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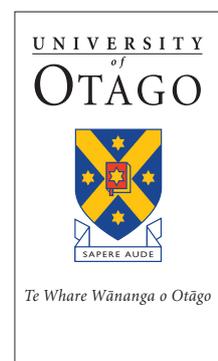
New Zealand Farmers and Wetlands

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The information in this report is accurate to the best of the knowledge and belief of the authors acting on behalf of the ARGOS Team. The authors have exercised all reasonable skill and care in the preparation of information in this report.

Table of Contents

Executive Summary	7
1. Introduction	8
1.1 Background and Objectives.....	8
1.2 Research Design and Methods.....	8
2. Literature Review	9
2.1 Historical background to wetlands in New Zealand.....	9
2.2 Why are wetlands and waterways on farms important?.....	10
2.3 Social research on landowners and wetlands.....	10
3. Quantitative Results from the 2005 Farmer/Grower Survey	14
3.1 Introduction.....	14
3.2 Method.....	14
3.3 Results.....	15
3.3.1 <i>Comparing sectors within primary production</i>	15
3.3.2 <i>Comparing farm management systems within sheep and beef</i>	18
3.3.3 <i>Comparing farm management systems within dairy</i>	20
3.3.4 <i>Comparing management systems within horticulture</i>	22
3.3.5 <i>Comparing management systems within the kiwifruit industry</i>	25
3.4 Summary and conclusion of quantitative results.....	28
4. Qualitative Results from Interviews with Farmers	30
4.1 Introduction.....	30
4.2 Method.....	30
4.3 Results.....	30
4.3.1 <i>How do farmers conceptualise wetlands and waterways?</i>	30
4.3.2 <i>Farmers' motivations to develop and manage wetlands & waterways</i>	31
4.3.3 <i>Fencing wetlands and waterways</i>	33
4.3.4 <i>Farmers' perceptions of regulatory issues and organisations</i>	35
4.3.5 <i>Financial issues</i>	38
4.4 Summary and conclusion of qualitative results.....	39
5. Conclusion and Recommendations	41
6. References	43
7. Appendix: Questions Relating to Wetlands in the 2005 New Zealand Farmer and Grower Attitude and Opinion Survey: Sustainability in Primary Production	45

List of Tables

Table 1: Key motivations for landowners to restore wetlands in the USA.....12

Comparing sectors within primary production

Table 2a: The importance of recreational activities on farm or orchard:
 spending time and money on developing wetland areas.....15

Table 2b: The importance of recreational activities on farm or orchard
 waterfowl shooting.....16

Table 2c: The importance of recreational activities on farm or orchard:
 fishing in wetlands and waterways.....16

Table 2d: The importance of recreational activities on farm or orchard:
 Spending time looking at wetland areas.....16

Table 2e: Limitations to wetland development: not having the money.....17

Table 2f: Limitations to wetland development: not having the expertise.....17

Table 2g: Limitations to wetland development: the inappropriateness of
 wetlands for the environment of a farm or orchard.....17

Table 2h: Limitations to wetland development: no interest in developing
 wetlands.....17

Comparing farm management systems within sheep and beef

Table 3a: The importance of recreational activities on farm or orchard:
 spending time and money on developing wetland areas.....18

Table 3b: The importance of recreational activities on farm or orchard:
 waterfowl shooting.....18

Table 3c: The importance of recreational activities on farm or orchard:
 fishing in wetlands and waterways.....19

Table 3d: The importance of recreational activities on farm or orchard:
 spending time looking at wetland areas.....19

Table 3e: Limitations to wetland development: not having the money.....19

Table 3f: Limitations to wetland development: not having the expertise.....19

Table 3g: Limitations to wetland development: the inappropriateness of
 wetlands for the environment of a farm or orchard.....20

Table 3h: Limitations to wetland development: no interest in developing
 wetlands.....20

Comparing farm management systems within dairy

Table 4a: The importance of recreational activities on farm or orchard:
 spending time and money on developing wetland areas.....20

Table 4b: The importance of recreational activities on farm or orchard:
 waterfowl shooting.....21

Table 4c: The importance of recreational activities on farm or orchard:
 fishing in wetlands and waterways.....21

Table 4d: The importance of recreational activities on farm or orchard:
 spending time looking at wetland areas.....21

Table 4e: Limitations to wetland development: not having the money.....21

Table 4f: Limitations to wetland development: not having the expertise.....22

Table 4g: Limitations to wetland development: the inappropriateness of
 wetlands for the environment of a farm or orchard.....22

Table 4h: Limitations to wetland development: no interest in developing
 wetlands.....22

Comparing management systems within horticulture

Table 5a: The importance of recreational activities on farm or orchard:
 spending time and money on developing wetland areas.....23

Table 5b: The importance of recreational activities on farm or orchard:
 waterfowl shooting.....23

Table 5c: The importance of recreational activities on farm or orchard:
 fishing in wetlands and waterways.....23

Table 5d: The importance of recreational activities on farm or orchard:
 spending time looking at wetland areas.....23

Table 5e: Limitations to wetland development: not having the money.....24

Table 3f: Limitations to wetland development: not having the expertise.....24

Table 5g: Limitations to wetland development: the inappropriateness of
 wetlands for the environment of a farm or orchard.....24

Table 5h: Limitations to wetland development: no interest in developing
 wetlands.....25

Comparing management systems within the kiwifruit industry

Table 6a: The importance of recreational activities on farm or orchard:
 spending time and money on developing wetland areas.....25

Table 6b: The importance of recreational activities on farm or orchard:
 waterfowl shooting.....26

Table 6c: The importance of recreational activities on farm or orchard:
 fishing in wetlands and waterways.....26

Table 6d: The importance of recreational activities on farm or orchard:
 spending time looking at wetland areas.....26

Table 6e: Limitations to wetland development: not having the money.....27

Table 6f: Limitations to wetland development: not having the expertise.....27

Table 6g: Limitations to wetland development: the inappropriateness of
 wetlands for the environment of a farm or orchard.....27

Table 6h: Limitations to wetland development: no interest in developing
 wetlands.....27

Table 7: Key findings from quantitative results.....28

Executive Summary

This research focuses on how New Zealand farmers approach the management of wetlands and waterways on their farms, and was funded by a Fish & Game New Zealand Research Scholarship, in association with the Agriculture Research Group On Sustainability (ARGOS). The goal of the research was to explore farmers' perceptions of wetlands and waterways on their land and to discover what barriers may impact upon their strategies to protect or develop these areas. As little social research is available in this area, this study sought to gather enough data to provide an overview of farming management practices with regard to wetlands and waterways, and to establish some useful parameters for future research in this area. The research in this report incorporates the results from a section of questions about wetlands and waterways sent out to random samples of farmers in all main sectors of primary production as part of a larger quantitative survey looking at sustainability on farms. This report also includes results from qualitative research based on tape-recorded interviews with 36 sheep/beef farmers and 19 dairy farmers. Key findings from this research are as follows:

- The majority of farmers who participated in this research are motivated to restore and protect wetlands and waterways on their farms. The historic prioritisation of draining wetlands to make them 'productive' no longer appears to be generally accepted amongst farmers. This research also found that the main reason for developing wetlands is not necessarily related to utilitarian benefits for the farm. The most commonly cited motivation for caring for wetlands and waterways was an aesthetic appreciation of the wildlife and plant life found in wetlands, as well as a more general desire to look after the environment.
- The terms 'wetland' and 'waterway' have a wide variety of meanings for farmers and are often conceptualised differently from other areas described as 'bogs', 'swamps' or 'creeks.' The use of these different names often denotes different approaches to management and varying ideas about the level of protection that is appropriate for a particular area. For example, 'wetlands' are usually fenced without question, whereas a shallow 'bog' or 'swamp' is frequently not seen as needing the same level of fencing off from stock.
- Results from the quantitative survey suggest that there are remarkably similar attitudes towards wetlands and waterways across the different farming sectors surveyed in the research. The qualitative interviews did, however, reveal more definite differences between the dairy and sheep/beef sectors in terms of attitudes towards fencing of wetlands and waterways. Most farmers did not question the need to fence off all the waterways on dairy farms, but several sheep/beef farmers argued that their sector should not have to comply with the same regulations as the dairy industry because their stock management practices are significantly different.
- Financial considerations play an important role in decisions about restoration and protection management practices on a farm. In particular, fencing of waterways is extremely expensive and there was some debate particularly from sheep/beef farmers in hill country about the merits, or even practicality, of fencing off all waterways on the farm. Many farmers complained about the expense of fencing off wetlands and waterways, and this is an area where some financial assistance would be useful to help ensure that farmers are able to abide by regulatory requirements aimed at protecting these areas.
- Many farmers were concerned that non-farming organisations and policy makers do not understand the realities of farming, and this research suggests that farmers currently feel they are not a part of the regulatory decision-making processes associated with wetlands and waterways. Gaining the full cooperation of farmers is important to ensure that wetland and waterway preservation strategies are widely practiced on private land, where much of New Zealand's remaining wetlands are now located.

1. Introduction

1.1 Background and Objectives

The main goal of this research was to explore the attitudes of farmers in New Zealand toward wetlands, including their long-term goals with regard to wetland habitats and species. This study also sought to identify farmers' perceptions of the main barriers to maintaining, restoring, and developing wetlands. As little research is available in this area, the study took a fairly 'broad-brush' approach to try to determine some of the key issues that impact upon farmers' management of wetlands and waterways on the farm.

1.2 Overview of Research Design and Methods

This research incorporates both quantitative and qualitative research methods and was facilitated through ARGOS (Agricultural Research Group on Sustainability). ARGOS is a coalition of researchers within Lincoln University, the University of Otago, and Agribusiness Development Ltd., who are taking a transdisciplinary approach to understanding determinants of sustainability in New Zealand agriculture. The ARGOS project includes a longitudinal study with over one hundred farm households covering a variety of different farm sectors (such as kiwifruit, lowland beef/sheep, and Dairy) and covering different farming sectors (conventional, Integrated Pest Management, and organic). (See www.argos.org.nz for details of the study design.)

The quantitative component of this current research on wetlands was incorporated into the 2005 Farmer/Grower survey carried out by the AERU at Lincoln University. This survey was used to gather information from farmers in New Zealand and comprised of a twelve-page A4 booklet with questions designed to fit under the broad theme of sustainability. The booklet and a separate covering letter, which introduced and explained the questionnaire, was posted to 400 randomly selected farmers from each of sheep/beef, dairy, horticulture, arable and specialist livestock sectors, and to registered organic farmers. The general layout and design of the questionnaire was based on previous national surveys of farmers (for example, Cook *et al.* 2000; Fairweather *et al.* 2003), which has proven to be an easily understood format. The data obtained from this survey were analysed by crosstabulating each set of responses using different groupings. (For a more in depth discussion of the quantitative design method, see Section 3.2.)

