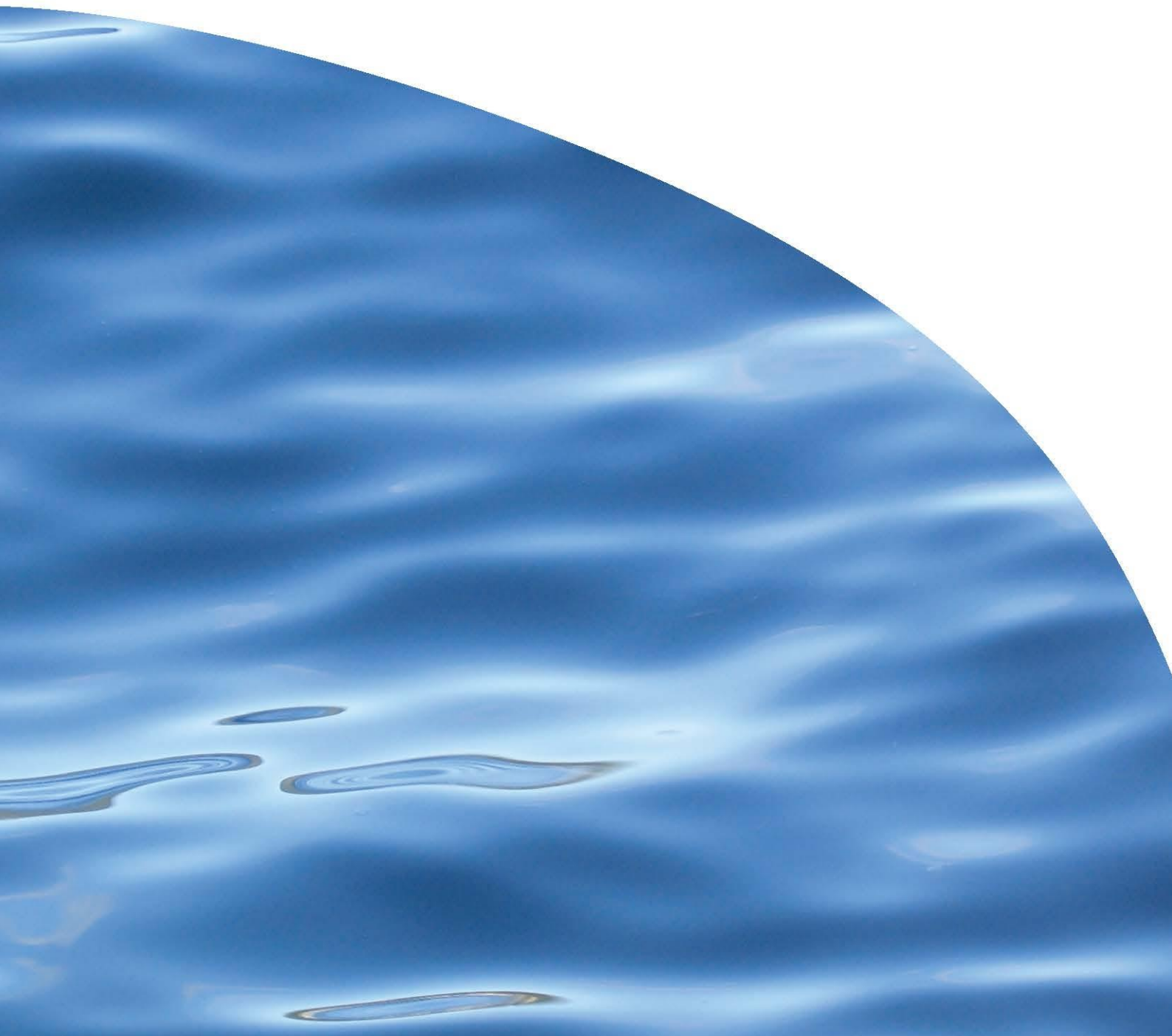




REPORT NO. 2844

**COMMUNITY PERCEPTIONS OF COLLABORATIVE
FRESHWATER PLANNING:
A SURVEY IN THREE NEW ZEALAND REGIONS**



COMMUNITY PERCEPTIONS OF COLLABORATIVE FRESHWATER PLANNING: A SURVEY IN THREE NEW ZEALAND REGIONS

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EXECUTIVE SUMMARY

Regional councils are trialling collaborative planning as a means of addressing New Zealand's complex challenges in freshwater management. Following recommendations by the Land and Water Forum, collaborative freshwater planning processes are now underway in Canterbury, Hawke's Bay, Northland, Tasman, Waikato, and Wellington.

This study assessed the views of members of the general public on freshwater management in areas using collaborative planning processes, and compared the results to areas without such processes. Cawthron Institute and Landcare Research sponsored a telephone survey during 1–15 May 2015 in three North Island regions—Northland, Waikato, and Hawke's Bay—with a total sample size of 450 people. People involved in farming and in water management were disproportionately represented in the sample.

The survey sought people's opinions on certain aspects of freshwater planning. These included:

- awareness of collaborative processes underway in the catchment
- effectiveness of their regional council at managing fresh water
- perceived conflict over freshwater management
- fairness of freshwater management, and
- representation of interests in freshwater management processes.

Our hypothesis was that in areas in which collaboration is successful, the wider community will have a more positive opinion of the regional council, will perceive greater agreement about freshwater management (as opposed to conflict), and will have a greater sense that the council is fair, all relative to regions in which there is no collaborative process. We would expect this to be true even if there is low awareness that a collaborative planning process is underway.

We conducted this survey well before collaborative processes reached consensus recommendations in any of the regions studied. Our report therefore provides a baseline against which future survey results may be compared. As expected for this baseline study, in most cases the differences in perceptions about freshwater planning between catchments with and without collaborative processes were small and not statistically significant.

Nonetheless, some interesting findings emerged. We expected that awareness of these collaborative processes would be low, and the survey bore this out. In catchments with a collaborative process underway, 21% of respondents said they were aware that a collaborative process was taking place in their local area. Fifteen percent of people in areas without a collaborative process thought that a collaborative process was taking place when, in fact, it was not.

We used multivariate regression analysis to separate the influence of various factors such as region, collaborative process, occupation and ethnicity on respondents' perceptions of freshwater management. We found that:

- Respondents from Hawke's Bay catchments with a collaborative process gave their regional council a higher average score for how well the council manages freshwater bodies, compared with respondents in Hawke's Bay catchments without a collaborative process.
- Respondents from Hawke's Bay catchments consider there is less agreement between competing interests than respondents from other regions.
- Respondents involved in forestry, regardless of region, consider that there is more agreement between competing interests over water management, have more confidence that their interests in water management would be taken into account by the regional council, and have more confidence that the regional council's water management processes are fair, compared to respondents not involved in forestry.
- Respondents employed in water management or other environmental management areas, compared to other respondents, are more likely to consider their regional council's water management processes to be fair.
- There was no significant influence on any of these perceptions by gender, Māori ethnicity, or employment in government or farming.

The survey also found some interesting differences in perceptions about freshwater management depending on respondents' levels of participation in freshwater planning.

- Across areas both with and without collaborative processes, people who participate at a medium or high level in freshwater planning processes perceive greater conflict in freshwater management than those who participate at lower levels or do not take part at all.
- Participation was also negatively correlated with people's views of regional council management, fairness, and confidence that their interests would be addressed.

It may be that people who participate in planning processes do so because they are dissatisfied with freshwater management, in which case the results are not surprising. But if higher participation primarily reflects greater understanding and knowledge of freshwater management, these negative correlations would be of concern.

Further funding is being sought to repeat this survey at intervals over the next three or four years to identify whether public perceptions change as collaborative processes come to a result and move into implementation. Further funding would also allow us to conduct more interviews and other targeted research to gain a better understanding of the local factors influencing public perceptions of collaborative planning in different regions. This would help to explain some of the regional variation observed in this study.

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1. INTRODUCTION

1.1. Freshwater reforms in New Zealand

1.1.1. *Conflict over water; NPSFM 2011 and 2014*

Freshwater management in New Zealand faces complex challenges. Land-use intensification, increasing demand for water, and an ever more numerous, invested, and diverse array of stakeholders has brought mounting conflict over freshwater resources (Ministry for the Environment 2013).

Collaborative approaches are recognised as better suited to resolving complex challenges in environmental planning (Dietz et al. 2003; Ansell & Gash 2008; Innes & Booher 2010) particularly for freshwater management (Scholz & Stiffler 2005; Pahl-Wostl et al. 2008). Many aspects of collaborative planning set it apart from traditional planning processes. Specifically, collaborative planning engages parties in decision-making processes to achieve joint learning, build capacity for problem-solving and adaptation, and generate more durable solutions that are accepted by the wider community (Innes & Booher 2010).

Faced with a stalemate over how to address challenges in freshwater management, the New Zealand Government opted for a collaborative governance approach in 2009 when it sought advice from the Land and Water Forum (LAWF). LAWF was formed by industry groups, environmental and recreational non-governmental organisations (NGOs), iwi, scientists, and other organisations with a stake in freshwater and land management to develop a shared vision and a common way forward using a stakeholder-led collaborative process (Land and Water Forum 2016). The Forum's first report recommended that the government proceed with a national policy statement (Land and Water Forum 2010), which the government duly released in 2011 (MfE 2011). The National Policy Statement for Freshwater Management (NPSFM), updated in 2014 (MfE 2014), sets out objectives and policies for freshwater management to provide national consistency in local planning and decision making while allowing for regional flexibility. Under the NPSFM, regional councils are required to set objectives for freshwater bodies that reflect national and local values and to set flow, allocation, and water-quality limits to ensure those objectives are achieved.

Following recommendations in a second report from LAWF (2012), the Government proposed amending the Resource Management Act 1991 (RMA) to enable regional councils to choose collaborative approaches to freshwater decision-making, along with additional changes such as independent hearing panels and limited appeal rights (MfE 2013). The proposed amendments were introduced to Parliament in November 2015, by which time several regional councils were already using collaborative approaches to decision making to meet the requirements of the NPSFM. As of

November 2015, collaborative freshwater planning processes were underway in Canterbury, Hawke's Bay, Northland, Tasman, Wellington, and Waikato.

1.1.2. Collaborative freshwater planning research: evaluating the New Zealand experience

New Zealand's collaborative freshwater planning experience has attracted the attention of international scholars who cite the country's many cases as positive examples of collaborative planning (Holley & Gunningham 2011; Weber et al. 2011; Holley et al. 2013; Curtis et al. 2014; Holley 2015).

New Zealand researchers are also studying collaborative planning processes, especially those in Canterbury, to understand the implications for freshwater management and for local democratic processes. Salmon (2012) investigated the extent to which the development of the Canterbury Water Management Strategy (CWMS)—the guiding document for the region's collaborative approach to freshwater planning—was democratic; the effectiveness of the CWMS; and how the CWMS altered institutional norms, risks, and incentives of resource users and the government. Memon and Kirk (2012) looked at the role of Māori participants in collaborative water governance, while Lomax et al. (2010) reviewed the internal processes of developing the CWMS, the content of policies, and their anticipated challenges and opportunities. The review was subsequently extended by Memon et al. (2012) who looked more specifically at the development of the Hurunui Waiau Zone Implementation Programme.

Nissen (2014) investigated the representativeness of Canterbury's collaborative freshwater planning processes and found that 'descriptive representation'—a claim of representation based on a person's background or interests rather than any formal accountability—was acting as a form of exclusion. Nissen recommended that collaborative groups should be kept at some distance from actual decision-making because they are not representative. Thomas (2014) found that this lack of accountability results in a degree of disconnection between the collaborative group members and the general public. She concluded that the willingness of central and regional governments to intervene in the collaborative processes has constrained the prospect of genuine collaboration in Canterbury.

