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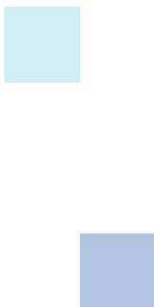
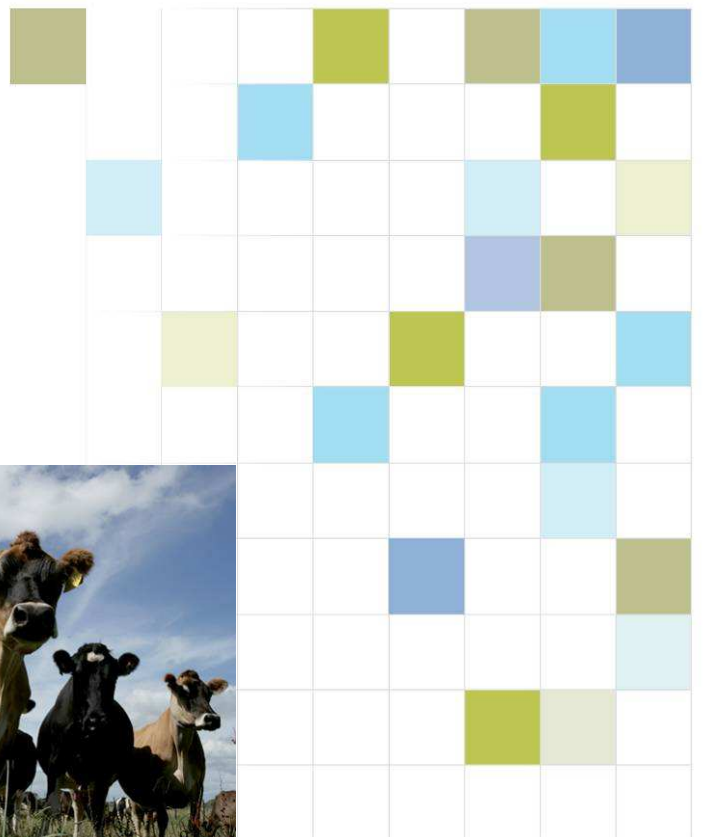
# What has Changed Stream Management Practices in the Waitao Sub-Catchment?



August 2011



*New Zealand's science. New Zealand's future.*



# **What has changed stream management practices in the Waitao sub-catchment?**

**Prepared for**

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**August 2011**

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# Executive Summary

## Introduction

This report follows the effect of the Waitao-Kaiate Environment Group and Te Awa O Waitao Restoration project on environmental awareness and knowledge, stream management practices and social capital of Waitao Catchment residents from 2004 to 2011. Previous research within the Waitao Catchment in 2004 and 2007 (Blackett & Wilson 2008) has already looked at 1) the efforts of the Te Awa O Waitao Restoration Project Joint Steering committee, 2) the formation and activities of the Waitao-Kaiate Environment Group, and 3) a joint submission in opposition to a proposed landfill site in an old pumice quarry. It was suggested that these activities had resulted in;

- 1) An increased awareness of the role of poor stream management practices in water quality degradation.
- 2) An increased knowledge of the impacts of land and stream management practices.
- 3) A general acceptance of riparian planting as a mitigation measure to reduce impacts of land use and land management practices and a willingness to take action around planting waterways.
- 4) Increased social capital as a result of increased interaction between local residents.

A further series of interviews and face to face surveys in 2011 (reported in the current document) allows for further clarification on the impact of restoration activities in the catchment and the identification of factors which have contributed to stream restoration activities. The research also provides some key lessons which may be relevant to other local restoration projects (and voluntary action movements, more generally) within the Bay of Plenty Region. Before reviewing the outcomes of this study it is important to note that the effects described are restricted to those participants with properties in the Waitao Valley. Changes in awareness and perception do not appear to extend to residents of Rocky Cutting or Kaitemako Roads.

## Changes in environmental knowledge and awareness

Overall, research participants demonstrated an increase in environmental knowledge and awareness evident through their ability to 1) more clearly articulate local problems and, by extension, to discuss solutions, 2) evaluate the pros and con of different mitigation strategies, and 3) draw on a wide array of water and habitat assessment tools. The increase in knowledge seems to have created an appetite for further knowledge and a greater confidence in their ability to seek out resources and act. Information regarding the ecological success of restoration activities (i.e., 'official' technical data demonstrating the 'real' impact of their activities) was something which many participants felt was missing and could and should be provided by 'experts'.

### **Changes in stream management practices**

Stream fencing and riparian planting activity is widespread and underpinned by an aspiration to have all the streams in the catchment managed in this manner. Another very important result is that ALL of the people surveyed and interviewed thought that the activities of the Waitao-Environment group were worthwhile (whether active members in group activities, or not). Many participants supported the vision to fence and plant waterways in the catchment with native vegetation. This included those who were not directly involved in group activities

Results from the survey show that 82% of participants believe that the Waitao-Kaiate Environment Group has made a difference to the way that local people manage the stream on their property. Participants based this observation on visual changes in the landscape and an increasing engagement with the landowners in the area, particularly some of the owners of larger properties. Key drivers for change appear to be an increased awareness of their personal impacts on the stream system through their land management practices (learning through association with the Environment Group), sustained and persistent pressure from a variety of sources and the availability of fencing and planting subsidies through the local councils.

### **Changes in Social capital**

Over the last 6 years the community has moved from low levels of social capital and a limited sense of local community to a situation where local residents are strongly connected through a social network which extends along Waitao Road, Kaiate Road and Garret Road. This network is being used to spread and share information, knowledge and ideas, and also to bring together skills in order to work towards community goals. Although this network is currently anchored around the Environment Group, it is not exclusive to group members. It is highly likely that the social side of the environment group – which includes several fun, community-wide social events – encourages the coming together of group members and non-members which, in turn, has given rise to other social activities within the catchment.

Although the 2007 work concluded that the changes in knowledge, action and social capital were due to the efforts of multiple groups, the 2011 data suggests that it is largely the Environment Group which is likely to be responsible for continuing this momentum and building on it.

### **Some potentially useful lessons from this work**

In the authors' view there are some lessons from this research which could be relevant to other care groups in the Bay of Plenty Region<sup>1</sup> these include;

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<sup>1</sup> Please note these have not been checked against current practice due to time constraints on this project.

- A stable local population creates a strong group with effective social networks which is more likely to affect change on the land.
- Voluntary groups will have natural boundaries which may be defined geographically or by other social factors. This presents a challenge to any resource management strategy which utilises voluntary groups because group boundaries and catchment boundaries may be mismatched. Whole catchment groups may be difficult to establish and maintain if people live along different roads and don't share a common point of reference.
- Extensive social networks can develop through care groups and these networks facilitate knowledge transfer and achieve group goals. Moreover, they help the group act collectively on other matters which may not be directly related to the core purpose of the group.
- Social events are a critical component of all care groups as it allows time for people to mix and mingle and for social networks and social capital to grow. Meetings and events which provide entertainment or activities for children are especially well attended.
- Identification and recruitment of group "ambassadors" who are well connected and respected will help groups grow.
- It may take an event (or crisis) to galvanise the community to act and form a care group. Without such an "event" the community will remain unaware and largely unmotivated.
- The role of science and technical knowledge and also local knowledge is important to achieve meaningful results. The way in which this project has integrated these aspects to generate action has been very well managed.
- Fencing subsidies appear to promote riparian fencing and planting on larger farms. However, one on one contact with Council staff and an acceptance of the personal responsibility of the impacts of their stream management practices on water and habitat quality have preceded the uptake of the subsidy.
- Care groups dislike bureaucracy so keep the process as simple as possible.
- A positive relationship between the council and community groups is essential to the formation of a working partnership.
- People appear to be confused about the respective roles of the regional and district councils, moreover, they tend not to make any distinction between them.
- Positive reinforcement for care groups and individual landowners would be useful to cement the gains made in regards to stream management practices and potentially ensure further action.
- Individual groups may feel isolated and further support for group-group interactions could be worthwhile.



# 1. Introduction

## 1.1 Introduction

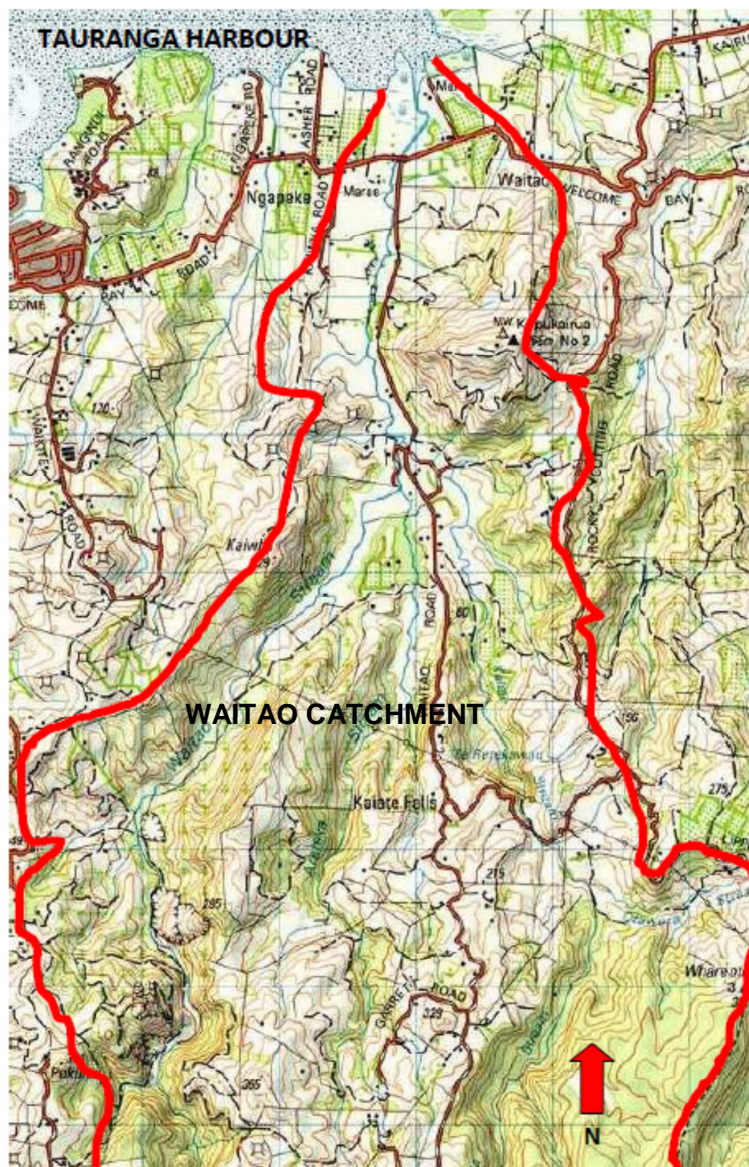
Voluntary environmental care groups are a common element of resource management strategies throughout New Zealand (Byron & Curtis 2001). They are popular with resource management agencies, viewed as highly participatory and inclusive mechanisms for 1) overcoming common barriers to action on environmental issues and 2) bringing about behaviour change. The main argument is that by acting at the local level, alongside neighbours, members develop a sense of ownership of local issues, they assimilate new knowledge and skills, develop a stronger sense of community and a greater willingness to accept responsibility for action (Beierle & Konisky 2001).

A successful care group (or community group in general) is thought to exhibit three important characteristics; high social capital (Hibbard & Lurie 2000), action competence (Margerum 2002) and an ability to access resources (Walton 2003). Social capital is a similar concept to ideas of physical capital (machinery etc.) and human capital (Putnam 1993) and is described as “*the ties between and process that make resources and opportunities available to those within a social network*” (Fien & Skoien, 2002). The important elements are the inter-personal relationships (and sense of community, trust and respect for others within the network, and shared values) formed and the resources which become available through forming a social network (Wilson 1997; Putnam 1993; Portes 1998). Communities or groups may have varying levels of social capital which can be built up as they work together and individuals become more connected.

Action competence relates to the confidence a group has in its ability to undertake actions. This confidence originates from the skills and knowledge built up within in a group through collective problem solving, group learning and shared experiences (Margerum 2002; Fien & Skoien 2002). The process of acquiring this knowledge is a group activity and requires coming to terms with the complex biological, social, economic and political contexts of a problem including; understanding the effects and impacts, gaining an appreciation of the underlying cause of the problem, determining what strategies are available to create change and to develop alternative strategies and visions (Jensen 2002). In order to do this, a group will need to have access to a wide range of resources including, funding, technical knowledge and support, practical assistance and inspiration and ideas from other similar groups who have been successful (Walton 2003). This is where outside agencies become particularly important in assisting groups to achieve their objectives.

This report follows the effect of the Waitao-Kaiate Environment Group and Te Awa O Waitao Restoration project on environmental awareness and knowledge, stream management practices and social capital of Waitao Catchment residents from 2004 to 2011. The Waitao catchment is situated at the south-eastern end of the Tauranga Harbour (Figure 1). It contains four named

streams the Arateka, Otawera, Kaiate and the Waitao and numerous unnamed tributaries, drains and small wetlands and ponds. The catchment is approximately 3300 ha, beginning in the Otawa Ranges draining into the Rangataua Bay branch of Tauranga Harbour. It has a vegetative cover of approximately 41% native forest, 37% pasture, 10% pine plantation, and 8% scrub. Landuse encompasses a mix of dry stock farms (beef, sheep and deer), lifestyle blocks and Maori owned land around the bush head waters and the lowland areas. There are two Marae on the lowland sections of the stream and eight hapu have an interest in the area, particularly Nga Potiki, Ngati Pukenga and Ngati He. The catchment is within easy commuting distance of Tauranga City and is home to approximately 130 households.



**Figure 1: A map of the Waitao Catchment**

Previous research within the Waitao Catchment in 2004 and 2007 (Blackett & Wilson 2008) has already highlighted that a combination of efforts of the Te Awa O Waitao Restoration Project Joint Steering committee, the formation and activities of the Waitao-Kaiate Environment Group and a collective submission in opposition to a proposed landfill site in an old pumice quarry probably resulted in;

- 1) An increased awareness of the role of poor stream management practices in water quality degradation.
- 2) Increased knowledge of the impacts of land and stream management practices.
- 3) A general acceptance of riparian planting as a mitigation measure to reduce impacts of land use and land management practices and a clear will to take action around planting waterways.
- 4) An increase in social capital as a result of the increased interaction between local residents.

