



**MARLBOROUGH
DISTRICT COUNCIL**

Recreational Water Quality Report

2011-12

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Executive Summary

Thirteen river locations and eighteen coastal locations in Marlborough are monitored on a weekly basis during the summer months (November to March inclusive) and assessed against the Ministry for the Environment's (MfE's) bathing water guidelines.

Marlborough's rivers and coastal waters are generally of good quality and are safe for recreational activities. However rivers that drain urban and intensive agriculture areas and coastal beaches which are located in urban areas and/or which have a significant river flow to them are more prone to poor water quality and are sometimes not safe for recreational activities, even during dry weather. Wet weather events frequently result in exceedances of MfE's guidelines and therefore swimming following rainfall is not recommended, particularly in urban and intensive agricultural areas.

During the 2011-12 summer, half of river sites monitored were categorised as safe (i.e. compliant with both the alert and action level guidelines) for recreational use for more than 95% of the time. This is typical for the region's freshwater sites. The poorest performing sites were located on the Rai, Taylor and the Opawa at Malthouse Reserve. The best site (100% compliant) was the Pelorus at the SH6 Bridge, the Wairau sites and the Waihopai. Coastal water quality in Marlborough is generally very good and during the 2011-12 bathing water season, nearly three quarters of the sites were categorised as safe for recreational use for more than 95% of the time. This is slightly below what is typical for Marlborough's coastal sites. 100% compliance with the bathing water guidelines was achieved at Bobs Bay, Marfells Beach; Mistletoe Bay, Portage, Waikawa Bay and Whites Bay. The poorest water quality was recorded for Momorangi and Picton Foreshore.

Suitability for recreation grades (SFRG's) have been derived using MfE's methodology and are based on the most recent five years of microbiological data and sanitary inspections classes. All of the river sites have sufficient samples to determine complete grades whilst seventeen of the eighteen coastal sites have sufficient samples to obtain beach grades. Regular monitoring of each site is recommended to allow for comparisons in recreational water quality each year and to assign complete Suitability for Recreation Grades (SFRG's) to each site. Four coastal sites had an improvement in their grades (Hakahaka improved from 'Very Poor' to 'Poor'; Momorangi improved from 'Poor' to 'Fair'; Portage improved from 'Very Poor' to 'Good' and Tirimoana improved from 'Fair' to 'Good'). The river sites showed one improvement in the beach grade and one deterioration in the beach grade. The Pelorus at the state highway bridge improved from 'Fair' to 'Good', however the Wairau at Wairau Rowing Club deteriorated from 'Good' to 'Fair', thus there is no net change in the number of freshwater sites classed as 'Good'.

The beach survey carried out in January/February 2012 showed that the sites included in the Recreational Water Quality Monitoring Programme needed to be changed. It is recommended that sampling cease at fifteen of the sites and that five new sites be added to the monitoring programme. The sites where sampling is ceasing all have complete grades calculated i.e. 5 or more years of complete data. The survey also showed that water quality and scenery are the most important factors influencing the public's enjoyment at river and beach swimming sites. It is recommended that Councils webpage is updated to reflect the findings of the survey.

The use of microbial source tracking (MST) is recommended for a number of sites where bacterial contamination is known to be an issue; sites include the Wairau Diversion at Neals Road, The Taylor River at Riverside, the Opawa at Malthouse Lane, Hakahaka Bay, Trimoana and Picton Foreshore.

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1. Introduction

District councils are required under the Health Act 1956 to monitor environmental factors affecting public health and to abate conditions likely to be offensive or injurious to health. Water quality in our rivers and coastal areas can have an impact on public health when used for contact recreation purposes. Monitoring results are regularly communicated to the district health board.

Regional councils have responsibilities under the Resource Management Act 1991 for the planning and management of natural resources including fresh and coastal waters. The Marlborough District Council as a unitary authority has responsibility for both district and regional functions.

Guidelines for the safe use of recreational waters are defined by the Ministry for the Environment in the Microbiological Water Quality Guidelines (MfE, 2003). The recreational waters in Marlborough are sampled in accordance with these guidelines. Results are sent to the Ministry for the Environment each year for national reporting. Recreational water quality is one of 22 national core environmental indicators. Environmental indicators are used to provide cost-effective, practical and meaningful information on high-priority environmental issues.