The qualitative research is based on semi-structured interviews with sheep/beef and dairy farmers. These interviews were recorded and subsequently transcribed. Analysis of the interview data was carried out within a sociological inductive research paradigm, in which themes and issues that emerged during the interviews became the focus, rather than testing a preset problem or hypothesis. There was a general goal in these interviews, however, to explore farmers' management and attitudes towards wetlands on their property. (For a more in depth discussion of the qualitative design method, see Section 4.2.)

2. Literature Review

2.1 Historical background to wetlands in New Zealand

Historically known as “swamps, marshes, mires, morasses [and] bogs”, wetlands have been widely regarded as places of melancholy, death and disease in European societies (Giblett 1996: xi). Historian Geoff Park (2002) explains that British settlers, who were accustomed to the aesthetic appeal of the “flat openness” of the British fens, found New Zealand’s dense swamp forests and “towering, vine-tangled *kahikatea*” particularly unwelcoming and unsettling (Park 2002: 153). In 1844, a surveyor called Tockett described Southland as a “vast swamp unfit for human habitation” (cited in Sutton 2000, 52).

Very quickly, however, the ‘ecological imperialism’ (Crosby 1986) of the colonial British re-shaped the New Zealand landscape. During the pioneering era, wetlands were considered wastelands that needed to be drained in order to become ‘productive’. For many settlers the draining of wetlands was clearly understood as a metaphor for taming and purifying nature, as this comment from a colonist-farmer reveals:

The cultivation of a new country materially improves its climate. Damp and dripping forests, exhaling pestilent vapours from rank and rotten vegetation, fall before the axe; and light and air get in, and sunshine ripening goodly plants. Fen and marsh and swamp, the bittern’s damp domain, fertile only in miasma, are drained; and the plough converts them into wholesome plains of fruit, and grain, and grass (Charles Hursthouse 1857, cited in Park 2002: 151).

Since European settlement of New Zealand, approximately 90% of wetlands have been drained for housing, commercial development, and agricultural production. This equates to more than three million hectares of land (Cromarty and Scott 1996) and wetlands are now regarded as one of New Zealand’s rarest ecosystems (Burns 1982). Along with an emphasis on making wetlands economically productive, the English land laws that were established in New Zealand during the nineteenth century, made a delineation between waterways and dry land. As a result, with the introduction of private land ownership, clear distinctions were required between swamps and lakes, rivers, and estuaries – but these distinctions were not a feature of Maori society. Rather, Maori emphasized the relationships and interconnections within and between wetland ecosystems, such as cycles of fish spawning and eels running to the sea. Maori settlements were often concentrated along floodplains, estuaries and lagoons to make the most of the rich and diverse flora and fauna within these wet areas (Park 2002: 160 -161).

In contrast, the cultural emphasis from British settler society in New Zealand was not focussed on living alongside wetland ecosystems, but rather to drain and convert those wetlands into completely different landscapes that would fit within the British farming model. The extensive draining of New Zealand’s wetlands has allowed for the development of enormous tracts of highly fertile farmland upon which the country has become highly economically dependent. The practice of converting wetlands into productive farming landscapes went largely unchallenged until the mid-1980s. Up until this time, farmer were not only encouraged to drain wetlands, but were also eligible for government subsidies to help facilitate this (Gerbeaux 2002/2003).

In the past two decades, however, there has been a gradual turn around in how wetlands are perceived both by farmers and the wider population. This change has its roots in an international movement that began in the 1970s, which aimed to preserve and protect existing wetlands and to develop new areas of wetland. The predominantly negative associations made with wetlands in the past, are now changing to more positive and even idealised conceptions about these landscapes. In an echo of Thoreau’s idyllic views of wetlands as primitive and real examples of the raw and the natural, wetlands now represent,

for increasing numbers of people, a precious and sacred nature: “I enter a swamp as a sacred place, a sanctum sanctorum. There is the strength, the marrow, of Nature” (Thoreau, cited in Giblett 1996).

The Ramsar Convention Bureau, based in Switzerland, is the main international organisation leading the drive for wetland conservation. It was established in 1971 when the representatives from eighteen nations signed a treaty in Ramsar, Iran, with the goal of co-ordinating wetland habitat preservation efforts on a global scale (Mathews 1993). In 1996, the anniversary of the signing of the convention (February 2nd) was officially designated ‘World Wetlands Day’. In New Zealand, several organizations (such as conservation groups, regional councils and Fish and Game New Zealand), are involved in various activities and events, which aim to draw attention to wetland preservation both on this day and year round. As wetland areas have increasingly become the focus of conservation efforts, there has been a gradual change in how these areas are perceived. This growing appreciation of wetland habitat demonstrates how values associated with natural areas can change over time. Even the name ‘wetland’ denotes a change in understanding, as nomenclatures such as ‘swamp’ or ‘bog’, with their negative connotations, are tending to be used less frequently.

2.2 Why are wetlands and waterways on farms important?

While the importance of protecting existing wetlands and restoring degraded systems may be growing in acceptance, there are many challenges to actually implementing effective management of these areas. One of the key issues that has been highlighted in recent research, is that many wetlands are situated on privately owned land, and therefore the attitudes, perceptions and management activities of landowners are crucial to the long-term success of any conservation or restoration efforts (Jones *et al.* 1996; Pease *et al.* 1997; Rispoli and Hambler 1999; Bennett and Whitten 2002). One key group of landowners that have control over wetland areas are farmers and in New Zealand a growing number of farmers are seeking funding in order to restore or protect wetland areas on their land (RNZ 2006).

2.3 Social research on landowners and wetlands

While this research report focuses on farmers and wetlands, there is very little existing research that focuses solely on this area. Most of the literature that is available is directed at ‘landowners’ and wetlands. This following section provides an overview of this literature, and in many cases the landowners in these studies are also farmers. The term ‘landowner’ is complex, however, and does not necessarily mean that all the participants in these studies do have title over the land where they live. In the context of this current study, all the participants are farmers, but not all are necessarily landowners, as some are farm managers for absentee landowners.

New Zealand

As already highlighted, very little social research is available in New Zealand with regard to farmers’ perspectives on wetland management. McLeod’s (forthcoming, 2004) research into the social practices of duck hunting in New Zealand includes some information about the increasing importance that duck hunters place on the protection and development of wetlands. While all duck hunters in New Zealand contribute to wetland conservation through the purchase of their gamebird hunting licence from Fish and Game New Zealand, McLeod (2004) observed that farmers who are involved in duck hunting, were often likely to have taken a very hands-on approach to wetlands by developing a pond or wetland area on their land. This research also highlighted the appreciation that some duck hunting landowners and farmers have for wetlands, and concluded that this was not solely driven by a pragmatic desire to increase hunting opportunities, but was also connected to a conservation ethic and a desire to be ‘close to nature’.

Jones *et al.* (1995) research is currently the most in depth study to focus on landowners and wetlands in New Zealand. This research included two surveys: one administered nationally to

local and regional and councils, and the other to a group of landowners living in the Franklin district – a predominantly rural area situated just south of Auckland. Jones *et al.* (1995: 160) report that at the time of these surveys there was “an alarming lack of information and understanding among resource management agencies about wetlands” and that the agencies themselves were concerned about the lack of technical expertise and financial resources available to them. From the survey administered to 42 landowners in the Franklin district, Jones *et al.* (1995) conclude that, while landowners may feel positively about implementing wetland conservation practices on their land, there were certain barriers that prevented or limited these practices. Examples of some of the barriers that were raised in the study include: the costs there are involved with protecting wetlands; a lack of knowledge and information about how to implement management practices to protect wetlands; and antipathy from landowners towards institutions, such as regional councils, who are charged with ensuring regulations relating to effluent and nitrogen runoff. With regard to this third point, Jones *et al.* (1995: 157) observe: “while landowners may not be fundamentally opposed to conservation, and in fact some carry out conservation on their land, many are opposed to what they see as interference from councils or other agencies involved with conservation.” This finding fits with international research, which “also confirms antipathy amongst landowners towards command-and-control (regulatory) approaches to conservation, accompanied by a strong preference for voluntary mechanisms and incentive schemes” (Jones *et al.* 1995: 158). Jones *et al.* (1995) also found that, for a large number of landowners in their study, utilitarian attitudes prevailed with regard to wetland conservation. For example, many farmers valued wetlands for the seasonal grazing that they provided for stock. In order to implement successful strategies that will protect and develop wetlands, these utilitarian values need to be taken into account and Jones *et al.* (1995: 159) argue regulations will not be enough to get extensive wetland conservation efforts from landowners, and that, “in many cases, direct compensation or reward may be necessary.”

USA

There are a few useful international studies that have focussed on landowners and wetlands. In the USA, wetland preservation and restoration has a far higher profile than in New Zealand, and this is at least partly due to the political importance that wetlands have had in the past few decades. In 1977, President Carter established wetland protection as an official part of US Government policy, thus ending the established Federal assistance for wetland draining and conversion that had been in place since 1849 (Pease *et al.* 1997). In 1989, President George Bush highlighted, in a speech to Ducks Unlimited, the implementation of an important new policy that he called, ‘no net loss’. This policy legislated that for every wetland that was drained, a replacement wetland must be created (Robertson 2000).

Of the wetlands that now remain in the United States, approximately 75% are owned privately. However, while ownership of wetlands is predominantly private, the long-term benefits of having wetlands are mainly public. There is currently some tension in the USA with the government required to find “the right combination of public subsidies to private landowners and regulatory restrictions that allow both public values and private rights to be maintained and the wetlands to remain on the landscape” (Pease *et al.* 1997: 2). A national survey by Pease *et al.* (1997) sought to explore the reasons behind why landowners restore wetlands. 305 phone interviews were undertaken across the United States with landowners who had participated in some kind of wetland restoration programme during the previous ten years. This research provides some useful categories for considering what motivates landowners to restore wetlands. (See Table 1 for a summary of these findings.)

Table 1: Key motivations for landowners to restore wetlands in the USA (N=305)

Reason	Number Reporting Extremely Important
To provide habitat for wildlife	257
Provide habitat for games species of wildlife	205
Wanted to leave something wild for future generations	201
Natural beauty	184
Financial help was available to do it	149
To restore some of the functions of wetlands, like to clean run-off water	106
Concern over loss of wetlands in this region	97
Land wasn't usable for crops anyway	92
Educational purposes	67
Good public relations for me	43
Financially profitable	32

(Source: Adapted from Pease *et al.* 1995: 9)

Pease *et al.* (1997) concluded in their research that it was crucial that information about wetland restoration programmes was disseminated more widely, particularly to those rural landowners who are non-traditional farmers. (Non-traditional farmers were defined as those landowners who obtained less than 80% of their household income from farming.) Rural landowners who were earning the majority of their income from employment off the farm were less likely to hear about incentives and programmes that could assist them in developing wetlands on their land. Pease *et al.* (1997) also found that many landowners complained that when given assistance from a government fund to build a wetland, they only ended up with a 'pond', which they wished was somewhat 'deeper'. The authors conclude from this that it is important for biologists and ecologists to communicate "to landowners the value of shallow-water, even temporary, wetlands to migratory birds and other wildlife" (Pease *et al.* 1997: 12). In connection to this point, Pease *et al.* (1997) emphasise how important it is to educate landowners about wetlands: "the more education they have regarding their wetland, the less chance it will be torn up and put back into crop land" (Pease *et al.* 1997: 13). It is clear, however, that this education does need to take into account the different ecological environments within the USA, and the variety of financial incentives available to landowners in different States. (For examples of comprehensive information that is currently being produced and made available for farmers in some States of the USA see, Wisconsin Wetlands Association 2005; Millar and MacGowan 2000).