Sinner et al. (2015) conducted three focus groups in Canterbury to explore views about collaborative planning from people not directly involved as members of collaborative planning groups. The study explored whether the level of engagement of an individual or group in collaborative freshwater planning affects their perceptions of the legitimacy of that process. Among focus group participants who had participated in the planning process (e.g. had attended a workshop or made a submission), those affiliated with environmental, recreational and community groups were all quite negative about the transparency, accountability and representativeness (i.e. legitimacy) of the process. In contrast, those from farming backgrounds were more

likely to give a positive overall assessment of collaborative decision making even though they also recognised the shortcomings thereof. Members of the public who had no involvement in the process had very little awareness that a collaborative process was underway. When told about it, they were unanimously sceptical about whether their views and interests were represented in the process.

The Canterbury focus group study (Sinner et al. 2015) had a small sample and concerned a single collaborative process in a single region—a region that has unique circumstances arising from legislation that replaced its elected councillors with government-appointed commissioners. The study recognised the need to explore community perceptions of collaborative freshwater planning with a larger sample across multiple regions.

1.1.3. Research objective for this survey

The objective of the present study is to assess how collaborative planning processes influence the perceptions of the wider community, in particular, people's views about the degree of conflict over freshwater management and how well people feel their views are being represented and taken into account. Ultimately, we want to explore the regional differences in the practice of collaborative planning that could explain variation in how it is perceived by the wider public.

Our hypothesis is that, in catchments in which a collaborative process is successful, the wider community will have a more positive perception of the council, will tend to a perception of agreement about freshwater management (as opposed to conflict), and will have a greater sense that the council is fair. This is relative to catchments in which there is no collaborative process or collaborative processes are not successful. We would expect this hypothesis to hold even if there is low awareness that a collaborative planning process is underway. We would also expect change over time as collaborative processes work towards and achieve consensus, and possibly further change subsequently, e.g. if an apparent consensus unravels as collaborative recommendations are implemented.

The survey used in this study was undertaken well before collaborative processes reached consensus recommendations in any of the regions studied. It is primarily intended to provide a baseline against which future survey results may be compared. Nonetheless, some interesting findings have emerged, and these raise questions about why there are differences between regions and between different demographic groups.

2. SCOPE: COLLABORATIVE PLANNING IN THREE REGIONS

This research involves three New Zealand regions that are currently using collaborative planning for freshwater management in selected catchments: Hawke's Bay, Northland, and Waikato (Figure 1). Each region also includes areas in which no collaborative process is underway, effectively serving as a control to enable assessment of the effects of collaborative planning processes and outcomes on community perceptions.

This section provides a brief outline of the nature of the collaborative processes in each region.

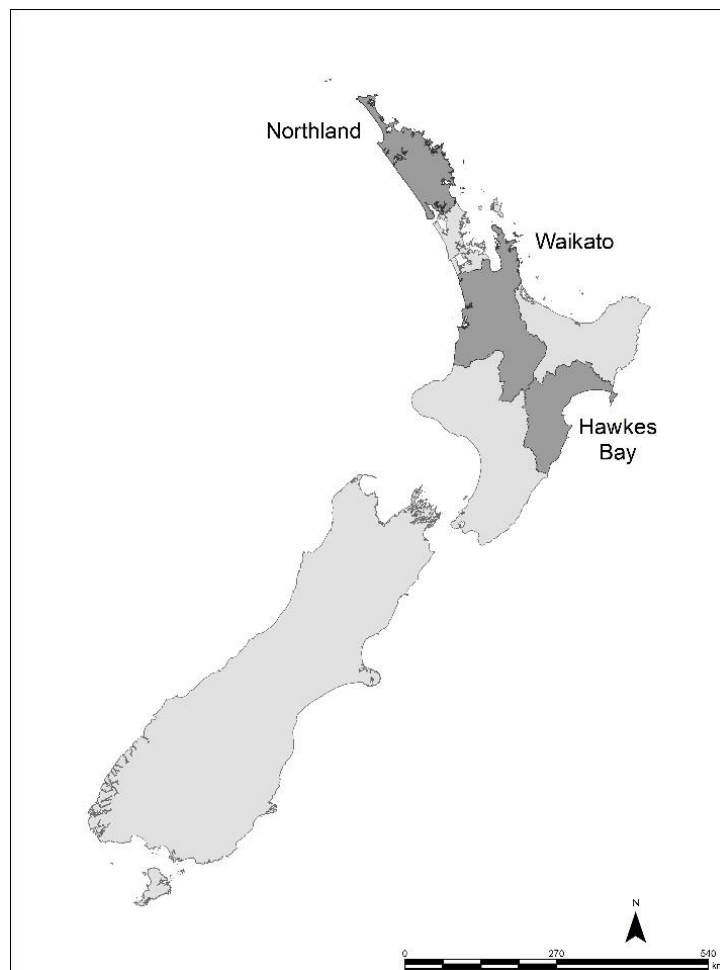


Figure 1. The boundaries of the Northland, Waikato and Hawke's Bay regional councils.

2.1. Hawke's Bay

In Hawke's Bay, the regional council is reviewing the management of land and water in the Tūtaekuri, Ahuriri, Ngaruroro and Karamū (TANK) catchments, in which more

than 85% of the region's population live and work (see Figure 2). A collaborative stakeholder group (the 'TANK Group') was established to make recommendations for a plan change to implement the Hawke's Bay Land and Water Management strategy and the Government's 2014 NPSFM¹. It is focusing on water-related issues including water quality, flows and allocations in the four catchments, including wetlands and estuaries (HBRC 2015).

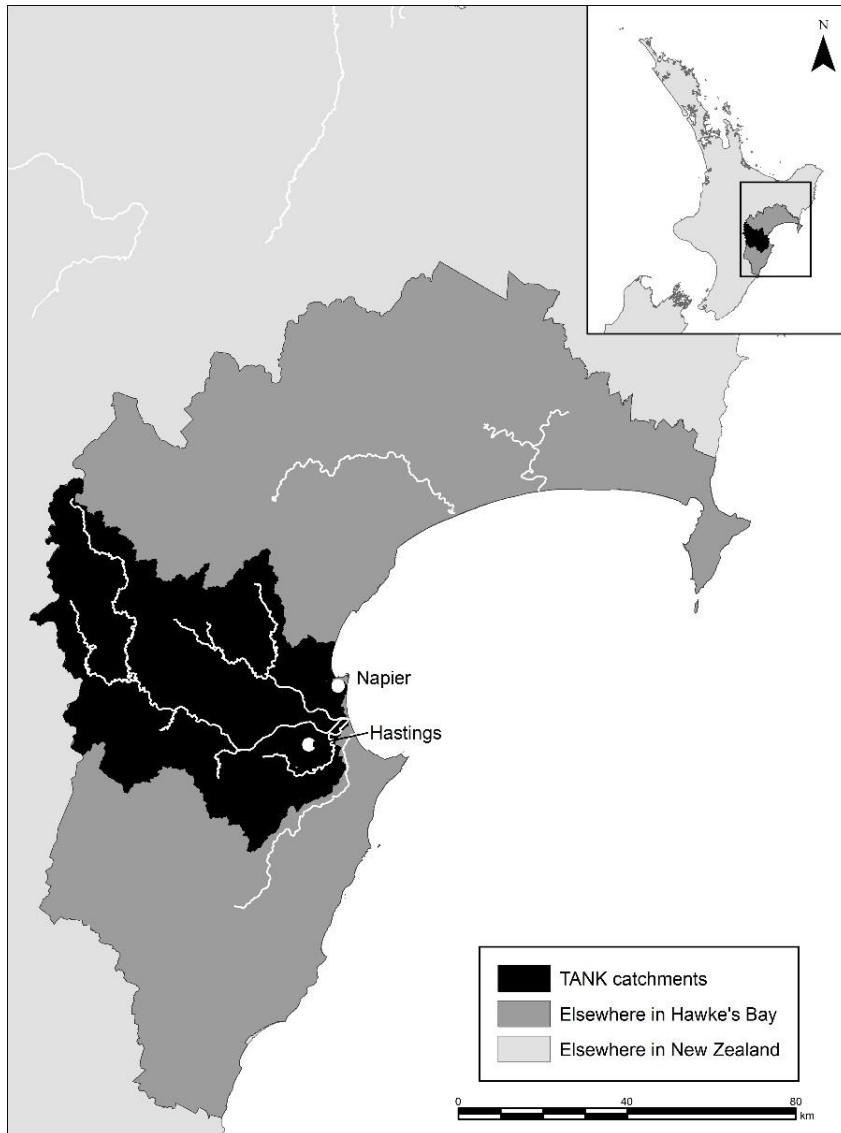


Figure 2. The TANK catchments and Hawke's Bay Regional Council boundaries. The TANK catchments include the population centres of Napier and Hastings.

¹ Disclaimer: The lead author of this report has been closely involved in the TANK process, as part of the project team designing the collaborative process.

The TANK Group, which first met in 2012, comprises 30 people representing a broad range of interests including horticulture, farming, environment, recreation, forestry, and iwi. The Hawke's Bay Regional Council has 'given a good faith commitment to support any consensus recommendations from the TANK Group' (HBRC 2015).

The TANK Group produced its first report in 2014, which summarised its work to date. The report included a set of 'Interim Agreements' which are 'supported in principle' by most parties but not all (TANK Group 2014). The issues and agreements covered in the first report are preliminary and high level; the more detailed recommendations on water quality and quantity limits are yet to come. The project aims to release a proposed plan change for formal submissions in December 2017 (HBRC 2015).

2.2. Northland

Northland's collaborative freshwater planning experience began in 2012 with the 'Waiora Northland Water programme'². Under the programme, the Northland Regional Council collaborates with communities to give effect to the NPSFM, using a collaborative stakeholder process to set goals and standards for managing freshwater resources. Five catchments (Mangere, Waitangi, Doubtless Bay, Whāngārei, and Pouto Lakes) were prioritised initially for such processes (Figure 3). A sixth catchment (Ngunguru) was added later, after we conducted our survey.

In each area, a collaborative stakeholder group, known as a catchment group, has been formed to provide local input and recommendations on maintaining and improving fresh water in the area. The catchment groups comprise representatives nominated by a range local interests—for example, iwi/hapū, landowners, industry (like farming and forestry), environmental groups, recreational users, and councils. Each catchment group is tasked to work collaboratively to maintain and improve the state and management of the catchment's fresh water; to work with Northland Regional Council to deliver the Waiora Northland Water programme; and to discuss and develop objectives, policies and rules for the Water and Soil Plan for Northland. Decisions are by consensus, and members are expected to engage with their wider networks to share information and to get feedback on the matters being considered.

² <http://www.nrc.govt.nz/Your-Council/Council-Projects/Waiora-Northland-Water/What-is-Waiora-Northland-Water>

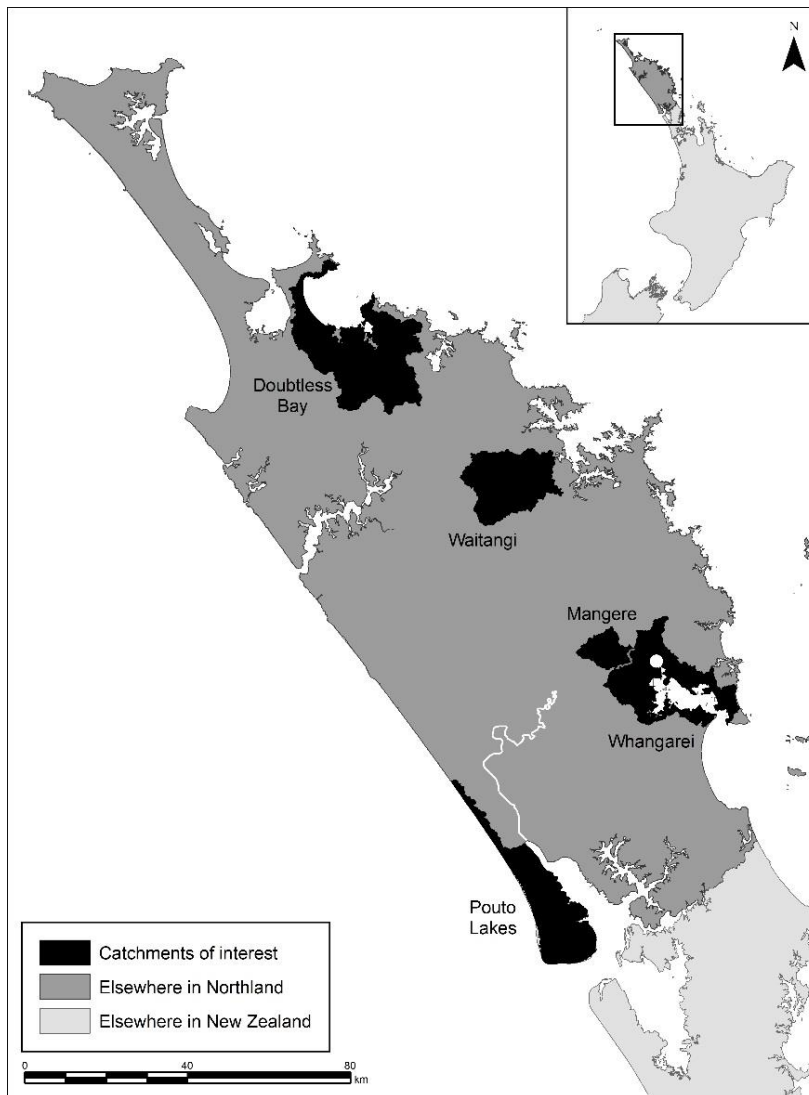


Figure 3. Catchments with collaborative planning processes in Northland region.