Although these changes were detected, little actual stream fencing and planting had occurred on privately owned non-Maori land as the Waitao-Kaiate Environment Group was just getting started. Since 2007, the Environment group has been busy and is now considered to be a successful care group. By conducting a further series of interviews and face to face surveys the longitudinal data set allows for further clarification on the impact of restoration activities in the catchment on environmental knowledge, stream management practices, and social capital. An additional objective is to tease what factors have contributed towards successful stream restoration activity within this catchment and provide some key lessons which are relevant to other local restoration projects ( voluntary action in general) within the Bay of Plenty Region.

## **2. Method**

### **2.1 Introduction**

The objective of this work was to establish and report on any change in environmental awareness knowledge and action, stream management practices and local sense of community (including social capital) that had occurred between 2004 and 2011. Moreover, it aimed to detect if any potential changes were linked to the stream restoration activities of either the Te Awa O Waitao Restoration Project or the Waitao-Kaiate Environment Group. Although direct cause and effect links are very difficult to uncover in social research, because of an inability to manipulate situations in a controlled environment, some indirect inferences have been made. Data for this report was drawn from previous interviews (2004 and 2007), a 2007 survey of 43 catchment residents, and a further round of interviews and surveys conducted in July 2011.

## **2.2 Interviews**

As many participants of the 2004 and 2007 interviews as possible were re-contacted, in order to establish if any aspect of their views, awareness or knowledge of local stream management issues had changed. Seven of the original ten participants agreed to be interviewed. They represented a mix of land uses including lifestyle blocks and larger farms. A further 6 people assisted by providing a more detailed background of the various activities of the groups and agencies operating in the catchment.

Similar interview processes and protocols were applied for this round of interviews as applied in 2004 and 2007. Participants were interviewed using a semi-structured technique which revolved around a base set of questions listed in Appendix 1. Questions were not necessarily confined to those listed, nor were they approached in a set order as they were asked where appropriate. The recruitment process involved establishing initial contact via a letter (Appendix 2) which was followed up by a phone call asking if they wished to participate in this round of interviews. Notes were taken at each interview and written up immediately following the interview. These notes are held at a secure location at AgResearch and the full contents are confidential to Dr Paula Blackett (as interviewer) and any future project manager as appropriate.

## **2.3 Face to face surveys.**

A face-to-face structured interview (referred to as “the survey”) of 43 residents of the Waitao River catchment was conducted in July 2011. The survey (Appendix 3) was largely as that which was conducted in late 2007 by members of the Waitao-Kaiate Environment Group. It was designed to canvas information from all residents about their understanding of water quality issues in the Waitao Stream and wider Tauranga Harbour, their past and current involvement with the Restoration Project and the Waitao-Kaiate Environment Group and also their perceptions of the various activities. Participants were recruited by phone and every resident in the catchment was contacted to see if they would participate. After each survey, an information letter providing the researcher’s contact details was left with the respondent (Appendix 4).

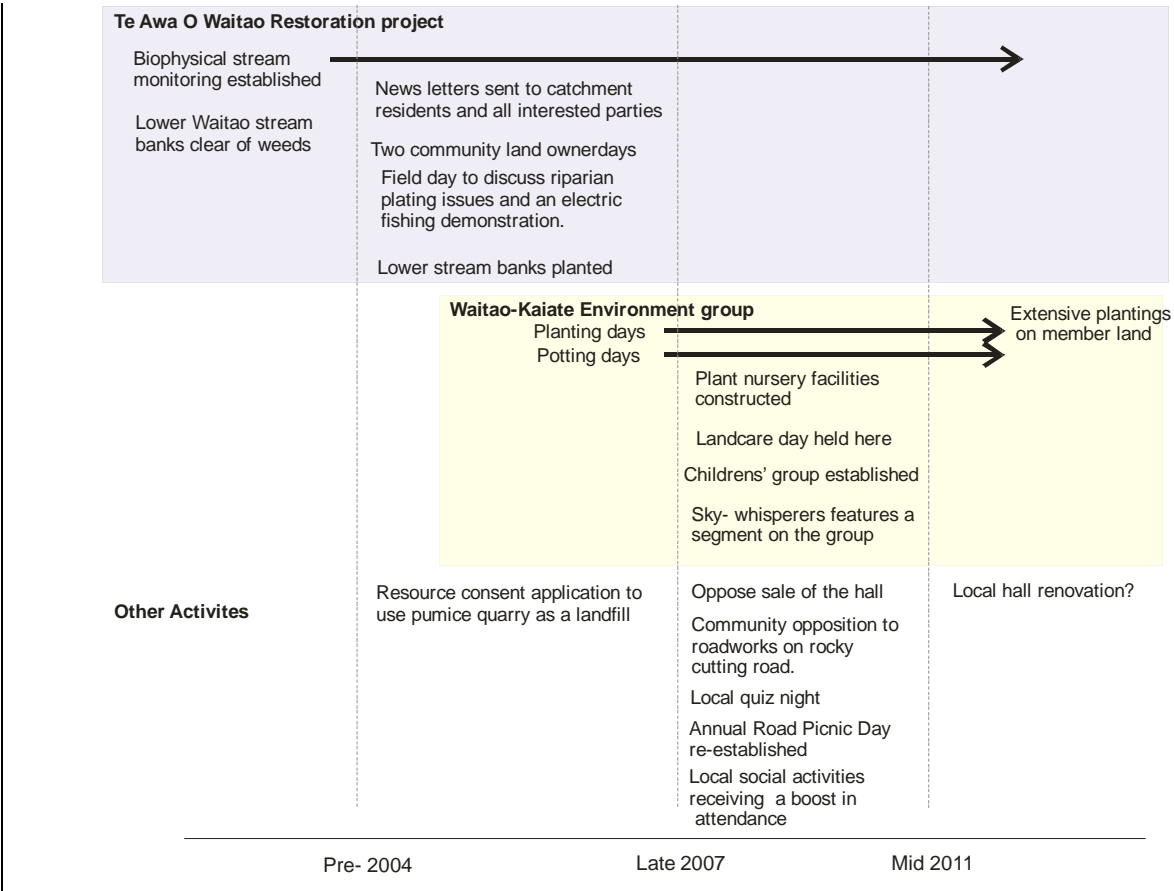
### 3. Results and Discussion

#### 3.1 Introduction

Results and discussion are presented in four parts. First, an overview of local social and environmental activities from 2004 to the present provides the reader with the necessary background information for the study. Second, key findings from the interview data are presented and interpreted. Third, key findings from the face-to-face survey will be presented and interpreted. Finally, the concluding section teases out and discusses common elements from the survey and interviews.

#### 3.2 An overview of local social and environmental activities

The data has allowed for the construction of a diagram illustrating the activities of Te Awa O Waitao Restoration Project and Waitao-Kaiate Environment Group, as well as other key events or issues in the area between 2004 and 2011 (Figure 2). Each group will be discussed in more detail separately to provide the context for the discussion of the survey and interview data.



**Figure 2: A summary of activities of Te Awa O Waitao Restoration Project and the Waitao-Kaiate Environment Group between 2004 and 2011**

### **3.2.1 Te Awa O Waitao Restoration Project**

Te Awa O Waitao restoration project was initiated in 2004, as a result of growing concern among local Hapu about water and habitat quality issues in the Waitao Catchment. Of particular concern was increasing sedimentation, declining water and habitat quality, erosion, catchment deforestation, spread of pest plants, undervaluation of Maori knowledge, resources and rongoa, and dumping of rubbish.

The project is managed by a joint steering committee comprised of representatives from Nga Papaka Rangataua, NIWA, and New Zealand Landcare Trust. It aims to achieve several key interlinked goals within the Waitao stream and the wider catchment. First, it aims to improve water and habitat quality in the stream and the Rangataua Bay branch of the Tauranga Harbour (south-eastern end of the Tauranga Harbour, Welcome Bay, Tauranga). Second, it aims to facilitate local community learning and action around stream restoration. Finally, it aims achieve its goals by merging Maori traditional knowledge with Western science, in a meaningful way.

In 2004, the project was in its early stages. Weed clearance had occurred on Maori owned land in the vicinity of Welcome Bay Road and water monitoring sites had been selected and on-going monitoring was established. Tom Cooper was installed as project Kaitiaki. His role involved conducting water quality work (using the NIWA SHMAK), interacting with local residents both Maori and non-Maori, and organising/supervising riparian restoration work carried out by volunteers and landowners.

Between 2004 and 2007, Te Awa O Waitao restoration project was active in collecting biophysical data (water habitat and quality data and aquatic species composition), restoring stream margins on Maori owned land, and engaging with the local community through informal contacts and three catchment field days (Cooper et al. 2007; Rowe et al. 2006; Cooper et al. 2006a; Cooper et al. 2006b). In addition, all stream margins in the Maori owned, lower parts of the catchment were fenced and planted.

By 2007, a clearer picture of local water and habitat quality was emerging through on-going monthly monitoring at 13 sites across the catchment. Early indications suggested that water clarity had decreased down the catchment as the percentage of pasture increased. It was also evident that E.coli counts were above those recommended for contact recreation at 11 of the 13 study sites including the popular recreation site of Kaiate falls. Fish surveys revealed diverse and rich native fish fauna, including several Toanga species. Fences had been erected along the stream margins and native riparian

vegetation had been planted on eight Maori owned blocks, which span from the river mouth to around 1.5km inland.

The Joint Steering Group produced three newsletters which were distributed to all households within the Waitao Catchment and other interested stakeholders. Two community landowner meetings and a field day were held in 2006/2007 to introduce locals to the restoration project, environmental monitoring data feedback and discuss local water and habitat quality issues. The field day involved an electric fishing demonstration and issues around riparian planting on private property. Each event was well attended. There was a hiatus in contribution of the NZ Landcare Trust to the Joint Steering Group from 2007 when the coordinator resigned to join the Bay of Plenty Regional Council, and was not replaced for about three years. Presentations were made to an Eco-Summit organized by Ngaiterangi Iwi at eco-summit held at Tahuwhakatiki Romai Marae, Waitao, 5-6 June 2008 (Cooper et. al., 2008), to a hui at Whetu Marae, Welcome Bay, Tauranga, 18 August 2009 and (jointly with Waitao-Kaiate Environmental Group) to Environment Bay of Plenty's Regulatory and Management Committee on 29 September 2009 at Whakatane (Cooper et al., 2009). Monthly water quality monitoring continues, and there have been repeat surveys of native fish (2009/10) and riparian vegetation and function ratings (2010). Flood conditions precluded planned fish surveys in autumn 2011. The Joint Steering Group has not produced any further annual reports but presented a review of the project as part of a land care day held in the catchment in March 2001 (Quinn et al., 2011). Informants were not aware of any further material produced by the Joint Steering group.

Overall, Te Awa O Waitao has provided strong leadership around riparian planting initiatives and facilitated the connection and knowledge transfer between scientists and local catchment residents.

### **3.2.2 Waitao-Kaiate Environment Group**

In early 2007, an Environmental Group formed within the Waitao Valley section of the catchment. Named the Waitao-Kaiate Environment Group, it is run by a local residents committee, assisted (where appropriate) by the New Zealand Landcare Trust and the Bay of Plenty Regional Council. At the time of the last series of interviews and survey the group was newly established and had organised several meetings, set up a native plant nursery, formed numerous sub-committees to act on local issues and held 'riparian plant potting days'. Moreover, key group members were active within the community furthering group goals. The group enjoyed widespread support from residents along

Waitao Road (Blackett & Wilson 2008). The group has been very active between 2007 and the present.

The purpose built native plant nursery has been expanded and one participant estimated “*we grow about 3000 plants per year*”. A Saturday morning spent “*Picking out seedlings from the tray and potting them up*” remains a very popular activity. In March 2011, the nursery hosted the Landcare Networking Field Day which was aimed at Landcare and Community Groups within the Bay of Plenty area and Waihou River catchment. This event attracted 43 people from 14 different care groups and showcased the restoration efforts in the catchment and toured the nursery facility. A children’s group has recently been established. This group meets on a Sunday morning and appears to be attracting families who are not involved with the Environment Group, including some from outside of the valley.

A segment for a Kathleen Gallagher film called ‘The Sky-whisperers’ was recently filmed in the Waitao catchment. This documentary style film is a sequel to the recent water whisperers and earth whisperers.

### **3.2.3 Other relevant events and activities**

#### **3.2.3.1 Responses to environmental issues**

Prior to the interviews and surveys in 2007, the pumice quarry was sold and the new owner applied for resource consent to establish a landfill for local building demolition waste. As a result, an immediate neighbour organised a public meeting to oppose the application and begin the co-ordination of submissions in opposition. Once composed, a joint submission was taken from door to door for signing along the length of the Waitao Valley part of the catchment. However, it was not taken along Rocky Cutting Road, Kaitemako Road or Kaiwha Road. This ‘event’ is likely to have been one of the triggers for establishing the Environment Group (Blackett 2008).

More recently, run-off from the newly sealed Rocky Cutting Road caused localised erosion on adjacent landowners’ properties. Although run-off from Rocky Cutting Road was listed as an environmental issue in both 2004 and 2007, it now appears to be worse than ever. Several residents have formed a group to pursue a solution to this issue.

Another significant local issue was the proposed sale of the “old school hall” on the corner of Waitao Road and Kaiate Falls Road. This building is in disrepair and the sale of the land to the adjacent landowner was proposed. The community objected and



expressed a desire to renovate the building and potentially use it as a local hall. Similar to the road run-off issue a small group has been formed to investigate this proposal.

### **3.2.3.2 Regular social activities**

There are several regular social events which were not reported in either the 2004 or the 2007 interviews;

- A local monthly quiz night is held in the shed of one of the local residents. This is usually attended by between 10 and 20 people, several of whom do not attend care group meetings or planting and nursery days.
- The annual Waitao Road picnic has been re-instated on Waitangi Day. It is well supported and attended by a wide range of people *“often a totally different demographic to those who attend other local events”*.

Overall, participants believed that local social activities have received a boost in membership since the Environment Group was established. Participants suggested this was because the social network had been enhanced by the Environment Group which informed people along *Waitao Road* what was going on.

## **3.3 Key observations: Interviews**

A number of key themes can be drawn from the interview data. These will be reported and discussed around general topic headings. Before entering into a detailed discussion of the results there are a couple of points which require highlighting upfront as they are relevant to the discussion as a whole. First, the Waitao Catchment is effectively split into several communities based on geography. This includes: Kaitemako Road residents, Waitao Valley residents (included Waitao Road Kaiate Road and Garrett Road), and, a further division between Waitao Road and Rocky Cutting Road and another possible group around Kaiwha Road. Second, all those within the valley portion of the catchment area are, to some extent, involved with the Environment Group. Either they are a member themselves, or their spouse is a member.