United Kingdom

In the United Kingdom, there is some research available that specifically focuses on farmers and wetlands. A study carried out by Rispoli and Hambler (1999) examined attitudes towards wetland restoration in Oxfordshire and Cambridgeshire. This study included four sample groups: 15 farmers with wetlands on their land; 8 farmers not on wetland, but living near a partly restored wetland; 25 members of a wetland restoration group; and 30 randomly selected individuals from the general public. This study found that there was a generally positive response to wetlands, with only 4% of participants associating wetlands 'with disease or a hazard to children'. Rispoli and Hambler (1999) suggest that gender may be a factor to consider with regard to attitudes to wetlands, as they found that significantly more women participants in their research were in favour of wetland restoration, than the male participants. It is also noted, however, that there needs to be further research with a larger sample group to clarify these findings about gender and wetlands. In common with Pease *et al.* (1997), Rispoli and Hambler (1999) highlight the importance of education with regard to wetland restoration. In the British study, it is noted that there is some confusion from participants both about how to identify wetland habitat, and also about defining what restoration actually entails.

Australia

In Australia, government funding (through Land & Water Australia) has supported important research on the social values of wetlands. A research project carried out by Bennett and Whitten (2002) between 1997 and 2001 focused on the management of wetlands on private property – where the majority of Australia’s remaining wetlands are now found. This research was centred on case studies from two Australian locations that differed markedly in terms of both biophysical and socio-economic characteristics: the Upper South East of South Australia (USES), and the Murrumbidgee River Floodplain (MRF). (Two reports summarise farmers’ perceptions of wetland management from these two areas: see, Whitten and Bennett 1998 (USES), and Whitten and Bennett 2000 (MRF). In their overview of the research project, Bennett and Whitten (2002) identify a range of different landowner values associated with wetlands, some of which were seen as benefits, and others as costs. ‘Grazing for stock’, ‘pleasure/recreation’ and ‘hunting pest species’ were identified as the top three benefits of wetlands in both locations, while ‘weed source’, ‘feral animal harbour’ and ‘nuisance animal harbour’ were identified as the main three wetland costs or problems. Bennett and Whitten (2002: 5) observe that: “wetland owners received strong profit signals to exploit their wetlands, but little if any financial reward has been available from wetland conservation.” They suggest that the overall management of wetlands across Australia could benefit from ensuring that the benefits to landowners of wetland conservation efforts exceed the costs of those efforts.

The international research discussed here can provide some useful starting points for research in New Zealand, but there are significant differences – both in the physical landscapes and regulatory frameworks of Australia, the United Kingdom and the United States – to the New Zealand situation. Therefore, while this literature does highlight potential areas to focus on, it is important not to assume that the findings in these studies can automatically be applied in the New Zealand context.

3. Quantitative Results from the 2005 Farmer/Grower Survey

3.1 Introduction

A self-administered questionnaire was posted out by the AERU at Lincoln University to a random sample of farmers and growers, provided by various sources within the primary production sector. (For a full report on this survey, see Fairweather *et. al* 2006.) Due to funding provided by the Fish and Game scholarship, two sets of four statements about wetlands were designed and included in the survey. (A copy of the wetland questions is provided in the Appendix.) The first set of statements asked each respondent about the level of importance to them of the following recreational activities on their farm or orchard: spending time and money on developing wetland areas; waterfowl shooting; fishing in wetlands and waterways; and spending time looking at wetland areas. The second section asked how important the following factors were in limiting wetland development on the respondent's farm or orchard:- not having the money; not having the expertise; wetlands being inappropriate for the environment on the farm; and not having an interest in developing wetlands.

3.2 Method

The addresses of 400 farmers and orchardists were randomly selected from each of the sheep/beef, dairy, horticulture, arable and specialist livestock sectors, with other addresses of organic farmers and horticulturalists randomly selected by AgriQuality and BioGro. ZESPRI provided a random selection of the addresses of kiwifruit growers. As the random samples were supplied from each of the sources, rather than taking a random over all the sources combined, it is not appropriate to present the sample sizes (N) as percentages over the whole primary production sector.

The data obtained from this survey were crosstabulated for each set of responses using different groupings. First, an analysis was done over all the major primary production sectors - sheep/beef, dairy, horticulture, arable and specialist livestock – excluding organic farms and orchards. Second, the results were considered within each of these sectors but making comparisons between conventional, integrated or organic farming systems, by adding to the data the responses from organic farmers and growers. For ease of reporting the responses in the 'very unimportant' and the 'unimportant' categories were combined as were the 'very important' and the 'important' categories. Tables for each of the results are presented below. Statistical tests of significance of the relationship between the two variables in each crosstabulation table were carried out and these are mentioned only when they were significant.

It was difficult to know how to report these results. The 'not applicable' category was important because it showed those who might like to make a response but could not because it was not applicable to their property presumably. It needs to be shown as a percentage because of the differing numbers across the sectors. However, when the results are also divided into percentages according to how respondents answered on the 'unimportant' to 'important' scale, if the percentage of /not applicable' responses is high then automatically the percentages of these responses will be lower. To compensate for this the 'not applicable' responses were removed and only the applicable responses were analysed in crosstabulations using the adjusted sample size (adj. N), and these are also presented as percentages, because of the differing numbers in each sector or management system. (See Table 2a as an example.)

3.3 Results

The response rates for each sector were just over 30%, and for the organic farmers it was 53%.

The respondents were mainly male ranging from 88% of the sample on average across the five primary production sectors, 86% across sheep/beef, dairy and horticulture and 82% for kiwifruit. This means that when these households received this survey addressed to 'the farmer' it was mainly the men who answered the questionnaire. The average age also did not differ very much over the different samples used for the following analyses. The average age was 56 for the five sectors as a whole, for sheep/beef and horticulture, 54 for dairy and 58 for kiwifruit. When the gender and age data were compared across sectors and management systems there were no significant differences except the 'integrated' horticulturalists who were on average, three years older than the organic horticulturalists.

3.3.1 Comparing sectors within primary production

As described above, respondents in the survey (excluding those practicing organics) were asked the importance to them of each of four recreational activities on their farm or orchard. Their responses are shown in Tables 2a to 2d. No statistically significant relationships were found between the sectors.

Forty percent of the horticulturalists and one third or more of the arable farmers found these questions not applicable, probably indicating the lack of wetlands on their properties. The proportion of 'not applicable' responses for those in the other sectors varied according to question and sector.

When the respondents for whom the questions were applicable were considered, arable farmers found it less important to 'spend time and money on developing wetland areas' as a recreational activity (Table 2a) while horticulturalists were the ones who found it most important. Thirty-seven percent of specialist livestock farmers found waterfowl shooting as a recreational activity on their farm most important (Table 2b) – the highest over all sectors. For all sectors fishing in the wetlands and waterways on their properties was unimportant for 49 percent or more of respondents (Table 2c) while spending time looking at wetland areas was most important for horticulturalists with 51% of them reporting this (Table 2d).

Table 2a: The importance of recreational activities on farm or orchard: spending time and money on developing wetland areas

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	127	17	105	34	28	38	100
Dairy	124	12	109	28	31	41	100
Horticulture	118	40	71	23	24	54	101
Arable	78	33	52	46	27	27	100
Specialist livestock	65	17	54	26	28	46	100
Total/% of total	512	24	391	31	28	41	100

Note: Totals may not add to 100% due to rounding.

Table 2b: The importance of recreational activities on farm or orchard: waterfowl shooting

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	124	17	103	51	20	29	100
Dairy	126	13	110	44	27	29	100
Horticulture	117	43	67	58	21	21	100
Arable	79	20	63	57	21	22	100
Specialist livestock	66	14	57	42	21	37	100
Total/% of total	512	22	400	50	23	28	101

Note: Totals may not add to 100% due to rounding.

Table 2c: The importance of recreational activities on farm or orchard: fishing in wetlands and waterways

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	125	21	99	56	24	20	100
Dairy	124	18	102	49	24	28	101
Horticulture	116	43	66	52	18	30	100
Arable	79	32	54	52	20	28	100
Specialist livestock	65	23	50	54	28	18	100
Total/% of total	509	27	371	52	23	25	100

Note: Totals may not add to 100% due to rounding.

Table 2d: The importance of recreational activities on farm or orchard: spending time looking at wetland areas

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	126	18	104	43	20	37	100
Dairy	123	16	103	34	28	38	100
Horticulture	117	39	71	24	25	51	100
Arable	79	32	54	40	28	33	101
Specialist livestock	65	23	50	36	36	28	100
Total/% of total	510	25	382	36	26	38	100

Note: Totals may not add to 100% due to rounding.

The next set of questions considered the factors that limited wetland development. 'Not having the money' (Table 2e) was of least importance to arable farmers, as was 'not having the expertise' (Table 2f), though for only 25% of respondents overall was this important, presumably meaning that they did not feel they or others they had access to, had the expertise to develop wetland areas. Nearly half of the arable farmers felt that wetlands were inappropriate for the environment of their farm or orchard (Table 2g) compared with the other responses which were well under that figure, and for an average of 40% of the respondents a lack of interest was not an important factor in limiting the development wetlands on their property (Table 2h).

Table 2e: Limitations to wetland development: not having the money

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	121	31	83	30	25	45	100
Dairy	116	20	93	34	30	36	100
Horticulture	115	46	62	29	31	40	100
Arable	75	36	48	40	33	27	100
Specialist livestock	63	29	45	36	24	40	100
Total/% of total	490	32	331	33	29	38	100

Table 2f: Limitations to wetland development: not having the expertise

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	120	29	85	45	29	26	100
Dairy	116	18	95	43	31	26	100
Horticulture	115	45	63	33	41	25	99
Arable	75	36	48	48	35	17	100
Specialist livestock	62	27	45	40	31	29	100
Total/% of total	488	31	336	42	33	25	100

Note: Totals may not add to 100% due to rounding.

Table 2g: Limitations to wetland development: the inappropriateness of wetlands for the environment of a farm or orchard

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep & beef	123	29	87	41	25	33	99
Dairy	119	24	91	35	34	31	100
Horticulture	113	44	63	44	30	25	99
Arable	76	29	54	32	20	48	100
Specialist livestock	60	23	46	44	30	26	100
Total/% of total	491	31	341	39	28	33	100

Note: Totals may not add to 100% due to rounding.