2.3. Waikato

Operating under co-management legislation implemented to settle Treaty of Waitangi claims, the Waikato Regional Council and local iwi have established the project entitled 'Healthy Rivers: Plan for Change/Wai Ora: He Rautaki Whakapaipai'. The project is tasked with making recommendations to reduce inputs of sediment, bacteria and nutrients to restore the health of the Waikato and Waipa rivers, the catchments of which are among New Zealand's most productive agricultural landscapes (Waikato Regional Council 2015) (see Figure 4).

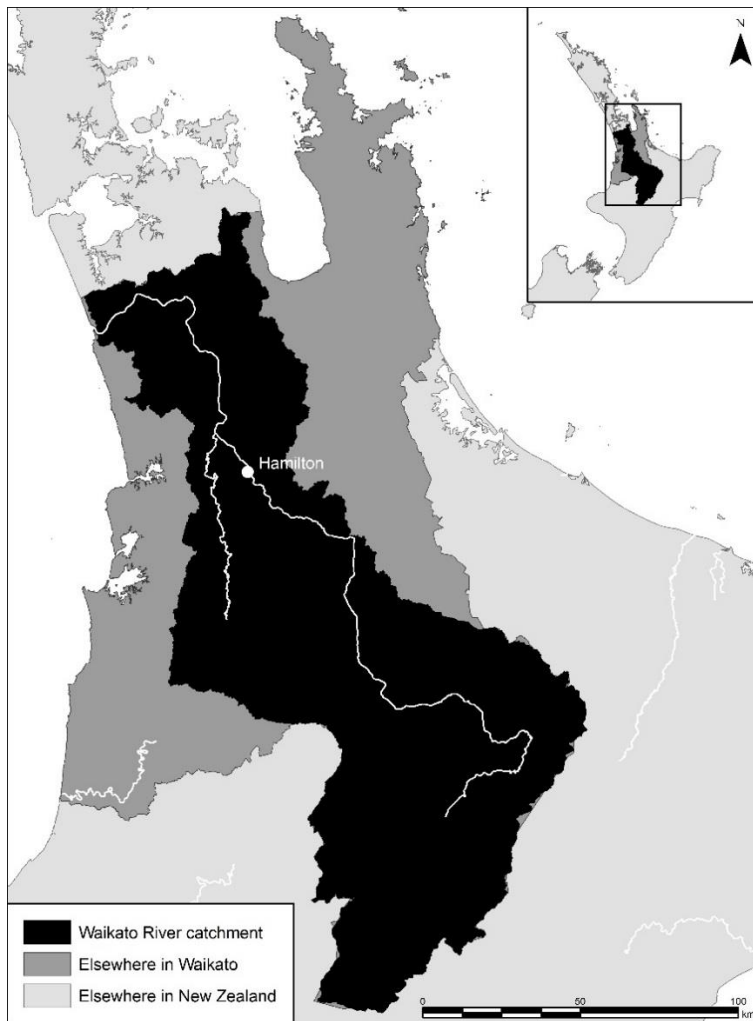


Figure 4. The Waikato and Waipa catchments of the Waikato region. The Waipa River is the major tributary joining the Waikato River northwest of Hamilton.

The project's collaborative stakeholder group has 17 sector representatives (e.g. from dairy, horticulture, energy, environment, tourism, forestry, and Māori) and seven community representatives. Most sectors nominated their own representatives while a selection panel for the project chose the community representatives and the remaining sector representatives. Over six weeks from late March to early May in 2015, overlapping with the survey conducted for this report, the Healthy Rivers project ran a public engagement process that included a facilitated stakeholder workshop, five community drop in sessions around the Waikato and Waipa river catchments and an online survey (Healthy Rivers 2015).

In March 2016, the group approved a report outlining its recommendations for water quality objectives and limits, to be incorporated into a publicly notified proposed plan by July 2016 (Healthy Rivers 2016).

3. METHODS

3.1. Telephone survey

Using a professional market research firm, we conducted our general public survey by telephone between 1 and 15 May 2015 in three North Island regions—Hawke’s Bay, Northland, and Waikato. In each region, two populations were sampled and surveyed: one from catchments in which a collaborative freshwater planning process is underway and one from other catchments in the region (Table 1).

Table 1. Locations of the General Public Survey.

Region	Collaborative planning areas	Other areas
Northland	Doubtless Bay	Elsewhere in Northland
	Waitangi catchment	
	Mangere River catchment	
	Whangarei Harbour catchment	
	Pouto catchment	
Waikato	Waikato River catchment	Elsewhere in Waikato
Hawke’s Bay	Tūtaekuri, Ahuriri, Ngaruroro and Karamū (TANK) catchments	Elsewhere in Hawke’s Bay

The survey design was informed by the preliminary findings of the aforementioned Canterbury focus group research (Sinner et al. 2015) and a literature review on evaluating collaborative planning processes (Cradock-Henry 2013). Specifically, Cradock-Henry (2013) identified many aspects of collaborative freshwater planning processes suitable for evaluation including

- process aspects such as inclusive representation
- the right of non-government parties to participate and influence the process and its outcomes in a fair way (Renn et al. 1995)
- social aspects such as improved knowledge, understanding and skills
- outcome aspects such as the outputs are regarded as meeting the wider environmental, social, cultural, and economic objectives of the public.

From these, we developed questions concerning those aspects that relate to perceptions of the wider community. These were perceptions of how well the regional council manages fresh water, the perceived fairness of water management, perceptions of conflict versus agreement over water management, and how well a person’s interests and concerns were taken into account in water management.

3.2. Recruitment

The market research firm, UMR Research, was contracted to recruit survey respondents from catchments with and without collaborative planning in Hawke's Bay, Northland and Waikato. The firm provided a list of telephone exchanges for each region and the lead author of this report identified which communities were in the catchments involved in collaborative freshwater planning processes and which were not. We did not have precise boundaries of the exchanges, and some exchanges appeared to include areas both inside and outside of the collaborative catchments. These exchanges were thus excluded from the sampling.

The market research firm was asked to complete 30 telephone interviews with respondents at least 18 years old from each of the five collaborative catchments in Northland, 60 interviews each from the collaborative catchments in Waikato and Hawke's Bay, and 60 each from elsewhere in Hawke's Bay, 'elsewhere in Northland', 'elsewhere in Waikato'. The targeted total sample size was therefore 450 responses.

Households with landlines in the identified telephone exchanges were contacted by telephone during April and May 2015. The interview started as follows:

Hello. My name is XXX. I'm calling from UMR Research. We are conducting an important study on behalf of Landcare Research about your local water catchment area. A catchment is an area bounded by a feature such as a ridge line, which captures and concentrates stormwater runoff. Are you aged 18 or over and would you like to participate?

Willing respondents were then asked a series of questions to help them identify which catchment they live in. If the market research firm was unable to determine their catchment with confidence, the respondents were excluded from the survey sample. This introduction was followed by a series of questions about collaborative freshwater planning in the catchment, including their opinions of the regional council. Results are presented in Section 4 of this report.

Surveys conducted using phone calls to random landline numbers are subject to known limitations. Response rates to telephone surveys are low and falling, such that those who agree to complete the survey may not be representative of the wider population. More importantly, there is a growing number of cell phone-only households that are demographically different than households with landlines, and these cannot necessarily be adequately addressed by stratifying and weighting for these differences (Kempf & Remington 2007; Link et al. 2007). The results must be interpreted in this light.

The research protocol was assessed in accordance with Cawthron's policy on ethics for research with human subjects. Based on the anonymity of the telephone interviews

conducted by an external research firm and the non-personal nature of the questions, we determined that the research was of low risk to survey participants and that no further protections were necessary.

3.3. Data analysis

Survey data were analysed in Microsoft Excel, R (R Core Team 2015) and Stata³. Except where noted otherwise, results from this survey are considered statistically significant using a 90% confidence interval, i.e. where the p value is less than 0.1, indicating there is a less than 10% chance that the result would be generated randomly if the null hypothesis were true (that the variable has no effect on survey responses).

We used four questions with responses on a scale of 0 to 10 to assess the effects of collaboration on public perceptions. These questions asked about

- how well the regional council manages fresh water
- the degree of agreement between competing interests on freshwater management
- how fair the council's water management processes are, and
- how well the respondents felt their interests and concerns would be taken into account by the council.

For each of these questions, we used multivariate regression to identify whether differences in responses were correlated with the presence or absence of collaborative planning and other variables. Because the distributions of the four response variables are truncated at 0 and 10 (i.e. are not true normal distributions), we used a tobit functional form for the regressions⁴. Hawke's Bay and Northland regions were included as separate dichotomous (0,1) variables (sometimes known as dummy variables) with Waikato region as the default region, and we also included interaction terms for Northland x collaboration and Hawke's Bay x collaboration.

Demographic variables included as dichotomous explanatory variables were:

- Female
- Self-identification as Māori
- Current or past employment in (four separate variables):
 - farming
 - forestry

³ <http://www.stata.com/>

⁴ Tobit models use maximum likelihood estimation and were selected because the survey results represent truncated data, i.e. a response could not be lower than 0 nor higher than 10, whereas a normal distribution has a small proportion of extreme values. We performed the same regressions using Ordinary Least Squares (OLS) and got broadly similar results, but the tobit models identified some variables as statistically significant that the OLS regressions had not.

- water or environmental management
- government.

Participation was also included as a dichotomous variable in the multivariate regressions. Respondents who had made submissions or attended meetings or hearings about freshwater management were scored as 1, with others as zero.

The regression results are included in full in the Appendix, and the more noteworthy results are presented in the following section of this report.

4. SURVEY RESULTS – COMMUNITY PERCEPTIONS

4.1. Demographics of survey respondents

Among the 450 respondents, 229 are male and 221 are female. Ages range from 18 years to 71+, with the median age of respondents in the mid-50s. In terms of ethnicity, survey respondents are New Zealand European (84%), New Zealand Māori (14%), and Pacific Island, Asian, and other ethnicities (2%) (see Table 2).

Survey respondents were asked if they were currently or previously employed in several sectors that have an interest in freshwater management. Of the sample, 39% reported employment in farming, followed by construction/civil planning (9%), forestry (8%), central or regional government (7%), environmental management (5%), and water management (10%), with the remaining 22% either employed in other industries or unemployed. Employment data from Statistics New Zealand suggest that the sample may have some self-selection bias towards those with a greater interest in freshwater management. Each of the three regions has between 15% and 17% of its population employed in farming⁵, much less than the 39% in the sample. And the Statistics New Zealand category 'other services', which includes government and environmental and water management, accounts for about 10% of employment in Waikato region and 11% across New Zealand⁶, whereas in our sample they accounted for 22% (see Table 2).

Table 2. Demographic characteristics of survey sample by region, in absolute numbers (left) and percentages (right). Numbers do not total 'n' because some categories are not shown.

