



**Dairying and Clean Streams Accord
Regional Action Plan for Taranaki
Annual Report
2008/2009**

Prepared by the
Taranaki Regional Council
Private Bag 713
Stratford

October 2009

Document: 586458

Executive summary

This report reviews the Taranaki region's performance and achievement in meeting the targets of the Dairying & Clean Streams Accord, as set out in the Regional Action Plan for Taranaki, in the 2008/2009 year.

The preparation of the report is an action set out in the Regional Action Plan for Taranaki. The Taranaki Regional Council agreed from 2005 onwards to report to Fonterra and the Taranaki community on an annual basis on the targets of the Regional Action Plan for Taranaki (the Plan).

The Dairying and Clean Streams Accord is part of a range of activities to promote sustainable dairying farming in New Zealand. It focuses on reducing the impacts of dairying on the quality of New Zealand streams, rivers, lakes, ground water and wetlands to achieve clean and healthy water.

The Plan adapts the actions outlined in the Dairying and Clean Streams Accord to Taranaki conditions. The Regional Action Plan for Taranaki was prepared by local representatives of the Fonterra Co-operative Group, Federated Farmers, and the Taranaki Regional Council.

In total 1,686 property plans for Fonterra supplier dairy farms have been prepared, representing 93% of the total Fonterra supplier dairy farms in the region. Annual monitoring of works completed is conducted onsite by land management staff of the Taranaki Regional Council. In addition, all properties were inspected to monitor dairy shed discharge permit compliance. Set out below is a summary of Taranaki's progress against the targets of the Regional Action Plan for Taranaki over the 2008/2009 period:

- 93% of Fonterra supplier dairy farms in Taranaki have a property plan [**Taranaki target: 90% of dairy farms are to have a property plan by 2010**].
- 66%* (6909 km) of streambank is protected by fencing. Of the total streambank protection, 57% (5952 km) consists of fencing that was already in place (existing) at the time of preparing the property plans, 9% (957 km) consists of new work completed on dairy farms [**Taranaki target: 50% of property plans are to be implemented by 2010, 90% by 2015**].
- 56%* (4298 km) of streambank is protected by planting and vegetation. Of the total streambank protection, 48% (3699 km) consists of vegetation that was already in place (existing) at the time of preparing the property plans, 8% (599 km) consists of new work completed on dairy farms [**Taranaki target: 50% of property plans are to be implemented by 2010, 90% by 2015**].
- 98%* of all regular stream crossings points at the regional level are adequately bridged or culverted [**Taranaki target: 50% of regular crossing points are to have bridges or culverts by 2007, 90% by 2015**].
- 100% of dairy farms in Taranaki have a farm dairy effluent discharge consent that complies with the Taranaki Regional Fresh Water Plan [**Taranaki target: 100% of dairy farms to have a consent that complies with regional plan by 2004**].

* The sample size of 93% of dairy farms should be representative of regional conditions.

- 82% of regionally significant wetlands are fenced [**Taranaki target: 60% of regionally significant wetlands are to be fenced by 2005, 90% by 2010**].
- 99.5% of Fonterra supplier dairy farms in Taranaki have a nutrient budget in place [**Taranaki target: Fonterra to have 100% of dairy farms with systems in place to manage nutrient inputs and outputs by 31 December 2007**].

Overall, the Accord partners and the Taranaki dairy farming community should be satisfied with the progress made to date on most of the targets set out in the Regional Action Plan for Taranaki.

However, an issue that continues to exist is the relatively slow pace of property plan implementation. Whilst the target for 2010 has been met, this is largely due to existing fencing and planting carried out pre-Accord. If plan implementation continues at its current rate the implementation target for 2015 will not be met. The Taranaki Regional Council has continued to make adjustments to its approach to promote wider and faster implementation. However, if the 2015 implementation target is to be met, other Accord partners and ultimately dairy farmers will need to apply more effort to physical works.

Table of contents

1	Introduction	1
1.1	Purpose	1
1.2	Background.....	1
1.2.1	Regional Action Plan for Taranaki.....	2
1.2.2	Data collection and sources	2
2	Report on progress 2008/2009	3
2.1	At a glance	3
2.2	Exclusion of stock from water bodies	4
2.3	Percentage of regular crossing with bridges or culverts.....	9
2.4	Farm dairy effluent discharge compliance with plan.....	11
2.5	Protection of regionally significant and important wetlands.....	13
2.6	Nutrients are managed effectively	15
3	Water quality	17
3.1	Scope of this report in respect to water quality monitoring.....	17
3.2	Water Quality: an overview comment.....	17
4	Issues & further actions: where to from here	25
4.1	Plan implementation	25
4.1.1	Promotion of riparian management	25
4.1.2	Riparian Implementation Strategy Survey	26
4.1.3	Contractor service	26
4.1.4	Farmer financial position	26
4.2	Moving forward.....	27
5	Conclusion	29
	Glossary/Interpretation of data.....	31
	Appendix I – An example of a GIS property plan	33
	Appendix II – Property plans prepared on dairy farms to 30 June 2009	37

1 Introduction

1.1 Purpose

The purpose of this report is to review the Taranaki region's performance and achievements in meeting the targets of the Dairying & Clean Stream Accord, set out in the Regional Action Plan for Taranaki, over the 2008/2009 year.

The report is an action set out in the Regional Action Plan for Taranaki. The Taranaki Regional Council has agreed from 2005 onwards to report to the Fonterra Co-operative Group and the Taranaki Community on an annual basis on the targets of the Regional Action Plan.

1.2 Background

The purpose of the Dairying and Clean Stream Accord [the Accord] is to promote sustainable dairy farming in New Zealand. It focuses on reducing the impacts of dairying on the quality of New Zealand streams, rivers, lakes, ground water and wetlands.

The Accord is an agreement between Fonterra Co-operative Group [Fonterra], regional councils, unitary authorities, the Ministry for the Environment, and the Ministry of Agriculture and Forestry to work together to achieve clean healthy water in dairying areas. The goal is to have water that is suitable, where appropriate, for fish, stock water and swimming (in areas defined by regional councils).

The six priorities for actions outlined in the Accord are:

- the exclusion of dairy cattle from streams, rivers and lakes and their banks;
- farm races are to include bridges or culverts where stock regularly cross a watercourse;
- that farm dairy effluent is appropriately treated and discharged;
- that nutrients are managed effectively to minimise losses to ground and surface waters;
- regionally significant wetlands are to be fenced and their natural water regimes are protected; and
- Fonterra and regional councils develop regional action plans to implement the Accord by June 2004.

1.2.1 Regional Action Plan for Taranaki

The Taranaki Regional Council has agreed to report to Fonterra and the Taranaki Community at an aggregated regional level on the following:

- Number of farms with a riparian property plan and the implementation of such plans;
- Percentage of regular crossings with bridges or culverts;
- Farm dairy effluent discharge compliance with the Regional Fresh Water Plan for Taranaki; and
- Protection of regionally significant and important wetlands.

Fonterra has agreed not to collect Accord-related information from Taranaki dairy farmers that the Taranaki Regional Council is to collect as part of the Regional Action Plan. This approach is to ensure that there is no duplication in information collection and reporting. Fonterra make an annual contribution to the Taranaki Regional Council for its Accord related work.

From 2010 reporting will also be done at the individual property level.

