THE STATUS OF NEW ZEALAND AGRICULTURAL SECTOR OWNED ENVIRONMENT MANAGEMENT SYSTEMS (EMS) - ARE THEY A REALISTIC ALTERNATIVE TO AVERTING FURTHER ENVIRONMENTAL REGULATION?

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Abstract

The environmental sustainability of intensified New Zealand pastoral farming activities is now both measurable and questionable. Intensification of land use and consequent diffuse nutrient loss can now be irrevocably linked to water quality degradation in some Lakes and lowland rivers. With increasing confidence in the use of OVERSEER®, there is increasing ability to both measurably quantify the impact and address the issue.

Two laudable initiatives are challenging land users towards improving water quality goals; the Primary Sector Water Partnership and The Land and Water Forum. Good management practices and audited self management are principle recommendations in both of these initiatives.

The present status of three New Zealand pastoral industries Environment Management System's (EMS's) are reviewed for their adequacy to demonstrate effective self management and achieve the goals and targets outlined in both the Partnership and Forum initiatives. The review will compare these New Zealand systems with international best practice principles that include demonstrable 'continuous improvement'. Reference will be made to Australian dairy industry 'self management' programmes and their relative effectiveness.

Key challenges for the primary sector EMS's facilities will be the ability of these programmes to demonstrate; widespread uptake, credibility, transparency, audit ability and continuous improvement that is underpinned by either incentives or penalties.

There are clear challenges for the existing pastoral sector systems in New Zealand to satisfy wider community expectations for improved water quality. There are also some specific obligations in relation to co-management of catchments under the new Waikato River Settlement Act.

Provided these challenges can be met, there is a real and exciting potential for positive and collaborative change in NZ water and land resource management - a 'fresh start for Freshwater' - perhaps.

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Introduction - Status of water quality in NZ

The International Flat Earth Society is the oldest continuous Society existing on the world today – but it is down to just 60 members.

Environmental degradation, particularly of water quality is inextricably linked to the intensification of farming – as sure as the Earth is round. This presentation presumes that the participants at this 2011 FLRC workshop are united in belief that the earth is round and that where land use intensification is occurring in New Zealand we have increasingly degrading freshwater quality with minor exceptions. Recent NIWA reports confirm the linkage between land use intensification and declining water quality.

http://www.mfe.govt.nz/issues/water/water-quality.html#reports
http://www.mfe.govt.nz/publications/treaty/waikato-river-scoping-study/index.html

If modern New Zealand agriculture is to ever be truly sustainable, and not eroding our natural capital, we have to start to try and reverse water degradation trends with effective strategies that will make progress. It is encouraging to see that the dairy industry leadership now openly acknowledges nutrient-loss issues:

"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 NZ. Addressing these trends is perhaps the greatest challenge facing the Primary Sector in general and dairying in particular" DairyNZ and Fonterra PSWP Annual Report 2009-2010.

Collaborative Stakeholder Initiatives

What is also becoming clear is that what we are doing now to manage water quality degradation issues is not efficient or effective on a National scale. Recognition by most stakeholders of this failure with water quality governance in New Zealand has led to the

founding of a Government initiated stakeholder group - **The Land and Water Forum (LWF).** This forum has recently (2010) produced a report - *A **Fresh Start for Freshwater*** - www.landandwater.org.nz/ . This report contains some keys as to how we might be doing things differently in the future.

In 2008 the forum members were selected from a wide variety of industries and organisations who have an interest in water and its management – Iwi, agricultural, industrial, urban and environmental organisations – everybody with a major interest in fresh water was represented. The forum was supported by government, but not led by government, and was charged with the task of using a collaborative process to reach a number of objectives including; using a consensus process to identify shared outcomes and goals for freshwater, identify options to achieve them and compile a report for Government that recommends these shared outcomes, goals and long-term strategies for freshwater in NZ. Major policy decisions based on the forums recommendations are expected to be made in June 2011.

The Government specified 5 deliverables that it expected from the Land and Water Forum. One of these is; "encouragement of voluntary measures, continued better targeted support for primary sector partnerships". This voluntary aspect of environmental management is the primary focus of this paper.