Table 2h: Limitations to wetland development: no interest in developing wetlands

Sector	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Sheep/beef	115	36	74	41	32	27	100
Dairy	114	22	89	39	37	24	100
Horticulture	112	43	64	42	31	27	100
Arable	76	32	52	39	29	33	101
Specialist livestock	61	26	45	38	36	27	101
Total/% of total	478	32	324	40	33	27	100

Note: Totals may not add to 100% due to rounding.

3.3.2 Comparing farm management systems within sheep and beef

The data were analysed across the sheep/beef farmers with the responses from organic farmers certified through BioGro or AgriQuality added to the data (Tables 3a to 3d). In the first section of questions there were always less than 20% of the respondents who felt the questions were not applicable, whereas in the second section this rises to between 27% and 34%. We do not know why there is this change in response except perhaps the first part the question would be not applicable because farmers who did not have wetlands on their farm around which they could participate in recreational activities, whereas in the second part responses could include this reason, and/or that farmers felt they were not limited in any of these ways, and/or that there were no possible places for wetlands on their farm to which the questions could refer.

There was only one crosstabulation demonstrating a significant relationship between variables and that was between management system and 'spending time and money on developing wetland areas as a recreational activity' (Table 3a). This activity was much more important to organic sheep/beef farmers with only one reporting it as unimportant (4%) whereas 50% of the integrated sheep/beef farmers thought it unimportant. There were no relationships between the management systems and the importance of shooting waterfowl or fishing on the farm – the majority of farmers reporting these activities as unimportant (Tables 3b and 3c). Similarly there were no obvious differences between the proportions of farmers finding 'looking at wetland areas' important or unimportant except that a greater proportion of organic farmers were neutral about this activity (Table 3d), thus decreasing the proportion for whom it was unimportant.

Table 3a: The importance of recreational activities on farm or orchard: spending time and money on developing wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	104	18	85	31	29	40	100
Integrated management	23	13	20	50	20	30	100
Organic	26	12	23	4	30	65	99
Total/% of total	153	16	128	29	28	43	100

Note: 1. Totals may not add to 100% due to rounding.
2. Chi-squared test = 12.1, $p = 0.016$. Significant relationship between these variables.

Table 3b: The importance of recreational activities on farm or orchard: waterfowl shooting

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	101	16	85	51	19	31	101
Integrated management	23	22	18	50	28	22	100
Organic	25	4	21	58	29	13	100
Total/% of total	149	15	127	52	22	26	100

Note: Totals may not add to 100% due to rounding.

Table 3c: The importance of recreational activities on farm or orchard: fishing in wetlands and waterways

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	102	20	82	55	23	22	100
Integrated management	23	26	17	59	29	12	100
Organic	25	8	23	44	35	22	101
Total/% of total	150	19	122	53	26	21	100

Note: Totals may not add to 100% due to rounding.

Table 3d: The importance of recreational activities on farm or orchard: spending time looking at wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	103	17	86	43	21	36	101
Integrated management	23	22	18	44	17	39	100
Organic	26	12	23	17	44	39	101
Total/% of total	152	16	127	39	24	37	99

Note: Totals may not add to 100% due to rounding.

The next set of questions considering the factors that limited wetland development showed no significant relationships between the different management systems of sheep/beef farmers and limitations to wetland development (Tables 3e to 3h). Having said that no statistically significant relationships exist some possible tendencies can be commented on. Organic farmers were more likely to feel it was a lack of expertise that limited their development of wetlands (Table 3f) while conventional farmers were less likely to feel that the inappropriateness of their farm was a limitation to the development of wetlands. Both integrated and organic farmers did not think that a lack of interest was a limiting factor (Table 3h).

Table 3e: Limitations to wetland development: not having the money

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	98	32	67	30	28	42	100
Integrated management	23	30	16	31	13	56	100
Organic	24	8	22	32	18	50	100
Total/% of total	145	28	105	31	24	46	101

Note: Totals may not add to 100% due to rounding.

Table 3f: Limitations to wetland development: not having the expertise

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	97	29	69	44	30	26	100
Integrated management	23	30	16	50	25	25	100
Organic	25	16	21	33	19	48	100
Total/% of total	145	27	106	43	27	30	100

Table 3g: Limitations to wetland development: the inappropriateness of wetlands for the environment of a farm or orchard

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	100	31	69	36	28	36	100
Integrated management	23	22	18	61	17	22	100
Organic	24	33	16	50	19	31	100
Total/% of total	147	30	103	43	24	33	100

Table 3h: Limitations to wetland development: no interest in developing wetlands

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	92	38	57	37	35	28	100
Integrated management	23	26	17	53	24	24	101
Organic	24	25	18	61	22	17	100
Total/% of total	139	34	92	45	30	25	100

Note: 1. Totals may not add to 100% due to rounding.

3.3.3 Comparing farm management systems within dairy

When the data for dairy farmers was supplemented by the responses from the survey of organic dairy farmers and analysed across management systems (Tables 4a to 4h) no statistical tests were able to be carried out because many of the cells contained too few responses. When compared with the other sectors it was apparent that most saw the questions as applicable to them.

As the results could not be statistically analysed, all the following comments in this section are about possible tendencies in the data. Integrated and conventional dairy farmers were less likely to respond that developing wetlands was an important recreational activity compared with organic farmers (Table 4a). Shooting waterfowl and fishing were unimportant activities on the farm for most farmers (Table 4b and Table 4c) especially organic farmers, however integrated farmers were equally divided about the importance of fishing while to organic and conventional dairy farmers this activity was unimportant to the majority. The results on the importance of looking at wetlands were fairly evenly spread over all possible responses except for those of organic farmers who were more inclined to be neutral on this activity (Table 4d).

Table 4a: The importance of recreational activities on farm or orchards: spending time and money on developing wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	111	14	96	26	32	42	100
Integrated management	13	0	13	39	23	39	101
Organic	23	9	21	19	24	57	100
Total/% of total	147	12	130	26	30	44	100

Note: Totals may not add to 100% due to rounding.

Table 4b: The importance of recreational activities on farm or orchard: waterfowl shooting

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	113	12	99	42	29	28	99
Integrated management	13	15	11	55	9	36	100
Organic	23	13	20	65	15	20	100
Total/% of total	149	13	130	47	25	28	100

Note: Totals may not add to 100% due to rounding.

Table 4c: The importance of recreational activities on farm or orchard: fishing in wetlands and waterways

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	111	17	92	50	24	26	100
Integrated management	13	23	10	40	20	40	100
Organic	23	17	19	68	11	21	100
Total/% of total	147	18	121	52	22	26	100

Table 4d: The importance of recreational activities on farm or orchard: spending time looking at wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	110	17	91	33	29	39	101
Integrated management	13	8	12	42	25	33	100
Organic	23	9	21	19	52	29	100
Total/% of total	146	15	124	32	32	36	100

Note: Totals may not add to 100% due to rounding.

The next set of questions considering the factors that limited wetland development showed that 50% of the organic farmer respondents felt that money was a limiting factor in the development of their wetlands (Table 4e). A lack of expertise did not seem to be a limitation (Table 4f) but 56% of integrated farmers felt that wetland development was not appropriate on their farms (Table 4g). Again a lack of interest did not seem to be a limiting factor with integrated and organic farmers more likely to feel this way (Table 4h).

Table 4e: Limitations to wetland development: not having the money

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	104	21	82	35	28	37	100
Integrated management	12	8	11	27	46	27	100
Organic	22	9	20	20	30	50	100
Total/% of total	138	18	113	32	30	38	100

Table 4f: Limitations to wetland development: not having the expertise

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	104	18	85	42	31	27	100
Integrated management	12	17	10	50	30	20	100
Organic	22	9	20	30	45	25	100
Total/% of total	138	17	115	41	33	26	100

Table 4g: Limitations to wetland development: the inappropriateness of wetlands for the environment of a farm or orchard

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	108	24	82	35	37	28	100
Integrated management	11	18	9	33	11	56	100
Organic	22	9	20	55	20	25	100
Total/% of total	141	21	111	39	32	30	101

Note: Totals may not add to 100% due to rounding.

Table 4h: Limitations to wetland development: no interest in developing wetlands

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	103	22	80	38	39	24	101
Integrated management	11	18	9	56	22	22	100
Organic	21	14	18	67	22	11	100
Total/% of total	135	21	107	44	35	22	101

Note: Totals may not add to 100% due to rounding.

3.3.4 Comparing management systems within horticulture

When the data for the horticulture sector were supplemented with the responses of those from organically certified management practices, the analysis of the data for which these questions were applicable, showed two slightly significant relationships. Integrated and organic horticulturalists were less likely to see water fowl shooting and fishing as important recreational activities on their properties compared with those using conventional management practices (Tables 5b and 5c). Though it does not show a statistically significant relationship, it is interesting to observe that around 50% of all respondents saw looking at their wetlands as an important recreational activity and more organic respondents were neutral in this regard than any others (Table 5d). However, it is important to note that around 40% of respondents overall thought that all of these questions were not applicable to them, probably indicating that they did not have wetlands on their property (Tables 5a to 5d).

Table 5a: The importance of recreational activities on farm or orchards: spending time and money on developing wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	38	32	26	27	19	54	100
Integrated management	80	44	45	20	27	53	100
Organic	57	44	32	19	28	53	100
Total/% of total	175	41	103	21	25	53	99

Note: Totals may not add to 100% due to rounding.

Table 5b: The importance of recreational activities on farm or orchard: waterfowl shooting

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	38	42	22	41	27	32	100
Integrated management	79	43	45	67	18	16	101
Organic	56	43	32	81	9	9	99
Total/% of total	173	43	99	66	17	17	100

Note: 1. Totals may not add to 100% due to rounding.
2. Chi-squared test = 9.64, $p = 0.047$. Slightly significant relationship between these variables but two cells have expected values less than 5.

Table 5c: The importance of recreational activities on farm or orchard: fishing in wetlands and waterways

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	37	38	23	30	22	48	100
Integrated management	79	45	43	63	16	20	99
Organic	56	55	25	56	28	16	100
Total/% of total	172	47	91	53	21	26	100

Note: 1. Totals may not add to 100% due to rounding.
2. Chi-squared test = 9.6, $p = 0.048$. Slightly significant relationship between these variables. (One cell with expected value less than 5.)

Table 5d: The importance of recreational activities on farm or orchard: spending time looking at wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	38	32	26	23	19	58	100
Integrated management	79	43	45	24	29	47	100
Organic	56	38	35	11	43	46	100
Total/% of total	173	39	106	20	31	49	100

Note: Totals may not add to 100% due to rounding.