1.2.2 Data collection and sources

The information for this report has been collected by the Taranaki Regional Council through the development and monitoring of property plans, the monitoring of consents and other sources of information as follows:

- Individual property plans are prepared from a GIS database framework with all measurements of lengths and areas completed to $\pm 5\%$. Information is then collected during the year on plan implementation (mainly on fencing and planting streambanks and stream crossing structures).
- Monitoring of consent compliance for dairy shed wastewater was undertaken with specified monitoring procedures on 100% of dairy farms.
- Wetland protection information was obtained from ongoing site visits/monitoring conducted by officers of the Taranaki Regional Council to identify the status and protection requirements of the wetlands.
- Information on nutrient budgets was obtained from Fonterra.






Note: a glossary is provided on page 31 of the report outlining the meaning of the terms noted above, such as monitoring, and also includes an interpretation of the following terms: reporting period, sample size, and the total length of stream bank protected by fencing and planting.





2 Report on progress 2008/2009

2.1 At a glance

Progress on the Accord targets is summarised in Table 1. A detailed overview of the targets follows throughout section two of the report.

Table 1: Progress on Accord Targets

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	Target	Are we on track?
% of dairy farms that have a property plan	36%	49%	62%	78%	93%	90% of dairy farms to have a property plan by 2010	
% of streambank protected by fencing on all property plans prepared	54%	57%	60%	61%	66%	50% of property plans to be implemented by 2010	
- % of streambank protected by existing fencing	50%	52%	55%	55%	57%	90% by 2015	
- % of streambank protected by new fencing	4%	5%	5%	6%	9%		
% of streambank protected by planting & vegetation on all property plans prepared	42%	44%	47.3%	51%	56%	50% of property plans to be implemented by 2010	
- % of streambank protected by existing vegetation	37%	39%	41.7%	45%	48%	90% by 2015	
- % of streambank protected by new planting	5%	5%	5.6%	6%	8%		

	2004/2005	2005/2006	2006/2007	2007/2008	2008/09	Target	Are we on track?
% of regular crossings with bridges or culverts on the property plans prepared	96%	97%	93%	97%	98%	50% of regular crossing points are to have bridges or culverts by 2007, 90% by 2015	
% of dairy farms that have a effluent discharge consent that complies with the Fresh Water Plan	99.90%	99.95%	100%	100%	100%	100% of dairy farms to have a consent that complies with regional plans by 2004	
% of regionally significant wetlands fenced	64%	74%	79%	76%	82%	60% of regionally significant wetlands are to be fenced by 2005, 90% by 2010	
% of farms with nutrient budget in place (Fonterra data)	22%	39%	65%	99.1%	99.5%	Fonterra to have 100% of dairy farms with systems in place by 2007	

2.2 Exclusion of stock from water bodies



Implementation

The Taranaki Regional Council has been working with landowners to develop property plans since the conception of the riparian management programme in 1993. This has been a voluntary programme for landowners.

Part of a typical plan is shown in Appendix I (page 33).

To date 1,686 property plans have been prepared for Fonterra supplier dairy farms, out of a total of 1,806 Fonterra supplier dairy farms in Taranaki; which is 93% of all Fonterra supplier dairy farms in Taranaki. This represents an increase of 15% from that recorded in 2007/2008 – refer to Figure 1.

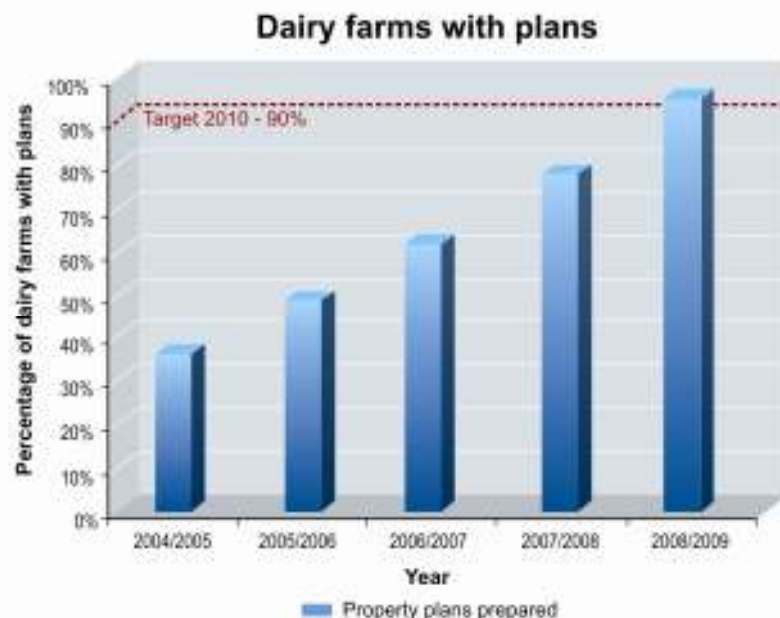


Figure 1: Percentage of dairy farms with a property plan (2004/2005 – 2008/2009)

Approximately 176, 583 hectares of dairy farming land has been covered by the plans prepared.

A map of all the plans prepared on dairy farms is shown in Appendix II (page 37).

Of the 1,686 property plans prepared, a total of 6,909 kilometres of streambank is fenced, with a total of 4,298 kilometres protected by planting and vegetation (natural bush).

A total of 3,555 kilometres of fencing is proposed [unfenced], whilst a total of 3,441 kilometres of planting is proposed [currently not planted/vegetated or requiring additional planting].

Therefore, of the property plans prepared, a total of 66% of the streambank is protected by fencing with a total of 56% protected by vegetation (refer to Tables 2 and 3).

The majority of protection is from fencing and vegetation that was already in place at the time of plan preparation. As at 30 June 2009, a total of 5,952 kilometres of fencing was recorded as already in place (existing) at the time of plan preparation (making up 57% of the total streambank protection), with a total of 3,699 kilometres of vegetation already in place at the time of plan preparation (making up 48% of the total streambank protection).

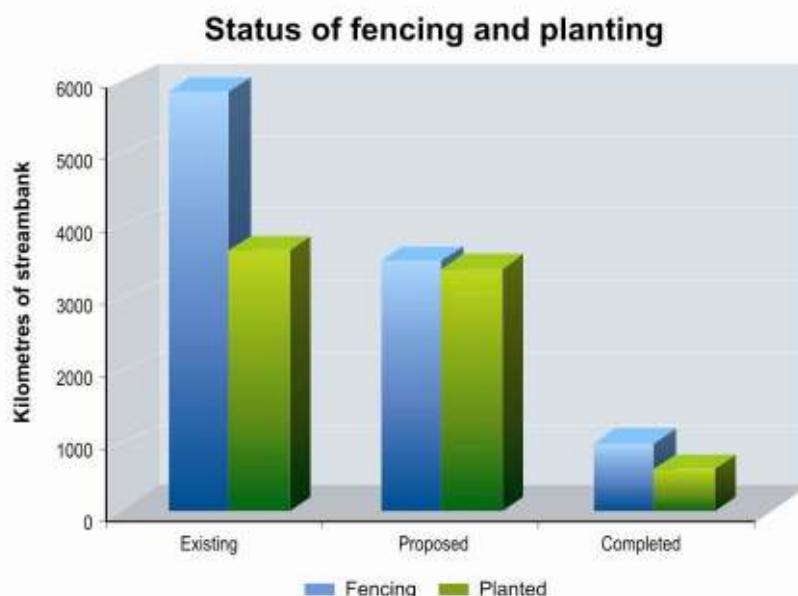


Figure 2: Status of fencing and planting in Taranaki – 2008/2009

A total of 957 kilometres of new fencing has been completed (making up 9% of the total streambank protection), whilst a total of 599 kilometres of planting has been carried out (making up 8% of the total streambank protection).