### **3.3.1 Land use and physical changes within the catchment**

Few participants had made any major changes to their land use activities over the timeframe for these interviews. However, some of the minor changes that have occurred include;

- 1) A small area of pines converted to pasture.
- 2) Farm expansion on to additional leased land – although the stock type remained the same, the number of stock increased to meet the available land area.
- 3) One participant had recently leased their pasture land and rented their home.

- 4) Retirement of either stream bank for riparian planting or wetland areas.
- 5) Increasing use of land in the catchment for the wintering of dairy cows.

Overall, the land use is reasonably stable and the catchment appears to have very low turnover of existing residents, although one of the more potentially significant changes is an increasing presence of winter dairy grazing. However, all the participants noted *“There are more and more farms broken up into lifestyle blocks and they all have access up the road”*. Comments of this nature are fairly common amongst residents of a rural community within easy commuting distance of a city (Blackett, 2006). Although this comment has been made consistently since 2004, it appears to bring only a few new people into the catchment every couple of years.

### **3.3.2 Changes in environmental knowledge and local environmental issues**

In 2004, the environmental knowledge of participants was “patchy and lacked an overall catchment management perspective” (Blackett, 2004). The 2011 interviews show that this has changed considerably, principally for residents of the Waitao Valley area (Waitao Road, Garret Road, and Kaiate Falls Road). In general, participants exhibited a far more detailed understanding of the issues and challenges of catchment management and in particular the impact of local land use activities. An interesting example is the broadening of understanding of what types of factors help determine overall water quality. Initially participants judged water quality on visual measures, primarily water clarity, but now they have broadened that definition to other non-visible measures such as bacterial contamination.

There are several perceived environmental issues in the area at present, some of these are new, but most are on-going unresolved issues. The impact of run-off from Rocky Cutting Road on to adjacent properties and the resulting suspended sediment load entering the Waitao stream and its tributaries was raised in 2004 and remains an issue. Although the nature of the problem has changed since the road was sealed, residents feel the issue is still unresolved. Recently, levels of erosion on land adjacent to the road sparked the formation of a group of residents to pursue the issue with the councils.

Floodwaters in the mid to lower portion of the catchment near the confluence of the Waitao and Arateka streams remains a problem for landowners and a potential threat to plantings in the area. Similar to the concerns regarding road run-off, this was first raised in 2004 and probably still remains a perceived barrier to riparian planting in the area.

Weed control remains a concern for several participants as blackberry is believed to be a particular problem in the lower part of the catchment. They are worried that the weeds will out-compete the riparian plantings, if blackberry weeds are not controlled.

A *new* issue for the Waitao catchment is concern over the increase in the use of local land as dairy run-off blocks. Several participants were concerned about the impact of such land use on stream water and habitat quality and, more importantly, whether or not stream restoration activities would be undermined.

It is interesting to note that although discharges from the SWAPP quarry sedimentation ponds were listed as a concern in both 2004 and 2007, the problem appears to have been resolved, or forgotten. There was some speculation that on-going interaction between the quarry management and Te Awa O Waitao had something to do with the resolution of this problem – however this could not be confirmed in the course of these interviews.

### **3.3.3 Changes in awareness of stream management issues**

The 2007, interviews identified a clear increase in awareness and interest around stream management issues from residents of the Waitao Valley area (Waitao Road, Garret Road, Kaiate Falls Road). Participants expressed a greater understanding of the rationale for riparian planting as a management tool for improving water and habitat quality and more awareness that their on-land activities might impact on the stream. Many expressed an intention to engage in riparian planting in the future. In 2011, these participants had moved from understanding the impacts of their stream management practices towards acting to mitigate the effects. Actions took the form of fencing and planting on their own land, working with the Environment Group to assisting others to fence and plant their properties, and *“spreading the word”* with other neighbours.

All of the participants on Waitao Road were involved (to some degree) with the Waitao-Kaiate Environment Group and all but one had fenced and planted stream margins. One of the participants deserves a special mention due to the huge amount of work which has occurred on their property in a short time frame. In 2007, the landowners, with the help of the Regional Council had formulated a plan to plant four of the streams on their property using fencing subsidies from the Bay of Plenty Regional Council and Western Bay District Council. Four years later, 3km of fencing had been erected, all of the stream margins were fenced, and many of them planted. They have done the vast majority of the work themselves *“it has been a huge job”*, but they have *“just got on with it”* and are very pleased with the results. This is a marked change in views and practice given the

same landowners scepticism of the value of riparian planting in the first set of interviews in 2004.

For many of the participants there are several key things which have encouraged them to fence and plant waterways on their land. These include: an increased awareness of their personal impacts on the stream system through their land management practices, sustained and persistent pressure from a variety of sources, and the availability of fencing and planting subsidies through the local councils.

In 2004, participants were largely able to articulate the impacts that other peoples land management practices had on stream and harbour quality, but had trouble defining what their own impacts might be. The 2011 interviews have shown that participants are now able to better evaluate their own impacts on the stream and act to mitigate these. Increased knowledge is likely to be due to multiple factors including:

- Local learning events hosted by the Te Awa O Waitao Restoration project between 2005 and 2007. Many participants still recall the field day which demonstrated the diversity of local fish life using electric fishing techniques.
- Stream monitoring and feedback on where the problems in the catchment were likely to be originating.
- Learning through participation with the Environment Group, *“Initially people are not sure how to plant but after going to a couple of planting days they think I can do this myself on my place, it’s not so hard”*.
- Interacting with neighbours who were enthusiastic about stream planting. The Environment Group has some very good “ambassadors” who are well known and liked throughout the valley and enthusiastic about the Environment Group’s goals.
- Association with Council staff who assisted with farm environment plans and gaining funding.

For one landowner, once they understood and acknowledged the impacts of their management practices on the stream they felt obliged to act, *“We felt terrible that the cloudy water was due to our animals”*. Now their stream margins have been fenced they *“...can rest easy that any cloudy water is not due to us.”*

Sustained and persistent pressure and encouragement has come from a variety of sources, including neighbours, environment group members, friends, the Regional Council and constant water quality monitoring through Te Awa O Waitao Restoration

Project. It is interesting to note that landowners who have fenced and planted their stream margins are critical of neighbours who have not. Moreover, they would like to see more pressure brought to bear on these landowners to encourage a change in stream management practices. Some of the participants are actively working to influence their neighbours.

The ability to obtain subsidies to fence and plant from the Bay Of Plenty Regional Council and Western Bay District Council was an important driver to undertake riparian planting. One landowner decided to take advantage of the subsidies while they were there, *“The problem isn’t going to go away and we should get the help while it is on offer.”*

All of those interviewed who had fenced and/or planted their stream margins were very pleased with what they had achieved and felt it would add to the beauty of the Valley and, over time, improve stream water and habitat quality. In addition, there is a perception that the additional planting has brought more birds into the valley. At this point in time it is impossible to prove this beyond the anecdotal evidence of participants.

One of the landowners interviewed did not want to fence the stream margins due to concerns over the effect their stock would have if they *“walked the fences”*. However, it appears as though fencing the stream margins may be part of their long term farm plan.

Participants from Kaitemako Road and Rocky Cutting Road, did not exhibit this change in awareness of stream management issues. However, for these participants the stream was on the lower portion of their land. One property was already fenced with intact riparian vegetation which probably has more to do with the local topography of the area (steep bush clad river banks) than any landowner’s awareness. The other was fenced used a single hot wire to keep the cattle out of the stream.

### **3.3.4 Sense of community**

As noted earlier (Section 3.3.2), the Waitao catchment is still effectively split into several communities. These different communities have limited interactions outside of connections between particular individuals.

In 2003, levels of social capital<sup>2</sup> within the Waitao catchment were very low; overall participants did not know their neighbours particularly well and there was a limited sense of community. In essence, there were individual groups of neighbours who knew each other, but the overall community feeling along the length of the valley which had existed in previous decades was lost.

By 2007, there was evidence for increased social capital, within the Waitao valley community. For example, people were getting to know each other better through meeting more often and working together to achieve shared goals, they were borrowing things from each other and learning about what sorts of skills and resources were present within the community. All of this is likely to be attributable to a combination of Te Awa O Waitao Restoration Project, the Environmental Group, and opposition to the landfill consent application (Figure 3.1). Te Awa O Waitao Restoration Project contributed through community days and events and the project Kaitiaki moving through the catchment interacting with landowners. Local opposition to the landfill consent application provided locals with an additional reason to meet and discuss common interests and to organise themselves as a community to oppose an ‘undesirable’ change to the area. They had learnt “*There is more power in having a group of people to support you when going to Council ... there is more leverage on issues*”. Since its inception in early 2007, the Waitao-Kaiate Environment Group organised several meetings, formed numerous sub-committees to act on local issues, has presented (with Te Awa o Waitao project team) to the Bay of Plenty Regional Council Regulatory and Management Committee, and held ‘riparian plant potting days’. In addition, key group members are active within the community furthering group goals.

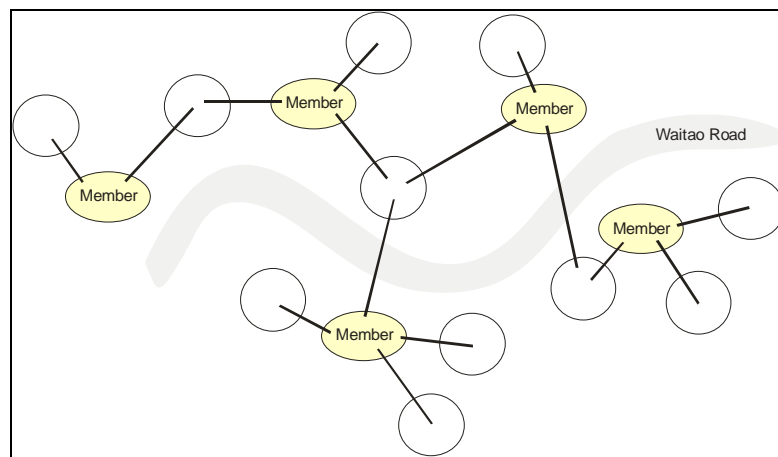
Overall, the 2011 the interviews suggest that social capital has increased, building on what had started 3-4 years earlier. The Environment Group has moved from strength to strength. They continue to run a very successful nursery and complete extensive planting projects on members’ properties. As well as working on individual properties, they are able to co-ordinate efforts across multiple properties, for example, the fencing and future planting of a wetland owned by five different families.

One participant believed that the group has a membership base which is spread reasonably evenly along the length of Waitao Road. Each member’s property is

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<sup>2</sup>Social Capital is described by Fien and Skoien, (2002) as “*the ties between and process that make resources and opportunities available to those within a social network*”.

contiguous with non-member neighbours thus providing the group with a very good overview of *“the feeling on certain issues along the road”* (Figure 3). This sort of information/social network did not exist before 2004 and it appears to have facilitated the spread of information, skills and resources along the road. For more communication there is a large community notice board at the beginning of Waitao Road informing everyone in the Waitao Valley section of the catchment of up-coming activities.



**Figure 3: Social networks diagram**

Participants enjoyed both the planting aspects of the Environment Group and the social side *“It’s great - when you’re done planting and you go back to the house for a cup of tea and a chat”*. People could contribute to the Environment Group goals and become involved in local community activities in a way which best suited them, *“I find the planting too hard these days, so I do some baking for the morning tea”*. In essence, there are jobs for everyone, and one participant described it as a very friendly environment, *“At all the meetings you get a warm welcome, a smile, and a cup of tea”*. Although it is difficult to establish direct cause and effect, it is likely that the appeal of the social side of the environment group has been one of the catalysts for an increase in other social activities in the catchment.

Members of the Waitao Valley community have access (partially through the Environment Group) to some key people with valuable skills and knowledge. For example, there are several people with skills around native seed collection and germination who choose appropriate plants for the habitat, a well respected fencing contractor, many people with practical skills and advice for land management challenges, and plenty of willing and enthusiastic helping hands for planting. Many of the participants reported learning a lot from the group activities and this has boosted their confidence to work on their own land. It is also quite possible that the increase in confidence may translate to a greater willingness to collectively tackle other local issues

as well, i.e. local school hall renovation. Group members are well aware that they achieve more as a group than as individuals so they are very willing to form “sub-committees” to work towards their objectives. In addition, resources are also available through this social network, for example members have access to plants or an ability to borrow particular equipment from their neighbours

Social networks within the Waitao Valley portion of the catchment do not appear to extend into Kaitemako Road or the Rocky Cutting Road communities, the former suggesting that *“they are not relevant to us”*. However, this may begin to change over time as the children of the Environmental Group and the opposition to the Rocky Cutting Road run-off issue draws people in from other areas.

### **3.3.5 What factors detract from local riparian planting initiatives?**

There are several factors that were raised by participants which have the potential to affect the relationships between individuals/the care group/the community and the two supporting councils involved. The first point to make is that interviewees did not understand the two council’s roles. Several participants described what they perceived to be conflicting messages from the councils. On one hand the councils support riparian planting in order to improve water and habitat quality, yet on the other hand they either undermine the efforts or do not act effectively to protect the work by landowners. Two examples were repeatedly cited by participants. Firstly, the perceived failure of the district council to adequately manage the run-off from Rocky Cutting Road was seen as undermining water and habitat quality improvement objectives in the catchment, *“The council is now putting more sediment into the streams than some of the farmers.”* Secondly, an area of newly planted trees was eaten, twice, by a neighbour’s stock that had escaped down the stream channel. This was very disheartening for the landowner and they felt that the council could do more to help resolve the problem and punish the offender. While the regional council staff had spoken to the offending landowners involved, there were no rules to force the landowner to stop his practice.

In late 2010, a key member of the Environment Group moved away from the area. This person made a special contribution in terms of managing the financial and reporting side of the group activities and as a regional council employee knew how the system worked and how to best get access to resources. Since then, participants have felt they struggle to get reimbursed for expenses (as they don’t really *“get”* the ins and outs of the financial systems and processes within the council) and feel a little more isolated from the regional council. This problem has been exacerbated by the recent turnover of catchment management officers. Turnover of council staff, especially those who deal directly with landowners, represents a loss of skills, experiential knowledge and



understandings, and requires new relationships to be established. As a new council officer has been appointed, this person will have to work towards building a relationship with the group.

Communication between the Environment Group and Te Awa o Waitao Restoration group has been lost. In 2007, the groups were in regular contact, exchanging information and there was a feeling that everyone was working together towards the same goal. However, this has changed considerably. Although the participants knew that water quality monitoring (through Te Awa O Waitao) was on-going, they did not know any of the recent results. A few of the participants were at the Landcare Day and saw a presentation regarding the research but this was the first they had heard about this in some time. Some of the participants felt that contact with Landcare Trust had also reduced somewhat. Overall they were feeling a little bit *“on their own”* and lacking input and feedback from other resource management organisations. They knew they were part of something other than local planting and fencing but didn't feel they had a *“big picture”* of work in the region and where they fitted in.