Another laudable collaboration that deserves our attention is the **Primary Sector Water Partnership** (PSWP - May 2008). Its members are a group of major primary sector organisations that committed to goals to maintain or enhance water quality from primary production land with demonstrable and accelerated progress on the resolution of water quality issues from agricultural land within 5 years (2008 + 5 = 2013). One of the major focuses in the PSWP is Nutrient Management - including some Nutrient Management targets – one of these is; "By 2013, 80% of nutrients applied to land nationally are managed through quality assured nutrient budgets and nutrient management plans". The Partnership's latest 2009-2010 report calls its members to account against these targets and there are clearly some difficulties arising with the issue of diffuse nutrient loss as well as some good news within some specific focus catchments.

Stakeholder aspirations for Voluntary Methods

A noticeable commonality with both the LWF and the PSWP is that they both advocate strongly for voluntary measures for managing water quality. With the LWF, voluntary measures feature in 5 of the principle recommendations; codes for good management practice, continuous improvement of good management practice and particularly, audited self management. The PSWP recommendations are very similar with respect to the setting of targets including some specific nutrients related targets, and advocating for voluntary "self management regimes, with appropriate auditing". There is also some recognition in this that regulation is needed as a backstop.

Environment Management Systems (EMS)

The LWF and PSWP recommendations advocating for the use of voluntary systems for environmental management appear to have compatibility with an existing international protocol – Environment Management Systems (EMS). The underlying principles of the internationally recognised Environment Management Systems (EMS) are also fundamentally linked to International Standards for environmental Management - ISO 14001.

It may not be necessary to 'reinvent the wheel' with adopting voluntary mechanisms for water quality management amongst stakeholders in New Zealand. Perhaps the LWF's call for "A Fresh Start for Freshwater", while visionary in our context in New Zealand, can actually pick up existing and proven internationally accepted procedures through EMS? Perhaps we should look at this EMS as a probable template so we do not waste time in getting rolling with new voluntary management procedures by pondering their design when that 'wheel' already exists.

The guest speaker in the following session at this 2010 FLRC Workshop was Genevieve Carruthers, a specialist on Environment Management Systems (EMS). Refer to her following paper in these proceedings for detail of what formal EMS entails.

Brief features of EMS include fundamentals such as: it is voluntary, it is a live process, it is on-going and has an ethic of 'continuous improvement', it is a proven option for 'self management', it provides a framework and structure for declaring a specific policy related to environmental performance. The fundamental steps of EMS include; identifying risks, setting targets, listing actions, scheduling achievable actions, check-off and verification of implementation, review and the option of Certification and 3rd party audit.

Status of EMS in NZ Pastoral Farming Sectors

Table 1 below, provides a summary of the status of existing sector owned provisions for environmental management and compares them to the EMS standard features shown in the first column. Across the top of the table are 3 NZ Pastoral Sector organisations and these have been subjectively scored with ticks, crosses and question marks according to how they match up with the formal EMS principles and features.

Beef and Lamb NZ's new 2008 Land and Environment Plans (LEP) and in particular its Level 3 LEP, ticks most of the boxes and is arguably NZ's most advanced sector owned EMS. Provision of a formal monitoring and auditing system appears to be still developing but it clearly provides NZ sheep and beef farmers with an excellent platform for comprehensive and demonstrable environmental performance. The big "But" is Uptake - not a lot of farmers have picked up on it.

The **Deer Farmers Landcare Manual** 2004 has the provision of a Sustainable Management Plan (SMP) Template designed along EMS principles and theoretically ticks some of the boxes. Although the deer industry has some excellent extension provisions through monitor farms and an Environment Awards process in strong collaboration with environmental agencies (e.g. RC's and Fish and Game) their Sustainable Management Plan (SMP) provision is pretty much in recess and very few deer farmers are using it. There is currently no centralised registration of SMP plans.

The **DairyNZ** column in Table 1, is populated with ticks and question marks relating to a number of separate but not necessarily integrated initiatives; the Farm Environment Action Plan (FEAP), the Clean Streams Accord and Nutrient Management Plans (NMPs). The FEAP concept was promoted at the FLRC workshop in 2009 (proceedings pages 315 – 324) as an EMS that accommodated a "trade off" process in a "farms systems context". It was trialled on two Rotorua farms in early 2010 but its current status is unclear. The Dairy and Clean Streams Accord has terms requiring an audit process but it's not an on-farm EMS, it is an agreement between parties with specific achievement targets and timelines. The Accord is however leading to a significant roll-out of Nutrient Management Plans (NMPs). While a

NMP is a credible tool, and represents excellent advancement in practical on-farm environmental management it is not bound within an EMS-like structure that ensures adherence against EMS features, for example the ethic of continuous improvement.