Table 2: Status of streambank fencing on Taranaki dairy farms

Kms	To 2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Existing at time of plan preparation to date	2573	3357	4256	5140	5952
Completed on all property plans to date	196	308	393	523	957
Total fencing protection	2769	3665	4649	5663	6909
Proposed fencing	2405	2752	3128	3616	3555
Total recorded streambank: Fencing (protected + proposed)	5172	6415	7776	9278	10464
% of streambank protected by fencing	54%	57%	60%	61%	66%

Table 3: Status of streambank planting/vegetation on Taranaki dairy farms

Kms	To 2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Existing vegetation at time of plan preparation to date	1537	1960	2500	3170	3699
Completed on all property plans to date	203	268	336	419	599
Total planting/vegetation protection	1740	2228	2836	3589	4298
Proposed planting	2424	2810	3159	3410	3441
Total recorded streambank: Planting (protected + proposed)	4164	5038	5995	6999	7739
% of streambank protected by planting	42%	44%	47.3%	51%	56%

Rate of implementation

Whilst the rate of implementation by Taranaki dairy farmers of new fencing and planting has been slow, the 2010 target of 50% streambank protection has been met, thanks to the work carried out on Taranaki dairy farms pre-Accord.

However, the Taranaki dairy farming community will not be able to rely on the work carried out pre-Accord to meet the 2015 target. The annual average rate of implementation will need to increase substantially (approximately threefold for fencing and fivefold for planting), to meet the 2015 target.

The service

The plan preparation service is offered free of charge and supported by the Riparian Plant Scheme. The 'Riparian Plant Scheme' provides plants at cost to Taranaki Regional Council riparian plan holders.

The scheme involves the Council contracting nurseries to supply suitable native riparian planting material. By bulk purchasing these plants, the cost of the plants is reduced and the Council then passes on these savings to riparian management plan holders.

In 2008/2009, the Council supplied a total of 254,038 plants to 702 property plan holders, bringing the total number of plants supplied under this scheme to 1,563,660 (refer to Table 4).

Information packages outlining all aspects of the property plan programme are available to all interested parties. Taranaki Regional Council staff also attend workshops and field days to advocate the benefits of developing a property plan and to promote good riparian management.

In addition, the Council has implemented a Communications Plan to promote the implementation of property plans (refer to Section 4, page 25).

Table 4: Number of riparian plants supplied

Year	Number
1996/1997	15,656
1997/1998	25,000
1998/1999	32,630
1999/2000	51,320
2000/2001	69,400
2001/2002	92,000
2002/2003	115,000
2003/2004	95,018
2004/2005	219,000
2005/2006	150,691
2006/2007	200,038
2007/2008	243,869
2008/2009	254,038
Total	1,563,660

Monitoring

The Taranaki Regional Council property plan monitoring programme has been established based on a GIS mapping system. Annual monitoring of works completed (including fencing and/or planting) is conducted onsite by land management staff of the Taranaki Regional Council. The database records the date and extent of all works completed with considerable accuracy at the farm level and by extension at aggregated levels.

Action plan

The Taranaki Regional Council will continue to provide advice and information to landowners as at present. Whilst the 2010 target has been met for plan implementation, this is mainly due to existing fencing and planting, that is work carried out pre-Accord. Monitoring by the Council confirms that the implementation rate of plans is slow, as shown in Figure 2, if the implementation rate of plans continues at the same rate, Taranaki will not meet the target set for 2015. The Taranaki Regional Council cannot at this time enforce the implementation of property plans and therefore any increase in implementation will have to come from the efforts of the farming community and/or the other partners involved in the Accord.

2.3 Percentage of regular crossing with bridges or culverts

TARANAKI TARGET

Regular crossing points bridged or culverted



Implementation

On-farm analysis has been carried out by the Taranaki Regional Council to identify the stream crossing issue in Taranaki and the options to address the issue during the preparation of the individual property plans.

Table 5: % of regular crossings with bridges or culverts 2004/05 on property plans prepared – 2008/09

	2004/05	2005/06	2006/07	2007/08	2008/09
% of regular crossings with bridges or culverts	96%	97%	93%	97%	98%

Included on each property plan are the types of existing crossings, new crossings needed and the location of the crossings.

Of the 1,686 property plans prepared, 98% of regular stream crossing points are adequately bridged and/or culverted (refer to Table 5).

An information sheet has been prepared by the Taranaki Regional Council regarding the construction of bridges and culverts for stock access purposes. The information sheet outlines smart options for stream crossings and clarifies consent requirements.

In addition, the Council has published a guideline (on behalf of the Taranaki Rural Sustainability Community Group) for farmers on the design, installation and maintenance of culverts, so as to minimise impacts upon fish passage, bank erosion, streambank degradation, and to achieve the goal of the Dairying and Clean Streams Accord. The development of the Guidelines was supported by the Ministry of Agriculture and Forestry Sustainable Farming Fund.

The Taranaki Regional Council also provides resource consent advice and information in regard to the construction of bridges and culverts.

Monitoring

Stock crossings that are required are included on each property plan prepared. Each property plan is updated on an annual basis and the monitoring identifies the number of required crossings installed.



Guideline produced by the Council on the installation of culverts

Action plan

The Taranaki dairy farming community have achieved the targets set for 2007 and 2015 and should be congratulated. The Taranaki Regional Council will continue to provide advice and information as at present to maintain delivery of the target. Based on the estimated plan output per annum and the work carried out to date, the Taranaki dairy farming community should continue to meet the target set for 2015.

2.4 Farm dairy effluent discharge compliance with plan

TARANAKI TARGET

Dairy farms are to have farm dairy effluent discharge consent that complies with the regional plan



Implementation

All dairy farms in Taranaki have a farm dairy effluent discharge consent that complies with the Regional Fresh Water Plan for Taranaki¹.

Table 6: % of dairy farms that have an effluent discharge consent that complies with the Fresh Water Plan 2004/05 – 2008/09

	2004/05	2005/06	2006/07	2007/08	2008/09
% dairy farms	99.90%	99.95%	100%	100%	100%

The Taranaki Regional Council has in place an extensive farm dairy discharge monitoring programme². The programme includes providing advice and information for all types of systems used to treat and dispose of farm dairy effluent. Such advice and information includes:

- improving existing effluent treatment systems
- effluent collection
- system selection and design
- management and maintenance
- design criteria for some systems.

Issuing, monitoring and enforcing resource consents using the latest technology, are also addressed in the programme.

Monitoring

The Taranaki Regional Council annually inspects all farm dairy effluent systems for compliance with resource consent conditions. All monitoring information is recorded in the Council's database. Appropriate enforcement action occurs where compliance is deficient. The rate of compliance with consent conditions after first inspection in 2008/2009 was 96% (refer to Table 7, page 12).

¹ Essentially this means that all dairy farms in Taranaki have a resource consent for the discharge and disposal of dairy effluent. The systems are then monitored for compliance with resource consent conditions (refer to Table 7, page 12).

² Taranaki Regional Council, 2007. *Farm Dairy Discharge Monitoring Programme*.

Table 7: Farm dairy discharge enforcement tools used and compliance rates

Enforcement tools used	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Abatement notices	105	117	108	73	74	71
Infringement notices	2	4	14	11	7	15
Prosecutions	1	0	0	4	3	2
Consent non-compliance rate	4.9%	4.3%	4.8%	2.8%	3.9%	4.0%

The overwhelming majority of dairy farmers are in compliance with their resource consents and should be congratulated. The minority in non-compliance will be monitored and appropriate action taken. Most of the non-compliance is minor and enforcement is taken for the significant non-compliance.