2. Objectives of the Recreational Water Quality Monitoring Programme

The objectives of the recreational water quality programme are:

1. To provide the results of monitoring to the public as soon as they become available. Towards this end, results are displayed on Councils website as soon as they become available from the laboratory. Figure 1 below shows how results are presented on the website at: <http://www.marlborough.govt.nz/Recreation/Swimming-and-Boating/Swimming-Locations.aspx>

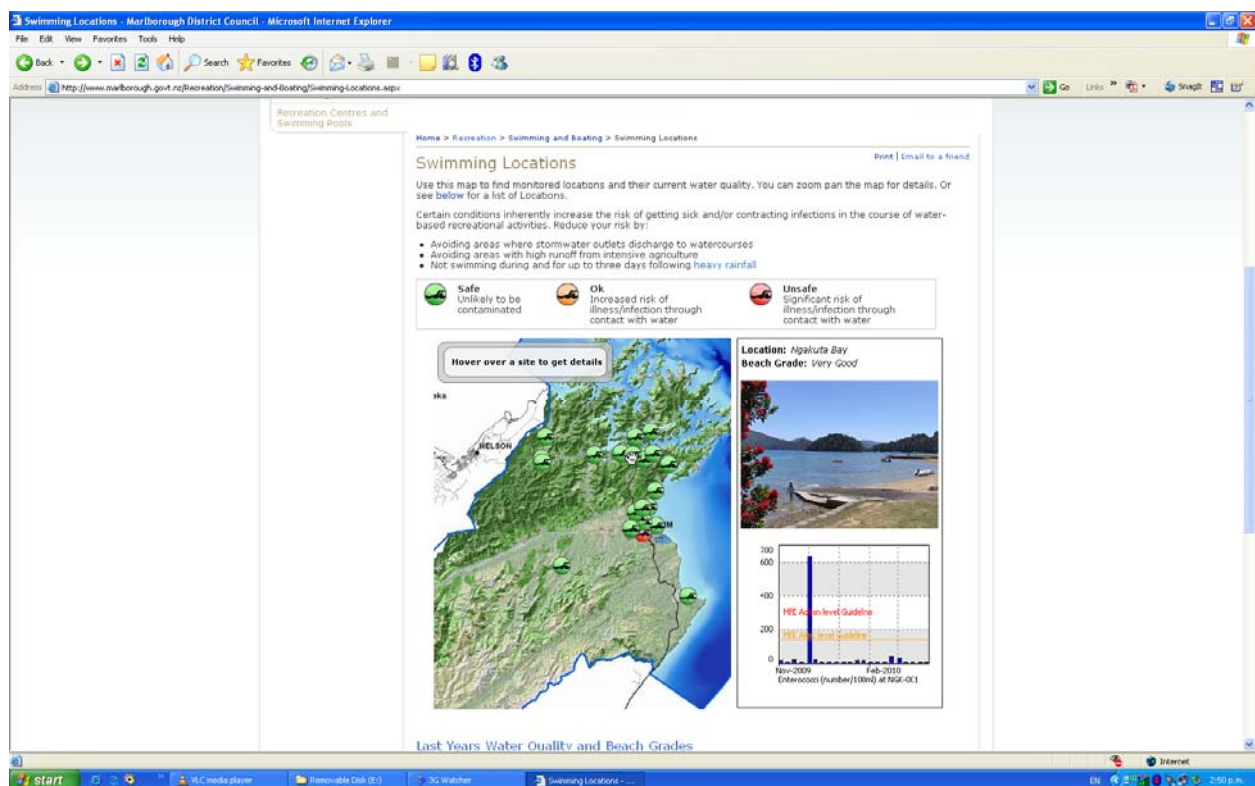


Figure 1: Screenshot of how recreational water quality results are displayed on the Councils website.

2. To assess the safety of each site in relation to the risk of contracting illness/infection at each site on a weekly basis and to inform the public as soon as possible. This includes taking follow-up samples

where exceedances occur and reporting results to the District Health Board as shown in the flow chart in Appendix 1.

3. To grade bathing water sites using MfE's 2003 guidelines for grading swimming rivers and beaches.
4. To assess the results of annual monitoring to allow for national comparisons between bathing water sites and to enable long term trends in river and coastal bathing water quality to be determined.
5. To help identify sites which require additional investigation due to excessive faecal contamination in areas which are deemed high risk to the public i.e. areas which receive high contact recreation use.