Region	Northland no.	Waikato no.	Hawke's Bay no.	Northland %	Waikato %	Hawke's Bay %
Gender and Ethnicity						
Female	93	63	65	44%	53%	54%
Maori	36	14	11	17	12	9
Employment						
Farming	100	40	34	48	33	28
Forestry	22	7	5	10	6	4
Water/Env't	15	7	7	7	6	6
Government	16	7	7	8	6	6
n (sample size)	210	120	120			

⁵Statistics New Zealand community profiles for Northland region, Waikato region and Hawke's Bay region, available at www2.stats.govt.nz.

⁶ <http://www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Community-and-economy/Economy-and-resource-use/e2-report/>

The catchments with a collaborative process in the Waikato region include Hamilton and other urbanised centres, and the TANK catchments in Hawke's Bay include Napier and Hastings. In Northland, one of the catchments includes much of the Whangarei urban area and another borders on it. The survey did not ask respondents to identify themselves as urban or rural residents, which could be a useful addition to follow-up surveys as we expect rural residents to have a higher level of knowledge of and participation in freshwater management.

4.2. Participation in freshwater management

We categorised survey respondents based on their level of participation in freshwater planning. The most common means of participation are reading media articles about water management (66%) and discussing water issues with others (54%) (Figure 5). For the purposes of this report, respondents who participate in one or both of these activities but no others are categorised as having 'low participation' in freshwater planning.

The next most common forms of involvement in water management issues are attending a public meeting (10%), contacting local or central government (10%), participating in a meeting of industry (7%), and participating in a meeting sponsored by an NGO (12%). Participants who report at least one of these are categorised as having 'medium participation' unless they also made a submission about water management issues to central or local government (5%) or spoke at a council hearing about water management issues (3%), in which case they are categorised as 'high participation'.

Participation in freshwater management

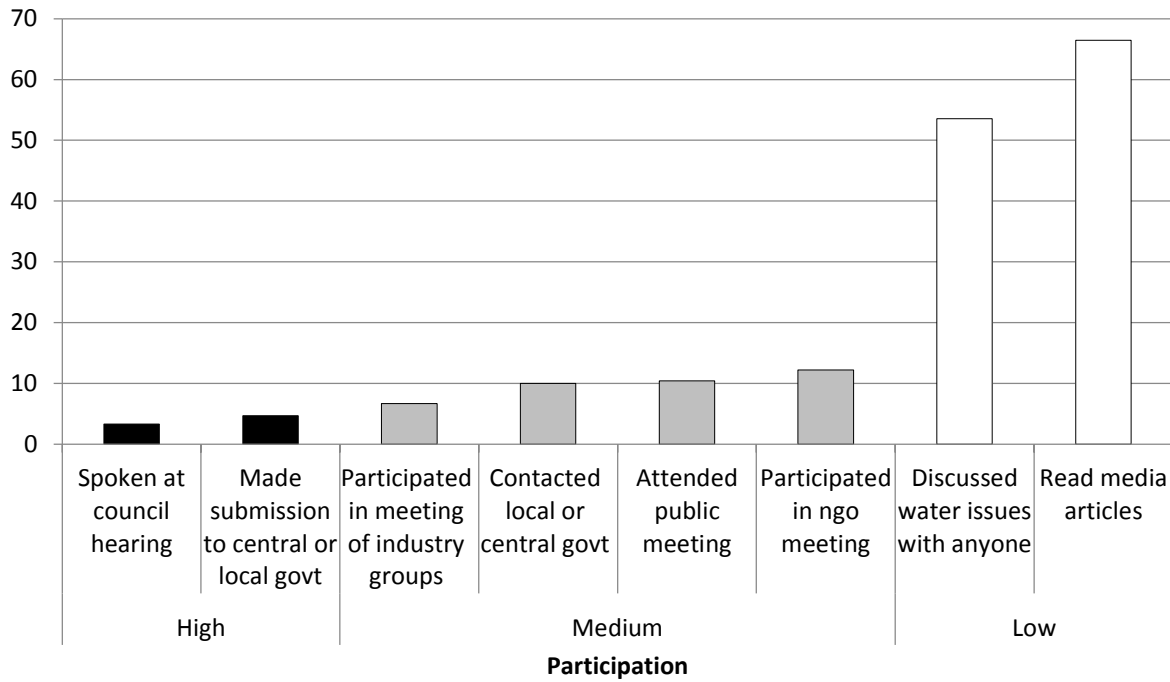


Figure 5. Ways in which people participate in freshwater management.

Of the entire sample, 75% reported participating in freshwater management in some way. Figure 6 shows the breakdown by level of participation. Participation of 25% at medium or high levels might reflect self-selection bias as discussed in the previous section; that is, those who had actively participated in water management may have been more likely to agree than others to take part in the survey.

Participation in freshwater management

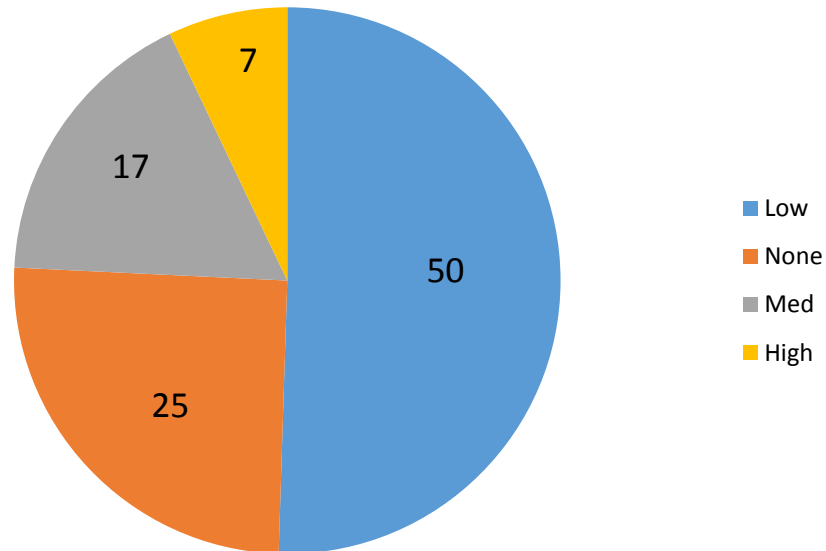


Figure 6. Participation in freshwater management. Percent of respondents reporting participating in activities categorised as low, medium and high participation in freshwater management. Percentages do not add to 100% due to rounding.

Overall, approximately 6% of survey respondents have participated in freshwater management at a high level, 17% at a medium level, 57% at a low level, and 20% have not participated. Participation rates are qualitatively similar in catchments with and without collaborative processes and are not statistically distinguishable (except in the case of no participation in Hawke's Bay, in which respondents in the TANK catchments are statistically more likely to report no involvement) (Figure 7).

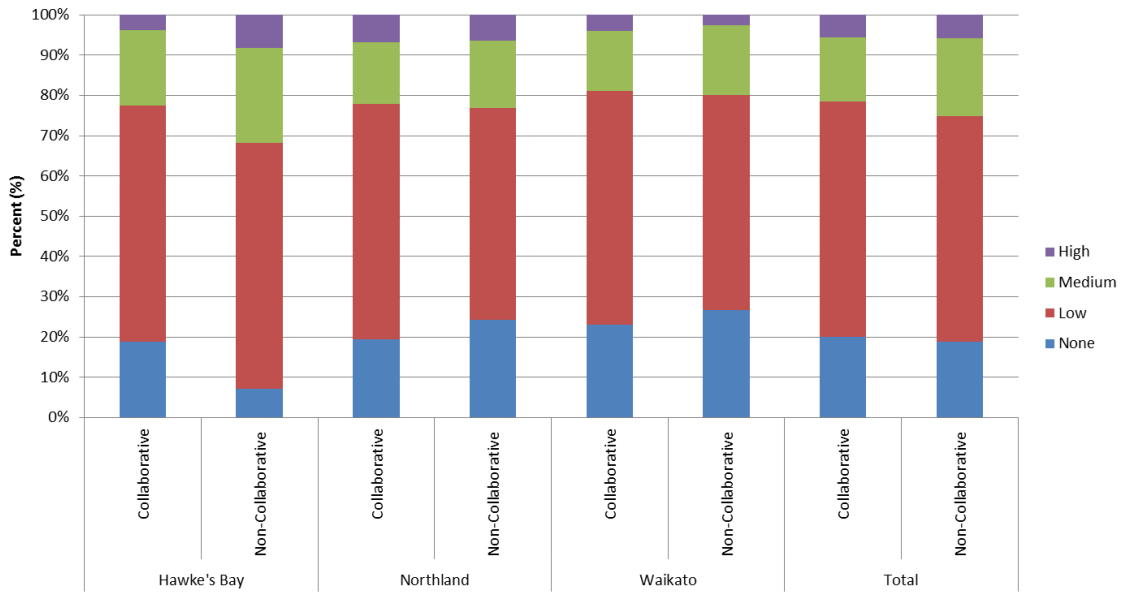


Figure 7. Percent of people participating in freshwater management at different levels in Hawke's Bay, Northland, Waikato, and overall.

4.3. Awareness of collaborative planning processes

Respondents were asked “Are you aware of any collaborative catchment groups working with the regional council in your area?” Overall, 21% of survey respondents in areas with collaborative processes are aware (correctly) that collaboration is taking place while 15% of respondents in areas without collaborative processes incorrectly think that a collaborative-planning process *is* taking place (Table 3). Five percent of people in collaborative areas are unsure if collaboration is occurring while 9% are unsure in areas without collaborative processes.

Table 3. Number and percent of survey respondents who were aware or unaware of collaborative processes in their area. Percentages do not add to 100% due to rounding.

Region	Area	Number (n)	Aware %	Not aware %	Unsure %
Northland	Mangere River catchment	25	28	64	8
	Waitangi catchment	21	29	67	5
	Whangarei Harbour	21	24	76	0
	Doubtless Bay	24	4	83	13
	Pouto catchment	24	13	83	4
	Total Northland collaborative	115	16	77	6
	Anywhere else in Northland	43	21	72	7
Waikato	Waikato River catchment	49	22	78	0
	Elsewhere in Waikato	47	11	81	9
Hawke's Bay	TANK catchments	49	22	69	8
	Elsewhere in Hawkes Bay	51	14	76	10
Combined	Collaborative	213	21	74	5
	Non-collaborative	141	15	77	9

4.4. Regional council management of fresh water

Survey participants were asked how well their local regional council manages freshwater bodies in their area. The wording was as follows:

Using a scale from 0 to 10, where 0 means very poorly, and 10 means very well, in your opinion how well does the [xxx] regional council manage freshwater bodies?

Our hypothesis is that collaboration will result in less conflict and less adverse publicity about regional councils, and hence a higher score for councils' management of freshwater. However, councils may prioritise collaborative approaches in catchments that have more difficult issues, which could lead to lower scores in collaborative catchments at least initially. This survey was designed to get a baseline reading on this question so that we can test for change over time.

Overall the scores for regional councils' management of freshwater were not statistically distinguishable between catchments with and without collaborative processes (Figure 8). Interestingly, people in the Pouto catchment are remarkably positive (mean = 6.46) about the Northland Regional Council's freshwater management.