Action plan

The Taranaki Regional Council will continue to offer advice and support to Taranaki dairy farmers throughout the region along with carrying out annual inspections, with necessary enforcement, to confirm compliance and maintain delivery of the target.

2.5 Protection of regionally significant and important wetlands

TARANAKI TARGET

Regionally significant wetlands to be fenced



WETLANDS STATUS

22 wetlands within dairy farms - June 2009*

18 wetlands are protected - June 2009

4 have stock access (not protected) - June 2009

Implementation

The Taranaki Regional Council has continued to advocate wetland protection through education, advice, funding, and information as part of the sustainable land management programme.

As illustrated in Figure 3, the number of wetlands protected in 2008/2009 has increased from the number recorded in 2007/2008. At present 82% of wetlands are protected, up from 76% recorded in 2007/2008.

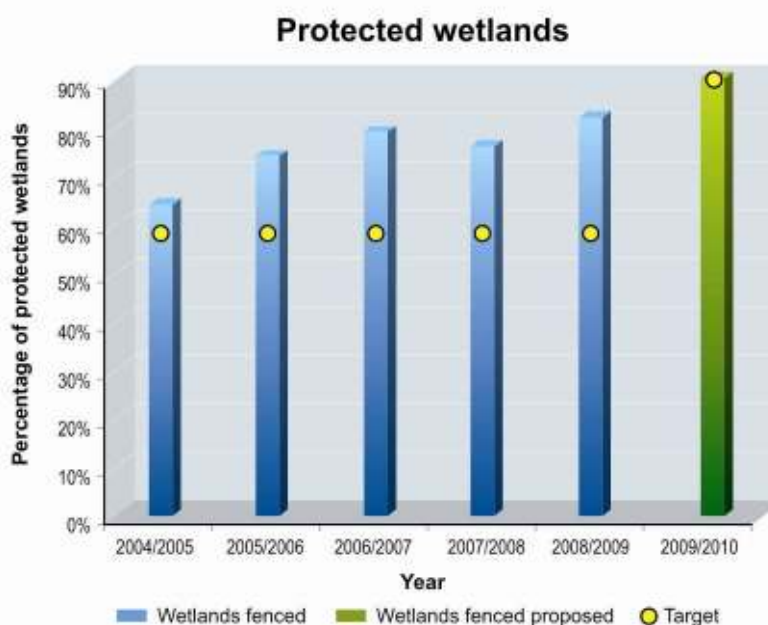


Figure 3: Wetlands fenced and proposed 2004/2005 – 2009/2010

Taranaki Regional Council staff conducted site visits to properties with significant wetlands as part of the Taranaki Regional Council's Biodiversity work. At these site visits dairy

* The number of wetlands on dairy farms in Taranaki is not static, due to land use changes, such as farm conversions, residential subdivision development.

farmers were offered advice with regard to protecting the significant wetlands on their properties and were encouraged to fence the wetlands.

In addition, on-farm analysis is carried out annually to identify the status and protection requirements of wetlands on dairy farms in Taranaki whilst preparing and monitoring property plans.

Monitoring

The Taranaki Regional Council maintains a database of the regionally significant wetlands. The database includes information on location, property owner/occupier and current protection status (including the level of protection and the extent of fencing). Regionally significant and important wetlands are included on each property plan prepared. The level of protection for each wetland is monitored and recorded on each plan.

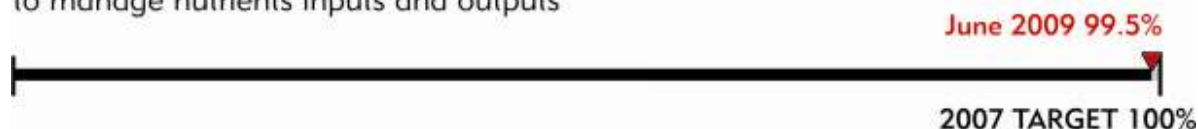
Action plan

The Taranaki Regional Council is currently working with landowners for the enhanced protection of the wetlands, whilst working with the dairying community to maintain and enhance the already protected wetlands.

2.6 Nutrients are managed effectively

TARANAKI TARGET

Dairy farms to have systems in place to manage nutrients inputs and outputs



The Taranaki Regional Council is not required to collect information and/or report on nutrient inputs and outputs, as it is the responsibility of Fonterra under the Regional Action Plan for Taranaki. The information is only included to provide a complete progress report on Taranaki's performance in achieving the targets of the Regional Action Plan.

Table 8: % of farms with nutrient budget in place 2004/05 – 2008/09

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
% of dairy farms with a nutrient budget in place	22%	39%	65%	99.1%	99.5%

As at 30 June 2009, 99.5% of Fonterra supplier dairy farms had a nutrient budget in place. Fonterra data in Table 8 shows that the percentage of farms with a nutrient budget in place has steadily been increasing since the implementation of the Accord.

Implementation

The responsibility for sound nutrient management is placed on the individual farmers. However, a number of initiatives are in place throughout New Zealand to actively promote nutrient management. The initiatives include:

A code of practice for fertiliser use [implemented by Fert Research]. This involves:

- A voluntary code of practice that sets limits on nutrient levels³; and
- User guides available to all interested parties that outline best practice in terms of fertiliser use in meeting production and environmental goals.

The Fertmark quality assurance programme. This involves:

- The registration of fertiliser products to Fertmark's constitution and rules; and
- Independent audits of nutrient levels on manufacturers and importers registered to Fertmark are carried out.

Fertiliser companies each provide advice and information to their clients on nutrient budget services, soil testing, and product information and development.

³ Ballance Agri-Nutrients and Ravensdown Fertiliser Co-operative both promote the voluntary code of practice.

Monitoring

Information on nutrient budgets on Taranaki dairy farms has been obtained from Fonterra. It is a mandatory requirement that all suppliers have a budget available at annual dairy inspections, with a \$200 revisit fee in place for suppliers that do not produce a nutrient budget at inspections.

Action Plan

The responsibility for sound nutrient practice to minimise losses to ground and surface waters sits largely with the individual farmer. However, support and guidance from Fonterra and the fertiliser companies are essential in encouraging farmers to meet the targets of the Accord. At present, information obtained/recorded by Fonterra shows that 99.5% of Taranaki dairy farms have a nutrient budget in place.

3 Water quality

3.1 Scope of this report in respect to water quality monitoring

The Accord targets focus on outputs to achieve defined goals as noted earlier. Success or otherwise in achieving the water quality goal is not measured as a part of the Accord but Councils, including this Council, have state of environment monitoring programmes in place to measure the performance of their policies including those of the Accord.

The Dairy and Clean Streams Accord is but one of the many strategies and activities in place to promote water quality objectives in the Taranaki region. For example, very substantial projects and programmes exist to provide for effective and appropriate industrial and municipal waste and wastewater disposal. The Council recognises that a wide range of activities and processes, both natural and manufactured, influence water quality in the region.

The Taranaki Regional Council has in place a comprehensive state of the environment monitoring programme which is regularly reviewed and reported on. It is not proposed to annually undertake a specific water quality report related to Accord related activities as such a task would be fraught with analytical and interpretation complexities providing little confidence in the reliability of any assessment or evaluations.

That noted, a qualified, overview statement is provided herein, simply to present an early alert to any plainly obvious trends which arise from dairy farming activities, whether in whole or in part.

3.2 Water Quality: an overview comment

The Taranaki Regional Council initiated comprehensive state of environment monitoring (SEM) in 1995 to inform itself and the regional community on the state of the region. The results of the programme describing Taranaki's environment have been comprehensively reported three times to date, in the 1996, 2003 and 2009 State of the Environment Reports^{4,5,6}.