The next set of questions considering the factors that limited wetland development showed no significant relationships between those who practiced the different management systems of horticulturalists and the questions asked in the survey (Tables 5e to 5h). The figure of 40% finding these questions not applicable in the first section rose to 45% in this section indicating that at least eight more horticulturalists found this section not applicable, indicating perhaps, as before, that they did not have potential wetland areas to develop or did not see limitations to doing this development.

More organic respondents saw wetlands as inappropriate on their property whereas more conventional respondents did not see this as a limiting factor (Table 5g). Apart from this there were no notable variations in the responses to any of the questions over the different management systems.

Table 5e: Limitations to wetland development: not having the money

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	36	47	19	26	26	47	99
Integrated management	79	46	43	30	33	37	100
Organic	51	43	29	31	17	52	100
Total/% of total	166	45	91	30	26	44	100

Note: Totals may not add to 100% due to rounding.

Table 5f: Limitations to wetland development: not having the expertise

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	36	47	19	32	47	21	100
Integrated management	79	44	44	34	39	27	100
Organic	51	43	29	45	21	35	101
Total/% of total	166	45	92	37	35	28	100

Note: Totals may not add to 100% due to rounding.

Table 5g: Limitations to wetland development: the inappropriateness of wetlands for the environment of a farm or orchard

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	36	47	19	58	26	16	100
Integrated management	77	43	44	39	32	30	101
Organic	56	45	31	26	26	48	100
Total/% of total	169	44	94	38	29	33	100

Note: Totals may not add to 100% due to rounding.

Table 5h: Limitations to wetland development: no interest in developing wetlands

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
Conventional	36	44	20	40	35	25	100
Integrated management	76	42	44	43	30	27	100
Organic	51	53	24	38	42	21	101
Total/% of total	163	46	88	41	34	25	100

Note: Totals may not add to 100% due to rounding.

3.3.5 Comparing management systems within the kiwifruit industry

When the data were analysed across the kiwifruit orchardists there were no significant relationships between the responses of those growing kiwifruit under different management systems or with different cultivars of kiwifruit.¹ The responses are summarised in Tables 6a to 6d. Like the horticulturalists in the previous section, a large number considered these questions were not applicable to them. This time 40 % to 45%, approximately, found the first section not applicable and this rose to 50% in the next section, a difference on average of 12 to 20 orchardists, indicating again that more is going on apart from the likelihood that they do not have wetlands on their property.

Shooting wildfowl and fishing were not considered important recreational activities by most kiwifruit orchardists (Table 6b and Table 6c). Though there was an absence of statistically significant relationships showing up, it is interesting to note certain tendencies in the data. Gold orchardists did not find looking at their wetlands an important recreational activity compared with Green and Organic Green who did so. These responses may be explained by whether or not these respondents lived on their orchard - another question in the survey. Further exploration of the data using these responses found that there were no apparent differences for those who lived on or off the orchard, giving no substance to this explanation.

Table 6a: The importance of recreational activities on farm or orchard: spending time and money on developing wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	99	41	58	33	29	38	100
KiwiGreen Gold	83	43	47	38	17	45	100
Organic Hayward	59	42	34	27	35	38	100
Total/% of total	241	42	139	33	27	40	100

¹ Note that these data come from the survey of kiwifruit orchardists. None of it is included in the first section of these results.

Table 6b: The importance of recreational activities on farm or orchard: waterfowl shooting

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	96	43	55	56	26	18	100
KiwiGreen Gold	82	43	47	75	15	11	101
Organic Hayward	59	48	31	68	16	16	100
Total/% of total	237	44	133	65	20	15	100

Note: Totals may not add to 100% due to rounding.

Table 6c: The importance of recreational activities on farm or orchard: fishing in wetlands and waterways

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	96	48	50	48	26	26	100
KiwiGreen Gold	83	42	48	65	17	19	101
Organic Hayward	58	43	33	52	24	24	100
Total/% of Total	237	45	131	55	22	23	100

Note: Totals may not add to 100% due to rounding.

Table 6d: The importance of recreational activities on farm or orchard: spending time looking at wetland areas

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	97	41	57	30	28	42	100
KiwiGreen Gold	82	42	48	52	23	25	100
Organic Hayward	58	40	35	23	31	46	100
Total/% of total	237	41	140	36	27	37	100

Note: Chi-squared test = 9.32, $p = 0.054$. Nearly a significant relationship between these variables.

The next set of questions considering the factors that limited wetland development showed no significant differences between those who practiced the different management systems of kiwifruit orchardists (Tables 6e to 6h). The only tendency that is worth remarking on is that the Gold orchardists were more likely than the others to say that lack of interest was a limiting factor in the development of wetlands on their orchard.

Table 6e: Limitations to wetland development: not having the money

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	92	44	52	39	25	37	101
KiwiGreen Gold	80	55	36	31	31	39	101
Organic Hayward	55	53	26	23	27	50	100
Total/% of total	227	50	114	33	27	40	100

Note: Totals may not add to 100% due to rounding.

Table 6f: Limitations to wetland development: not having the expertise

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	92	46	50	44	32	24	100
KiwiGreen Gold	81	53	38	29	45	26	100
Organic Hayward	54	50	27	37	30	33	100
Total/% of total	227	49	115	37	36	27	100

Table 6g: Limitations to wetland development: the inappropriateness of wetlands for the environment of a farm or orchard

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	95	43	54	28	28	44	100
KiwiGreen Gold	78	55	35	40	23	37	100
Organic Hayward	54	56	24	33	25	42	100
Total/% of total	227	50	113	33	26	42	101

Note: Totals may not add to 100% due to rounding.

Table 6h: Limitations to wetland development: no interest in developing wetlands

Management system	N	% NA	Adj. N	% Unimportant	% Neither	% Important	Total %
KiwiGreen Hayward	92	49	47	32	43	26	101
KiwiGreen Gold	82	55	37	57	35	8	100
Organic Hayward	54	61	21	43	33	24	100
Total/% of total	228	54	105	43	38	19	100

Note: Totals may not add to 100% due to rounding.

3.4 Summary and Conclusion of Quantitative Results

The important findings are summarised in the following table:

Table 7: Key findings from quantitative results

Importance of activities	%	Note
Spending time and money	41	65% for organic farmers
For shooting	28	In horticulture, highest for conventional
For fishing	25	In horticulture, highest for conventional
For looking	38	In dairy, highest for conventional
Limitations		
Money	38	45% for sheep/beef farmers
Expertise	25	In sheep/beef, highest for organic farmers
Inappropriate	33	48% for arable farmers
No interest	27	

Looking at these results shows among farmers in New Zealand there is solid support for developing wetland areas on their farms as a recreational activity. Nearly one half reported that this activity was important or very important. Interest is much higher among organic farmers. Just over one third said that they want to do this so they can spend time looking at wetlands, while about one quarter said that either shooting or fishing were important. Regardless of how the wetland is used, there is interest among farmers in wetlands for recreational activity. While one third of farmers said wetland development was inappropriate, the others emphasised lack of money as the main limiting factor.

Farms and orchards for which these questions were not applicable varied over the different sectors. For the first four questions about recreational use of wetlands similar percentages of sheep/beef and dairy farmers (12 – 19%) found these questions not applicable to them. This compares with the horticulture and kiwifruit sectors for whom these first four questions were not applicable to 39 to 47 % of the respondents, perhaps indicating the lack of wetlands on many of these properties (compared with farms), particularly wetlands on which these activities could take place. However, an interesting change occurs in the way the proportion of 'not applicable' responses change in the second set of four questions on limitations to wetland development. In the responses of sheep/beef farmers the 'not applicable' responses rise by about 12% whereas there is little change in the dairy responses. Similarly proportion of 'not applicable' responses in the horticulture sector stays the same but rises by about 8% for the kiwifruit sector. Why should this be? Why would there be more 'not applicable' responses for the limitations to wetland development questions? Is it that in addition to not having wetlands there are no suitable places for wetland development on their properties for some of the sheep/beef and kiwifruit respondents? Basically there were not enough questions to inform this issue.

Comparing the responses to the questions across the sectors shows a remarkably similar pattern. Spending time and money on the development of wetland areas as a recreational activity was regarded as important by around 40% of respondents across sheep/beef and dairy farmers and kiwifruit orchardists, the only difference being that this was considered important by 53% of horticulturalists. Waterfowl shooting was important to around one quarter of sheep/beef and dairy farmers, but only 17% and 15% of horticulturalists and kiwifruit orchardists respectively. Fishing on the other hand was important to around one quarter of the respondents independent of sector. Sending time looking at wetland areas

was also important to around 36% of sheep/beef and dairy farmers and kiwifruit orchardists but 49% of the horticulturalist respondents found this important.

A comparable pattern of similarity is apparent across the responses to the questions to do with limitations to the development of wetlands. Around 40 % of respondents feel that lack of money is a limitation whatever sector they farm in. Similarly around 28% of respondents feel the limiting factor is their expertise, while around 22% have no interest in developing wetlands, independent of sector. The only slight difference occurs in the kiwifruit respondents with 42% of them feeling that wetlands are inappropriate for their farm environment compared with around 30% for the other sectors, perhaps indicating the size and uniformity of many kiwifruit orchards.

4. Qualitative Results from Interviews with Farmers

4.1 Introduction

Questions relating to wetlands and waterways were incorporated into the first round of ARGOS interviews with Dairy farmers carried out in May/June 2006, and the second round of ARGOS interviews with Sheep & Beef farmers carried out from November 2005 to March 2006. Questions regarding wetlands were not incorporated into interviews with Kiwifruit orchardists as the results from the quantitative survey revealed that the landscapes of these orchards are unlikely to include wetlands on them. The following analysis is based on 36 interviews with Sheep & Beef farmers and 19 interviews with Dairy Farmers.

4.2 Method

The first and second rounds of qualitative interviews mentioned above are part of an ongoing longitudinal study being conducted by the ARGOS group. With the funding available from the Fish and Game scholarship, questions were added to the first round of dairy interviews, and the second round of sheep/beef interviews to explore how farmers think about the wetland and waterway environments on their farms. These questions were presented in a very open-ended way, allowing for flexibility in the topics that were discussed in the interview. The initial questions usually revolved around whether the farmer considered wetlands to be relevant to their particular farm environment. Following on from this, farmers were asked how they managed the wetlands and waterways, with some exploration of the constraints or challenges that farmers faced with managing these types of areas. Some questions were also asked about what farmers enjoyed, or found important about wetland areas.

On completion of the interviews, the recordings were transcribed by an independent sub-contractor and returned as word files. These files were then coded in terms of various emergent themes using ATLAS (a qualitative software tool). The following section outlines these themes, and includes a selection of quotations from the transcribed interview material in order to present the ideas and attitudes of farmers in as accurate and immediate a way as possible. In order to maintain their anonymity, none of the farmers are identified, however, the sector and type of farm is noted.