### 3.4 Key Observations: Survey 2011

This section of the report presents the findings of the 2011 Waitao Sub-Catchment Social Survey. The survey closely replicates that which was administered in the catchment in 2007 – developed and reported by Blackett & Wilson (2008). The following sections of the current report deliver the findings of the 2011 survey. Wherever possible and if appropriate, comparisons have been made with data from the 2007 survey.

#### 3.4.1 Characteristics of the survey sample (people, land and waterways)

The following three subsections of the report (3.3.1.1 – 3.3.1.3) provide a brief description of the survey sample, covering demographic and land use data, and also an indication of the types of waterways on respondents' properties. The remainder of the sections report the findings from questions 5 – 23 of the 2011 survey.

##### 3.4.1.1 People

In 2011, data collection procedures elicited 43 responses from an estimated group of 100 households across the catchment (the exact same number of respondents who elected to participate in the 2007 survey). As in 2007, most respondents (70%) indicated that they lived in the Waitao Valley section of the catchment, either on Waitao Valley Road (22), Garrett Road (6) or Kaiate Falls Road (2). Other respondents were from Rocky Cutting Road (2), Welcome Bay Road (2), Kaitemako Road (4), Waikite Road (1) and Kaiwha Road (1). Three respondents chose not to provide an address.

In regard to household composition, couples with 1, 2, 3 or 4 children living in the home at the time of surveying represented the largest group of respondents (49%). This compares well to the 2007 survey and shows that children are a considerable component of the community. The next largest group of respondents (40%) were couples, with no children living in the home. Three single households and 2 multiple adult households also responded.

Only four survey respondents provided an answer to the question “how long have you lived at your current address”. Qualitative data suggests, however, that the population of the Waitao Valley is reasonably well-established and stable, with few properties having changed hands over the last 5 to 10 years. While five respondents to the 2007 survey said that they rented their properties, the 2011 sample comprised only land and home “owners”. Fifty eight per cent of those who responded to the survey were active participants in **at least one** community-based environmental initiative, with 9 of these respondents involved in **more than one** activity/group.

### 3.4.1.2 Land use

Question 4 of the survey asked respondents to indicate how their land was used. The vast majority of the survey respondents (25, about 60%) indicated that their property was a lifestyle block (a grouping which included one residential property and a Papa kāinga or traditional dwelling). The remaining 40% of the sample comprised horticultural operators (1 respondent) and dry stock sheep and beef farmers (8 and 6 respondents respectively). Four participants did not answer this question. When broken down by land use, the sample compares well to the 2007 survey sample, which was dominated by lifestyle block owners, followed by those who farm sheep and beef.

### 3.4.1.3 Waterways on respondents' properties

The properties of twenty nine respondents (67%) contained waterways, defined here as streams, drains, ponds or wetlands. This figure closely represents that of the 2007 survey in which 70 per cent of respondents' properties were contained a waterway of some sort or another. Like the 2007 survey, many properties had more than one type of waterway within their boundary. The distribution of each waterway type across the survey sample, and also which part of the stream system each one is related to, is illustrated in Table 1 below.

**Table 1: Respondents with waterways on their property by waterway type (note some respondents had more than one waterway on their property) (2011)**

	Streams	Drains	Ponds/wetlands
Waitao	●●●●●●●●	●●●●●●●●●●●●●● ●●●●●●	●●●●●●●●●●●●●● ●●●●●
Arateka	●●●●●●●●		
Otawera	●●●●●●●●		
Kaiate	●●●●		
Unnamed tributary	●●●●	●	

### 3.4.2 Waterway management (Waitao Catchment)

Question 5b of the survey asked respondents who owned properties which adjoined streams to indicate how they managed the stream margin to which they had access. The question was open-ended and elicited details of a variety of stream margin management strategies which were being implemented by property owners across the catchment. The following bullet points describe the general nature of the stream margin strategies practiced by survey respondents:

- Two respondents reported that they fenced waterways on their property (using either electric or permanent fencing) and did not specify any other stream margin management activities. (In 2007, six respondents reported a management strategy of fencing streams with either electric fences or permanent fences).
- Eight respondents reported utilising a mixed stream margin management strategy on their property comprising fencing and riparian planting and/or landscaping with trees and shrubs. (In 2007, three respondents reported a mixed strategy involving fencing and planting streams and waterways, including wetlands and drains).
- Eight respondents reported that they had partially fenced waterways on their property and were able to name those which stock could access. (In 2007, six respondents had *partially* fenced and/or planted waterway margins on their property). Most wanted to fully fence and/or plant the margins, and some indicated that they were working towards this goal.
- Five respondents reported a stream margin management strategy involving planting only. Most were keen to mention that they used “native” trees and shrubs in these management regimes. (No respondents reported a “planting only” strategy in the 2007 survey).
- Two participants undertook weed control and did not specify any other activities. One of them cut vegetation from a drain on their property, the cleared weeds from around a spring to enable the regeneration of native plants. (In 2007, one respondent indicated that they undertook weed control along their stream margin and but did not specify any other activities).
- Two respondents indicated that they did not at all manage the waterways on their property. (In 2007, eight respondents said they did not manage the waterways on their property, in any way).

### 3.4.3 Water way use (Waitao Catchment)

Question 6a of the survey asked the respondents to indicate how they and their families use the waterways in the Waitao Catchment. Their responses are illustrated in Table 2 (note that respondents were able to indicate more than one use). Of the total 43 respondents, 11 reported no use of catchment waterways.

**Table 2: Use of waterways in the Waitao Catchment (2011)**

Waterway use	Number of responses 2007	Number of responses 2011
Recreation (see list below for a breakdown of activities)	16	<b>30</b>
Stock water open stock access to the water or reticulated stock water	9	<b>16</b>
Domestic water supply; both full time and emergency supply	6	<b>9</b>
Aesthetic view and appreciation of aquatic life	5	<b>2</b>
Food gathering, particularly watercress	4	<b>2</b>
Drainage: waterways receive farm runoff	1	<b>1</b>
Irrigation for general farm purposes and gardens	1	<b>1</b>
Reserve water resource for fire fighting	0	<b>1</b>

#### 3.4.3.1 Recreational activities

The 2011 survey captured specific detail of the recreational use of catchment waterways. The following list presents a breakdown of the activities:

- Swimming (13)
- General play in and/or around waterways (8)
- Fishing for eels (3)
- Canoeing and/or kayaking (2)
- Dog walking/dog swimming (2)
- Local social gatherings (1)
- Occasional duck shooting (1)

### 3.4.4 Stream Values (Waitao Catchment)

Question 6b asked survey respondents to state what they valued about the catchments' waterways. Forty one respondents answered this question. Five individuals stated that they **did not** value the waterways, with one of them noting they were a "hindrance" while another made note of the flood risk they posed. The remaining 36 (84% of the total sample) attached positive values to catchment waterways. Their answers are presented in Table 3 (note that some respondents attached more than one positive value to the waterways). The 2011 results demonstrate the continuing importance of the aesthetic value of the Waitao Stream and its various tributaries. They also show a continuing awareness and attachment among residents to the ecological value of the catchments' waterways.

**Table 3: Positive values associated with Waitao Stream and tributaries**

Positive value	Number of responses 2007	Number of responses 2011
Aesthetics: beautiful, natural, sound of water and/or waterfalls	21	21
Ecology: supporting terrestrial and aquatic biodiversity	8	8
Clean, clear, unpolluted and drinkable (natural) water source	4	4
Recreation ("natural playground", walks)	10	2
Utility value: water supply for house and/or farm (1), food source (2)	6	3
Other: part of the farm (1), access (1), planting (2), feedback from council (1)	-	5
General appreciation (intrinsic, part of community)	-	12

### 3.4.5 Water quality in the Waitao Catchment

#### 3.4.5.1 Perceived water quality in the Waitao Catchment

Question 7 of the survey asked respondents to indicate what condition they thought the Waitao Stream and its tributaries were in. As in 2007, in 2011 perceptions of water quality were variable through the catchment (Table 4). However, the two most common beliefs were that catchment water quality was either "OK" (29%) or "poor" (29%).

**Table 4: Overall perception of water quality in Waitao catchment (n=41) (2011)**

Very good	Good	OK	Poor	Very poor
7	9	12	12	1

Forty five per cent of those who had waterways on their property described water quality in the catchment as “good” to “very good”, compared to just 28% across these two categories among those who did not have a waterway on their property. Apart from this slight variation (and caution should be taken given the small sample size), there was little difference between the two resident groups in regards to perceived water quality.

#### **3.4.5.2 Local methods for assessing good and poor water quality**

As in 2007, participants typically based their perceptions of “good” water quality (Table 5) around visual assessments, most notably the appearance of the water (clarity). The next most common indicator of “good” quality was the taste and perceived drinkability of the water. When grouped together, the presence of specific plant and fish species was also a commonly used indicator of “good” water quality. Compared to the 2007 survey, there now seems to be less reliance on “word of mouth” about the “good” condition of the water (perhaps suggesting that locals are now more confident in identifying “good” water quality through their own visual means). Respondents were able to indicate more than one indicator

**Table 5: Indicators of GOOD water quality (mentioned by local residents)**

Indicators of “GOOD” water quality		2007	2011
Visual Assessments	Clear water (colour)	34	<b>23</b>
	Stable stream banks	7	<b>1</b>
	Fenced stream	5	<b>2</b>
	Free flowing water (no debris)	3	<b>2</b>
	Absence of large silt deposits	3	-
	Stream bank planted	3	<b>3</b>
	Presence of fish	7	<b>3</b>
	Presence of eels	4	<b>4</b>
	Presence of frogs	1	-
	Presence of insects – incl. glow worms	2	-
	Good growth of watercress	1	<b>2</b>
Word of mouth	Low micro-organism count	1	-
	Results of water quality monitoring	3	-
	Knowing a particular native fish species was present	2	-
*	No noticeable taste/drinkability	4	<b>7</b>

Use of flora and fauna as an indicator

In 2007, few respondents knew what to look for in order to identify “poor” water quality (Table 6). The 2011 survey produced dramatically different results, with a wide variety of indicators reportedly being used by the respondents. There were no particular standouts, although the amount of silt in the waterway had the most bearing on the perception of “poor” water quality (suggesting that clear water is perceived to be of a higher quality than cloudy water). Interestingly, in 2007 no respondents reported being informed about “poor” water quality in the catchment via “word of mouth”. In 2011, however, “word of mouth” had become a significant indicator of water quality, suggesting that the community was now more attentive to water quality reporting and also talked more among themselves about these matters.



**Table 6: Indicators of POOR water quality (mentioned by local residents)**

Indicators of “POOR” water quality		2007	2011
Visual Assessments	Stock in waterways (or evidence of)	1	6
	Waterway choked with debris	1	8
	Silt deposits		
	Stream bank covered in weedy or pest plant species	1	-
	Extensive algal growth	1	4
	Stream channel choked with aquatic plants (1)	1	-
	Rubbish in water	-	2
	Possum faeces in water	-	1
Word of mouth	Reported E-coli levels	-	3
	Reported nitrate levels in water	-	2
	Newspaper reporting	-	2
	Talking with locals (social connections)	-	3
*	Deterioration of Kaiate Falls for swimming	-	4
	Bad smell (especially stock effluent stench)	-	4

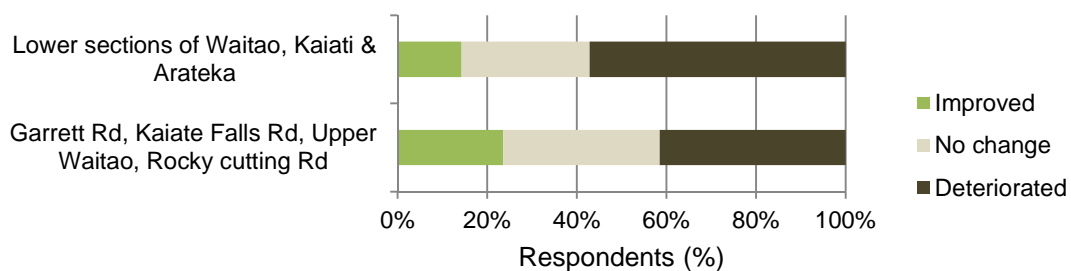
### 3.4.5.3 Perceptions of change in stream condition

Question 9 of the survey asked respondents if they thought the condition of the stream had changed in the last few years, and to provide some comments about the changes they had witnessed. Their answers are captured in Table 7. The table shows that local residents had mixed views on whether the state of stream condition had changed. Most (41%) of them, however, thought that it had deteriorated.

**Table 7: Perceptions of change in stream condition (locations will differ) (2011)**

Improved (11)	No change (12)	Deteriorated (16)
Overall improvement (3)	Much the same (12)	Overall deterioration (4)
Less dead stock in water (1)		Change in water colour (2)
Better farm practices (1)		Worse smell (1)
Care group activities (2)		More pollution (1)
More fencing (1)		Greater siltation (4)
More riparian planting (2)		State of river reporting (1)
Less silt (1)		Greater levels of erosion (1)
		More stock in waterways (2)

In general, respondents in 2011 with properties on Garrett Road, Kaiate Falls Road, the upper sections of the Waitao and Rocky Cutting Road mostly perceived water quality to have deteriorated (44%) (Figure 4). This indicates a small shift in perception – in 2007 respondents in these areas mostly thought that water quality had remained unchanged over the preceding years. In 2011, like in 2007, those participants with properties in the lower parts of the both the Waitao and the lower sections of the Kaiate and Arateka also believed that water quality had decreased in the catchment in the last few years (44%). This was the same perception in 2007.