The three main components of interest when determining freshwater quality are physicochemical, biological, and microbiological monitoring results. When carried out consistently for successive years the data can be utilised to determine water quality trends, as well as the current state. With 12 years of physical and chemical data analysed by the Taranaki Regional Council for 10 state of the environment monitoring sites, detection of trends in water quality through statistical analysis is now possible (refer to Table 9, page 18).

Water quality data is also available for a longer period for three sites that have been monitored by NIWA as part of the national river water quality monitoring programme. Trends have been analysed for the whole 18 year dataset for these sites and compared with trends in the data for these three sites over the past 12 years (refer to Table 10, page 19). These comparisons enable us to detect *changes* in the trends over the longer term.

⁴ Taranaki Regional Council, 1996. *State of the environment, Taranaki region*.

⁵ Taranaki Regional Council, 2003. *Taranaki – Our place, Our Future. Report on the state of the environment of the Taranaki region – 2003*.

⁶ Taranaki Regional Council, 2009. *Taranaki - Where We Stand. State of Environment Report 2009*.

Table 9: Trends in surface water quality at state of the environment monitoring sites in Taranaki: 1995-2007

Catchment Level	Location	Water Quality Variable												
		Dissolved Reactive P	Total Phosphorus	Nitrate	Ammonia-N	Total Nitrogen	Faecal coliforms	Enterococci	Conductivity	black Disc	Suspended Solids	Temp °C	Biochemical O ₂ Demand	pH
Upper	Patea River Barclay Rd	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Upper/Middle	Punehu Stream Wiremu Rd	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Middle	Stony River Mangatete Road	☹	☹	☺	☺	☺	☹	☺	☺	☹	☹	☺	☺	☺
Middle	Patea River Skinner Rd	☹	☺	☹	☺	☹	☺	☺	☺	☺	☺	☺	☺	☺
Middle	Waiwhakaiho SH3	☹	☹	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Middle	Waingongoro Eltham Rd*	☹	☺	☹	☺	☹	☺	☺	☺	☺	☺	☺	☺	☺
Lower	Mangaoraka Stream Corbett Rd	☹	☺	☺	☺	☺	☺	☹	☺	☹	☺	☺	☺	☺
Lower	Waingongoro SH45	☺	☺	☺	☺	☹	☺	☹	☺	☺	☺	☺	☺	☺
Lower	Punehu Stream SH45	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Lower	Mangaehu River Raupuha Rd	☹	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
Total no. sites: Improvement ☺		0	0	0	1	4	1	0	2	0	0	3	1	0
No change ☺		2	8	7	9	3	8	8	10	8	9	7	9	10
Deterioration ☹		8	2	3	0	3	1	2	0	2	1	0	0	0

Key:

- * Data for this site only for the past 9 years: 1998 – 2007
- ☺ statistically very significant improvement P<0.01 (1%)
- ☺ statistically significant improvement P<0.05 (5%)
- ☺ no statistically significant change
- ☹ statistically significant deterioration P<0.05 (5%)
- ☹ statistically very significant deterioration P<0.01 (less than 1% probability that the trend is due to natural variability and doesn't represent an actual change)

Table 10: Trends over the past 18 years and over the past 12 years – tables (a), (b) and (c)

(a) Waingongoro River at State Highway 45

	18 years	
		12 years
Ammonia	☹️	
		☹️
DRP	☹️	
		😐
Total Phosphorous	☹️	
		😐
Nitrate	☹️	
		☹️
Total Nitrogen	☹️	
		☹️
Clarity	😐	
		😐

(b) Manganui River at State Highway 3

	18 years	
		12 years
Ammonia	😊	
		😐
DRP	😊	
		😊
Total Phosphorous	😊	
		😊
Nitrate	😐	
		😐
Total Nitrogen	☹️	
		😐
Clarity	😊	
		😐

Key:

- 😊 statistically significant improvement P<0.01 (1% probability of error)
- 😄 statistically significant improvement P<0.05 (5% probability of error)
- 😐 no statistically significant change
- ☹️ statistically significant deterioration P<0.05 (5% probability of error)
- ☹️ statistically significant deterioration P<0.01 (1% probability of error)

Data: NIWA

Examining Table 9 (trends over 10-12 years) and Tables 10 (trends over 12 years compared with trends over 18 years), what is noticeable is that traditional and fundamental indicators of concerns over pollution, organic matter (BOD), suspended solids, clarity, conductivity (dissolved matter), and bacterial contamination, generally show no apparent trends at most sites over the past 12 or 18 years.

Fundamentally, these aspects of water quality could be considered stable. This is during a time when the number of consents involving water abstractions and discharges has increased considerably, urban centres are spreading, and livestock farming has intensified.

(c) Waitara River at Bertrand Road Bridge

	18 years	
		12 years
Ammonia	😊	
		😐
DRP	☹️	
		😐
Total Phosphorous	😐	
		😐
Nitrate	😐	
		😐
Total Nitrogen	☹️	
		☹️
Clarity	😐	
		😐

However, more nutrients are being released into the region's streams overall, particularly in the middle and lower catchments. At sites with 18 years of data, all of these trends in nutrients have either plateaued or have become less statistically significant, that is, the rate of deterioration may have slowed down at these sites.

While increased nutrient levels are not being reflected in trends in the aquatic health of streams of the region⁷ (i.e. ecological health is improving in the region's streams, particularly at mid and lower catchment sites); increasing nutrients into the mid and lower reaches of the region's catchment where stream ecological health is already poorer than in upper catchments and less than what might be expected in ideal conditions, is of concern. Furthermore, trends in nutrient losses from land to fresh water is a real issue for Taranaki, environmentally and economically.

Changes in the amount of organic wastes

Biochemical oxygen demand levels, an indicator of the amount of organic wastes entering our streams, are a 'good news' story for the region's streams. They show no apparent trends over the past 12 years, despite increasing intensification of dairy farming during this period. Some extrapolation from earlier data suggests instream BOD levels may have actually fallen⁸. This may reflect the adoption of treatment pond designs that provide a higher degree of treatment for dairy farm effluent, an increasing proportion of such ponds discharging to land instead of to water, and improvements in the quality of other discharges.

Changes in phosphorus levels

The overall story for phosphorus, particularly dissolved reactive phosphorus, is however not such good news. In addition to many sites not meeting phosphorus targets, most sites in the Council's monitoring programme (80%) show a statistically significant deterioration in dissolved reactive phosphorus has occurred over the past 12 years, and a couple of sites also show deterioration in total phosphorus (refer to Table 9).

Deterioration found at sites in upper catchments most probably reflects natural causes such as an increase of phosphorus leaching from volcanic material exposed by subsidence and erosion events within the headwaters in the National Park. However, deteriorating trends in the middle and lower catchments will have been influenced by farming activities within the catchments, as well as these natural events.

At the mid-catchment site in the Waingongoro River (upstream of the Eltham wastewater treatment system and the Riverlands meatworks discharges), dissolved reactive phosphorus deteriorated over the past nine years (refer to Table 9). Interestingly, while dissolved reactive phosphorus has shown deterioration when viewed over the past 18 years at a site further down the catchment (State Highway 45) (refer to Table 10), over the past 12 years levels have shown no apparent trend at this site. This suggests that the deteriorating trend may have been arrested in recent years. This may be attributed, at least in part, to reduced waste loadings from the Riverlands meatworks discharge. A similar pattern has been found in the Waitara River at Bertrand Road (refer to Table 10). Interestingly, significant improvements in dissolved reactive phosphorus levels in the Manganui River at SH3 are evident over the past 18 years and even more so over the past 12 years (refer to Table 10).

