standard.. A summary of the survey results are set out in the Table on page 20.
Forest Owners will support Universities, research consortiums and CRIs to undertake field trials of risks, costs & benefits of incorporating environmental impact mitigation methods and techniques into common agricultural systems.	No progress in this area
Forest Owners will assist MfE to develop, within two years (December 2009), a National Environmental Standard (NES) under the RMA for a defined list of plantation forestry activities relating to protection and maintenance of water quality. The NES will aim to establish Permitted Activities conditions designed to protect water quality	Members of the NZFOA commenced discussions with the Ministry of Environment on the development of an NES in March 2009. A stakeholder group was convened in June 2009. This group included representatives of three forestry companies, the NZ Institute of Forestry, Iwi, Fish & Game, three Regional Councils, MAF & MfE A draft version of the NES will be distributed for comment in the last quarter of 2010.

Survey of forest operations management

Q1	Does your operational planning involve a documented Assessment of Environmental Effects, including a process to assess the Risk that a particular operation might pose?	**Yes**		**No**	
		78%		22%	
Q2	If you undertook Earthworks, Harvesting or Mechanical Land Preparation operations in the past year, did you undertake post-operation environmental audits using the Industry agreed voluntary rules.	**Yes**		**No**	
		97%		3%	
Q3	Does your operational planning involve a documented Assessment of Environmental Effects, including a process to assess the Risk that a particular operation might pose?	**All (100%)**	**Most (75%)**	**Some (50%)**	**None**
		78%	22%	0%	0%
Q4	What proportion of your planting or replanting programme adheres to the minimum 5m horizontal planting setback either side of permanently flowing streams?	**All (100%)**	**Most (75%)**	**Some (50%)**	**None**
		100%	0%	0%	0%
Q5	What proportion of your area harvested in the past year on slopes greater than 20 degrees was harvested using dozers, excavators or skidders requiring intensive tracking?	**None**	**Less than 10%**	**10% to 50%**	**More than 50%**
		9%	72%	19%	0%
Q6	Were water control structures maintained on landings and earthworks before, during and after harvest where required, to minimise the discharge of sediment?	**All the time (100%)**	**Most of time (75%)**	**Some of time (50%)**	**Never**
		66%	31%	2%	1%
Q7	Were slash management systems documented prior to harvest, maintained during harvest and monitored after harvest where required, to minimise the discharge of slash to streams?	**All the time (100%)**	**Most of time (75%)**	**Some of time (50%)**	**Never**
		54%	46%	0%	0%

Note: Percentages are weighted according to reporting members' gross forest area.

Reported area covers almost 100% of Forest Owners Association member reported area.
Reported area includes non-member area managed by forest managers that have responded to the survey.

Fertiliser Manufacturers Research Association

The fertiliser industry association (Fert Research) has two member companies – Ballance Agri-Nutrients Ltd and Ravensdown Fertiliser Co-Operative Ltd. These companies are co-operatives and between them supply some 95% of all fertiliser used in New Zealand. The companies each employ about 60 field representatives who are required to complete a comprehensive nutrient management training programme and whose function is to provide nutrient management advice and fertiliser recommendations to farmer shareholders. Staff use a range of tools to fulfil these obligations including the Overseer Nutrient Budgets Model.

Outputs from this model include farm level nutrient budgets and nutrient management plans. These outputs are used to increase the efficiency of nutrient use thereby assisting farmers in achieving sustainable economic and water quality outcomes.