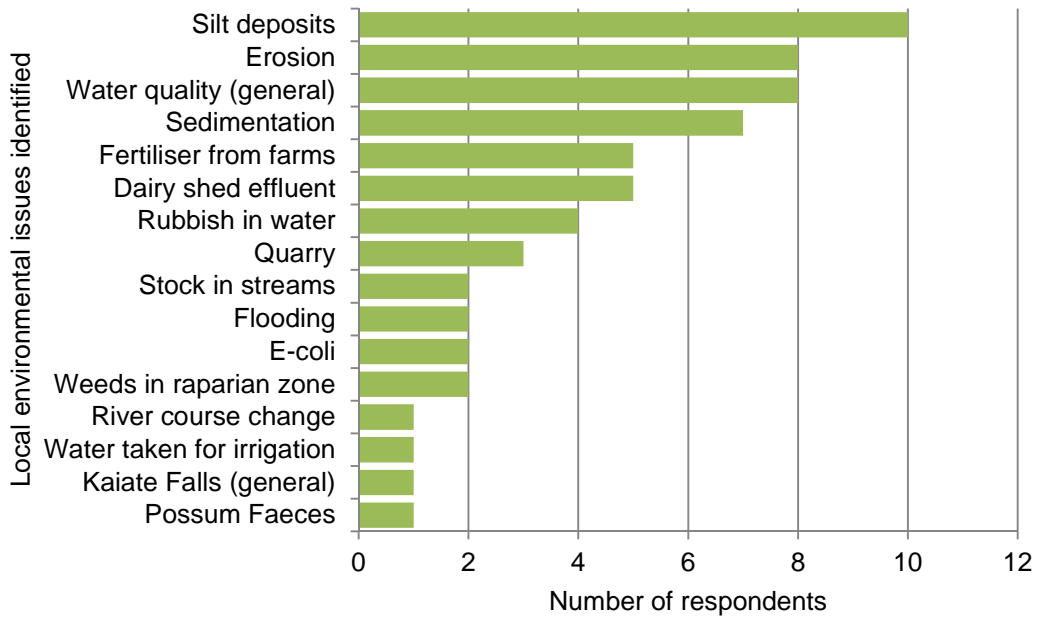


**Figure 4: Residents' perceptions of change in stream condition over the last few years (by the location of the residents' place of residence) (2011)**

### 3.4.6 Environmental issues in the Waitao Catchment

#### 3.4.6.1 Environmental issues with waterways in the Waitao Catchment

Question 10 asked the respondents what key local environmental issues or impacts they associated with the Waitao stream. Three respondents did not know of any environmental issues/impacts while two were firm in their view that there were no issues at all. A further 7 respondents did not answer this question. The remaining perceptions of current local environmental issues/impacts are presented in Figure 5.

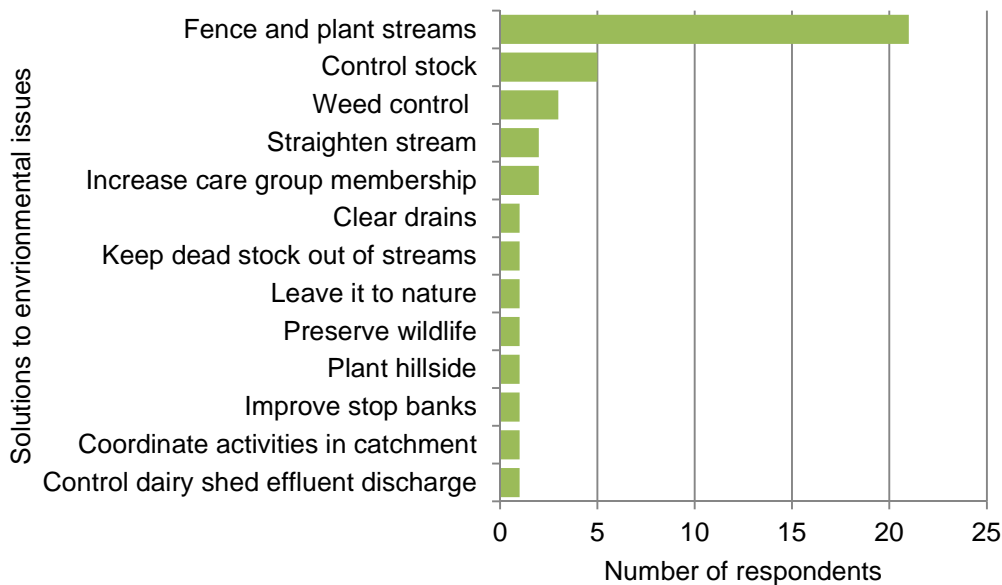


**Figure 5: Perceptions of local environmental issues (2011)**

As shown in Figure 5, the most commonly mentioned environmental issue in the Waitao catchment was silt deposits in the stream, with erosion and water quality issues at second place. Close in at third place was sedimentation. Interestingly, the respondents tended to separate impacts of farming into fertiliser and dairy shed effluent contamination. When combined together, these farm impacts rank 1<sup>st</sup> equal with silt deposits in the stream.

#### **3.4.6.2 Solutions to issues with waterways in the Waitao Catchment**

Question 10 also asked the respondents to identify things that could be done differently in the catchment (on their own properties or the properties of others) as a solution to some of these problems. The solutions they identified are presented in Figure 6.



**Figure 6: Perceived solutions to environmental issues (2011)**

As in 2007, by far the most common perceived solution to local environmental issues in 2011 was to fence and plant stream margins (21), and to exclude stock (5).

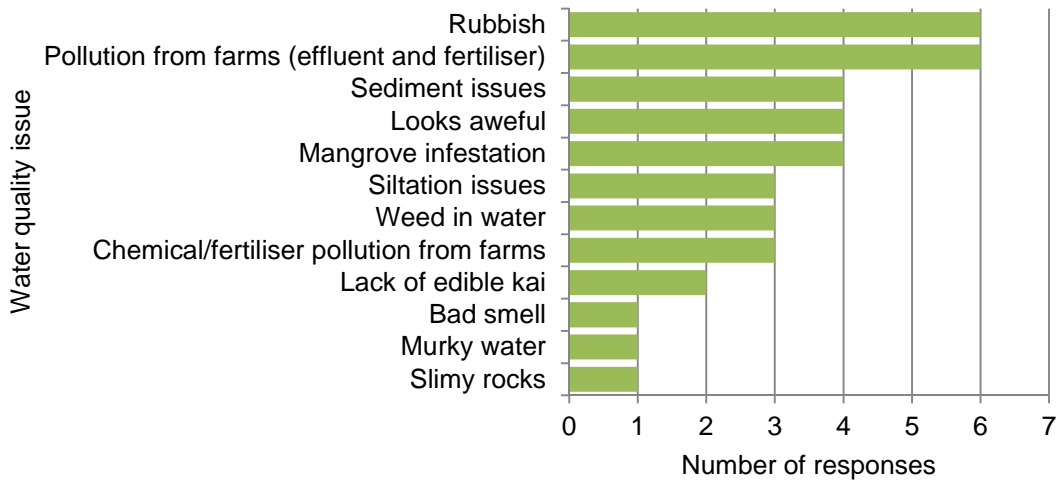
### 3.4.7 Observations of weed clearance in lower Waitao Catchment

The vast majority of survey respondents (88%) had seen the stream side weed removal, fencing and re-vegetation planting activities undertaken in the lower part of the Waitao stream. This compares well with results of the 2007 survey where 93% of respondents had observed these changes. Like in 2007, the vast majority (87%) of the respondents who had noticed these activities viewed them in a very positive light, with only one negative comment given (i.e., that *“its costs farmer a lot”*). Five respondents provided no comment, while two provided neutral comments (i.e., *“I have seen them but haven’t paid much attention”*). While viewing the activities favourably, several of the respondents expressed their concern over the ongoing management and neglect of the plantings which has seen weeds establish (a concern also reflected in the 2007 survey).

### 3.4.8 Tauranga Harbour

#### 3.4.8.1 “Water quality” issues in Tauranga Harbour

Question 11 asked the respondents if they thought there were any **water quality** issues in Tauranga Harbour and, if so, to indicate what these issues were (Figure 7). Sixty five per cent said that there were issues.

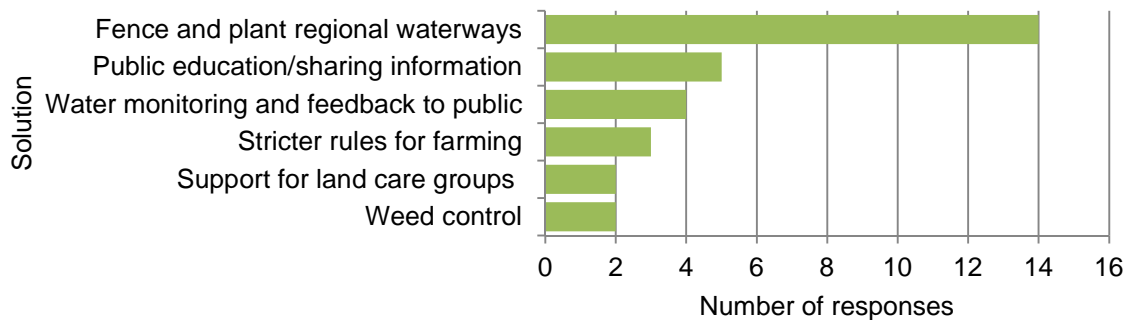


**Figure 7: Perceptions of water quality issues in Tauranga Harbour (2011)**

The top two water quality issues noted were the presence of *litter and rubbish in the water* (6), and *pollution from farms* (effluent/fertiliser) (6). These were followed by sediment issues (4), it “looks awful” (4) and mangrove spread (4).

### 3.4.8.2 Solutions to “water quality” issues in Tauranga Harbour

Question 11 also asked respondents what could be done to improve **water quality** in Tauranga Harbour (Figure 8). Fourteen respondents did not provide an answer; stating that they did not know what could be done at this scale. Two said that these environmental issues were too complex.

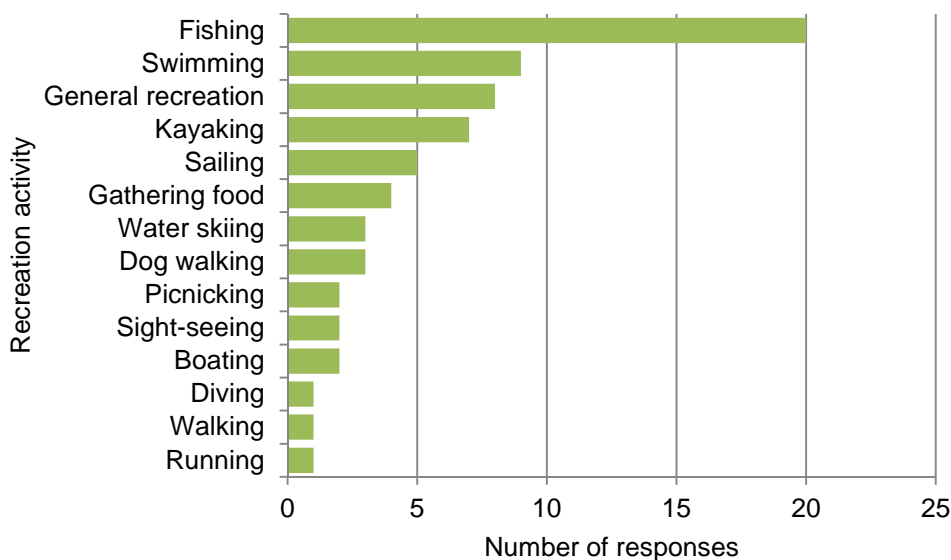


**Figure 8: Perceived solutions to environmental issues in Tauranga Harbour (2011)**

The majority noted that the main solution for water quality issues in the harbour was fencing and planting regional waterways.

### 3.4.8.3 Use of Tauranga Harbour (including Rangataua and Welcome Bay)

Question 14 of the survey asked respondents if they used Tauranga Harbour. Sixty-five per cent of the respondents indicated that they did use the harbour for the purpose of outdoor recreation (Figure 9).



**Figure 9: Recreation undertaken in Tauranga Harbour and surrounding environs**

That figure shows a diverse range of recreational activities, with fishing the most popular in the harbour area (note that more than one activity could be listed).

### 3.4.8.4 Values associated with Tauranga Harbour

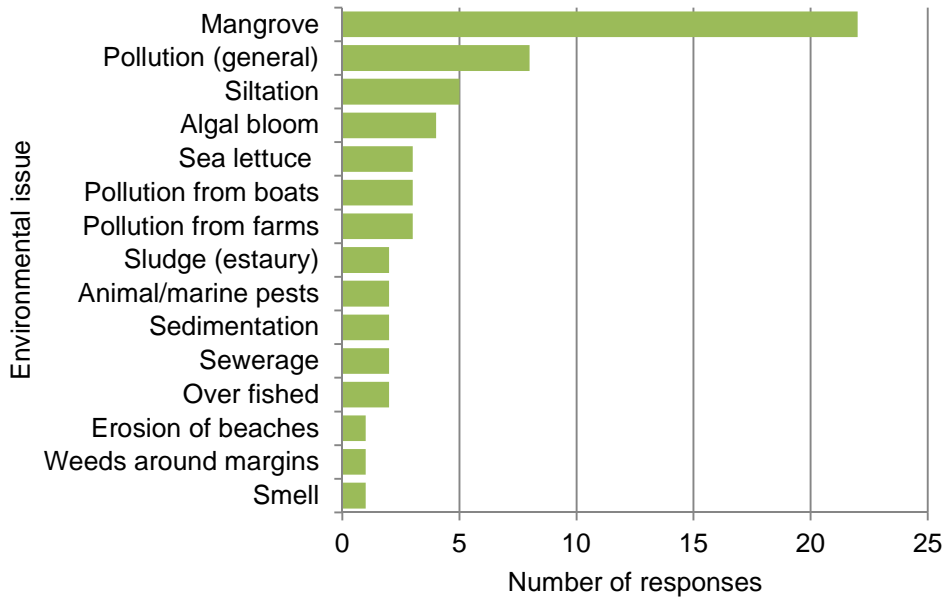
The second part of Question 13 asked respondents what they valued most about the harbour. Their answers indicate that the harbour is valued for a wide range of reasons including:

- Aesthetic value and natural beauty (22)
- Recreation site (especially for fishing or swimming) (10)
- Intrinsic value (“sense of it being there in the community”) (9)
- Under-developed and quiet (3)
- Access to water (3)
- Natural flora and fauna (1)

### 3.4.8.5 General environmental issues associated with Tauranga Harbour

Question 14 asked the respondents what they thought were the main environmental issues with the harbour. Three survey participants provided no answer, while a further three stated that they did not know of any. One person said there were no environmental issues. However, 84% of the respondents did identify one or more environmental issues

associated with the harbour (Figure 10). This figure shows that there is a great deal of concern over the spreading mangrove.



**Figure 10: General environmental issues associated with the harbour**

It is important to note that 3 of the 22 respondents who identified mangrove as an issue were not in favour of its removal, seeing it as a natural part of the harbour environment.

#### **3.4.8.6 Solutions to environmental issues associated with Tauranga Harbour**

Question 14 also asked the respondents to suggest solutions for the environmental problems they had identified (Figure 10). Reflecting many respondents' concerns regarding the spread of mangrove, the most popular solution was "mangrove removal or management" (22). This was followed by "better management, monitoring and enforcement" (7), "public education and information sharing" (5), "getting farmers on board" (4), "planting and fencing waterways" (3) and "dredging the harbour" (3). One respondent suggested more support for Landcare groups, and another individual suggested that more rubbish bins in the harbour area would help matters.