⁷ Taranaki Regional Council, 2009. *Taranaki – Where We Stands. State of Environment Report 2009.*

⁸ Taranaki Regional Council, 2006. *Trends in the quality of the surface water of Taranaki.*

Changes in nitrogen levels

The overall story for nitrogen in Taranaki's waterways is more positive, although some concerns do emerge. The majority (70%) of Council's monitored sites show no statistically significant change in nitrate or total nitrogen levels over the past 12 years, and ammonia levels have not statistically changed at any of the monitored ring plain sites (Table 9). These results are encouraging, as the use of nitrogenous fertiliser, especially urea, is increasing, and intensification of stocking rates means more urine in paddocks and more effluent in ponds. All these mean more nitrogen, primarily as ammonia which is transformed into nitrate, potentially entering our environment. Stabilisation of ammonia concentrations in particular indicates enhanced treatment of effluent and disposal to land rather than water are showing environmental benefits. However, some sites in the mid-catchment zone do show deterioration in either or both nitrate and total nitrogen, probably due to the pressures discussed above.

Over the longer term, nitrate levels in the Waingongoro River at SH45 have deteriorated over the past 18 and 12 years (Table 10), but this trend is not evident over the past nine years (Table 9). While ammonia levels have also been deteriorating over the past 18 years at the same site, this trend may likewise have been arrested over the past nine years (Table 9). This could also be due to improvements in the Riverlands discharge.

The lower Mangaehu River site (a hill country site in the Patea catchment) has shown statistically significant improvements in both ammonia and total nitrogen trends, for reasons as yet unknown.

Changes in bacteria levels

Most sites monitored do not show statistically significant trends in levels of bacterial contamination (either faecal coliforms or enterococci). Two lower catchment sites, of the Mangaoraka Stream and Waingongoro River, show anomalous trends of significant deterioration in levels of enterococci, but no changes in faecal coliforms. This is an unusual situation that could be due to environmental growth of enterococci, but warrants further investigation.

Changes in other variables

Dissolved oxygen levels in surface water throughout Taranaki are consistently high, and this situation is not changing.

Clarity, measured by the black disk method, is not significantly changing in 85% of the monitored sites. The exceptions are the Stony River (due to natural erosion episodes), and in the lower Mangaoraka Stream, where clarity is deteriorating.

Trends in temperature can be analysed from the Council's state of the environment programme because they are taken at the same time of day at each site. Interestingly, temperatures in our streams and rivers are either not changing significantly, or are measurably improving (i.e. getting cooler). The cooling effect is most pronounced further downstream on the ring plain, rather than at upper catchment sites, suggesting an influence other than natural temperature fluctuations.

Freshwater macroinvertebrates

The Council's SEM programme also measures freshwater macroinvertebrates in the region. The presence and abundance of different types of macroinvertebrates is an excellent indicator of freshwater quality. The key index used to measure freshwater

macroinvertebrates is the 'Macroinvertebrate Community Index' (MCI) which is based on scores for individual taxa living in stony streams according to their particular tolerance to organic pollution or nutrient enrichment. The higher the MCI the greater the proportion of organisms that prefer better water quality and better ecological conditions⁹.

A total of 53 sites in 23 rivers and streams have been surveyed as part of the programme, to monitor long-term regional water quality trends over the 12 year period (1995-2007). The results of the programme are reported in the Council's 2009 State of the Environment Report¹⁰, and are discussed briefly below.

Table 11: MCI categories of Taranaki stream 'health'

Grading	MCI
Excellent	>140
Very Good	120-140
Good	100-119
Fair	80-99
Poor	60-79
Very Poor	<60

Median MCI scores of greater than 120 were recorded at 10 sites, which included the upper reaches of the Patea, Manganui, Waiwhakaiho, Kaupokonui and Waingongoro rivers and Timaru, Maketawa, Waimoku and Katikara streams. MCI scores of greater than 120 are indicative of very good stream health, high water quality and good habitat conditions.

Eleven sites recorded good stream health scores (MCI scores between 100 and 119). The sites were mainly situated in mid to upper catchments, with these sites reflecting effects such as non-point source run-off, point source discharges and physical habitat changes downstream of the Egmont National Park boundary.

Twenty eight sites recorded fair stream health scores (MCI scores between 80 and 99). The sites tended to be located in the mid to lower reaches of rivers and streams, where cumulative impacts of point and non-point source discharges, and stream bed and stream bank changes, were more pronounced.

Four sites recorded poor stream health scores (MCI scores between 60 and 79). The sites were located in two smaller streams subject to point source organic overloading (Mangawhero Stream) and intensively industrialised catchments (Mangati Stream).

Of the 53 sites monitored, no site has significantly deteriorated and 17 sites have shown a statistically and/or ecologically significant improvement, with seven showing a highly significant improvement.

This general improvement in river and stream health is occurring principally at sites in the middle and lower reaches of catchments. These reaches are those that are most intensively used and under the greatest pressures. Reasons for the improvement relate primarily to improvements made to point source discharges, the improvements include, among other things, better compliance with farm dairy waste disposal conditions and other agriculture discharges (i.e. the disposal of waste from a piggery). Other reasons for improvement include natural events such as less severe flood events in an otherwise erosion-prone catchment.

⁹ Stark, J.D. 1985. *A Macroinvertebrate Community Index of Water Quality for Stony Streams*. Water and Soil Miscellaneous Publication No. 87.

¹⁰ Taranaki Regional Council, 2009. *Taranaki – Where We Stands. State of Environment Report 2009*.

Riparian initiatives

It is considered that riparian initiatives (Regional Council and/or Fonterra Dairying and Clean Streams Accord) have yet to have significant benefits for stream 'health' in terms of absolute values and trends. The results of monitoring suggest that significant improvements can be achieved through these initiatives. These improvements will more likely be discernible when greater proportions of catchments are fenced and planted, and as shading of waterways increased with growth of vegetation. These impacts will be measured over a longer term following establishment (say another 10 years).

4 Issues & further actions: where to from here

4.1 Plan implementation

4.1.1 Promotion of riparian management

A communications plan was developed by the Council during the 2007/2008 year to encourage farmers to increase implementation of riparian plans. Most communications activities are aimed at the group of plan holders that are “willing to do the right thing” and can be more readily motivated to act to increase the level of fencing and planting.

As key partners in the Plan, the Fonterra Co-operative Group Ltd, Fonterra Shareholders Council members and Federated Farmers are actively involved in delivering many of the communications activities.

The main method for promoting riparian fencing and planting is through Council and Fonterra staff meeting directly with farmers to discuss the riparian programme. The Plan also outlines a number of other communications activities for promoting riparian planting.

Throughout the year media releases were produced on key messages on the riparian programme, such as the environmental benefits of riparian management; the need to integrate riparian management into budgeting and farm management planning; the role of riparian management in future-proofing dairying; the provision of advice and support from the Council; the provision of plants at cost; and the coordination of contractors to carry out riparian work.

During the year the partners to *Regional Action Plan for Taranaki* have supported the riparian programme with comments to the media and the publication of opinion pieces in regional newspapers and dairy industry communications.

Riparian management topics were well featured in the regional media, in particular the Thursday Farmer section of the Taranaki Daily News, and in rural and community papers.

The riparian planting prize draw promotion was again used to increase plant orders and to encourage earlier ordering by plan holders. Fonterra sponsored two major prizes for Fonterra suppliers, a package of 700 riparian plans, pre-planting preparation, planting and maintenance valued at \$3,500, and goods to the value of \$2,500 from a RD1 store. They also provided 80 \$50 RD1 vouchers to reward early orders.