3. Sites

During the summer of 2011-12 a total of 13 freshwater bathing sites (Table 1) and 18 coastal water sites (Table 2) were monitored on a weekly basis from November to March inclusive, the location of these sites are shown in Appendix 2. Sampling takes place irrespective of weather or tide times, this ensures that trends over time take account of all conditions and are not skewed towards one condition, it is also in accordance with the MfE guidelines (2003). Details for each site (showing name, site ID and location) are shown in Tables 1 and 2.

Table 1: River Sites 2011-12

Site name	Site ID	Grid Reference (NZTM)
Taylor @ Hutcheson Street Bridge	TYR-5	1679716, 5404251
Taylor @ Riverside	TYR-16	1680023, 5403987
Opawa @ Malthouse Reserve	OPR-40	1683801, 5402597
Opawa @ Elizabeth Street Footbridge	OPL-1	1680393, 5404310
Wairau @ Blenheim Rowing Club	WRR-1	1684319, 5406605
Wairau @ Wairau Rowing Club	WRR-9	1682366, 5407875
Wairau @ Ferry Bridge	WRR-8	1681274, 5410163
Wairau Diversion @ Neals Road	WDV-1	1684047, 5411651
Pelorus @ Totara Flat	PLR-3	1648262, 5427731
Rai @ Brown River Reserve	RAR-2	1649232, 5436785
Rai @ Rai Falls	RAR-1	1648018, 5429266
Pelorus @ Pelorus Bridge	PLR-2	1648077, 5428091
Waihopai @ Craiglochart Bridge # 2	WHR-3	1655029, 5391098

Sites are chosen based on frequency of use, risk of contamination, importance (e.g. a high value kayaking/rowing site) and proximity to popular campgrounds/resorts. In general the beaches and rivers of Marlborough are suitable for contact recreational activities; however there are areas which are more susceptible to contamination which can lead to an increased risk of illness and infection, especially during and after periods of rainfall. Such areas are generally located in urban and areas of intensive agriculture.

Table 2: Coastal Sites 2011-12

Site name	Site ID	Grid Reference (NZTM)
Anakiwa	GRO-001	1677073, 5431495
Bobs Bay	PCT-3	1685171, 5430143
Hakahaka Bay	PTU-001	1693263, 5427510
Marfells Beach	MB-1	1700194, 5380089
Mistletoe Bay	OB-2	1681470, 5436007
Moenui	MOE-1	1666689, 5430394
Momorangi Bay	MOM-001	1678817, 5430879
Ngakuta Bay	NGK-001	1680514, 5430489
Oyster Bay	PTU-002	1693174, 5426985
Picton Foreshore	PCT-5	1684298, 5428815
Portage	POR-1	1686775, 5438697
Shelly Beach North	PCT-4A	1684586, 5428933
Te Mahia	TEM-1	1681395, 5436748
Tirimoana	TIR-5	1676233, 5430949
Waikawa Bay	WKB-1	1687695, 5431090
Wairau Bar	WRR-7	1688575, 5405201
Wairau Diversion	WDV-2	1686056, 5411923
Whites Bay	WB-1	1688425, 5417793

4. Sampling

The water quality at coastal sites is tested for the presence of enterococci¹ bacteria, whilst the water quality at freshwater sites is tested for *Escherichia coli* (*E. coli*)². These are commonly known as 'indicator organisms' as they give an indication of the presence or recent presence of faecal contamination which may indicate the presence of pathogens in the water. The results are reported in MPN/100mL (most probable number) and give an indication of the number of bacteria present per 100mL of water. All testing is carried out by Hill Laboratories Ltd. Coastal water samples are taken in water approximately 0.5m deep at a depth of approximately 0.2m from the surface. River samples are taken midstream where possible or as close to midstream as feasible, in order to obtain a sample representative of the well mixed zone, at a depth of approximately 0.2m from the surface. All samples are chilled and couriered to the laboratory for immediate processing. The temperature of the samples are checked on receipt at the laboratory and recorded on the chain of custody record. All samples received must be less than 10°C.

4.1. Indicator Organisms

An indicator organism can be defined as an organism which is used to indicate the potential presence of another organism. *E. coli* is chosen as the indicator bacteria for freshwater as it is deemed to be a good indicator of recent sewage and/or faecal contamination. Enterococci are chosen as the indicator bacteria for coastal waters due to its higher survival rates in saline waters and as such it is deemed to be a good indicator of recent sewage and/or faecal contamination. When monitoring surface waters used for recreational purposes, the primary concern is the presence of organisms which can cause illness and/or infection in people.