4.3 Results

4.3.1 *How do farmers conceptualise wetlands and waterways?*

One of the issues that quickly became clear in the interviews with farmers was the problem of how wet areas on a farm are named or classified. Several farmers stated that they did not have 'wetlands' on their farms, but then went on to describe a variety of different 'wet' areas, such as creeks, ponds or 'bogs', on their land. In the following extract, for example, a farmer is unsure whether a creek or a 'bog' constitutes a wetland:

- "There's a natural creek. But a wetland like a marsh wetland or something like that we don't have. I mean up in the tussock block, it's a bit boggy. But it's not like a natural wetland" (SB, Integrated).
- Another farmer does not consider ponds to really qualify as wetlands: [Do you have any things you might call wetlands?] "Not as such. The odd pond and that about. But not particularly wetland, no" (SB, Organic).
- Another sheep and beef farmer's response to the same question was: "We have a couple of creeks. There's a swampy bit here and there...not anything substantial though" (SB, Conventional).
- This dairy farmer explained: "We haven't got wetlands as such", but then went on to explain that there were a few little areas on the farm that were fenced off and planted out with flaxes and that: "The water running through is so clear" (Dairy, Organic).

There were also some divergent ideas about wet areas that are 'man-made' as opposed to 'natural' areas. Water races, which are common on many farms in Canterbury, are considered by some farmers to be features of a wetland ecosystem, but not by others.

- One farmer's response to the question, 'How do you manage your waterways?' was, "We've got a water-race, which is a man-made thing. Basically just clean it out every couple of years with the digger" (SB, Organic).
- In contrast, another farmer replied: "There's no wetlands on this country. And [as for] waterways – well, we've got stock waterways, county stock water-race, which I don't think qualifies because it's a man-made one" (SB, Conventional).

A further variation as to what constitutes a wetland or waterway related to seasonal differences in the farming landscape, particularly with some wet areas completely drying out during some parts of the year.

- For example, one sheep and beef farmer in Canterbury explained: "we have creeks, but they're not permanent waterways. They don't permanently have water in them" (SB, Organic).
- Another farmer stated: "There's one or two [areas] which might be wet for four months of the year, but we don't class them as wetland" (Dairy, Conventional).

4.3.2 Farmers' motivations to develop and manage wetlands and waterways

Farmers were not asked to directly state their motivations regarding the development or protection of wetlands or waterways on their land, but when the issue of management was being discussed many farmers articulated various viewpoints that revealed a number of different priorities that were important to that management. The following are some of the key themes that emerged in the interviews.

Wildlife and native plants

During the interviews, 15 farmers mentioned that their appreciation of the wildlife and native plants found in wetlands and waterway landscapes was an important motivation for developing or looking after these areas.

- One sheep and beef farmer who was planning to put in a wetland mentioned the desire to: "Encourage a bit of bird life...[to come] back" (SB, conventional).
- This sheep/beef farmer explained how much she enjoyed the wildlife and plants around ponds: "Ducks, wildlife, yeah, I would love to plant more trees and things around the ponds." Her husband added: "And we would quite like to put some lobsters in some of them, just for fun" (SB, Integrated).
- Another farmer mentioned an appreciation for eels and reminisced about when eels and fresh water crayfish were more plentiful: "I did come across a couple [of eels] there one day, you know, and it was just good to see eels... When we were growing up, we would walk up the creek and we would always have eels and those little creepy, crawly things...fresh water crayfish" (Dairy, Conventional).
- A dairy farmer's wife retold an amusing anecdote about her husband rescuing a frog from a cat, and suggests an increase in the frog population is an indication that their wetland management is succeeding at least in some ways: "And also the cat brought in a little frog. But [husband] rescued that. Put it in the bath and then we took it up to put it in a little wet area. And that was quite a...good size frog. So they reckon they're starting to come back, so we must be doing something right" (Dairy, Organic).

Environmental/Aesthetic values

Connected to an appreciation of wildlife and native plants, was a more general appreciation of 'nature'. Four farmers implied that their primary motivation for preserving and developing wetlands and waterways on their farms was due to a sense of wanting to look after the environment and an appreciation of looking at natural features, like streams and ponds.

- This dairy farmer, for example, compares the aesthetic pleasure of looking at a stream, to that of the ocean: "It is just like, you know, if you are living by the sea – you value the sea because it is good to look at. Well, I like water, I like the waterways, you know, the streams. I reckon they are a good thing, and... you don't want shit all

through them, you don't want them dirty... I want them to be clean" (Dairy, Conventional).

- This sheep/beef farmer also emphasised the enjoyment of looking at a stream: "I do not think we ever go up to [place name omitted] without saying how lovely it is [laughter] and that is the truth, we always say 'gee this is nice'. You know it is so picturesque with the stream up there, it is just lovely" (SB, Integrated).
- This sheep/beef farmer stated that developing ponds was a way to 'beautify' the farm: "They [ponds] enhance the environment. I think they are beautiful" (SB, Integrated).

Water and shade for stock

While for many farmers, wetlands are fenced off from stock (see Section 4.3.3 below), a few farmers utilise and even develop wetland and waterway areas for stock to drink from or shelter under.

- Two farmers indicated that their primary motivation for putting in ponds on their farms was to provide water for stock: [So you created ponds for?] "Stock water. A lot of those were put in before the water scheme went in, but there are others that were dug later. We had a digger in here for a day...about eight years ago. And that's just to catch run off down gullies really" (SB, Integrated).
- Another farmer emphasised that developing wetlands on his farm for stock to drink from, made these areas 'useful' and therefore relevant to productivity on his farm: "I suppose some people think it's much better to have a [fenced off] wet area. We've gone the opposite and tried to make it farmable...To me that's much more useful than a bog. Because a bog, they [stock] can't really drink out of really. Well, especially cattle" (SB, Conventional).
- An area described as swamp by one farmer, is an important area for cows to keep cool in summer: "We've got a bit of swampy area...that just looks after itself. We don't try and drain it and it just stays as is. There's willows down there...our cows sit under there all summer...They're just happy for the shade we think" (Dairy, Organic).

Hunting and Fishing

Without prompting, three farmers mentioned hunting/and or fishing as important motivations for developing wetlands on their farms.

- One farmer was very explicit that a key reason for his interest in wetland related to hunting and fishing: "Oh yeah...[we] do a lot of fishing and bird shooting" (SB, Integrated).
- Another farmer was asked whether he had any ponds set up on his farm, and he replied: "No, no only for duck shooting if we did".

The quantitative survey results outlined above (see Table 2b and 2c), show that between 20% to 30% of the farmers in this larger study group thought that waterfowl shooting or fishing activities were important. Therefore, it is surprising that so few farmers in the qualitative interviews mentioned hunting or fishing as priorities for wetland development. It should be noted, however, that there were no specific questions asked with regard to these recreational activities, and it is possible that with prompting more farmers may have expressed an interest in this area.

Tourism Opportunities

Three farmers mentioned that they associated wetlands with the promotion of farm tourism. One of these farmers was already taking tourists for tours on his farm, and the other two farmers mentioned the potential they hoped to realise in the future through tourism. For example:

- "And we've got these water features...and there's a tourism thing there, it might be the cleverest thing we've ever done" (SB, Organic).

Water Recreation

One dairy farmer mentioned one of the important aspects of the rivers on her farm was the recreational opportunities that these areas provided for the family to go swimming and paddling:

- “The kids go over there some times, well they used to – they have camped there and swam in the rivers but they always have...paddled in it, it is not really deep” (Dairy, Organic).

4.3.3 Fencing wetlands and waterways

The key issue that arose in the interviews when discussing management of wetlands was fencing. Over half of the farmers interviewed, discussed the importance of fencing in order to maintain and protect wetlands, but there were also some significant issues that farmers had with the regulatory requirements associated with fencing waterways and wetlands. The following section will outline the explanations that farmers gave for fencing wetlands and waterways on their farm. (For discussion of the specific concerns that farmers have with regulations and fencing, see Section 4.3.4.) Farmers’ attitudes towards fencing wetlands and waterways on their land were, to a large degree, affected by the topography of their farm and the cost of fencing.

Dairy farmers

Dairy farmers were largely accepting of the need to fence of wetlands and waterways on their farm, and several had already completed this process:

- “We’ve fenced off all our drains so cows don’t go in the waterways at all” (Dairy, Conventional).
- “We have a wetland down there, but that is protected – it is fenced” (Dairy, Conventional).

Seven dairy farmers mentioned that they were in the process of fencing of waterways on their farm, and while generally positive about this process, there was an emphasis on the time it would take to fence these areas:

- “We are starting to plan and fence of waterways. We have not done a lot yet” (Dairy, Conventional).
- “The drains are fenced off from the farm... with our other property there’s a lot more waterways and sort of springs and things and we are gradually going to try and fence them off as well so that the stock aren’t walking through them” (Dairy, Organic).
- This farmer went into detail about the process used on his farm to manage the fencing: “We sort of walk the farm and thought, ‘well, we don’t want the cows here’ - [because] it’s too wet or something like that. So we just use temporary fences to start off. And then sort of listed them in order of importance...and there’s one place out the back here that’s only getting permanently fenced now, and we’ve just had temporary fences in other areas. We sort of changed a few of the paddocks around a little bit” (Dairy, Organic).

Two dairy farmers mentioned the advantage to them of fencing off waterways, as it helped to limit stock loss.

- For example, this farmer commented: “It [fencing] is probably a bit of a pain because you have got to do it, but once it is done it is good really because it keeps your stock out of the water” (Dairy, Conventional).
- Another dairy farmer, whose land includes some hills and gullies, stated something similar: “I’ve found the farm easier to run...because you don’t have to go into gullies to see if the cows are coming out of it. We’ve probably lost around about a cow a year in swamps, maybe two – which I mean that’s about one thousand dollars worth. So we’ve spent more than that each year fencing them off, but long term it should be of benefit (Dairy, Conventional).

One of the dairy farmers was particularly positive about fencing off waterways, and when asked how he knew he was looking after the environment on his farm, responded that fencing waterways was an indication of this:

- “Well we are fencing off ours [waterways], but I don’t think it is a bad thing actually, I think it is good. Like...we shouldn’t be stuffing up the water...we should be keeping our stock out of it” (Dairy, Conventional).

Sheep/Beef farmers

For sheep and beef farmers, fencing was not seen as being such a straightforward issue. Those farmers who had larger bodies of water on their land, did not question the merits of fencing these areas however, there was much more ambivalence about the necessity of fencing all creeks and waterways on their farms. Six sheep and beef farmers did, however, say they had no problems with fencing on their properties. For example:

- “But my decision to fence it [river on farm]? No, I did that really more for my own beliefs and that’s what should be done” (SB, Conventional).
- “No, we don’t have any problems with that [fencing waterways]. But I tend to agree that those waterways should be protected” (SB, Organic).
- “No [problem] because we are quite green minded anyway, in fact the company’s locking up land, you know for regenerating native bush and there is a sort of deliberate policy of trying to fence off the waterways and putting in riparian zones” (SB, Organic).