This year, for the first time, non-Fonterra suppliers were eligible for a second prize package, sponsored by Revital Fertilisers. The prize was worth \$1,000 of riparian plants and \$2,000 worth of Revital Fertiliser.

The above sponsorship support is important and gratefully acknowledged.

Riparian management and the prize draw were promoted by advertising and a direct mail-out to plan holders, and the prize-winners were publicised through advertising and a media release.

The riparian planting prize draw promotion successfully increased the number of early orders of riparian plants for 2008/2009.

4.1.2 Riparian Implementation Strategy Survey

Since the implementation of the Regional Action Plan for Taranaki, the dairy farming community and the Council have undertaken a great deal of work to meet the targets of the Regional Action Plan. However, plan implementation [i.e. the completion of proposed fencing and planting of riparian margins] has been slow. In an attempt to determine the cause of this, the Council carried out a survey¹¹ to determine the barriers to farmers of implementing their property plans.

Overwhelmingly and at no surprise, time and cost were the biggest barriers to implementing the plans. Ninety eight percent of farmers were aware of the Accord and its deadlines, however, due to the lack of enforceability, and the increasing pressures on time and cost, implementing the plans were not seen as a priority.

4.1.3 Contractor service

In an attempt to reduce one of the barriers identified in the *Riparian Implementation Strategy Survey*¹², the barrier of available farmer time, the Council introduced a new initiative in 2007/2008, the contractor service. The contractor service involves the Council tendering for the provision of planting contractor services for land holders who are undertaking their first lot of riparian planting. The Council then facilitates the matching up of contractors with landholders.

In 2008/2009 the Council facilitated the matching up of contractors with land holders and over 20,000 plants were planted as a result. Feedback from all involved in the scheme was very positive.

4.1.4 Farmer financial position

Finance was also identified as a barrier to plan implementation in the *Riparian Implementation Strategy Survey*¹³; and hence the dairy payout has been an aspect that the Council has closely monitored in terms of plan implementation.

With the surge in the payout in 2007/2008 and the consequently improved financial position of many of the region's day farmers, it was felt that the financial barrier may not exist so strongly and farmers may be able to make progress. However, only a slight increase in plan implementation occurred over that period.

The final 2008/2009 payout of \$5.20 per kgMS is well down on last year's record payout of \$7.59 per kgMS, however, the payout still represents the third highest payout for Fonterra suppliers (refer to Table 12).

Table 12: Fonterra payout – per kgMS

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Fonterra payout	\$5.33	\$3.63	\$4.25	\$4.59	\$4.10	\$4.46	\$7.59	\$5.20	\$5.10 ¹⁴

¹¹ Taranaki Regional Council, 2007. *Riparian Implementation Strategy Survey*.

¹² As above.

¹³ As above.

¹⁴ Forecasted payout.

The Council will continue to monitor closely the payout and its impact on plan implementation. However, from the rates of implementation recorded over the past two financial periods it would seem that a higher payout may not necessarily be the driving force for increased implementation.

4.2 Moving forward

Progress in achieving Accord targets is generally good although, as noted earlier, the implementation of new riparian fencing and planting is progressing too slowly to meet the 2015 targets. This is not to say the targets will not be achieved, however an increase in effort by the dairying farming community is necessary, and time is becoming restrictive.

The Council will continue to implement the Communication Plan in an attempt to increase plan implementation. At this stage, the Council is satisfied to continue with its current implementation strategy and to monitor closely the implementation of the plans. The Council will continue to offer advice, information and assistance on all aspects of the Accord.

Of note, the Council carried out a review of the Regional Fresh Water Plan for Taranaki in June 2008, the review among other things looked at the use of non-regulatory methods [such as riparian planting and its implementation] and the impact of such methods on improving water quality. The Council assessed the usefulness of retaining such methods as non-regulatory tools or reclassifying the methods to regulatory tools. It was determined by the Council at that time that they would continue to utilise non-regulatory tools. However, the formal review of the Regional Fresh Water Plan is to commence in 2011 and this will be the appropriate time to once again assess if non-regulatory or regulatory methods are to be utilised to improve water quality and move the progress of property plan implementation forward.

5 Conclusion

The report reviewed the Taranaki region's performance and achievements in meeting the targets of the Dairying & Clean Streams Accord set out in the Regional Action Plan for Taranaki in the 2008/2009 year.

The Taranaki Regional Council has fulfilled its requirement in the completion of this report for Fonterra under the requirements of the Regional Action Plan for Taranaki.

The Taranaki dairy farming community is making progress towards achieving the targets set out in the Regional Action Plan for Taranaki; however an issue that continues to exist is the relatively slow pace of property plan implementation in respect of fencing and planting. The 2010 target has been met substantially due to existing pre-Accord fencing and planting. If plan implementation continues at its current rate the implementation target for 2015 will not be met. The Taranaki Regional Council has continued to make adjustments to its approach to promote wider and faster implementation. However, if the implementation targets are to be met a few years out, Accord partners and ultimately dairy farmers need to apply more effort to physical works.

Glossary/Interpretation of data

Riparian monitoring period: the monitoring of works carried out on dairy farms (i.e. fencing, planting and crossing status) was undertaken during the summer months of 2008/2009, by Land Management Officers of the Council, this monitoring captured the work undertaken by dairy farmers after 1 July 2008 (during the winter when planting and fencing is generally undertaken). The work undertaken by dairy farmers after 1 July 2009 (during the winter of 2009) will be captured in the summer monitoring of 2009/2010 and reported on in the 2009/2010 Annual Report. Hence the data in this report slightly underestimates what exists on farms.

Monitoring of compliance with the Regional Fresh Water Plan for Taranaki and wetland protection is carried out by Officers of the Council throughout the year.

Monitoring of nutrient budgets is carried out by Fonterra during the annual shed inspections. The inspections are undertaken throughout the year.