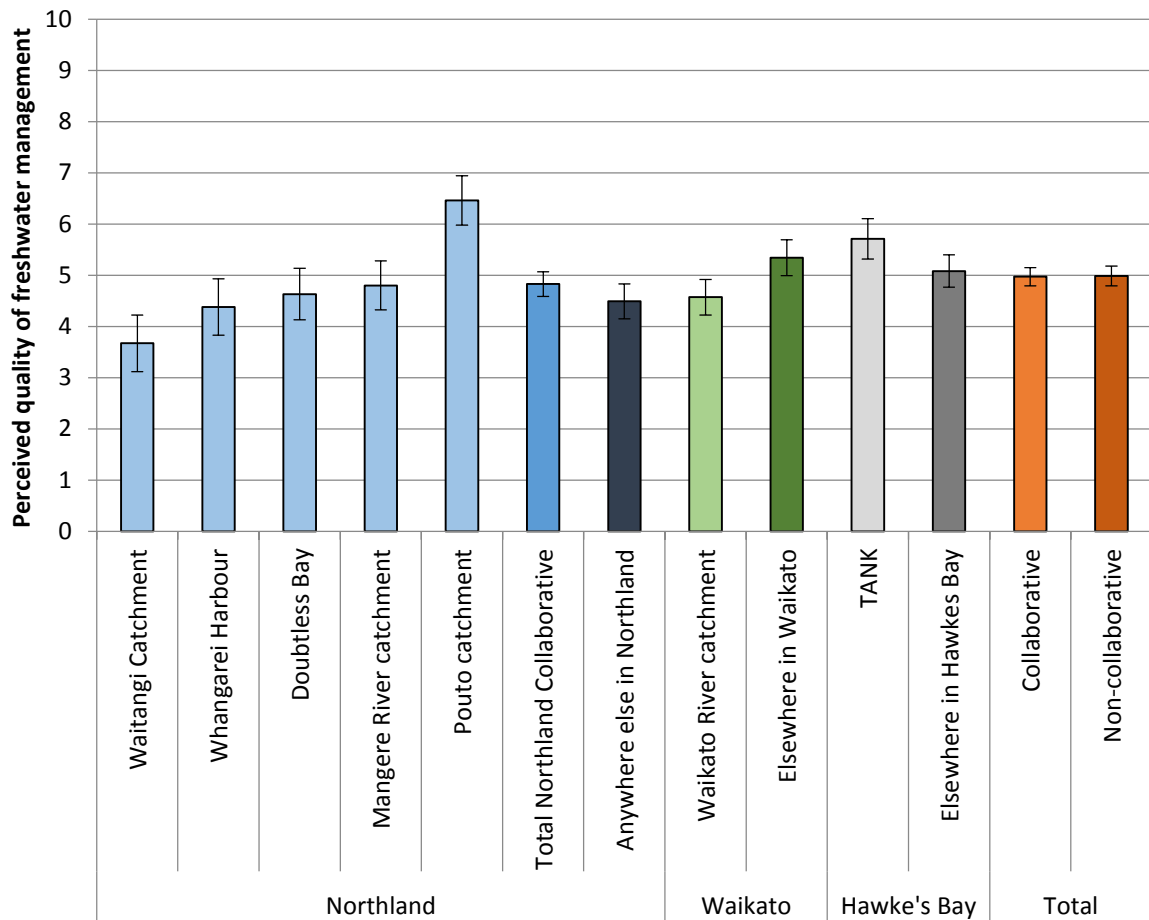


Figure 8. Perceived quality of regional councils’ freshwater management in collaborative and non-collaborative areas of Northland, Waikato, and Hawke’s Bay. Respondents answered on an eleven point scale, where 0=very poorly and 10=very well. Error bars denote standard error.

Across all three regions, the level of participation in freshwater planning affects people’s perceptions of how well the regional council manages freshwater in catchments. The higher people’s level of participation, the lower they score the regional council’s freshwater management, and vice versa (Figure 9).

The multivariate regression helps to tease apart the factors influencing perceptions of how well a regional council manages freshwater, and shows that differences between regions are statistically significant. Compared to Waikato, which was the default region in the model, Northland respondents gave their council an average score that was 0.88 points lower on the 0-10 scale ($p < 0.1$) while the mean score of Hawke’s Bay respondents in the collaborative catchment was 1.34 points higher ($p < 0.1$). Participation at medium or high levels lowered the average scores by 0.8 ($p < 0.01$). None of the demographic variables had a statistically significant effect. Full regression results are reported in the Appendix.

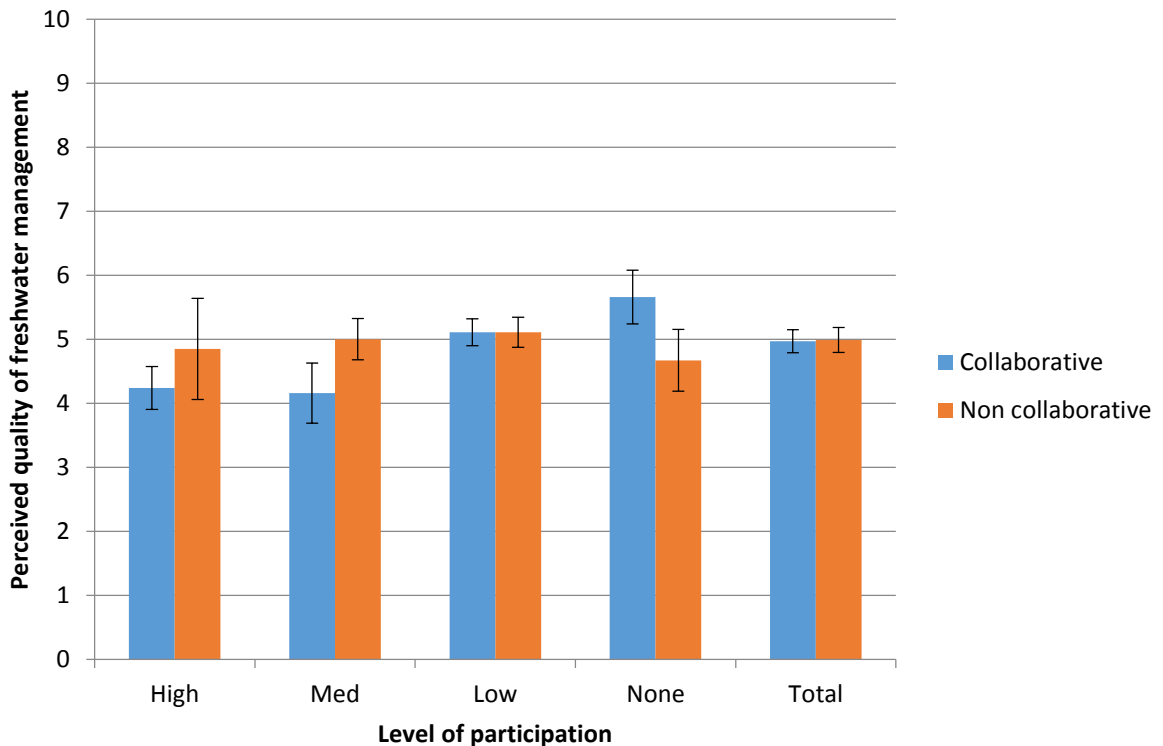


Figure 9. Perceived quality of regional councils’ freshwater management, by level of participation, in areas with and without collaborative processes. Error bars denote standard error.

4.5. Agreement

The survey asked for perceptions of agreement about freshwater management.

Thinking about conflict or agreement between competing interests over water management in your area, using a scale of 0 to 10 where 0 means lots of conflict and 10 means strong agreement, would you say there is conflict or agreement between competing interests over water management in your area?

This question was based on our hypothesis that collaborative processes should help to mitigate conflict compared to other planning processes. As collaborative processes continue and achieve resolution of issues, we expect that residents in catchments with collaborative planning will perceive greater agreement about freshwater management than residents of non-collaborative areas.

While collaborative areas have a higher mean score (4.95) than non-collaborative areas (4.64) (Figure 10), indicating more agreement in collaborative areas, this difference is not statistically significant ($p = 0.27$).

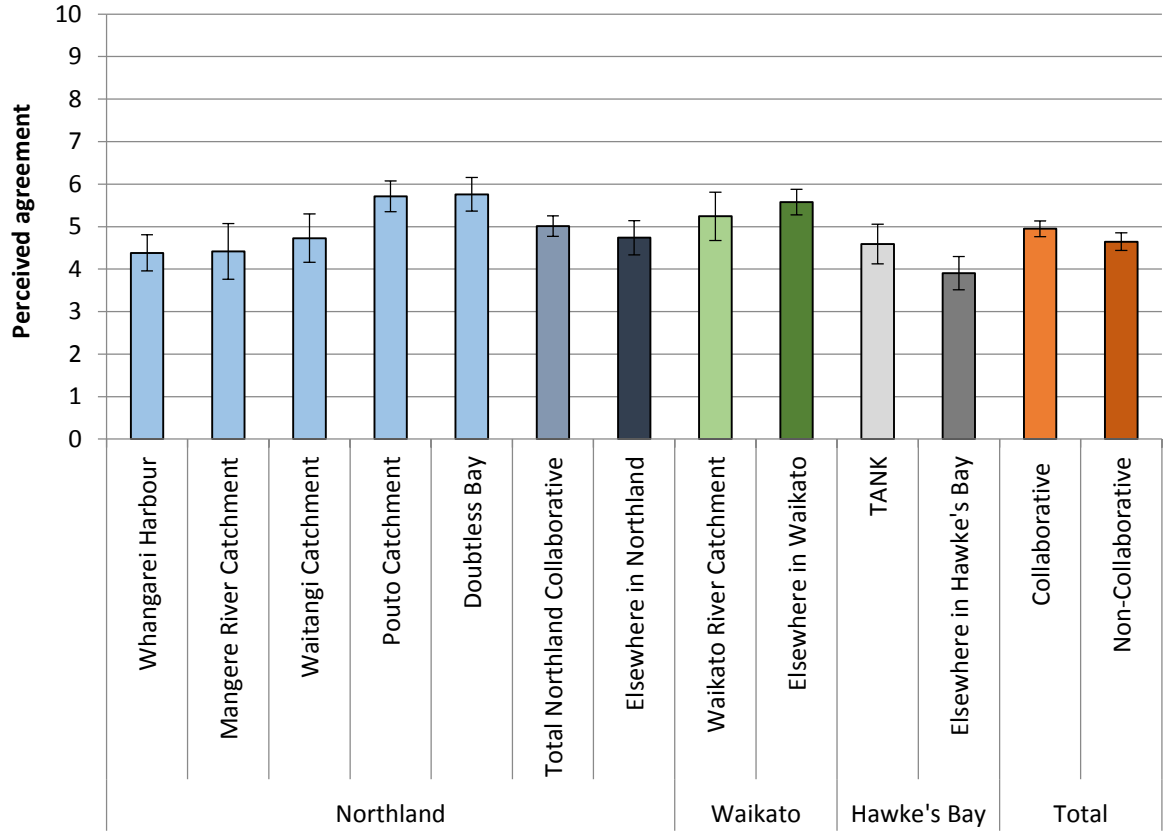


Figure 10. Perceived conflict or agreement in freshwater planning in catchments with and without collaborative and non-collaborative processes of Northland, Waikato, Hawke’s Bay, and in total. Respondents answered on an eleven point scale where 0 = a lot of conflict, and 10 = strong agreement. Error bars represent standard error.

Participation was found to affect perceptions of agreement, although this did not differ significantly between catchments with and without collaborative processes. Across all areas, people with higher levels of participation perceive greater conflict than those who participate at lower levels or do not participate at all (Figure 11).

This negative relationship between participation and perceptions of agreement also holds when assessed using multivariate regression. Medium or high participation is associated with a reduction of 1.12 points (on a 10-point scale) in perceived agreement on freshwater management. In addition, respondents from Hawke’s Bay gave, on average, a rating on agreement that was 1.54 points lower ($p < .01$) than Waikato, which was the default region. Northland respondents also had a lower average response on this variable, though it was not statistically significant.

Respondents employed in forestry had a more positive view of agreement on freshwater management relative to other respondents ($p < 0.1$). Regression results are reported in the Appendix.