### 3.4.9 Involvement in community initiatives in the Waitao Catchment

#### 3.4.9.1 Level of individual/family involvement in community initiatives

Respondents were asked if they or their families were involved in environmental management activities within the local community (Table 8). It is important to note at this point that some respondents were involved with more than one group. Overall, 58% (25) of those who responded to the survey were active participants in **at least one** community-based environmental initiative, with 9 of these respondents involved in **more than one** activity/group.

**Table 8: Distribution of local participation in stream management initiatives**

Group/initiative	2007		2011	
Te Awa O Waitao Restoration Project	5	12%	5	12%
Project Waitao-Kaiate Environmental Group	17	40%	22	51%
Bay of Plenty Regional Council Environmental Programme	5	12%	9	21%
Other Groups	4	*	1	2%

Table 8 shows that the greatest number were involved with the *Waitao-Kaiate Environment Group*, which is just over half of all the respondents (51%). (However, this number may be biased because the respondents surveyed were primarily from the Waitao Valley area, who as a whole, are potentially more likely to be members of the local Environment Group).

#### 3.4.9.2 Nature of individual/family involvement in community initiatives (2011)

Involvement with the various environmental management oriented groups (listed in Table 8) included:

- Involved with planting days (13)
- Attended environment group meetings or on the committee (11)
- Nature of involvement not specified (5)
- Involved with children's planting day (2)
- Plant propagation and nursery (1)



Question 17 asked the respondents who were involved in community initiatives to comment on how worthwhile they thought their engagement had been. Of the 25 respondents who were involved with the various groups, 21 found it to be worthwhile, 4 did not respond and 1 described their involvement as “frustrating”. These results are very similar to those reported in the 2007 survey, indicating that members continue to find their engagement in group activities meaningful.

### 3.4.9.3 Impact of involvement in community initiatives

Thirteen of the active group member respondents felt they had gained knowledge on reducing environmental impacts in the stream and harbour, and/or had learnt about land management practices in general through their involvement with the various groups (Table 9). The table shows that the majority of participants continue to learn through their participation in groups, across three key areas.

**Table 9: Learning as a result of group involvement**

Have found the group useful for learning more about...	Number of responses 2007	Number of responses 2011
...environmental impacts on the stream	78.3%	<b>68%</b>
...environmental impacts on the harbour	60.9%	<b>52%</b>
...local land management practices	65.2%	<b>60%</b>

For some respondents new knowledge had led to changes in behaviour (see Table 10).

**Table 10: Actions resulting from learning**

Action as a result of learning:	Number of respondents (2011)
Planted (more) native trees	<b>11</b>
Fenced waterways	<b>4</b>
Adopted a new land management strategy	<b>2</b>
Increased communication with neighbours	<b>1</b>
Cleared drains	<b>1</b>
Started to pass on information to children	<b>1</b>
Have thought more before acting	<b>1</b>

### 3.4.9.4 Non-participation

Of the 18 respondents not involved in any of the groups in 2011, 83% had heard about the activities and 39% thought they may attend future events. Most importantly, all of them (100%) thought the groups were worthwhile even though they were not personally involved. These figures compare well to the 2007 survey.

As in 2007, those respondents who did not think they would get involved with the Environment Group in the future cited time factors (particularly being 'too busy') as the main reason, followed by health issues associated with age.

### 3.4.10 Success in reaching out to the local community

There are several key people and organisations involved with catchment management in the Waitao catchment and many of the respondents had met these people at some stage. Table 11 lists these key people/organisations and the number of locals who had been in contact with them.

**Table 11: Contact between local residents and key people and organisations**

Key person/organisation	Number of respondents who had made contact with key people (2011)		2007
Waitao-Kaiate Group	33	77%	-
Tom Cooper	19	44%	67%
BOP Regional Council	20	47%	51%
NIWA	14	33%	39%
NZ Landcare Trust (Kate)	9	21%	60%*
Nga Whenua Rahui	6	14%	-
QEII	6	14%	-

\*In 2007 this was Robyn Skelton (NZ Landcare Trust)

In 2007 and 2011 representatives from the Waitao-Kaiate Environmental Group were the primary point of contact for most of the local people who were surveyed. The vast

majority of these respondents indicated that they had made contact with the group via attending meetings, social events and planting days.

As in 2007, Tom's contact with respondents was related mainly to his involvement with both the Environment Group and capacity as Te Awa O Waitao Restoration project Kaitaiki and interactions with locals while water quality sampling and discussing results.

Respondents have had contact with staff from Environment Bay of Plenty mostly through Te Awa O Waitao restoration project and educational events.

Contact with NIWA has mainly been through field days.

As a result of the above interactions most respondents said that they had gained knowledge and ideas on how to manage both specific and general environmental problems. Some enjoyed the sense of community they felt through these interactions, especially meeting likeminded people. Several found their interactions with "experts" interesting and enjoyed sharing and gaining knowledge through educational events.

Some of the groups/organisations produce informative material, such as newsletters. This information seemed to have good reach within the community, with 58% of those surveyed indicating that they had seen a newsletter produced by either, the Environment Group, Te Awa O Waitao Restoration Project or Bay of Plenty Regional Council. This figure included six respondents who indicated that they were not involved in any environmental group.

#### **3.4.10.1 Future membership**

Question 20 of the survey asked respondents to indicate if they defined themselves as a current member of the Waitao-Kaiate Environmental Group and then if they thought they intended to remain a member, in the future. About half (46%) of those who were not a member of the environmental group said that they intended to join sometime in the future. Similarly, several of those who were members of other groups (but not a member of the Waitao-Kaiate Group) said they were planning on joining sometime in the future. All 13 survey respondents who were current "members" intended to remain a member in the future. These results indicated that the group can at least expect the core membership to be maintained and perhaps even significantly supplemented with new members over the next few years. Those who did not intend to become members of the group in the future generally cited "too busy" or "health issues" as their reason for disengagement, with a few noting that the group's work was "not relevant" to them.

#### **3.4.10.2 Involvement in other community groups**

Question 21 asked the respondents if they were involved with any other community groups or if they attended other community events. Like in 2007, many 2011

respondents did engage with other community groups, including (no number equates to 1 response):

- Welcome Bay Painting Group\*
- Out of Our Own Backyard
- Waitao Hall Restoration Group (3)
- Hospice
- Tauranga Western Riding Club
- Welcome Bay Play Centre
- Forest and Bird
- Local children's group
- Tauranga Harbour Society
- Lions
- Deerstalkers Association
- Pony Club (2)
- Riding for the Disabled
- Gardening Clubs (3)
- Church (3)
- Bowls
- Youth Support
- Trailer Yacht squadron
- Marae
- Women's group (upper Waitao Road)
- Tai chi

Community events attended by the 2011 respondents included:

- Waitao Weekend BBQ/Picnics (12)
- Waitao Road Quiz Night (5)
- Waitao Christmas Function (4)
- Wine and Food Festivals
- Lions Events
- Welcome Bay Fun Day
- School Fair

### **3.4.11 Perceptions of the impact of local environment groups/projects**

Question 22 comprised three parts.

**Part A** asked the respondents to indicate if the Environment Group's activities had made a difference to *"their understanding of the environmental impacts of different land or stream management practices"*.

Of those who responded to this question, 63% said that the group's work had improved their understanding specific methods for protecting local flora and fauna). Several of those who said that it had not made a difference to their understanding, commented that they *already* had a good understanding of these management practices.

**Part B** asked the respondents to indicate if the Environment Group's activities had made a difference to *"the way people in the catchment manage the stream on their land"*.

Of those who answered this question, the overwhelming majority (82%) believed that the group's work had changed the way local people in the catchment managed the streams on their land. About half of them noted visible changes in the catchment, especially stream fencing and native trees planted. Others assumed change must be occurring due to increased participation by landholders in environment group activities.

**Part C** asked the respondents to indicate if the environment group's activities had made a difference to *"water quality in the Waitao stream and its tributaries"*.

Of those who responded to this question, the majority (66%) either did not think that it had or did not have the information to know. Most commented that they would like feedback from the council regarding the findings of their water quality monitoring activities. Among those (33%) who thought water quality had been improved, most also said they "assumed" that it had and would appreciate feedback from experts as to whether an in-stream difference had been made.

Overall, the responses to these three questions show that the group's activities have raised awareness of good environmental practices, subsequently leading to many local landholders carrying out pro-environmental activities, especially the fencing and planting of stream margins. However, the responses to Part C suggest that local people would appreciate feedback from "experts" as to whether or not this awareness and action had actually made a difference.

### **3.4.12 Future of the catchment**

Respondents were asked to comment on what they saw as a desirable future for the stream margins in the Waitao Catchment. Their comments were very diverse and have been included in Appendix 5.

A popular future vision for the streams in the catchment was for them to be lined with (native) tree and plant species and able to be used for swimming. Many respondents would like to see wildlife back in the area and the natural beauty of the catchment and its waterways “restored” and maintained. Several of them envisaged a future with farmers caring for the environment coupled with the continuation of Landcare group activities (which some perceived would rest upon support from council).

#### **3.4.13 Other issues respondents wished to raise**

At the end of the 2011 survey, respondents were asked if they had any further comments they wished to have noted and had not previously expressed. These included;

- Several respondents were genuinely happy with the community's pro-environmental activities.
- Five respondents requested more support for the land care group (given the success it was having).
- Several respondents believed that the community would benefit from regular reporting on the impact of their efforts through the publication of water quality monitoring data.
- One respondent felt that the most important issue was to restore Kaiate falls (described as a longstanding and highly valued community resource).
- Two participants wanted the stream banks to be stabilised.
- One respondent wanted to note the matter of goats causing damage in the catchment.
- Two respondents were concerned with the amount of rubbish in the waterway, with one noting frequent dumping at Rocky Cutting Road.
- One resident wanted to note the importance of returning the river to a swimmable state.
- One respondent wanted clarity around what to do if a fallen tree is found in the stream. Who should remove it?
- One respondent wanted an absolute ban on stock in the waterway.

### **3.5 Integrated interview and survey results**

In 2007, the changes within the community with respect to environmental knowledge and awareness, stream management practices and social capital were attributed to a combination of effects resulting from efforts of the Te Awa O Waitao Restoration Project Joint Steering committee, the formation and activities of the Waitao-Kaiate Environment Group and collective submission in opposition to a proposed landfill site in an old

pumice quarry. However, the 2011 data suggests that it is largely the Environment Group which is likely to be responsible for continuing this momentum and building on it.

### **3.5.1 Increased environmental awareness, knowledge and action**

The participants of the survey and the interviews have demonstrated an increase in environmental knowledge and awareness through their ability to clearly articulate local problems and discuss solutions, evaluate the pros and con of different mitigation strategies, and increased repertoire of water and habitat assessment tools.

Further, residents have gained a broader and more complete understanding of local environmental issues and a greater appreciation of the implications of land management practices. They are able to clearly express their concerns about environmental issues associated with the Tauranga Harbour and Waitao Catchment, and viewed riparian planting and fencing as a viable mitigation strategy. Moreover, participants showed an ability to thoroughly debate the advantages and disadvantages of different alternative actions within the catchment applying a good level of technical understanding. For example, the benefits and costs of using willows to stabilise stream banks appears to be a current debate within the catchment which is discussed with a high level of detail and knowledge.

The means with which local residents assess water quality has diversified. Earlier research illustrated a tendency to assess water and habitat quality based around water clarity (i.e., the amount of suspended sediment in the water column). However in the 2011 survey, participants provided a far more comprehensive and technical list of how they evaluated local water quality. In addition, many participants judged water quality not through first hand experience and personal evaluation, but through talking with others. This shows that not only have people learnt more about water and habitat quality, but that the information is spreading through social networks. It is interesting to note that the majority of participants believed that they continue to learn about the environmental issues, impacts, and solutions through their participation in groups.

An increase in local knowledge also seems to have created an appetite for further knowledge. Many participants appear to think carefully about the implications of land and stream management decisions and seek further information before acting to ensure they have chosen the best alternative. Furthermore, they have a greater confidence in their ability to seek out resources and act.

However, information regarding the ecological success of restoration activities was something which many participants felt was missing. In 2007, there was data available through Te Awa O Waitao Restoration Project on local water quality through the monitoring component of the restoration program. Yet, despite this monitoring program being on-going few results have been fed back to local residents, thus contact between Te Awa O Waitao Restoration Project and the Environment Group seems to have diminished. However, just less than half of the participants had personal contact with Tom Cooper (as Te Awa O Waitao Restoration Project Kaitiaki) and had discussed stream monitoring results with him. The Bay of Plenty Regional Council Staff and NIWA have maintained a presence in the local community primarily through educational events or field days. However, Landcare Trust is perceived to be less active in the catchment than before.

Of key significance is the fact that stream fencing and riparian planting activity is now widespread and underpinned by an aspiration to have all the streams in the catchment managed in this manner. Another very important result is that ALL of the people surveyed and interviewed thought that the activities of the Waitao-Environment group were worthwhile. Many participants supported the vision to fence and plant waterways in the catchment with native vegetation, including those who were not directly involved in group activities.

Arguably the best advocates for fencing and planting initiatives on individual properties are a few socially well connected and enthusiastic members of the Environment Group. These “ambassadors” do a great job in gaining additional buy-in from local property owners.

### **3.5.2 Changes in stream management practices**

Notably the survey highlights that 82% of participants believe that the Waitao-Kaiate Environment Group has made a difference to the way that local people manage the stream(s) on their property. Participants based this observation on visual changes in the landscape and an increasing engagement with the landowners in the area, particularly some of the owners of larger properties. Both interview and survey participants were surprised and impressed with some of the work done by local farmers. One participant in particular, had moved from an anti-stream management stance to fencing and planting all of the waterways on the property over the six year timeframe of this study (a considerable undertaking given the topography and number of waterways on the property). Many of the other survey participants had changed their stream management practice through their Environment Group membership, principally stream fencing and riparian planting. Along with a change in stream management practices is a change in



the perception of wetlands. Wetlands, once viewed as a messy problem area, are being interpreted as a potentially attractive feature of the catchment.

Other key drivers for change appear to be an increased awareness of their personal impacts on the stream system through their land management practices (learning through association with the Environment Group), sustained and persistent pressure from a variety of sources, and the availability of fencing and planting subsidies through the local councils. Several participants who had completed work on their own land wanted to see pressure brought to bear on others to better manage their stream margins.