¹ **Method:** MPN count using Enterolert, Incubated at 41°C for 24 hours. 1-7 Analysed at Hill Laboratories - Microbiology; 101c Waterloo Road, Hornby, Christchurch. MIMM 12.4. Minimum detection 1 MPN/100mL.

² **Method:** MPN count using Colilert (Incubated at 35°C for 24 hours), or 1-4 Colilert 18 (Incubated at 35°C for 18 hours), Analysed at Hill Laboratories - Microbiology; 101c Waterloo Road, Hornby, Christchurch. APHA 9223 B, 21st ed. 2005. Minimum detection 1 MPN/100mL.

Indicator organisms are monitored in recreational waters as it may not always be possible to identify specific disease causing organisms due to their low numbers, difficulty and expense of analysis among other reasons. Indicator organisms are preferred because 1) they are easy to sample and inexpensive to measure and 2) they can survive for several weeks and are therefore a definite indication of recent faecal contamination. *E. coli* and Enterococci are present in the gut of all warm blooded animals (including humans, mammals and birds), all of which are potential carriers of disease causing organisms in humans.

The number of Enterococci and *E. coli* present in a water sample (100mL) denotes the potential health risk of the waters to humans, it is not a direct measurement of the actual health risks, and therefore an exceedance of the guideline value indicates that there is an increased risk to bathers in the area. Further details on how this risk is quantified are available in the Microbiological Water Quality Guidelines (MfE, 2003).

4.2. Guideline Values - Coastal

The guideline values for safe coastal recreational sites have been determined by MfE and are as follows:

	For a <i>single</i> sample		Requirement	
Acceptable 'Green Mode'	< 140 Enterococci / 100mL	Highly likely to be uncontaminated	Routine monitoring	Safe 😊
Alert 'Amber Mode'	140 - 280 Enterococci / 100mL	Potentially contaminated	Investigate likely causes	OK 😐
Action 'Red Mode'	> 280 Enterococci / 100mL ³	Highly likely to be contaminated	Further investigation, inform relevant interested parties	Unsafe 😞

These levels are based on keeping illness risks associated with recreational water use to less than 2% (MfE, 2003). In addition, the Ministry of the Environment has developed Suitability for Recreation Grades (SFRG's) for swimming beaches. These are defined using the Microbiological Assessment Category (MAC) and the Sanitary Inspection Category (SIC) as defined by MfE.

4.2.1. Microbiological Assessment Categories (MAC)

The Microbiological Assessment Category is assessed using data from the previous 5 years. A minimum of 20 samples over the bathing water season (November to March inclusive) for each year is required in order to establish a complete MAC, if there are less than 100 samples over this 5 year period then the MAC status is defined as being incomplete or interim. The MAC was assessed for the 18 sites. Of the 18 sites assessed, 17 have adequate data over the past 5 years to calculate a complete MAC. The number of samples for each site ranges from 88 to over 100 for this 5 year period. Table 3 below defines the MAC grades for coastal sites.

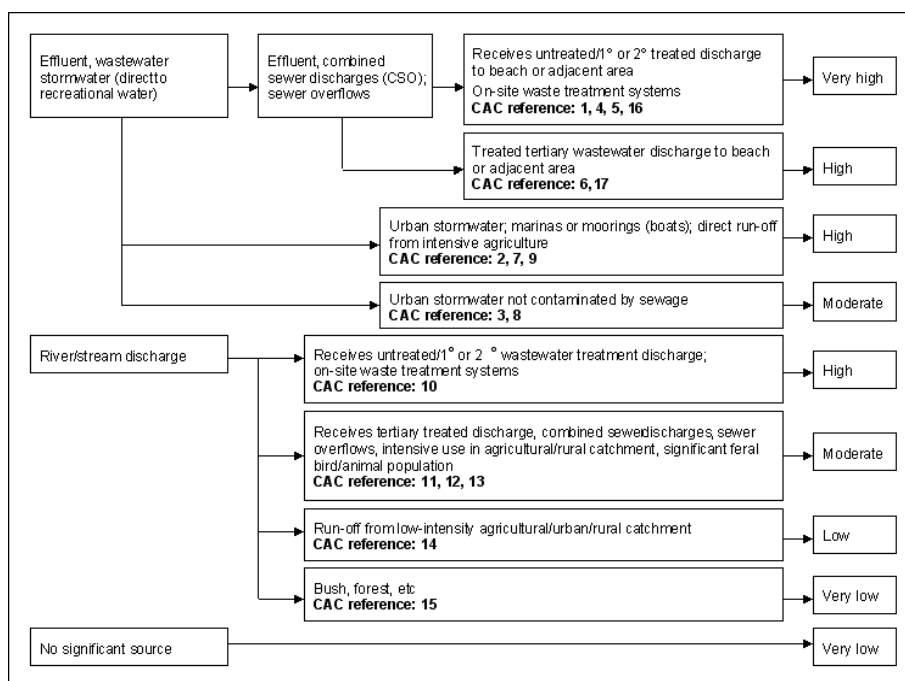
³ Applies to two consecutive single samples (resampled as soon as practicable after receiving first result) greater than 280/100mL