The fertiliser industry has made good progress in meeting its targets as well as contributing significantly to meeting longer term high level primary sector targets.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Contribute to the on-going development, upgrading and implementation of the Overseer Nutrient Budget Model including: – *Incorporation of a nitrification inhibitor component by Dec 2008.* – *Incorporation of wetlands and riparian margins by December 2008.* – *Review Overseer in light of the recently announced climate change policy.* – *Incorporate priority components into the next version of Overseer for release by December 2008.*	Investment in the development and upgrading of the Overseer Nutrient Budget Model has continued. The NZFMRA has invested $1.5 million over the past three years. This matches an equivalent amount from Ministry of Agriculture and Forestry (MAF). A Governance Agreement has been signed between Fert Research, MAF and AgResearch. The three organisations are now equal joint owners of Overseer. Investment in evaluating nitrification inhibitors has resulting in an increased understanding of this product to the point where a review of the existing component in Overseer can be undertaken. A climate change course has been added to the existing Massey Overseer Intermediate and Advanced training courses. To date 797 candidates have successfully completed the Intermediate Course and 234 have successfully completed the Advanced Course.
Develop and implement an accreditation scheme for nutrient management advisors by July 2008.	A comprehensive Overseer Training Programme has been developed for fertiliser industry staff. This programme forms the basis of company accreditation of staff. An independent external audit of internal company procedures and protocols has been completed.
Implement an independent external audit process of internal company procedures for auditing nutrient budgets by December 2007. *Implement a comprehensive audit process for nutrient budgets by July 2008.*	An independent audit of on farm delivery of nutrient management plans by Ballance Agri-Nutrients Ltd, Ravensdown Fertiliser Co-operative Limited and Summit Quinphos NZ has been undertaken. The external auditor found the procedures and protocols conformed to the requirements of the Code of Practice for Nutrient Management but suggested options for streamlining some systems.
Review, update and promote the Code of Practice for Nutrient Management This will include: – *Linking the Code to Overseer by December 2008.* – *Customising the Code template according to member company requirements by July 2008.*	The review of the Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) was completed in 2008 and incorporated into company systems. The nutrient management plan template in the Code has been customised by fertiliser companies for their individual use.

In 2010-2011 the fertiliser industry will continue to work closely with the other sectors assisting in the production of nutrient budgets and nutrient management plans. The industry will continue to invest in the on-going development and evaluation of technologies such as nitrification inhibitors. Work on evaluating 'second generation' inhibitors may be commenced during the year. In addition the fertiliser industry will continue its support for the redevelopment of the OVERSEER architecture. This will make it easier to link OVERSEER to other models and management systems. The upgrade will also see the completion of the integration of pasture, crop, vegetable and fruit modules providing greater flexibility for representing a farm in the model.

Irrigation NZ

Irrigation NZ (INZ) is pro-actively working with industry, researchers, regulators and the irrigation trade, to ensure irrigators have the required skills and knowledge to implement current best management practices, and therefore efficiently manage the available water resource. INZ's involvement in the PSWP cross sector initiatives is part of a commitment to ensure all irrigators have the knowledge and skills to make a difference on their farms and within their catchments. The irrigation efficiency targets are very ambitious and it will take a concerted effort to achieve them with the limited current resources. Despite this, INZ are extremely pleased with the progress made to date and will continue to strive to meet these targets.