EMS Features		**Beef and Lamb NZ's Land and Environment Plans (LEP) Level 3**		**Deer Farmers' Landcare Manual and Sustainable Management Plan (SMP)**		**DairyNZ – Farm Environment Action Plan (FEAP) / Clean Streams Accord / NMP's**	
Plan	Policy	✓	"..... sustainably managing air, soil and water resources …"	✓	"..... demonstrate progressive achievement of environmentally sustainable land management…"	✓	Dairy Industry Strategy for Sustainable Environment Management – recognises significant concerns
	Plan	✓	9-step programme plan including 5 specified standards	✓	SMP template and Case Study examples. Focus on LUC	✓	Proposed – Farm Environment Action Plan (FEAP)
Do	Operate	✓	Implementation via the Works Plan / prioritised tasks with 'achievable' targeting.	✓	Implementation via achievable annual increments - adjustment to farms economic performance.	✓	Proposed - Ranking process for actions based on integrated multi criteria decision making process.
	Control	**?**	Self controlled	**?**	Actions at landowner's discretion.	✓ **?**	Clean Streams Accord / NMPs FEAP Proposes self management
Check	Monitor	✓	Standards for monitoring environmental indicators every three years.	**?**	Target setting and measuring rate of achievement is recommended in template SMP	✓ **?**	Clean Streams Accord / NMPs FEAP - Proposes self management
	Record	✓	Recording achievements is a required standard	**X**	Recording of actions is voluntary, not controlled	✓ **?**	Clean Streams Accord / NMPs FEAP - Proposes self management own
Act	Review	✓	Annual at LEP level 3	**X**	Recommendation for review	✓ **?**	Clean Streams Accord / NMPs FEAP - Proposes self management
	Audit	**X** ✓	Not integral. Some processors requiring independent audit. Has an auditing guideline.	**X**	Optional at on farm level.	✓ **X**	Clean Streams Accord / NMPs FEAP - Not Integral
	Advance	✓	Advocates 'continuous improvement' and suggests optional progression to ISO 14001	✓	Advocates 'continuous improvement' and suggests optional progression to ISO 14001.	**?**	Unknown

Table 1. Summary of the status of existing sector owned provisions for environmental management.

To summarise all three sector provisions represented and summarised in Table 1: If there is to be a revolution in Water Quality management announced by Government in June 2011, as a result of the LWF recommendations in 'Fresh Start for Freshwater', all of these sectors do have some useful fundamentals, but all have major challenges ahead if they are to step-up to 'audited self-management' in the context of provision of credible, transparent and demonstrable on-farm EMS tooling.

Diagram 1 below illustrates a speculation of what could evolve in NZ after June 2011. New Zealand's pastoral sector owned and provided EMS's could be the hub of the workings for the **Fresh Start for Fresh Water.** Diagram 1

Diagram 2 below illustrates the current position of NMP's within EMS. NMP's in isolation are not an EMS. They have good potential for helping address New Zealand's water quality issues but they are not the 'be-all and end-all' of what is needed to make a profound and permanent turn around in the status of fresh water decline in NZ.