This organic sheep/beef farmer explains how he anticipated the importance of fencing wetlands before the idea was so widely accepted:

- “I think maybe five or ten years ago when we were cleaning up the waterways and doing fencing...people’s opinions were they thought that we were throwing money away, and not creating better productivity. But now that everyone’s attitudes are starting to swing because of the push of the government and everything like that – people are thinking, well, maybe we were doing the right thing then. And they’ve already taken all theirs away and stuffed all their waterways. So now it’s going to be a lot harder to try and preserve it or get it back to its natural state” (SB, Organic).

Some sheep and beef farmers whose farms are on steeper and more uneven terrain found there were some problems with fencing waterways and questioned whether this was really necessary anyway. This farmer for example argued:

- “Well, it is just not feasible, that is the bottom line, because you graze the gullies as well so it is all part of the system...it is just not feasible” (SB, Integrated).
- This farming couple also highlighted the difficulties they would have in fencing the waterways on their farm: [Male farmer] “Now that’s a major thing. If you have to fence off all your waterways from the stock, which technically we’re supposed to do. I don’t know how we’d do it. Because we’ve got waterways everywhere.” [Female farmer] “Everywhere. Down every gully. Well, not even in gullies sometimes...I mean it’s a good idea in theory to protect your waterways and to protect your creek banks. But it’s a really tricky one” (SB, Conventional).

Another problem that was mentioned by both a dairy farmer and a sheep/beef farmer was the challenge of putting in fences, which are then destroyed during flooding:

- “There are a few things that I know I have to improve, like fencing off my rivers which I am trying to do. But then you know the rivers flood and the fences get ripped out” (Dairy, Organic).
- The sheep/beef farmer mentioned how long it takes to recover from flooding: “I fenced it off probably, about fifteen, twenty years ago. And in 1991 we had a big flood and it took the whole lot out again. So that put a bit of a damper on that” (SB, Integrated).

4.3.4 Farmers' perceptions of regulatory issues and organisations

Perceptions of regulations relating to fencing wetlands and waterways

One of the main concerns that arose in the interviews with regard to the regulations of wetlands and waterways, was that the variations between different farming sectors and different regions were not being taken into account. Ten sheep/beef farmers felt that strict fencing of waterways was required on dairy farms, but that the same requirements were not necessary in the sheep and beef sector.

- This farmer observed: “There’s no doubt you can’t fence them [streams] all off. But I guess in a dairy situation with high stock numbers, you ought to” (SB, Conventional).
- This sheep farmer argued: “Being predominantly sheep farmers, the sheep are nowhere near as destructive and erosive around the edges of them [waterways]. At the moment there’s no issues, really with waterways” (SB, Organic).
- Those sheep/beef farmers, whose farms encompass hill country with a lot of gullies, were particularly alarmed about regulations that made it mandatory for all waterways to be fenced off. One farmer explained: “For the dairy farmers it is far more of a relevant topic because they are the one putting concentrates of stuff from cattle into waterways... effluent...is a real issue for them, a big issue. But in hill country like this, unless you have everything concentrated in one paddock in the winter...or some special circumstance, I think that the overall effect would be minimal” (SB Conventional).

This sheep/beef farmer was so concerned about a neighbouring dairy farmer fouling the waterways, that he took on a policing role and reported the farmer to the District Council:

- “Two or three years ago we had a neighbour...who was running dairy cows above us. And they didn’t bother fencing their water-races and the water-race just turned into mud. Disgusting. [And so what happened then?] Well, we got the water ranger” (SB, Conventional).

Several farmers expressed concern about potential regulations that might require them to fence areas of their farms that were only seasonal waterways. For example:

- “Earlier on they were talking about if the gully run water – which runs for only so many weeks a year – would be classed as a waterways. There is one paddock out there; there is another one round the corner. It would just bugger our farm up basically. You would spend absolutely thousands and thousands of dollars fencing off for a few weeks a year...because it runs water a few weeks of the year” (SB, Integrated).

One of the primary reasons for concern about regulations that required the fencing of seasonal waterways was that this would then remove an important source of grass for stock during dry periods of the year. This dairy farmer, for example, was not supportive of this:

- “We might have to fence all our drains in the future, which is a little bit ridiculous... these are not fast flowing streams or anything. And the cows do get in and graze them at this time of year when there is no water in them, which actually keeps the banks tidy and that anyway” (Dairy, Conventional).

Another farmer has seasonal ‘swamp’ areas on his farm fenced off, but he does still run stock in those areas when they are dry:

- “We’ve got some swamp areas... I mean they’re all fenced off. I do run stock in them, particularly when it gets dry like this” (SB, Organic).

Additionally, some farmers argued that without the stock controlling the weeds during the dry period, once the water returned there would be a problem with waterways becoming clogged with weeds and therefore the water would not run:

- If they are just left to grow, they are going to grow weeds, thistles, and all that sort of thing which are going to flow down to the lakes and put that unwanted vegetation there, so it is a pretty fine line then between whether you are protecting or causing a problem further down stream (SB, Conventional).

This sheep/beef farmer discussed the dilemma of striking a balance between weed control and stock fouling waterways:

- “There is one problem that’s developing with having stock out of the rivers and verges – they’re getting full of weeds. A lot of noxious weeds that sheep or cattle would’ve normally eaten are getting away and clogging up the waterways...So it’s only really come in since the stock have been forced out of the rivers. So they do a good job in certain ways, but they do dirty the water in other ways. So I don’t know what’s, you know, if there’s a happy medium somewhere along the line” (SB, Integrated)

Gaining the cooperation of farmers

Two farmers outlined the importance of gaining the cooperation of farmers if regulations of wetlands and waterways are to be accepted. This organic sheep/beef farmer highlighted the importance of using incentives, rather than penalties:

- “But if [regional/district] councils ever say to [sheep/beef] farmers - like they’ve done it to dairy farmers – that the waterways have to be fenced by... next June...[then] it’s all very well to have deadlines but they’ve got to put carrots out there. Farmers will respond to carrots. They’ll go doggie with sticks. It’s just the nature of farmers – they don’t like sticks” (SB, Organic).

This farmer emphasised that in order to get farmers cooperation, it is vital that the relevance of the regulations is made evident:

- “I think to get the cooperation of farmers in general you know...they are going to beat their head against a brick wall unless they do demonstrate the need for it” (SB, Conventional).

Perceptions of regulatory organisations

The quotation from the organic sheep/beef farmer who explains that farmers do not like ‘sticks’ was also born out by a fairly widespread suspicion amongst farmers towards organisations that enforce regulations relating to clean wetlands and waterways.

One dairy farmer felt that Fonterra was primarily the enforcer of regulations about protecting waterways and wetlands:

- “If Fonterra is involved, well that is it. They make the rules, they pick up the milk don’t they.” [So you think it is pretty much Fonterra to blame in that case, or are they responding to somebody else?] “Oh, they are responding to some else, I think... but they are in on it, so they can say, ‘well we will not pick your milk up unless you do this or do that” (Dairy, Conventional).

Three farmers were critical of local district or regional councils. This sheep/beef farmer expressed concern at the bureaucracy and amount of money that was involved in applying for permits from the local district council:

- “And I must admit I was concerned when I read that district plan on what we were going to be able to do and not do on our properties. And it inferred that you were going to have to have resource consents to dig offal holes, to apply fertiliser and I must admit I did not like the idea... As you know, when you get involved in those things...every time you get a permit issued there will be a fee, or you know there will be bureaucracy involved.” This same farmer then went on to explain the importance of education instead of a system of permit-issuing: “I think it’s much better if they can work towards educating people with best management practices, rather than getting sort of in the situation where you have got to issue permits for everything” (SB, Conventional).
- Similarly, this farmer highlighted the bureaucracy involved with dealing with local councils: “I think some of the people that work in the regional council and even the local district council – they just like creating paperwork for themselves. Keeping themselves in their job...[And] they can’t go in there pointing a big stick and say, ‘well, no you can’t’. They have got to have reasons. They have got to have some facts behind them” (SB, Integrated).

- This farmer made some interesting observations about how the Canterbury Regional Council's policies about wetlands have changed over time. He suggests that while a decade or so ago there was no protection for wetlands at all, current policy has gone too far towards the other extreme: "We even had somebody out from Environment Canterbury when we first came over here and we asked him about it [wetland] then, and he went and had a really good look around and said that it is just a waste of ground, 'go ahead and drain it'...But the change in attitude now...'no, you can not touch that', you know what I mean? And it is no different, it is just the same, it is just the attitudes have changed and they have really probably swung too far the other way" (SB, Integrated).

This farmer articulated a concern about the lack of knowledge that lawmakers have about the practicalities of farm management and the variation that is found between farms:

- "I think you find too that sometimes people who make the laws – it looks fine in theory. But when it comes to the practical aspect of implementing it, it doesn't work in practice. And I think that's where farmers are perhaps that little bit more practical... on each different class of land, you require a different style of how to do something. That's how I see it" (SB, Organic).

Two farmers were critical of the Department of Conservation (DOC). In particular, there was criticism of fencing off land that then becomes filled with weeds. This farmer argues, for example, that land needs to be actively managed or noxious weeds become a problem for farmers neighbouring DOC land.

- "You know you only have to look where some of this land is fenced off and it just becomes a bloody disaster. The weeds, in particular noxious weeds – and then they will maintain they have no responsibility towards the next door neighbour who is the farmer. And it is usually DOC, they are the worst neighbours in this area... They do not need all this land they are grabbing – or if they do, get somebody sensible in to manage it. The idea that you can lock it up and it stops [stays] in pristine condition is just rubbish" (SB, Integrated).
- Similarly, this farmer contends that fencing off waterways only makes it harder to look after these areas, turning them into a kind of waste land: "Once it's fenced off, well it's fenced off. You don't normally worry about what's on the other side of the fence. It will go like the rest of the government owned land or DOC land or railway land. It will just grow weeds and rubbish and pests. Not looked after by the landowner so much anyway" (SB, Integrated).

Two farmers made negative comments about Fish and Game New Zealand regulating or controlling wetlands and waterways.

- One farmer was concerned about access to a river on the boundary of his farm being affected – both by Fish and Game and the local district council: "This is going to start coming in. The local [name omitted] District Council is at the moment trying to put... bigger constraints on the [name omitted] River... in the way of access. And the Fish and Game, that's another body that's going to be putting constraints on access" (SB, Integrated).
- Another farmer raised the issue of weeds in waterways and suggests Fish and Game is one of the organisations pushing for these areas to be fenced off: "But Fish and Game, or whatever, want waterways to be left natural. But a lot of them end up getting weeds and stuff anyway." The farmer then queries: "I suppose fish can swim up through weedy creeks, do they?" (SB, Integrated).