Table 3: Microbiological Assessment Category (MAC) definitions for marine waters (MfE, 2003).

Grade	95 th Percentile (Hazen method)	
A	≤ 40	Enterococci / 100mL
B	41 - 200	Enterococci / 100mL
C	201 - 500	Enterococci / 100mL
D	> 500	Enterococci / 100mL

4.2.2. Sanitary Inspection Category (SIC)

The SIC assigns a category to the site based on the risk of contamination associated with faecal sources in the vicinity. Figure 2 details this risk. The SIC classes were updated for all coastal water sites in 2009 (MDC, 2009a).

**Figure 2: Sanitary Inspection Category for coastal water sites (MfE, 2003)**

4.2.3. Suitability for Recreation Grades (SFRGs)

Bathing water sites are graded according to the SFRGs, as follows:

- Very Good,
- Good,
- Fair,
- Poor
- Very Poor.

Suitability for Recreation Grades (SFRGs) are obtained using the MAC in conjunction with the SICs (figure 3) and are calculated using MfE's Recreational Water Quality Assessment software called 'Bathewatch'. There

are between 21 and 22 weeks in the bathing water season so it is important to ensure each site is consistently monitored over the bathing water season to ensure accurate reporting of MAC grades and Suitability for Recreation Grades (SFRGs). Where there are inconsistencies between monitored data and results from the SIC a conservative 'follow-up' grade is assigned.

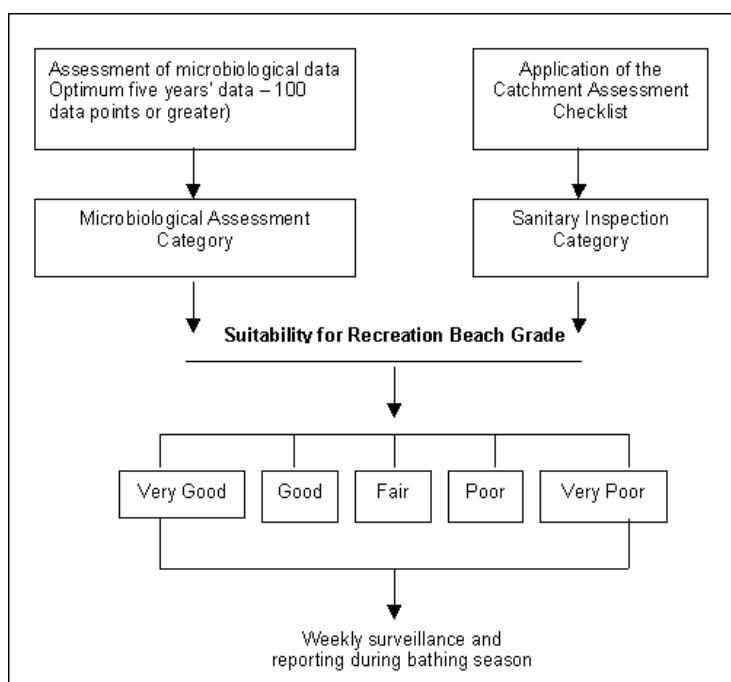


Figure 3: Requirements for grading beaches (MfE, 2003)

4.3. Guideline values – Rivers

The guideline values for safe freshwater recreational sites have been determined by MfE and are as follows:

	<u>For a <i>single</i> sample</u>		<u>Requirement</u>	
Acceptable 'Green Mode'	< 260 <i>E.coli</i> / 100mL	Highly likely to be uncontaminated	Routine monitoring	Safe 😊
Alert 'Amber Mode'	> 260 < 550 <i>E.coli</i> / 100mL	Potentially contaminated	Investigate likely causes	OK 😐
Action 'Red Mode'	> 550 <i>E.coli</i> / 100mL	Highly likely to be contaminated	Further investigation, inform relevant interested parties	Unsafe 😞

These levels are based on an estimate that approximately 5% of *Campylobacter* infections could be attributable to freshwater contact recreation (MfE, 2003). In addition, the Ministry for the Environment has developed Suitability for Recreation Grades (SFRG's). These are defined using the Microbiological Assessment Category (MAC) and the Sanitary Inspection Category (SIC).