COMMITMENTS	2009-2010 ACHIEVEMENTS
INZ – Design Code of Practice – *User guide to the design code aimed at accelerated adoption within the industry, irrigators, regional councils and irrigation suppliers, November 2008.* – *Launch the Design Code of Practice nationally over the period September to November 2007.* – *Development of NZQA accredited training for designer certification, mid-2008.* – *Implement an industry audit process for assessing the Code of Practice, uptake by 2010.* – *Review the Design Code of Practice by 2010.*	A 'Farmers Irrigation Toolkit' guide will be released in October 2010 through a series of nationwide workshops. The toolkit contains four elements; real life case studies demonstrating the financial implications of poor design; a specification guide so farmers can accurately identify their irrigation needs; a quotation evaluation guide to aid irrigators in comparison of merits of quotations; and drafts of model clauses for inserting in contracts with suppliers to ensure irrigators get the system they pay for. An industry audit process is currently under development. It will first be implemented for water meters alongside the water measurement regulations, before being expanded and released for irrigation design and installation across NZ.
INZ Evaluation Code of Practice. – *Undertake an education programme to encourage evaluation of existing systems to meet KPI's, January to November 2008.* – *Establish and maintain a register that records number of accredited evaluators and evaluations completed, March 2008.* – *Review the Evaluation Code of Practice by 2010.*	IrrigationNZ continues to run an industry education programme around the benefits of irrigation system evaluation. A number of industry market programmes are now beginning to incorporate irrigation evaluation aspects into their market compliance programmes.
Irrigation Scheme Self Management Systems. – *Complete the study of self management systems for irrigation schemes that reflects requirements of regulators, schemes and members, environmental NGOs, iwi and community.* – *Publish and promulgate findings over period July to November 2008.* – *Industry plan in place to release Self Management Systems completed by 2010 (subject to results).*	Work is well underway in both Canterbury and Otago for the implementation of Audited Self Management for irrigation schemes. Three schemes now have successful systems operating with a number of others being in the planning stage. Funding has been received for a project to investigate Audited Self Management options at the catchment / zone level for groups of 'individual consent holders'. This project, using the Rakaia-Selwyn as a case study will explore options and produce a template for wider roll out.
Irrigation Efficiency[6] – *Develop a methodology to estimate the irrigation demand of a range of soils and enterprises, based on irrigation system performance and real-time climate data, to derive industry BMPs (end 2009).* – *Trial the methodology to identify compliance with industry BMPs and outliers in a selected irrigation region, based on measurement of actual irrigation water use.* – *Implement facilitation and improvement services to assist poorly performing systems to comply with best practice norms.* – *Work with dairy, arable and horticulture to realise the goal of having 80% of all irrigation water use under self management to meet industry good practice guidelines.*	A collaborative project, between IrrigationNZ, FAR and DairyNZ has been drawn-up and funded for the development of an 'irrigation benchmarking' system to better establish irrigation water use requirements. This project will run from July 2010 to June 2012.

6 This will require support from industries , availability of metering of water use data, and support from industry extension specialists – as specified in the Leadership document.

Federated Farmers of New Zealand

Federated Farmers has advocated the importance of the Partnership in achieving freshwater objectives at both the catchment and national levels.

The Federation has also continued to support and work with other partners to encourage central and local government to work collaboratively with the primary sector when developing water plans, policies and strategies to ensure good outcomes are achieved across all dimensions of water. At the national level this has been through the Federation's active involvement in the Land and Water Forum as a member of the Small Group. At the regional level, representatives and staff worked alongside local government authorities, farmers and other key stakeholders to develop practical solutions to water issues through the plan and policy development process as well as industry and stakeholder-led seminars, forums and focus groups.

Federated has made a valuable contribution to the administration of the Partnership.

COMMITMENTS	2009-2010 ACHIEVEMENTS
Identification of priority water bodies/catchments	Federated Farmers has continued to work with regional councils, other primary sector partners, landowners and key stakeholders to identify priority waterbodies and catchments and to develop provisions and plans around their management as well as to raise awareness about the role that PSWP could play in mitigating impacts on freshwater.
Promoting tools and mitigation practices to members to address priority areas and specific issues	Information regarding tools and mitigation practices that members can use to address water-related issues is hosted on the Federated Farmers website. Policy advisors have supported members when they require further information or assistance on these matters.
10 in 10 Campaign	The 10 in 10 campaign and its associated resources are currently being reviewed by Federated Farmers' policy staff to reflect new knowledge and information around water and the impacts that farming has on its quality and quantity.
Acknowledge other industry or sector, agreed targets and agreements	Federated Farmers continued to be involved in the PSWP catchment programmes by providing the other Partners with the necessary support to ensure that the catchment programmes are a success.
Maintain dialogue with councils to update priority areas and mitigation	Policy advisors proactively engaged with local government through planning and policy development processes to ensure that the views of farmers are well represented in these processes. Over the past year, the Federation's policy advisors were involved in water planning and policy development processes with 14 regional authorities.

Primary Sector Water Partnership

Annual Report 2009-2010