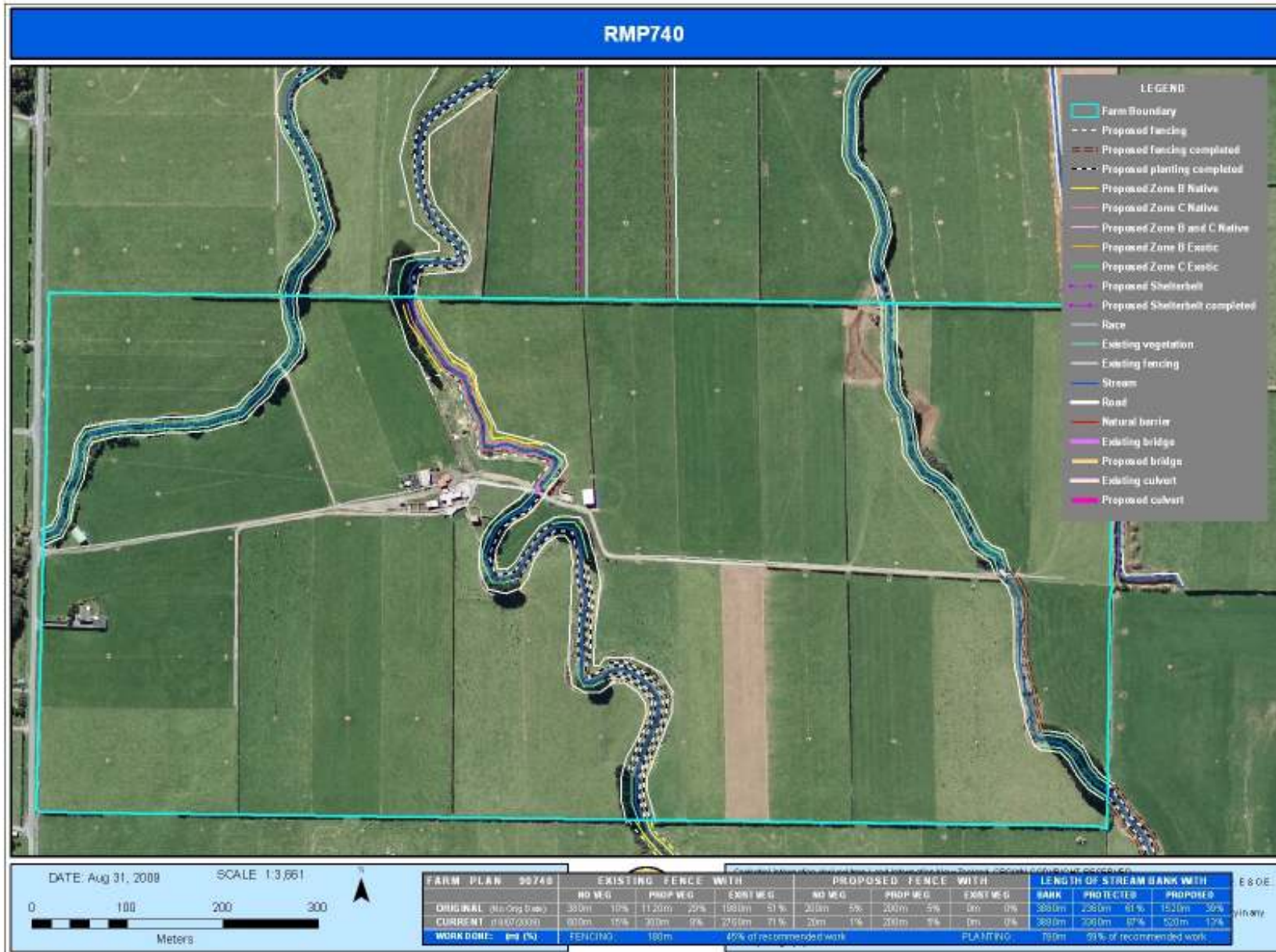
Reporting period: the reporting period for this Annual Report cover the 2008/2009 financial year (1 July 2008 – 30 June 2009).

Sample size: the total number of Fonterra supplier dairy farms that have a property plan in place make up the sample size used to report on the progress of fencing and planting protection, and dairy cow stream crossing status. As the number of property plans increase, so does the accuracy of reporting on a figure that represents regional conditions. As a consequence, there will always be some movement in the annual figures that are reported on, as the sample size increases.

The total length of streambank protected by fencing: includes existing fencing in place at the time of plan preparation and new fencing completed since the preparation of the plans.

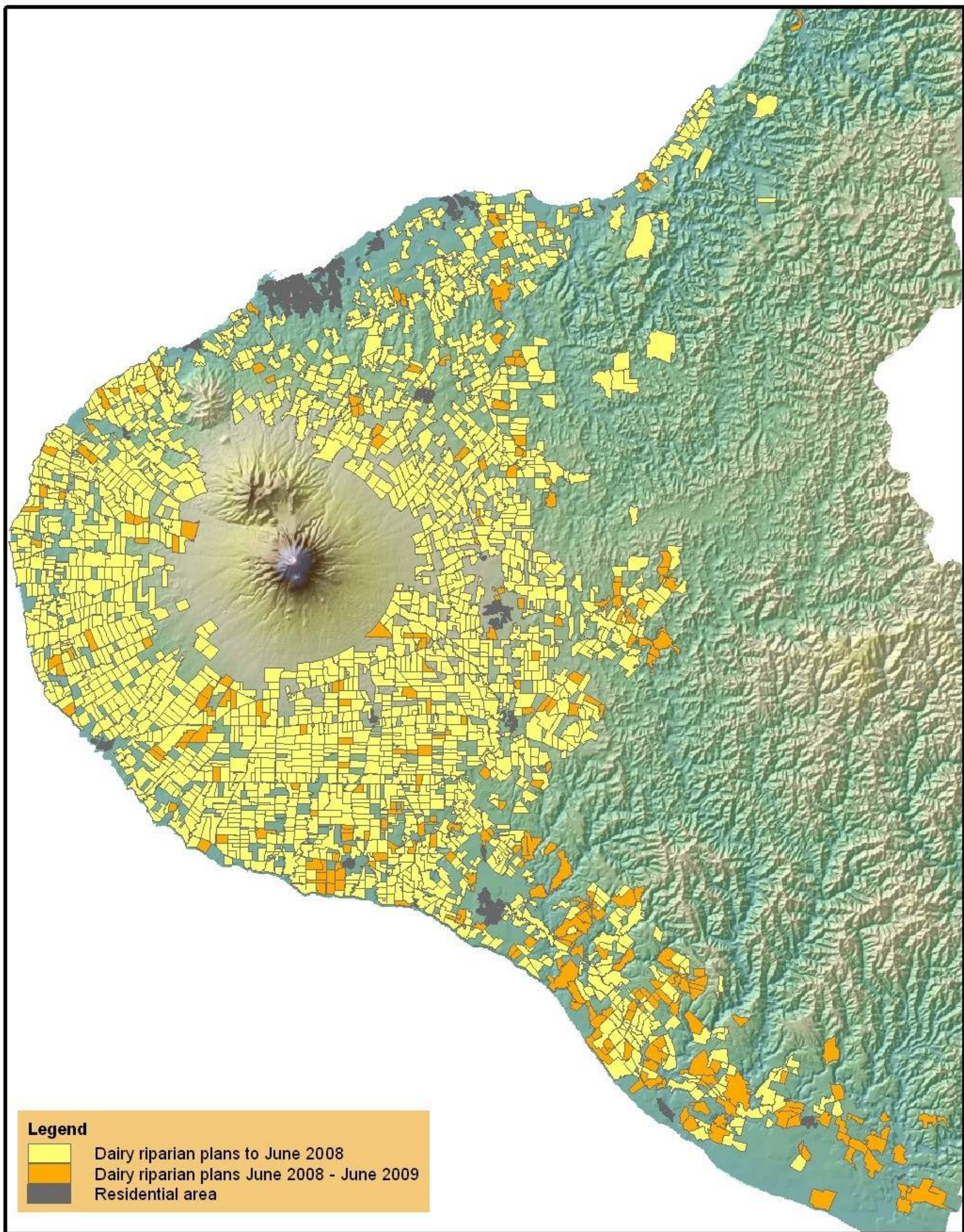
The total length of streambank protected by planting: includes existing vegetation in place at the time of plan preparation and new planting completed since the preparation of the plans.

Appendix I
An example of a GIS property plan



Appendix II
Property plans prepared on dairy farms to 30 June 2009

Riparian Management Plans Prepared for Dairy Farms in Taranaki



SCALE 1:450,000

0 5 10 20 km

DATE: 31 August 2009



Cadastral information derived from Land Information New Zealand. CROWN COPYRIGHT RESERVED. Information shown is the currently assumed knowledge as at date printed. If information is vital, confirm with the authoritative owner. E & O.E.

The information displayed has been taken from Taranaki Regional Council databases. It is correct to the best of our knowledge. Copyright is held and retained by the Taranaki Regional Council. This map may not be reproduced or transmitted to any other party in any form without the written permission of the Taranaki Regional Council. Aerial photography was flown in 2007.