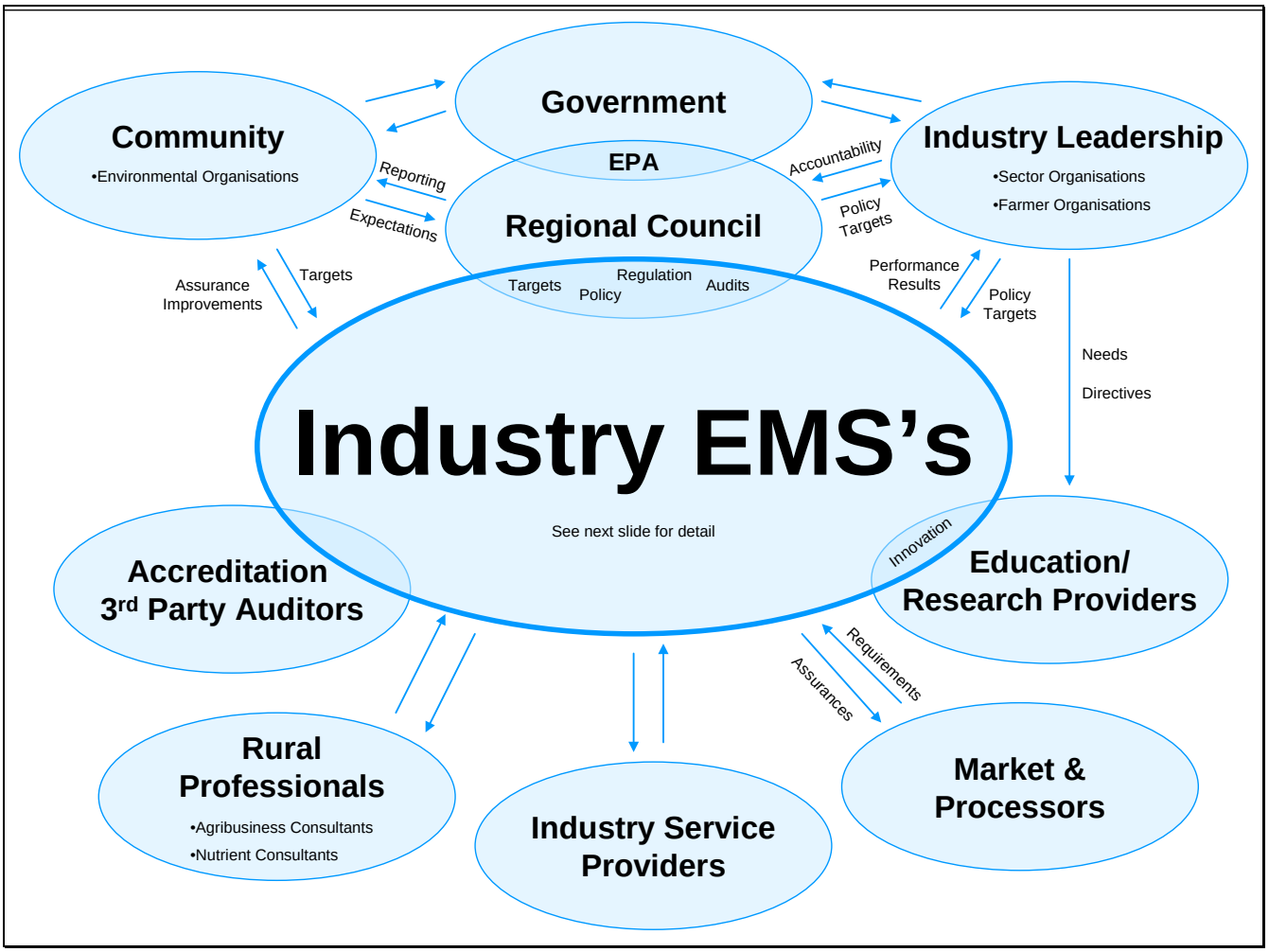

Diagram 1. Potential 'hub' role for NZ Industry EMS's

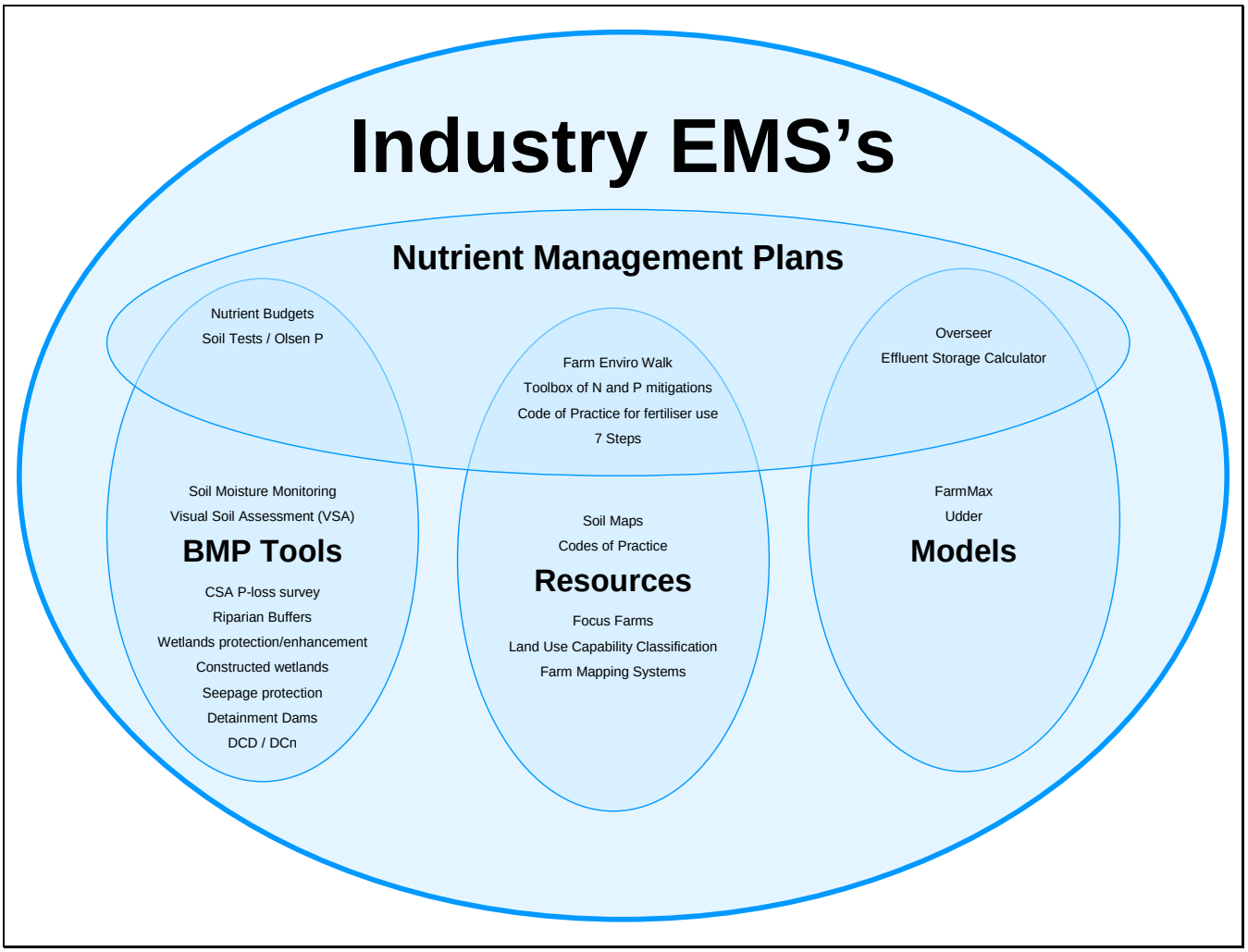

Diagram 2. NMP's are a fundamental part of a fully integrated agricultural based EMS

The Australian Experience

On farm Quality Assurance in Australia – Background

On Farm Quality Assurance Programmes are presently in operation in the Australian Dairy Industry. These have evolved as a result of potential market sanctions that could have resulted from the endosulfan residue scares of the late 90's in the Australian beef industry.
The Australian dairy industry however was also under the microscope, as there was a reasonable amount of cotton seed meal being fed as a protein and oil supplement in dairy feed mixes. The potential endosulfan residues therefore had a point of entry into the dairy supply chain.
As a result, FSANZ was active in encouraging all milk processors in Australia at the time, to get a full quality assurance programme in place in order to gain some control around traceability and risk management in the supply chain. This began at the farm.

"FSANZ (food safety Aus NZ) requires all dairy farms to have a documented on farm food safety programme"

This is an approach to whole of food chain safety. Since 2000, this programme has developed into a more comprehensive quality assurance programme for the industry.

In Practice;
Dairy Farms must implement a HACCP based Quality Assurance Program to ensure

- They gain a licence to operate from their state dairy food safety authority
- Their milk is accepted by their manufacturer

The Quality Assurance Programme covers areas such as

- Food Safety
- Animal Welfare
- Chemical Contamination
- Environmental Responsibilities

Regular auditing ensures dairy farmers assess food safety risks and ensure strategies are in place to deal with risks at all points of the supply chain.