Overall, whilst the catchment has seen a considerable shift towards fenced and planted stream margins, there are still a number of landowners who have not changed their management practices. However, there is some evidence to suggest that these landowners may be feeling pressure from other members of the community.

### **3.5.3 Local sense of community (social capital)**

Over the last 6 years the community has moved from low levels of social capital and a limited sense of local community to a situation where local residents are connected through a social network which extends along Waitao Road, Kaiate Road and Garret Road. This network is used to spread information, knowledge, ideas, share skills and work towards community goals; although it is currently anchored around the Environment Group, it is not exclusive to group members.

For many people, the social aspect of the Environment Group's activities is the element of the group which draws them in and keeps them interested because they enjoy spending time with their neighbours. Furthermore, it is more than just an opportunity to improve the local biophysical environment, the group also represents an important leisure activity as it is a regular time for locals to meet, discuss interests and annoyances and generally get to know each other better. Overall, the group is viewed as very welcoming and inclusive a very high percentage of those surveyed were either members of the group now or intended to join in the future.

It is likely that the enjoyment of the social side of the environment group combined with an enhanced social network has given rise to other activities within the catchment. Two examples are a monthly quiz night and the reinstatement of the annual picnic. Both of these activities are well attended and enjoyed by a mix of local residents beyond care

group members. All of these activities act to strengthen the ties and links between local residents and increase communication and a sense of local community.

The increase in communication and co-operation between neighbours is evident in several parts of this research. Firstly, knowledge sharing can be observed through the increased repertoire of water and habitat quality assessment measures which were reported by participants. Not only is there a more diverse and technical list, but many residents had made their judgements based on their neighbours' views. It is clear that people are talking about the issues and sharing knowledge and personal opinion. Secondly, collective action is increasing either by jointly fencing shared wetlands or forming action groups to pursue a solution to road run-off impacts or oppose the sale of (and potentially renovate) the old hall. In addition, by establishing a children's' group, some new people have been attracted from outside the Waitao-Kaiate falls - Garrett Road area, hence the social networks may slowly extend into other places. Overall, there appears to be a stronger sense of local community, a strong sense of place and of ownership of the river as well as a shared appreciation of the beauty of the area.

## **4. How is this research relevant to other groups?**

### **4.1 Introduction**

The interviews and surveys in the Waitao catchment have confirmed the presence of all the attributes of a successful care group (or community group):

- They have high social high capital; neighbours know and trust each other, they share skills and knowledge, work together, hold other social events and feel more a part of their local community than they did in 2004.
- They demonstrate action competence – the group is engaging in planting activities with confidence and enthusiasm. They have access to technical knowledge were necessary and operate their own nursery. Moreover, they have acquired knowledge and understanding of the impact of land management practices on stream systems and how to mitigate these. In addition, they now have the confidence to take on other issues for example the hall renovation or other local environmental issues.
- Funding and resources are available to the group to allow them to further their goals.

A key question now is how can this be applied<sup>3</sup> to other care groups or voluntary groups in the region?

## **4.2 What makes for high levels of social capital?**

### **4.2.1 A stable local population**

The Waitao catchment has a stable population which facilitates the development of high social capital. This is because it allows time for relationships to develop, such as trust and respect which is needed to establish norms, shared visions and goals. New-comers are generally assimilated into the existing culture and important skills and knowledge are retained.

**Lesson:** Groups in areas with a high turnover of residents are less likely to perform because the membership is likely to be unstable and does not allow time for social capital to fully develop. These groups may not function in the long term, without considerable external input such as the time and input of different members.

### **4.2.2 The influence of voluntary groups has boundaries**

The effect of the Waitao-Kaiate Environment Group and Te Awa O Waitao on environmental knowledge and stream management practices and enhanced social capital does not extend outside of the Waitao Road/ Kaiate Falls Road /Garrett Road area. This implies that the group has a limited influence, probably based on geographic boundaries - i.e., steep slopes which separate those who have access to their properties through Waitao Road and those who travel different routes. Although the property of residents on Kaitemako and Rocky Cutting Roads are within the Waitao Catchment they do not necessarily see the Environment Group or the restoration work as relevant to them.

The newly established children's branch of the environment group and the group formed to focus on resolving the road run-off issues on Rocky Cutting road may slowly extend the influence of the group.

**Lesson:** Voluntary groups will have natural boundaries which may be defined geographically or by other social factors. This presents a challenge to any resource management strategy which utilises voluntary groups because group boundaries and

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<sup>3</sup> It is important to note that the following discussion is based on data drawn from the current study (i.e., is context specific) and includes the opinion of the authors. Moreover, the "lessons" drawn from the current work have not been tested against current practice within the council or the New Zealand Landcare Trust due to significant project time constraints.

catchment boundaries may be mismatched. Whole catchment groups may be difficult to establish and maintain if people live along different roads and don't share a common point of reference. This is supported by Hale (1996) who suggests that community actions have been the most successful when they involve a small geographical area. Larger catchment may be best served by multiple care groups who operate independently but are strongly connected through resource management authorities or regular social interactions.

When looking to establish new care groups geographic boundaries are the most obvious factor to consider, especially where road access splits residents off into separate communities.

#### **4.2.3 Extensive social networks – everyone is connected**

All residents along in the Waitao-Kaiate Falls/Garrett Road area are connected through an extensive social network irrespective of whether or not they belong to the Environment Group. This has taken a while to develop and started with the Te Awa O Waitao restoration project events, collective opposition to the proposed landfill and the work of the Environment Group. Constant social interaction and activities keep this network functioning. A key communication tool for local social activities is the community notice board at the bottom of Waitao Road. Its location ensures that every resident knows what is going on, where it is happening and when.

The Waitao-Kaiate Environment Group has several socially well connected and charismatic “ambassadors” who spread the word and enthusiasm to those they meet. Such “ambassadors” facilitate the spread of enthusiasm and knowledge and often recruit new members.

**Lesson 1:** A community notice board would be valuable for all community groups as it allows for simple and effective communication of local events and meetings to all those who pass by. It provides an opportunity to alert people who are not already involved in the group.

**Lesson 2:** Social events are a critical component of all care groups as it allows time for people to mix and mingle and for social networks and social capital to grow. Meetings and events which provide entertainment or activities for children are especially well attended.

**Lesson 3:** Identification and recruitment of group “ambassadors” who are well connected and respected will help groups evolve and gain additional membership and support.

### **4.3 Establishing action competence**

#### **4.3.1 An event (or crisis) to galvanise the community**

The Waitao-Kaiate Environment group essentially started from a combination of factors which brought people together and made them aware of a particular environmental issue. Many care (or community) groups start in a similar manner. For this group, the key elements were technical evidence illustrating a problem, and people coming together to discuss issues and get to know each other.

**Lesson 1:** To establish community groups in other catchments may require “an event” or “series of events” which draw attention to local water and habitat quality issues. The high bacteria count (*E.coli*) in local swimming holes was a real concern to local residents in the Waitao catchment and may be applicable to other priority catchments. In other words, events could be constructed (e.g., design a “crisis”) to gain community attention.

**Lesson 2:** Another way to gain attention could be to establish children groups in the areas. The children’s group in the Waitao Catchment has attracted considerable interest as many people are willing to make time to take their children along to activities.

#### **4.3.2 The role of knowledge (Part A): science and technical support**

The role of science in care groups is interesting because it is necessary to highlight issues, understand potential mitigation strategies, and help to produce an overall plan. However, information on its own will not inspire people to act, but it could guide effective outcomes. Science must be introduced to groups at the right time and in an appropriate manner. In the Waitao catchment, NIWA, the regional council and NZ Landcare Trust played a role in providing scientific input largely through Te Awa O Waitao Restoration project Workshops, a field day, newsletters and on-going stream monitoring. These events are well attended and have had a clear impact on the community, for example, the electric fishing demonstration and subsequent results (as part of Te Awa O Waitao Restoration project) is still fondly remembered. More recently, input from outside agencies had diminished leaving the care group unsure of the current state of the water and habitat quality. It is interesting to note that a recent summary of local water quality was given in a presentation at the March 2011 Landcare event (Quinn et al. 2011), however, none of the participants mentioned it. Either they did not attend or they do not

recall it. Overall, written material on water quality information (i.e., newsletters sent to all households) seems to leave a more lasting impression than presentations alone (i.e., Landcare day presentation).

An important role for catchment management officers is developing a relationship with farmers in the catchment and working to convince them to mitigate the environmental impact of their stream management practices. Persistence in this regard, combined with offers to help develop a farm plan and investigate subsidies, has paid off in the Waitao catchment.

**Lesson 1:** The way in which scientific knowledge was introduced to residents of the Waitao catchment has been extremely successful in promoting knowledge and action. It was approached from a practical perspective using a combination of technical experts, and Landcare trust staff (who help set up the group(s)). Local residents were able to understand the problems and issues and feed what they had learned into their own social networks. A combination of presentations, field days and written newsletters are likely to be the most effective at reaching a wide audience.

**Lesson 2:** There is a need to link care groups with water quality data to allow them to see if they are making a difference. The Stream Health Monitoring and Assessment Kit (SHMAK) provides a good opportunity to do this. Moreover, data could be stored in an accessible form for all member groups to view.

**Lesson 3:** Persistence with landowners will probably pay off in the long run.

#### **4.3.3 The role of knowledge – Part B local knowledge**

There are a number of skills held by local residents which are invaluable to the functioning of the Environment Group. Many of these skills have been shared with fellow group members through nursery and planting days and has bolstered the confidence of others to undertake planting and fencing on their own land. In combination with a clearer grasp of scientific knowledge the community is more confident and has the ability to respond to issues as a collective, thus able to put more weight behind their argument and becoming more effective.

**Lesson:** local knowledge and skills need to be identified and used to complement those provided by external organisations.

## **4.4 Funding and support**

### **4.4.1 Subsidies appear to promote action**

The ability to obtain subsidies to fence and plant from the Bay Of Plenty Regional Council and Western Bay District Council was an important driver to undertake riparian planting. One landowner decided to take advantage of the subsidies while they were available as they wanted to act to mitigate their impacts on the stream on their land.

**Lesson:** The subsidies are worthwhile as a means to promote riparian planting. However, farmers are more likely to take them up if financial support is coupled with increases in environmental knowledge, awareness of personal impacts on water and habitat quality and community/social pressure. A multi-pronged approach which addresses the knowledge issue provides support for farmers to work through their options on individual properties (like the current farm plan approach) and assists with financial incentives for planting will remain the most effective.

### **4.4.2 Groups dislike bureaucracy – they are action oriented**

The Waitao-Kaiate Environment groups expressed a strong desire to “plant” and did not much like the bureaucracy that was required in order for them to continue. Although they did recognise that some paperwork was necessary, the loss of a key person and a change of the local council catchment management officer has confused the requirements and caused a few problems and friction.

**Lesson:** Check that the current procedures are simple, easy, and transparent – what is the awareness like? – can it be improved? - is support readily available? – do they promote goodwill between the council and voluntary partners?

### **4.4.3 Positive relationship between the council and community groups**

It is very important that the relationship of the council with the community is as positive as possible to ensure that goodwill is retained. However, the community see the councils (regional and district) as a whole unit and is often confused as to why one is supporting efforts to restore the catchment while another is perceived as undermining the group’s activities. An example of this is the erosion caused by road run-off on Rocky Cutting Road which is thought by the locals to put more sediment into the stream than any local land use. Whether or not this is actually true it affects the relationship with the council. Another issue is around supporting the protection of landowners’ plantings.

**Lesson:** Actions of the Councils as a whole have an impact on the relationship with care groups. Although, having said this, the strength of individual relationships can override this problem.

#### **4.4.4 Praise the group and individual landowners**

In short, people want to know *“how they are doing”* and as a consequence respond well to positive reinforcement. Members of the Environment Group felt they did not receive enough feedback either from an ecological (on water and habitat quality) or resource management perspective. In addition, praise individual landowners who have completed fencing and planting on their land.

**Lesson 1:** Provide feedback to let groups know how they are doing and embed praise for successful group activities into contact with group members.

**Lesson 2:** Endeavour to praise individual farmers and landowners for their action. They are good advocates with other landowners

#### **4.4.5 Support group – group interactions**

Apart from occasional events, the groups are largely operating in isolation from each other. An occasional or reasonably regular social gathering of groups in the Bay of Plenty and Kaimai region would be useful to break the isolation.



## 5. Conclusions

Between 2004 and 2011 there have been some considerable changes with respect to environmental knowledge and awareness, stream management practices and levels of social capital for residents of Waitao Catchment, Kaiate Falls and Garrett Road. From 2004 and 2007 these changes were attributed to a combination of effects resulting from efforts of the Te Awa O Waitao Restoration Project Joint Steering committee, the formation and activities of the Waitao-Kaiate Environment Group and collective submission in opposition to a proposed landfill site in an old pumice quarry. However, the 2011 data suggests that it is largely the Environment Group which is responsible for continuing this momentum and building on it.

The participants of the research have demonstrated an increase in environmental knowledge and awareness through an ability to more clearly articulate local problems and discuss solutions, evaluate the pros and cons of different mitigation strategies, and an increased repertoire of water and habitat assessment tools. The increase in knowledge seems to have created an appetite for further knowledge and a greater confidence in their ability to seek out resources and act.

However, more feedback regarding their efforts is required as information outlining the ecological success of restoration activities was something which many participants felt was missing.

Significantly, stream fencing and riparian planting activity is widespread and underpinned by an aspiration to have all the streams in the catchment managed in this manner. Another very important result is that all the people surveyed and interviewed thought that the activities of the Waitao-Environment group were worthwhile. Many participants supported the vision to fence and plant waterways in the catchment with native vegetation, including those who were not directly involved in group activities.

Results from the survey show that 82% of participants believed that the Waitao-Kaiate Environment Group has made a difference to the way that local people manage the stream(s) on their property. Participants based this observation on visual changes in the landscape and an increasing engagement with the landowners in the area, particularly some of the owners of larger properties. Key drivers for change appear to be an increased awareness of their personal impacts on the stream system through their land management practices (learning through association with the Environment Group), sustained and persistent pressure from a variety of sources, and the availability of fencing and planting subsidies through the local councils.

Lastly, over the last 6 years the community has moved from low levels of social capital and a limited sense of local community to a situation where local residents are connected through a social network which extends along Waitao Road, Kaiate Road and Garret Road. This network is used to spread information, knowledge ideas, share skills and work towards community goals; although it is currently anchored around the Environment Group it is not exclusive to group members. It is likely that the enjoyment of the social side of the environment group combined with an enhanced social network has given rise to other activities within the catchment.