Greenies

Two farmers expressed concerned about 'greenies' and their impact on the regulation of wetlands. This farmer was concerned that people who identify with Green politics, with no real knowledge of farm management, were pushing for unrealistic wetland regulations on farms:

- “There could be regulations coming in over fertiliser and stuff close to waterways... and all this sort of carry on seem to be, well I just think it seems to be led by Greenies that don’t really know. I don’t even know if they’ve ever been on a farm to be honest, to know how impractical some of it is. It’s totally impractical some of it” (SB, Conventional).

This farmer was particularly worried about the potential for ‘Greens’ to misrepresent farmers to the public, by using a few examples of farmers who do not protect waterways on their farms, and then suggesting that this behaviour is typical of the majority of farmers:

- “I just have a bit of a problem with some of the Greens, or you know, the people who pick farming as dirty. I mean there are some dirty farmers and it is a shame, but hey – not all farmers are like that. And you pick up a magazine and here is a cow standing in the stream and for that particular photo that would have to be a oncer. I mean you wouldn’t find a lot of farmers around here like that” (Dairy, Conventional).

4.3.5 Financial issues

Lack of money was the constraint most often highlighted by farmers as hindering them from developing or protecting wetlands and waterways on their land. It was clear that for many farmers, there was a desire to carry out changes, such as creating dams, clearing waterways, planting around ponds, but that money was the main constraint on these changes:

- “We don’t have much [of a] plan for the creek. If I had lots of money I’d probably go and clean it up with a digger and get rid of a lot of the willows and things. But that’s just uneconomical at the moment” (SB, Conventional).
- Another farmer had developed a pond on his farm but was unable to afford to do any further development: “And you would do a lot more ponds too, but once again it comes back to the financial restraint of the cost of damming” (SB, Integrated).

One of the questions asked during the interview about farming in general, related to what would the farmer invest in on the farm, if given a grant of fifty thousand dollars. For one farmer, fencing waterways was their top priority:

- “What would I do with it? Yes, I would probably fence off the waterways – [that] would be number one” (SB, Conventional).

The fact that the majority of farmers had different priorities for using ‘extra’ money, probably indicates the importance of directed subsidies or funding towards wetland protection on farms.

A sheep and beef farmer with a lot of wetlands and waterways on his farm was frustrated by the financial implications of protecting all the wetland ecosystems on his property:

- “I’d love to have every single piece of water on our farm fenced away from stock. But someone would have to give me a million dollars. And even then it probably wouldn’t be enough” (SB, Organic).
- Another farmer argued that advocates of the fencing of waterways on farms were not taking into account what the financial implications were for farmers, and that there should be more assistance for farmers to carry out this fencing: “I’d quite like them to put their money where their mouth is, to be honest” (SB, Integrated).
- Another sheep/beef farmer expressed a similar sentiment: “The only thing they will be wanting me to do is fence off gullies and creeks, which I would do if they gave me the money to do it. It is not likely to happen, so I won’t worry about it” (SB, Organic).

It appears from these interviews, that very few farmers are receiving financial assistance or grants for wetland protection and development. Only four farmers mentioned that they had accessed, or planned to access, financial assistance from external organisations. One farmer mentioned that he was intending to build a pond on his farm with the assistance of a grant from Fish and Game:

- “I found out that Fish and Game actually fund the building of ponds, as you encourage one person to shoot at the ducks, which is amazing. And I thought, ‘oh, I can get a pond built for free’. And I’m going to do it because at the moment it goes into a soak hole. So it may as well be made into something more beneficial on the place” (SB, Organic).
- Three dairy farmers from the Waikato mentioned that they were getting some assistance for fencing and protection of wetlands and waterways from Environment Waikato. As this quote reveals, the funding was crucial to this farmer getting started on some of the fencing of waterways on his farm: “It’s part of a ‘clean streams’ project where they pay for a third of it, and that was probably the incentive for me to do it, because I was thinking, I need to fence this off at some stage and while someone’s going to help me pay for it, well it’s a good time to do it [laugh], so that’s why we’ve done that” (Dairy, Conventional).
- Another farmer, who had arranged some funding from Environment Waikato for planting and developing wetlands on his farm, described how financial constraints were no longer such an issue: “Probably [dependent on] time more than capital, because we do get some funding from Environment Waikato, which will cover some of the cost” (Dairy, Organic).

4.4 Summary and Conclusion of Qualitative Results

Wetlands and waterways on farms are conceptualised and understood in a wide variety of ways by farmers. For some farmers, a wetland is considered to be a deep and substantial body of water, which is differentiated from shallower, wet areas – often described as bogs or swamps. Similarly the term ‘waterways’ is applied in a variety of different ways. These different nomenclatures are important, because they often denote a particular type of management style is associated with them. For example, there appeared to be little debate or questioning that ‘wetlands’ should be protected on a farm, but ‘bogs’ and ‘swamps’ were treated with far more variation.

Farmers are motivated to protect wetland and waterways on their farms, for a variety of different reasons. This research suggests that while a few farmers prioritised utilitarian benefits, such as shade and water for stock, as their main motivation for protecting wetlands, the largest group of participants in this study were primarily motivated by non-utilitarian reasons. The most common motivation that farmers outlined for preserving or developing wetland areas related to an appreciation of looking at, and experiencing nature and the environment. Recreational opportunities, such as hunting and swimming, were also identified as important by a small number of farmers.

Fencing was clearly the most important, and sometimes contentious, issue that farmers in this research associate with management practices around wetlands and waterways. A farmer’s perspective of fencing was clearly shaped by the type of farming that s/he was involved in and the particular topography of the farmland. The majority of dairy farmers in this research, with only a couple of exceptions, seemed to accept that fencing of waterways was something that must be done on the farm. (This is likely due to that fact that Fonterra requires such fencing to be completed on farms by 2010, and all the farmers interviewed supply Fonterra.) For sheep/beef farmers there was far more questioning of the necessity of fencing of all wetlands and waterways. Some farmers living in steep hill country were particularly dubious about the need to fence every waterway on their land, and there was particular concern about whether seasonal wetlands and waterways should be fenced as they provide grass feed for stock during dry periods.

There was also concern from farmers from both the dairy and sheep/beef sectors that the regulatory framework for wetland and waterway protection is being written by people who do not have a good grasp of the practical realities of the farm environment. In particular, several farmers argued that regulations that are applied without impunity to all farms, do not take into

account important variations between the different farming sectors and the divergent farm landscapes. Further to the enforcement of regulations, several farmers expressed resentment at having to follow rules that they felt were expensive or unnecessary on their farm.

This last point connects to previous research (Bennett and Whitten 2002), which has highlighted the importance of providing financial incentives for farmers to assist them in carrying out wetland development and protection on their land. Several farmers in this study wanted to carry out more fencing and protection measures for wetlands and waterways on their farm, but could not afford to do so. Only a tiny minority of participants in this study have accessed available financial assistance to help with wetland development.

5. Conclusion and Recommendations

- This research demonstrates that among farmers in New Zealand there is a great deal of support for the protection and development of wetlands on their land. These results give some encouragement for policy makers interested in promoting wetlands on farms. It is likely that policy initiatives would find a favourable reception, particularly if they focused on appealing to amenity values as separate from extractive values.
- The qualitative and quantitative research presented in this report illustrate the complexity of management practices associated with wetlands and waterways on farmland. The wide range of ideas about what areas of farmland come under the category of 'wetland' or 'waterway' needs to be taken into consideration in any policy framework. It is important that future studies which focus on wetlands – on private land in particular – are able to develop a research design able to capture the different conceptualisations of 'wetlands' and 'waterways' and the variety of management styles associated with different wet areas in a farm landscape.
- While the quantitative survey did not find a wide divergence in the responses of farmers from different sectors, the qualitative research suggests that with regard to fencing regulations, at least, there are some clearly different attitudes between sheep/beef farmers and dairy farmers. The landscapes of dairy and sheep/beef farms can vary significantly, as do the attitudes of farmers towards the appropriateness of fencing wetlands and waterways on their farm. It might be appropriate for these differences between different farming sectors and farming landscapes to be taken into account when developing regulations for wetland habitat development and protection.
- There needs to be better dissemination of information about wetlands to farmers. Fish and Game New Zealand provide comprehensive information on their website but this was not mentioned by any farmers in this research, and may only be accessed by farmers who are also gamebird hunters and fishers. Other organisations (e.g. Environment Waikato, Integrated Catchment Management (ICM) and Landcare Research) also have useful websites about wetlands, but it is unclear whether farmers know that this information is available. The Ramsar Convention Bureau was also not mentioned by any farmers and they have enormous resources available on their website along with some funding opportunities. Ideally, some kind of website could be developed especially for farmers which consolidates these types of resources so farmers have a central place to go for information.
- It is also clear that financial constraints are seen by many farmers as limiting the development and protection of wetlands and waterways on farms. There needs to be better dissemination of information about the grants and free consultancy services that are currently available for wetland development. This could perhaps be achieved by some kind of document that consolidates and summarises potential sources for funding assistance that is then distributed to all farmers. This is also an area that central government could contribute more financial incentives. In order to encourage farmers to adopt a preferable management strategy that will help to protect and develop New Zealand's wetlands and waterways, the benefits of a farmer's wetland conservation efforts need to outweigh the costs. This recommendation fits with research from Australia (Bennett and Whitten 2002) that also suggests that there will be substantial benefits to the wider community, if farmers and landowners are given more practical assistance to carry out wetland conservation and development. This could take the form of tax incentives or specific grants towards fencing, and free training and advice.

- Many farmers are concerned that non-farming organisations and bureaucrats do not understand the realities of farming, and this research suggests that farmers currently feel they are not a part of the regulatory decision-making processes associated with wetlands and waterways. Is it possible for Regional and District Councils and other regulatory agencies to improve their consultancy processes, so that farmers feel that their viewpoints and experiences are being taken into account? It is important that the cooperation of farmers is achieved to ensure that the wetland and waterway preservation strategies will be widely practiced on private land. To achieve this, it must be clearly demonstrated to farmers how meeting regulatory requirements will be beneficial to them, the environment in general, and even to New Zealand society overall.

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7. Appendix: Questions Relating to Wetlands in 2005 New Zealand Farmer and Grower Attitude and Opinion Survey: Sustainability in Primary Production

G. Wetlands

1. How important to you is each of the following recreational activities on your farm or orchard?

- | | |
|---------------------------------------|--------------------|
| (1) Very unimportant | (4) Important |
| (2) Unimportant | (5) Very important |
| (3) Neither unimportant nor important | (6) Not applicable |

Spending time and money on developing wetland areas

Waterfowl shooting

Fishing in wetlands and waterways

Spending time looking at wetland areas

2. How important to you is each of the following factors limiting wetland development on your farm or orchard:

- | | |
|---------------------------------------|--------------------|
| (1) Very unimportant | (4) Important |
| (2) Unimportant | (5) Very important |
| (3) Neither unimportant nor important | (6) Not applicable |

I do not have the money

I do not have the expertise

Wetlands are inappropriate for the environment of my farm

I have no interest in developing wetlands