The imminent threat to the processing industry was the potential for market sanctions. As a result, all the milk processors in the market at the time had an agreement that they had to work together on developing a programme that had consistent components. These components covered food safety and traceability down all points of the supply chain, welfare, environmental and management practises.

Due to the competitive nature of the milk processors in Victoria in the early 2000's, it was important that there was also an agreement of a minimum standard of compliance was set, across all dairy farms. This was because farmers could change milk processors at any time.

Initially there was resistance from sectors of the farming community to the implementation of the programme. However, a strong drive by processors to educate farmers for the need for it was successful in assisting the uptake and implementation on farm. There is no doubt, the pending requirements for change and adaptation were too great for some farms, and as a result, there was acceleration in exits from the industry by some farmers that were considering retiring anyway. Within three to four years, the on farm quality assurance programmes were designed, and implemented across the board.

Some milk companies introduced a financial incentive to speed up compliance levels on farm. There was also the introduction of mandatory training for farm owners and staff on farms, in order to achieve accreditation. In this training, staff and farmers gained an understanding of the importance of traceability, animal feeding and welfare aspects.

They also became conversant in environmental responsibilities, and of market pressures, and what may drive potential market sanctions.

These frameworks are still in place in Australia, with 55% of Victoria's milk supply being processed by Murray Goulburn, who is a dominant processor that ensures all their farmers and staff are part of a three day training course on quality assurance issues and requirements. This framework allows the introduction of new concepts and issues as they arise, and also assists with uptake, at the farm level, as staff and farmers become conversant with the rationale for the quality assurance programme.

NZ Challenges

The New Zealand Dairy Industry does have a quality assurance scheme in place that is audited by a third party. However, at present, there is no initiative such as mandatory training for staff and farmers for the rationale behind some of the components of the scheme. Presently there are no potential international sanctions threatening NZ dairy farmers for issues such as food safety, environmental performance, or animal management.

The only real pressures facing the industry at present are public perceptions from within the country, along with a threat of regulation in some regions. Consequently, the need for change is not as urgent as it was for the Australian Dairy Industry early in 2000-2001.

We do however understand there will be challenges ahead for the industry in order to satisfy wider community expectations for improved water quality. There are also some specific obligations in relation to the co – management of catchments under the new Waikato River Settlement Act. Information pertaining to the Vision and Strategy for the Waikato River, is available from www.river.org.nz

At present the NZ dairy industry is taking an active approach to better understand how dairy farmers may lift their production while averting further damage to the environment. There is a perception by many farmers, that if they are to be environmentally constrained in sensitive catchments, then their productivity and profitability will be adversely affected. However, there is some anecdotal evidence in some cases would appear to contravene this assumption. To be fair, we still do not have enough robust data on this to discuss it conclusively.

We do understand that in sensitive catchments, there may need to be a reduction in the load of nutrients reaching water bodies. We also need a thriving and profitable dairy industry. In sensitive catchments, we need to work closely with the innovative and leading farmers, in order to better understand their business performance and farm system management, alongside their nutrient outflows.

Through doing this, we may be able to identify a range of farm systems that are both profitable, and present a low risk to the receiving environment.

Acknowledgements

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State of play in New Zealand

As part of their role as opening speakers for this conference, the authors of this opening presentation were asked to "set the scene" for following discussion. Table 2 below provokes some topic areas on that request and outlines some opinion on; what is working?, what is not?, and where to from here?

Current state of play in NZ

	What is working	What is not	Where to from here
RMA	**Nutrient capping rules** (Var. 5, Rule 11) prevent gross land use intensification.	**Slow and cumbersome.** The horse that has bolted.	LWF. "Fresh start for fresh water"? Need the NPS on freshwater signed and actioned.
Council Initiatives	**Successfully capping nutrients in some catchments**	**Most catchments have water quality degradation issues.**	LWF. "Fresh start for fresh water"?
	Successfully engaging with some small catchment groups.	**Poor engagement with larger catchments. Farmers withholding performance information.**	Up skill of extension staff. Collaboration with Industry effort.
Community self-management	**Some catchments** are addressing water quality degradation related to farming intensification.	**Low uptake** with most communities	National, Regional and Industry leadership.
Individual self management	**Profitable, nutrient efficient farms exist in all catchments**	**Poor understanding at farmer and advisory level** to lead change	**Industry/Council incentives or regulation or both?** LWF?