Key lessons from this research which could be relevant to other care groups in the Bay of Plenty Region include:

- A stable local population creates a strong group with good social networks which is more likely to affect change.
- The influence of voluntary groups has boundaries and this will affect the use of such groups to manage whole catchments in an integrated manner.
- Extensive social networks can develop through care groups and these networks facilitate knowledge transfer and achieve group goals. Moreover, they help the group act collectively on other matters which may not be directly related to the core purpose of the group.
- It may take an event (or crisis) to galvanise the community to act and form a care group. Without such an “event” the community will remain unaware and/or largely unmotivated to act.
- The role of science and technical knowledge and also local knowledge is important to achieve meaningful results. The way in which this project has integrated these aspects to generate action has been very well managed.
- Fencing subsidies appear to promote riparian fencing and planting on larger farms. However, one on one contact with Council staff and an acceptance of the personal responsibility of the impacts of their stream management practices on water and habitat quality have preceded the uptake of the subsidy.
- Care groups dislike bureaucracy so keep the process as simple as possible.
- A positive relationship between the council and community groups is essential to the formation of a working partnership.
- Positive reinforcement for care groups and individual landowners’ stream management practices would potentially motivate participants and ensure further action.
- Individual groups may feel isolated and further support for group/group interactions could be worthwhile.

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## **Appendix 1: A list of interview questions**

### **Interview Questions – protocol semi structured interviews**

The questions listed are designed to facilitate discussion and will be put into the conversation at the appropriate time rather than in a specific order. Points of interest will be followed up.

#### **Catchment**

Has the area changed any over the last 3 years  
Population/ landscape.

Has any thing changed on your property in the last three years?  
(Like land use or land area?)

#### **Stream**

Do you use the Stream for anything?  
What do you value about the stream?  
What sort of condition do you think the stream is in? How do you assess that?  
Has your view changed over the last few years?  
What has changed it? (why has it changed? Main reason for the change)  
What do you think the main environmental issues are with the stream?  
Do you think this has changed over the last few years?  
Has the way you manage the stream on your property changed?  
What do you think has changed this  
What do you think about riparian planting? – have your views shifted at all over the years?  
Have you had any thoughts about having a go on your land?  
What have you done, how have you done, who helped what info was useful.  
What are you lacking to act? Who could provide this?  
What are some of the most important things you think you have learned about the stream and its management.  
Do you think you would have done it on your own?  
What do you think is the best way to help other people in other areas to manage their stream- what has been the most useful for you to improve how you manage your stream

#### **Involvement and contact**

Have you had anything to do with the Waitao Restoration project? Or Local Environment Group?

Field days? Meetings etc? if so what has retained your interest? Why do you still go  
What do you get out of it?  
Read any of the newsletters?. heard about it via word of mouth?

Do you feel included? Do you want to feel included or be involved?  
(if no what are the main barriers for you?)

Have you had any other contact with either Landcare, Tom Cooper (Te Awa O Waitao project team), NIWA or the Regional Council, Environment Group. Through any other things?

Do you think the restoration or environ group is having any effect on the catchment – physically or the people?(Do you know your neighbours better? Enjoy social time at meetings? Share resources equip etc ... feel a strong sense of place belonging to a community etc)

Do you think locals have a different understanding of the impacts of land use/management practices on the stream and harbour than they did before the groups started. What do you think has changed?

How important has the group been in the choices you have made? ( i.e., would you have done this by yourself?)

Do you think any of your views have changed – even slightly  
Have you noticed further changes around stream management in the catchment as a whole? How important has the environment group –restoration project been in this?

Have you taken any action on your property – are you planning something

Do you feel the Councils is supportive of what is happening here – what support? What else could be done and how?

What do you think might happen to with the stream and its management in the future

What would you like to see happen?

What advise/insights do you have for other landowners with streams on their properties in other areas.(what messages would you give them – what are the key things you have learnt?)

### **Specific to environment group/steering group**

Reflections –

How would you describe your achievements (key successes)

How have you achieved they – what have been the key factors in achieving success?

Are you happy with them – what else would you like to do

Would you do things differently if you have the chance again?

What have been the key challenges – how have you managed these – what are the on-going issues

How supportive has the council been? What could they do better or differently

What lessons/words of wisdom do you have for others who may be looking at doing similar things elsewhere.

What difference do you think you have made to land management practices/ stream management, and the community spirit? What? how? why? What evidence?

Do you tap into other care groups – or do you focus on your own tasks

Future plans?

## **Appendix 2: Letter sent to recruit interview participants**

(on letter head)

To xx

As you may remember, in 2003 Nga Papaka Incorporated, New Zealand Land Care Trust and NIWA began a restoration project to improve the health of the Waitao stream and its catchment..The aim of this project is to work together over a number of years to restore the Waitao stream by combining western science, traditional Maori knowledge and community action. As part of the early stages of this project you participated in an interview which asked a number of questions around your views on stream and harbour management. In 2007, we talked again about what, for you, has changed in the intervening years. This year we would like to talk to you once more to see what you think about the stream restoration work in the catchment, the various local groups doing the work and stream management practices in general. The one difference for this year's research is that it is being funded by the Bay of Plenty Regional Council. They want to get some understanding of what impact the local restoration groups have had on people living in the Waitao catchment so they can get some ideas on what similar groups in other catchment could achieve.

Once again you are invited to participate in our research and we would appreciate any assistance you can offer. Last time your input was very valuable for the project and we would like you to participate further, but you are under no obligation at all to be interviewed. Interviews would take about half an hour to an hour and a half and would take place at a time and place convenient to you. The information collected will be incorporated in various publications and used to inform Regional Council policy on restoration groups for other catchments around the Tauranga Harbour. All information you provide in an interview is confidential and your name will not be used.

Thank you very much for your time and help in making this study possible. This letter will be followed up with a phone call in the next couple of days, in the meantime, if you have any queries or wish to know more please contact me on the details below.

I look forward to talking to you again

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## Appendix 3: The 2011 survey.

### Waitao Sub-Catchment Social Survey 2011

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#### General demographics

Address : (This will be confidential)

No. people living in the household? \_\_\_\_\_

How many are children ? \_\_\_\_\_

**Question 1:** How long have you lived at your current address?

Do you own or rent?

**Question 2:** How big is your property in hectares/acres?

\_\_\_\_\_ hectares OR \_\_\_\_\_ acres

**Question 3:** How would you describe your property – lifestyle block farm etc. (*circle*)

*Lifestyle block*

*Farm*

*House lot*

Other: (i.e., business?)

**Question 4:** What is the main activity on the property? (*circle*)

*Lifestyle block*

*Horticulture*

*Dry stock: sheep/ beef deer*

Other (i.e., residential, other business, other livestock mix)

# Stream

## Question 5:

**Part A:** Do you have waterways on or bordering onto your property – streams or drains, ponds/wetlands-see map (*circle*)

Streams

*Drains Ponds/Wetlands None*

Waitao

Arateka

Otawera

Kaiate

Unnamed tributary

**Part B:** How do you manage the stream margins?  
(*i.e., are they fenced and/or planted with shrubs/trees etc?*)

## Question 6:

**Part A:** Do you (or your family) use the stream or drains? What for?  
(*i.e., open-access stock water, reticulated stock water, domestic drinking water, non-drinking domestic water (e.g., for washing /toilets), farm or garden irrigation, land drainage, flood protection, recreation, swimming, fishing/kai .. mainly aesthetics*)

**Part B:** Do you value the stream? What do you value about it?

**Question 7:** What sort of condition do you think it is in? (*circle*)

*Very good*

*Good*

*Ok*

*Poor*

*Very Poor*

**Question 8:** On what criteria do you base your assessment of water quality and general stream environmental health?

**Question 9:** Do you think the condition of the stream has changed in the last few years?  
How?

**Question 10:**

**Part A:** Are there environmental issues or impacts associated with the stream in this area?

**Part B:** What do you think is causing these problems?

**Part C:** Is there anything you could do differently on your property? Or other landowners in the catchment could do differently?

**Question 11:**

**Part A:** What do you think are some of the wider water quality issues in the Tauranga Harbour?

**Part B:** What do you think causes them?

**Part C:** What do you think need to be done to improve water quality?

**Question 12:**

**Part A** Have you seen the stream side weed removal, fencing and native re-vegetation planting undertaken in the lower part of the Waitao stream? (*circle*)

Yes

No

**Part B** (If yes)What do you think of it?

# Harbour

**Question 13:**

**Part A:** Do you use the Tauranga Harbour/Rangataua Harbour/Welcome Bay?

Yes

No

If yes.....For what?

**Part B:** What is it about the harbour that you most value?

**Question 14:** What do you think are the environmental issues associated with the harbour?

**Question 15:** What do you think causes these?

**Question 16:** How could these problems be addressed?

## Involvement with stream restoration/management

**Question 17:** Are you or your family involved in any of the activities of the Te Awa O Waitao Restoration Project, Waitao-Kaiate Environmental Group, Bay of Plenty Regional Council Environmental Programme, or other land/environment management groups?

Te Awa O Waitao Restoration Project	Yes	No
Project Waitao-Kaiate Environmental Group	Yes	No
Bay of Plenty Regional Council Environmental Programme	Yes	No
Other Groups (name)	Yes	No

### IF YES

What was your involvement?

Was it worthwhile?

Was getting involved useful to learn more about reducing the environmental impacts on:

<i>the stream</i>	Yes	No
<i>the harbour</i>	Yes	No
<i>Or learning about local land management practices?</i>	Yes	No

Have you made any changes as a result of what you learnt?

Are you planning any changes in the future?

**IF NO**

Have you heard about any of the activities? (*seen the newsletters?*)

Yes

No

Do you think you may attend in the future?

Yes

No

Do you think the group's activities are worthwhile?

Yes

No

Is there any particular reason for this?

**Question 18:** Have you met either Tom Cooper, Kate Akers from NZ Landcare Trust or anyone from NIWA, Bay Of Plenty Regional Council, the Waitao-Kaiate Environment Group, Nga Whenua Rāhui, QEII?

Tom

Yes

No

Kate

Yes

No

NIWA

Yes

No

BOP Regional Council

Yes

No

Waitao-Kaiate Group

Yes

No

Nga Whenua Rāhui

Yes

No

QEII

Yes

No

**If Yes**

What it was to do with?

Have you got anything out of these meetings (*if so what might they be*)



**Question 19:** Have you seen any of the newsletters or information that either group has produced?

Yes

No

**Question 20:** Do you think of yourself as a member of the Waitao-Kaiate Environmental Group now, or in the future?

Now

Yes

No

In the future

Yes

No

**If No**

Is there any particular reason for this?

**Question 21:** Are you involved with any other local community groups  
(list)

or attend other community events?

**Question 22:** Do you think the environment group or the restoration project (specify) is making (or has made) a difference to

**Part A:** Your understanding of the environmental impacts of different land or stream management practices?

Yes

No

Comments ....

**Part B:** The way people in this catchment manage the streams on their land?

Yes

No

What are these?

**Part C:** Water quality in the Waitao stream and its tributaries?

Yes

No

What are these?

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## In summary

**Question 23:** Do you have any thoughts on what the stream and its margins should be like in the future? *(or the area in general )*

Any further comments?

## **Appendix 4: letter left with respondents after the survey.**

### **Waitao Sub-Catchment Social Survey 2011**

Thank you for participating in our catchment-wide survey on water and stream management issues for the Waitao catchment. We appreciate your input.

The aim of the survey is to find out what you think about

- The health of your local stream and the Tauranga Harbour.
- If you think anything is affecting the health of the stream and harbour and what you think can be done about any issues.
- If you have been involved in any of the stream restoration activities in the Waitao catchment and what you think about them.

A similar survey was run in 2007 and provided very useful information to the stream restoration groups in your catchment – Te Awa Restoration Project and the Waitao-Kaiate Environment Group. This year the survey is funded by The Bay of Plenty Regional Council who wish to understand your views on stream water quality and management. They will use the information as part of their environmental decision making and planning process. In particular, they would like to know how successful the stream restoration groups have been and what lessons from this catchment can be used for other areas around the harbour.

Please note that your contribution will be one of 80 from around the catchment and will be confidential.

If you have any questions about the survey please feel free to contact

Catherine de Monchy on 544 4334  
Or Catherine@demonchy.co.nz

Paula Blackett on (07) 8385585  
Or paula.blackett@agresearch.co.nz

## Appendix 5: Respondents' comments about a desirable future for the Waitao Stream

Important to keep special places clean / nice. Like Kaiate Falls
Farmers on streams caring for waterways
Restoration of riparian zones
Keep going the way we are - not excellent, but very good quality of water
Would like to see fenced off, plantings, succeeding, growing up. Bring back bird life
Native corridor all along the stream. Re-vegetate all along. Erosion controlled. Repopulate stream with native species
Would love to see more weeping willows along the streams
Bit better managed - less weeds, stabilise river banks, more native plantings
Support for landowners to take better care of the streams
Preserved natural beauty – that would be great
Would be great to see more native plantings to restore the land
Hopefully all planted and pretty much like it was
Continuous bush from Ōtawa blocks to sea. Open up flora and fauna corridors, encourage native birds to travel along. Allow people to move along and be safe to swim again. Would love to see KopuKarua become a wetland island. Be great to bring kiwi kokako back
Areas that are regularly flooded should all be returned to native wetland plantings, both
Fenced and planted all the way to the top
Love to see a rural planner make a plan for how we should aim to restore the waterways
More planning of subdivisions to work out how to manage streams better. The corridor of bush from land to harbour that's supporting bird life, fish species in river back to how they were. Difficulty in managing the group with EBOP it was fine forming the group but not enough support ongoing. No clear cut instructions on how to manage the money
Lots of trees growing along banks. Not have to see some areas missed out

Would like to see lots of native trees and bird

Like to see people swimming in streams again, good water quality. Like to see wildlife coming back

Most of river is private, apart from Kaiate Falls. Don't know what goes on along stream. If it was more open to public access, user friendly, might have a better idea of what it's like

Would like to see waterways cleared of branches and fallen trees, clear weeds from banks, spray to make it neat and tidy

In a native appearance, natural enhances an area. Protects, stops flood damage

Proper river bed like Kaiate Falls - clean, bed rock. Don't mind how it looks so long as it's clean. No chemical pollution in it. Stabilise banks with plantings

It would be great if people could use the streams for drinking, swimming, fishing - water is safe not flooding badly, managed sensibly

Lower Waitao Road - park, landscaping, stream access, reserve it would be great to have

Be nice if they're all clear and pristine

On the right track. One day mine will be fenced off

Be nice if they are the same way they are now, if not better

Like to see main streams fenced and planted. Looks good

Would love to see dense native planting and fencing of stream banks, clean water

Like to see streams dredged to stop banks from eroding