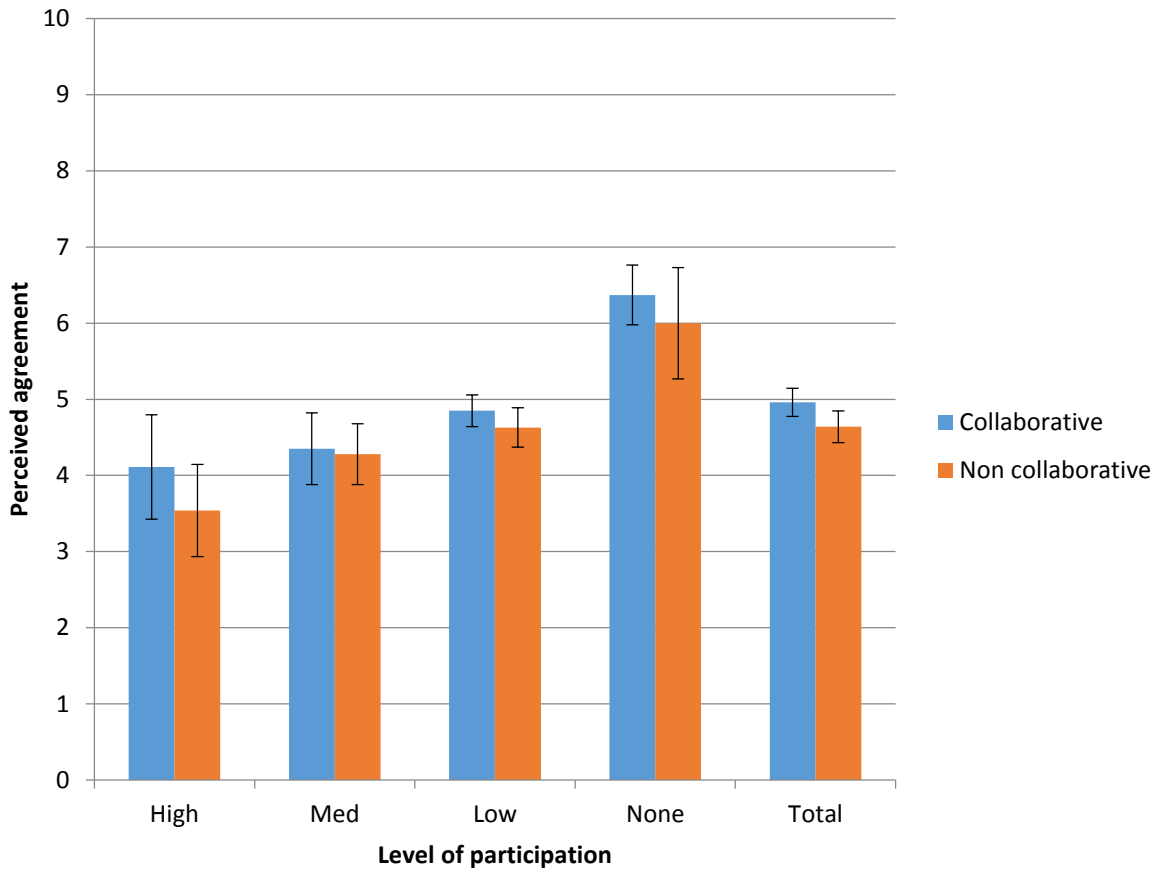


Figure 11. Mean perceived conflict or agreement in freshwater management, by level of participation in freshwater management, in catchments with and without collaborative processes, where 0 = a lot of conflict and 10 = strong agreement. Error bars denote standard error.

4.6. Fairness

The survey asked how fair people thought freshwater management processes were in their area.

Using a scale from 0 to 10, where 0 means not fair at all, 10 means very fair, in your opinion, how fair do you think the water management processes are in the [name of region] regional council area?

Our hypothesis is that, by including a broad range of stakeholders in the planning process and reaching consensual outcomes, collaboration will be perceived as fairer

than other planning approaches. We expect this effect to emerge only over time, however, so this question is primarily for purpose of establishing a baseline.

In all regions and in total, management in catchments with collaborative processes is perceived as fairer (5.11) than in catchments without collaborative processes (4.76) (Figure 12), but the difference is, marginally, not statistically significant ($p = 0.11$). There is greater perceived fairness in areas with collaborative processes in Hawke’s Bay (mean = 5.47) compared to elsewhere in Hawke’s Bay (mean = 4.61) ($p = 0.06$). In Northland and Waikato, areas with collaborative processes had higher mean scores for fairness compared to areas in those regions without collaborative processes, but those differences were not statistically different. And finally, again, the people of the Pouto catchment perceive freshwater planning processes as more fair than all other Northland areas and, indeed, than the other two regions as well.

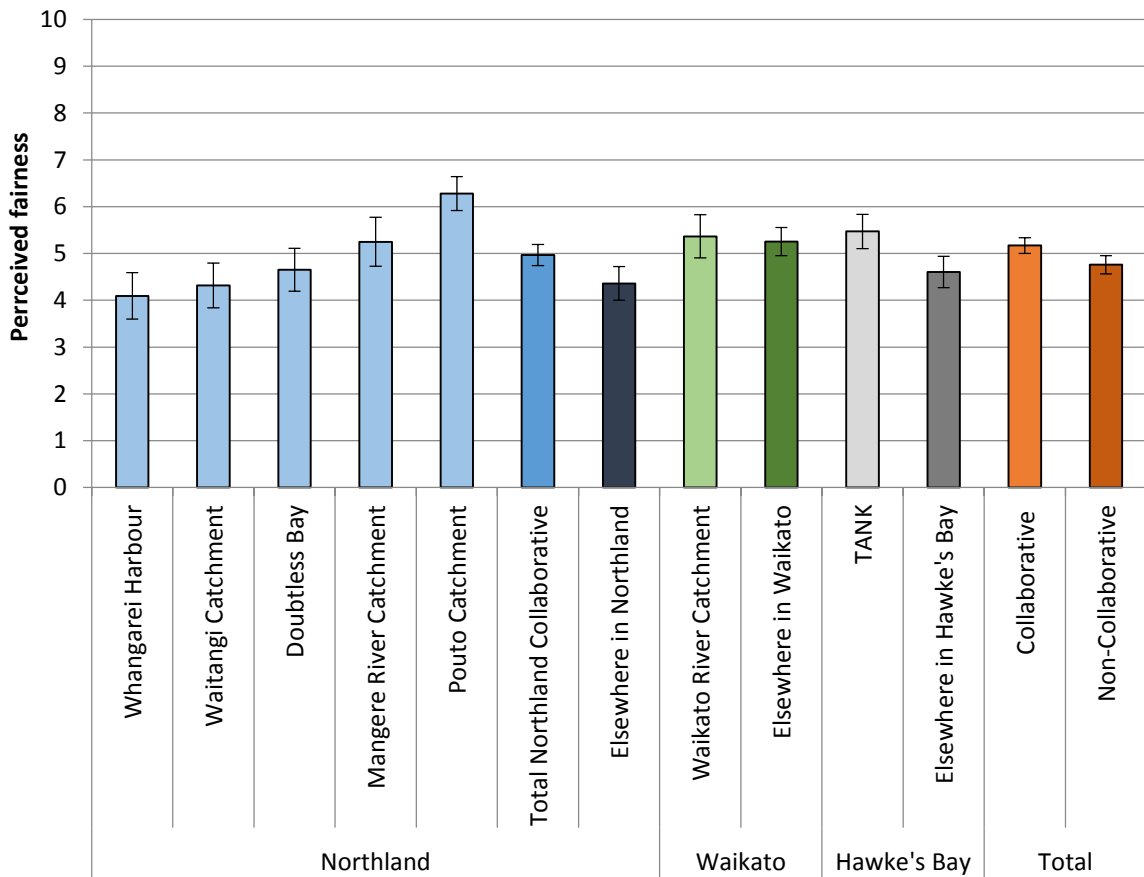


Figure 12. Perceived fairness of freshwater planning processes in areas of Northland, Waikato, and Hawke’s Bay with and without collaborative processes. Survey respondents answered on a 10 point scale where 0 meant not fair at all, and 10 meant very fair. Error bars denote standard error.

The multivariate analysis confirmed that people who participate at higher levels in freshwater planning processes have lower perceptions of fairness (-0.75 points, $p < 0.05$); see Figure 13. Conversely, respondents employed in forestry had a significantly higher perception of fairness (1.36 points, $p < 0.01$) compared to others. Full regression results are in the Appendix.

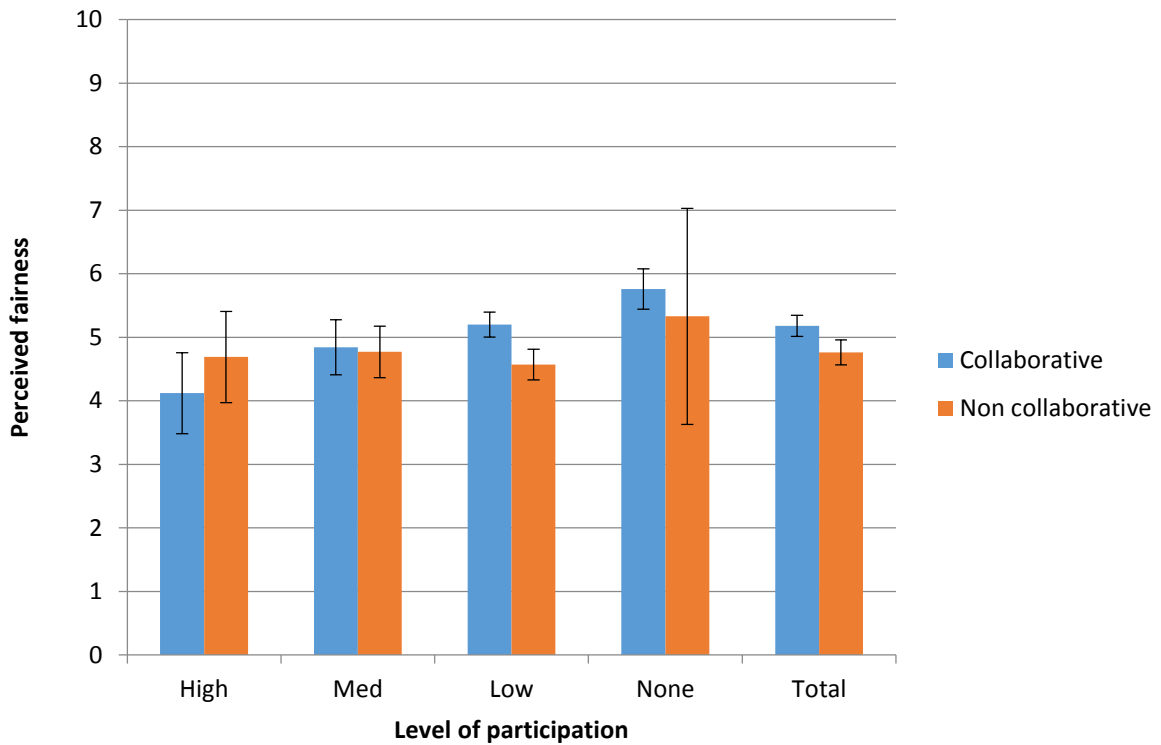


Figure 13. Perceived fairness of freshwater management processes by level of participation in collaborative and non-collaborative areas of Northland, Waikato, and Hawke’s Bay. 0 = not fair at all, 10 = very fair. Error bars denote standard error.

4.7. Interests taken into account

In the fourth response question, survey participants were asked whether their interests and concerns would be taken into account by the regional council.

Using a scale from 0 to 10, where 0 means not confident at all, and 10 means very confident, if you had concerns about how you, your family, or your business was affected by freshwater management, how confident are you that your interests and concerns would be taken into account by the [name] regional council?

Mean scores for ‘interests taken into account’ are higher in collaborative areas (4.81) than non-collaborative areas (4.4) overall, but the difference is outside the margins of

statistical significance ($p = 0.12$). There is also no statistically significant difference between collaborative and non-collaborative areas in Hawke’s Bay and Waikato. There is, however, a statistically significant difference in Northland between collaborative areas (mean = 4.79) and non-collaborative areas (mean = 4.04) ($p < 0.10$). And again, of all of the collaborative and non-collaborative areas across the three regions, the Pouto catchment has the highest mean score (mean = 5.81) on interests being taken into account (Figure 14).

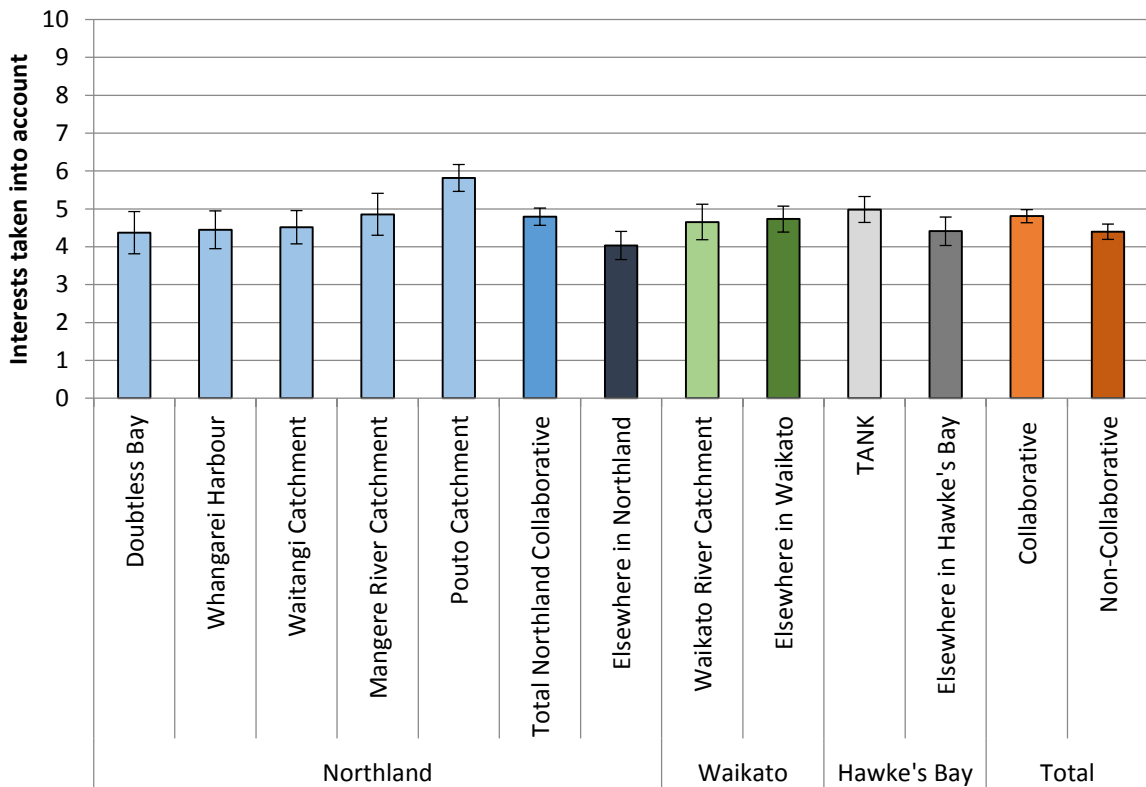


Figure 14. Survey participants' confidence that their interests are taken into account by regional councils in collaborative and non-collaborative areas of Hawke's Bay, Northland, Waikato, and in total. Answers were given on a scale from 0 to 10, where 0 meant not confident at all, 10 meant very confident. Error bars denote standard error.

The multivariate regression found that level of participation was negatively correlated with respondents' confidence that their interests are taken into account in freshwater planning, with medium-high participation resulting in a one point reduction (-1.04, $p < 0.01$) in the average score (Figure 15). Conversely, those involved in forestry scored 'interests taken into account', on average, one point higher than others (1.08, $p < 0.1$). Other variables did not have a statistically significant relationship with respondents' confidence that their interests are taken into account. Full regression results are reported in the Appendix.

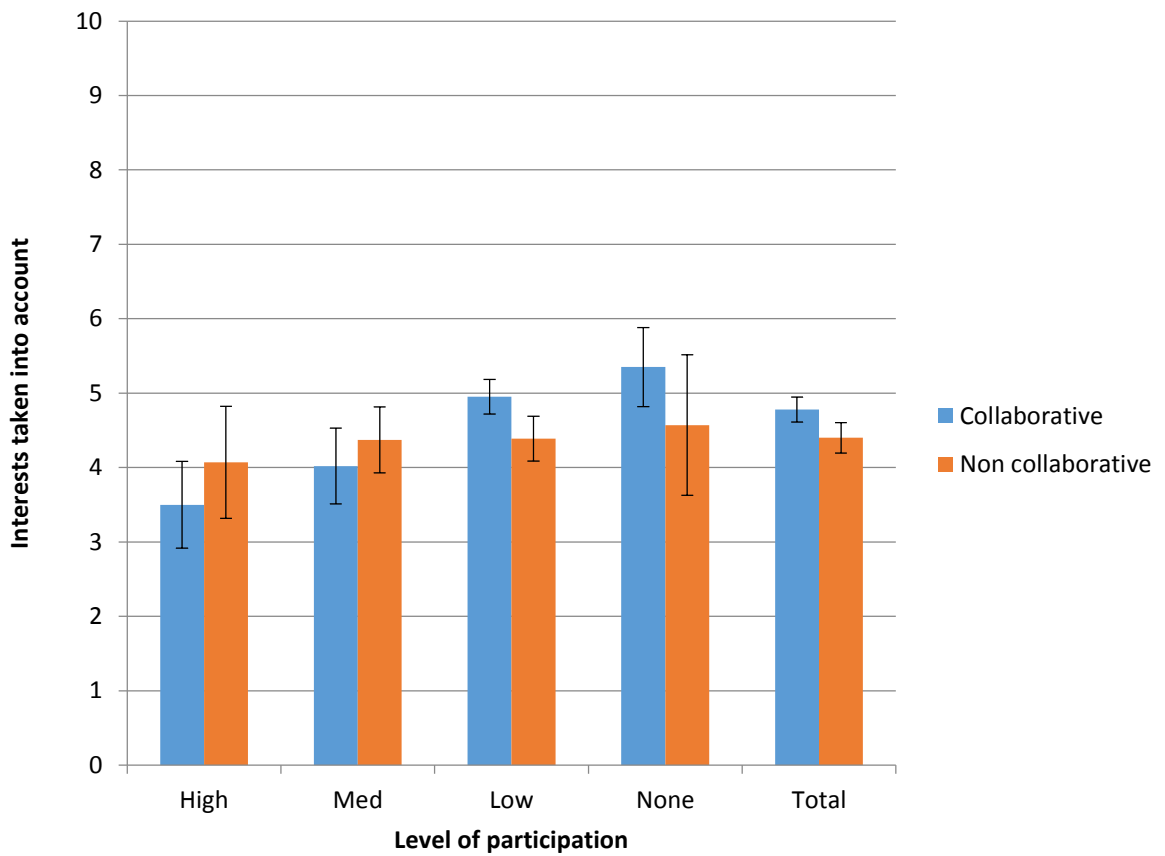


Figure 15. Confidence that interests are taken into account in freshwater management processes, by level of participation, in collaborative and non-collaborative areas of Northland, Waikato, Hawke’s Bay, and in total. 0 = not confident at all, 10 = very confident. Error bars denote standard error.

5. DISCUSSION

Research in Canterbury (Sinner et al. 2015) found a low level of awareness among the general public of collaborative planning processes. Given that the collaborative processes in the catchments sampled in this study had yet to reach substantive conclusions, we expected that awareness of these collaborative processes would also be low. The survey confirmed this expectation. In catchments with a collaborative process underway, 21% of respondents said they were aware that a collaborative process was taking place in their local area, while 15% of people in non-collaborative areas thought that a collaborative process was taking place when, in fact, it was not.

This low level of awareness of collaborative processes among the general public may or may not be a concern. This depends on the collaborative groups' expectations for how the values and other views of the public will be identified and considered in the planning process, and expectations about the proportion of the public that is likely to take an active interest in freshwater management. If the general public is somehow represented in the collaborative group, or is expected to have its say through a submissions process after the group has made its recommendations, low awareness of the collaborative process is probably not a problem. But if collaborative groups are relying on public input during the process, even if it is via group members, the groups should consider whether they are reaching their target audience.

For similar reasons, we did not expect that there would be a detectable difference in people's perceptions of freshwater management between collaborative and non-collaborative areas, as it may take time for collaborative processes to reach agreement and for differences in perceptions to emerge. From the survey, across all regions combined, no statistically significant differences were found for community perceptions of the effectiveness of regional councils at managing freshwater; conflict in freshwater planning; fairness in freshwater planning; and interests being taken into account in freshwater planning.

On the other hand, some evidence (at 90% confidence level) was observed for differences in perceptions of fairness and interests being taken into account. In Hawke's Bay, respondents in the catchments with collaborative processes consider freshwater management to be more fair, and have a more positive view of how well the regional council manages freshwater bodies, than do people elsewhere in Hawke's Bay. But respondents from Hawke's Bay consider that there is less agreement between competing interests than respondents from other regions.

Respondents from Northland gave lower scores for how well their regional council manages freshwater bodies than did respondents from Waikato and Hawkes Bay. But people in areas of Northland with collaborative processes feel more confident that

their interests are being taken into account than people living in areas of Northland without a collaborative process.

There may, of course, be any number of reasons for these differences in perceptions between people in catchments with and without collaborative processes. Factors such as high quality freshwater bodies in publicly visible locations; a homogeneous local population predisposed toward the established planning process; favourable or beneficial planning outcomes in the recent past; or positive recent media reports about freshwater issues could all influence survey participants' perceptions of freshwater management.

It is clear that such influence can occur without people being aware of a collaborative process in their area. In Northland, for example, people in the Pouto catchment were almost uniformly more positive about local freshwater management than people in other areas of Northland⁷. Such consistent positivity suggests Pouto's freshwater management is highly regarded by the local residents. This is despite the fact that, of all the areas surveyed in Hawke's Bay, Northland, and Waikato, the people of the Pouto catchment had the second lowest rate of awareness—three out of 24 respondents—of the type of planning process actually underway in their catchment. This raises the question of whether there have been recent events in the Pouto catchment that have reflected well on the regional council and freshwater management more generally.

The use of a collaborative process for freshwater planning does not necessarily lead to more or less confidence in freshwater management. The outcomes from any given planning process are also likely to be influenced by the history of conflict within a catchment, public perceptions about the health of freshwater bodies, and the design of a collaborative process including the amount of opportunity for public input. Of potentially greater interest is how the perceptions in any one catchment change over time. For now, it appears that differences between regions, or between catchments within a region, are more important than the presence or absence of collaborative processes in explaining residents' perceptions of various attributes of freshwater management. It will be interesting to see if this holds true over time, as the collaborative processes in these regions reach agreements and these are implemented.

Further research is needed to understand the regional differences identified in this survey, in order to better understand how regional publics are responding to collaborative freshwater planning. Northland's Pouto catchment is an example where local interviews could reveal why residents gave high marks to freshwater management. Is the collaborative process in that area working particularly well and, if

⁷ Pouto catchment had the highest mean score for self-assessed knowledge, effectiveness of regional council, fairness, and interests taken into account. For the other measure, agreement, Pouto catchment had the second highest mean score.

so, how is it different than in other Northland catchments, or are there other local factors that explain why Pouto is an apparent outlier?

There were also differences in perceptions about freshwater management depending on respondents' levels of participation in freshwater planning.

- Across both collaborative and non-collaborative areas, people who are more engaged (medium or high level of participation in freshwater planning processes) perceive less agreement (greater conflict) about freshwater management than those who participate at lower levels or do not participate at all.
- Participation was also negatively correlated with people's perceptions of regional council management, fairness, and confidence that their interests would be addressed.

It is possible that people who participate more actively in planning processes do so because they are dissatisfied about freshwater management, in which case the results are not surprising. But if higher participation primarily reflects greater understanding and knowledge of freshwater management, these negative correlations would be of concern; the results could suggest that those who know most about freshwater management are the most sceptical.

These perceptions warrant further monitoring, for if they endure it would bring into question whether collaborative planning as currently practiced in these regions will in fact strengthen local environmental democracy.

6. CONCLUSIONS

This report presents the results of a telephone survey of 450 residents in three New Zealand regions—Hawke’s Bay, Northland, and Waikato—on the topic of freshwater management. The aim of the report was to assess and compare the general public’s perceptions of freshwater management in catchments with and without collaborative planning processes.

Awareness of collaborative processes appears to be low. Of survey respondents living in catchments with collaborative processes areas, 21% said they were aware that a collaborative freshwater planning process was taking place in their local area. In areas without collaborative processes, 15% of survey respondents incorrectly thought that collaborative planning was taking place.

The other questions in the survey asked about knowledge of freshwater management issues, effectiveness of regional councils at managing fresh water, perceived conflict in freshwater management processes, fairness of freshwater management processes, and interests being taken into account.

While there were differences in these measures between areas with and without collaborative processes in each of the regions and in total, none of the differences were statistically significant. This lack of significant differences could be expected given the early stage of collaborative freshwater planning in New Zealand. The information in this report will provide baseline information against which future assessments of people’s perceptions of freshwater management can be assessed.

On the other hand, there were regional differences in perceptions of fairness and interests being taken into account, and differences between respondents depending on their level of participation in freshwater planning. Further research is needed to understand the reasons for differences in how regional publics are responding to collaborative freshwater planning.

People who participate more actively in planning processes may do so because they are dissatisfied about freshwater management. But if higher participation reflects greater understanding and knowledge of freshwater management, and leads to more negative perceptions of regional councils and their management, these negative correlations would be of concern.

Further funding is being sought to repeat this survey at intervals over the next three or four years in order to identify whether public perceptions change as collaborative processes come to a result and move into implementation. Further funding would also enable us to conduct interviews and other more targeted research to gain a better understanding of the local factors influencing public perceptions of collaborative planning in different regions.

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8. APPENDIX: RESULTS OF MULTIVARIATE REGRESSIONS

For each of four questions, we used multivariate tobit regression to identify whether differences in responses were correlated with the presence or absence of collaborative planning in the catchment, and with other variables.

In each case, we started with a single explanatory variable, the presence of collaborative planning in the respondent's catchment, and progressively added more variables. Seven equations were tested for each response (i.e. dependent) variable. We were not so much interested in which model gives the best fit as to confirm or reject the null hypotheses for each of the explanatory variables. Thus, we were looking for variables that were statistically significant across multiple versions of the model. See section 3.3 for more detail on methods.

The detailed results are reported in Tables A1, A2, A3 and A4 below. The number of responses (n) is different for each question because not every respondent answered every question.

Table A1. Regression results for Agreement ('Thinking about conflict or agreement between competing interests over water management in your area, using a scale of 0 to 10 where 0 means lots of conflict and 10 means strong agreement, would you say there is conflict or agreement between competing interests over water management in your area?')

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collaborative catchment	0.608** (1.97)	0.565* (1.85)	0.187 (0.30)	0.116 (0.19)	0.108 (0.18)	0.0400 (0.06)	0.0382 (0.06)
Northland		-0.544 (-1.42)	-0.760 (-1.42)	-0.815 (-1.51)	-0.787 (-1.46)	-0.861 (-1.56)	-0.850 (-1.54)
Hawke's Bay		-1.262*** (-2.99)	-1.586*** (-2.91)	-1.612*** (-2.96)	-1.640*** (-2.99)	-1.526*** (-2.74)	-1.535*** (-2.75)
Northland x collab			0.402 (0.53)	0.417 (0.55)	0.419 (0.55)	0.504 (0.66)	0.504 (0.66)
Hawke's Bay x collab			0.625 (0.74)	0.792 (0.94)	0.843 (0.99)	0.835 (0.99)	0.849 (1.00)
farming				0.202 (0.64)	0.209 (0.65)	0.312 (0.99)	0.309 (0.98)
Forestry				0.792 (1.46)	0.852 (1.62)	0.871* (1.68)	0.887* (1.75)
water or env'l management				0.600 (0.91)	0.607 (0.91)	0.852 (1.38)	0.851 (1.38)
government				0.0826 (0.11)	0.0969 (0.13)	0.267 (0.37)	0.267 (0.37)
Female					0.0513 (0.17)		0.00283 (0.01)
Māori					-0.408 (-0.78)		-0.143 (-0.27)
participation medium to high						-1.143*** (-3.20)	-1.124*** (-3.04)
constant	4.482*** (21.30)	5.148*** (15.01)	5.349*** (12.53)	5.188*** (11.41)	5.202*** (10.58)	5.450*** (11.53)	5.460*** (10.85)
collab+(Northland x collab) (F-test)			0.589	0.533	0.527	0.544	0.5422
collab+(Hawke's Bay x collab) (F-test)			0.812	0.908	0.951*	0.875	0.8872
Log likelihood	-758.7	-754.1	-753.8	-751.4	-750.9	-745.7	-745.6
McFadden's pseudo R-squared	0.00246	0.00845	0.00881	0.0121	0.0126	0.0196	0.0196
n	328	328	328	328	328	328	328
t statistics in parentheses	* p<.1	** p<.05	*** p<.01				

Table A2. Regression results for Interests ('Using a scale from 0 to 10, where 0 means not confident at all, 10 means very confident, if you had concerns about how you, your family, or your business was affected by freshwater management, how confident are you that your interests and concerns would be taken into account by the [name of regional council]?')

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collaborative catchment	0.434 (1.41)	0.441 (1.43)	0.265 (0.43)	0.269 (0.43)	0.339 (0.55)	0.159 (0.26)	0.225 (0.36)
Northland		-0.121 (-0.32)	-0.259 (-0.46)	-0.341 (-0.60)	-0.292 (-0.51)	-0.399 (-0.70)	-0.368 (-0.64)
Hawke's Bay		0.0942 (0.22)	-0.0322 (-0.05)	-0.0512 (-0.09)	-0.0526 (-0.09)	0.0458 (0.08)	0.0561 (0.09)
Northland x collab			0.248 (0.33)	0.271 (0.36)	0.224 (0.29)	0.331 (0.44)	0.293 (0.39)
Hawke's Bay x collab			0.232 (0.27)	0.323 (0.38)	0.271 (0.32)	0.334 (0.40)	0.265 (0.32)
farming				0.190 (0.59)	0.125 (0.40)	0.322 (1.00)	0.243 (0.76)
forestry				1.016* (1.88)	1.032* (1.92)	1.102* (1.97)	1.083* (1.95)
water or env'l management				-0.0355 (-0.05)	0.00735 (0.01)	0.235 (0.31)	0.257 (0.35)
government				-0.322 (-0.46)	-0.390 (-0.56)	-0.195 (-0.29)	-0.261 (-0.38)
female					-0.295 (-0.98)		-0.366 (-1.23)
Māori					-0.772 (-1.57)		-0.573 (-1.17)
participation medium to high						-1.078*** (-2.98)	-1.043*** (-2.89)
constant	4.323*** (19.39)	4.350*** (12.45)	4.446*** (9.80)	4.339*** (9.43)	4.567*** (9.40)	4.575*** (9.77)	4.819*** (9.70)
collab+(Northland x collab) (F-test)			0.513	0.540	0.563	0.49	0.518
collab+(Hawke's Bay x collab) (F-test)			0.497	0.592	0.610	0.493	0.490
Log likelihood	-974.0	-973.8	-973.8	-971.7	-969.9	-967.3	-965.9
McFadden's pseudo R-squared	0.000997	0.00118	0.00124	0.00334	0.00518	0.00787	0.00932
n	415	415	415	415	415	415	415
t statistics in parentheses	* p<.1	** p<.05	*** p<.01				

Table A3. Regression results for Fairness ('Using a scale from 0 to 10, where 0 means not fair at all, 10 means very fair, in your opinion, how fair do you think the water management processes are in the [name of regional council] area?')

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collaborative catchment	0.392 (1.40)	0.431 (1.55)	0.240 (0.43)	0.210 (0.38)	0.214 (0.38)	0.147 (0.26)	0.145 (0.26)
Northland		-0.569 (-1.62)	-0.577 (-1.10)	-0.711 (-1.34)	-0.700 (-1.32)	-0.745 (-1.40)	-0.750 (-1.40)
Hawke's Bay		-0.261 (-0.70)	-0.556 (-1.04)	-0.567 (-1.09)	-0.564 (-1.09)	-0.518 (-1.00)	-0.511 (-0.99)
Northland x collab			0.0416 (0.06)	0.0351 (0.05)	0.0307 (0.04)	0.101 (0.14)	0.106 (0.15)
Hawke's Bay x collab			0.570 (0.76)	0.677 (0.94)	0.670 (0.93)	0.684 (0.95)	0.673 (0.93)
farming				0.311 (1.06)	0.299 (1.02)	0.415 (1.39)	0.399 (1.33)
forestry				1.274*** (2.79)	1.277*** (2.79)	1.328*** (2.84)	1.316*** (2.81)
water or env'l management				0.935 (1.47)	0.941 (1.49)	1.161* (1.79)	1.161* (1.80)
government				-0.558 (-0.83)	-0.568 (-0.84)	-0.439 (-0.65)	-0.449 (-0.66)
female					-0.0403 (-0.15)		-0.0760 (-0.28)
Māori					-0.113 (-0.32)		0.00329 (0.01)
participation medium to high						-0.741** (-2.22)	-0.746** (-2.21)
constant	4.757*** (23.37)	5.068*** (15.79)	5.166*** (12.39)	4.973*** (11.74)	5.007*** (11.19)	5.130*** (12.00)	5.176*** (11.52)
collab+(Northland x collab) (F-test)			0.282	0.245	0.245	0.248	0.251
collab+(Hawke's Bay x collab) (F-test)			0.810*	0.887*	0.884*	0.831*	0.818*
Log likelihood	-781.4	-780.0	-779.6	-772.6	-772.5	-769.8	-769.8
McFadden's pseudo R-squared	0.00124	0.00303	0.00354	0.0125	0.0126	0.0160	0.0161
n	344	344	344	344	344	344	344
t statistics in parentheses	* p<.1	** p<.05	*** p<.01				

Table A4. Regression results for Management ('Using a scale from 0 to 10, where 0 means very poorly, 10 means very well, in your opinion how well does the [name of regional council] manage freshwater bodies?')

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collaborative catchment	0.128 (0.44)	0.163 (0.56)	-0.647 (-1.16)	-0.706 (-1.25)	-0.678 (-1.22)	-0.771 (-1.38)	-0.743 (-1.34)
Northland		-0.252 (-0.70)	-0.769 (-1.61)	-0.932* (-1.85)	-0.837* (-1.67)	-0.956* (-1.89)	-0.880* (-1.73)
Hawke's Bay		0.477 (1.23)	-0.263 (-0.49)	-0.356 (-0.66)	-0.396 (-0.74)	-0.268 (-0.50)	-0.305 (-0.57)
Northland x collab			0.935 (1.32)	1.001 (1.41)	0.968 (1.37)	1.052 (1.49)	1.021 (1.45)
Hawke's Bay x collab			1.388* (1.80)	1.586** (2.01)	1.627** (2.06)	1.616** (2.07)	1.642** (2.11)
farming				0.429 (1.28)	0.444 (1.31)	0.521 (1.58)	0.521 (1.56)
forestry				0.532 (1.01)	0.632 (1.28)	0.604 (1.18)	0.672 (1.37)
water or env'l management				0.158 (0.23)	0.151 (0.23)	0.348 (0.51)	0.325 (0.48)
government				0.367 (0.61)	0.324 (0.53)	0.526 (0.88)	0.478 (0.79)
female					0.147 (0.51)		0.0989 (0.35)
Māori					-0.785* (-1.73)		-0.611 (-1.32)
participation medium to high						-0.880*** (-2.91)	-0.800*** (-2.61)
constant	4.854*** (23.52)	4.813*** (15.51)	5.257*** (14.62)	5.085*** (13.38)	5.062*** (12.66)	5.268*** (13.49)	5.242*** (12.75)
collab+(Northland x collab) (F-test)			0.288	0.295	0.290	0.281	0.278
collab+(Hawke's Bay x collab) (F-test)			0.741	0.880*	0.949*	0.845	0.899*
Log likelihood	-819.5	-817.4	-815.8	-813.7	-812.1	-810.2	-809.2
McFadden's pseudo R-squared	0.000114	0.00274	0.00474	0.00719	0.00922	0.0115	0.0127
n	354	354	354	354	354	354	354
t statistics in parentheses	* p<.1	** p<.05	*** p<.01				