4.3.1. Microbiological Assessment Categories (MAC)

The Microbiological Assessment Category is assessed using data from the previous 5 years. A minimum of 20 samples over the bathing water season (November to March inclusive) for each year is required in order to establish a complete MAC, if there are less than 100 samples over this 5 year period then the MAC status is defined as being incomplete or interim. The MAC was assessed for all of the 13 sites; of the 13 sites assessed, all have adequate data over the past 5 years to calculate a complete MAC. The number of samples for each site ranges from 108 to 110 for this 5 year period. Table 4 below defines the MAC grades for freshwater sites.

Table 4: Microbiological Assessment Category (MAC) definitions

Grade	95 th Percentile (Hazen method)
A	≤ 130 <i>E.coli</i> / 100mL
B	131 - 260 <i>E.coli</i> / 100mL
C	260 - 550 <i>E.coli</i> / 100mL
D	> 550 <i>E.coli</i> / 100mL

4.3.2. Sanitary Inspection Category (SIC)

The SIC assigns a category to the site based on the risk of contamination associated with faecal sources in the vicinity. Figure 4 details this risk. SIC classes for the freshwater bathing sites were assessed in 2009 (MDC, 2009b).

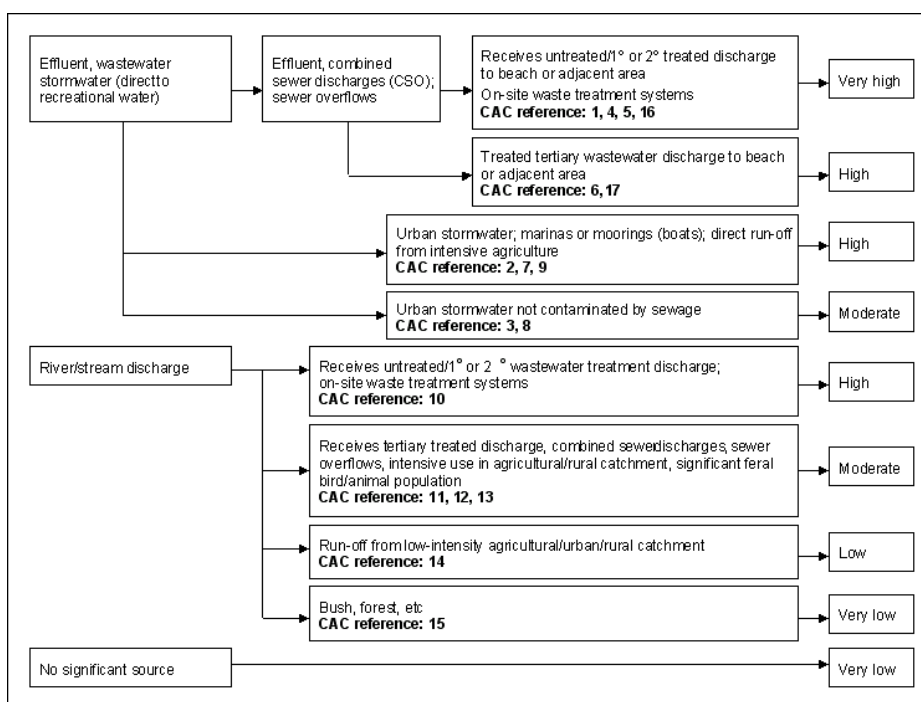


Figure 4: Sanitary Inspection Category for freshwater sites (MfE, 2003)

4.3.3. Suitability for Recreation Grades (SFRG)

Bathing water sites are graded according to the SFRGs, as follows:

- Very Good,
- Good,
- Fair,
- Poor and
- Very Poor.

Suitability for Recreation Grades (SFRGs) are obtained using the MAC in conjunction with the SICs (figure 5) and are calculated using MfE’s Recreational Water Quality Assessment software called ‘Bathewatch’. There are between 21 and 22 weeks in the bathing water season so it is important to ensure each site is consistently monitored over the bathing water season to ensure accurate reporting of MAC grades and Suitability for Recreation Grades (SFRGs). Where there are inconsistencies between monitored data and results from the SIC a conservative ‘follow-up’ grade is assigned.

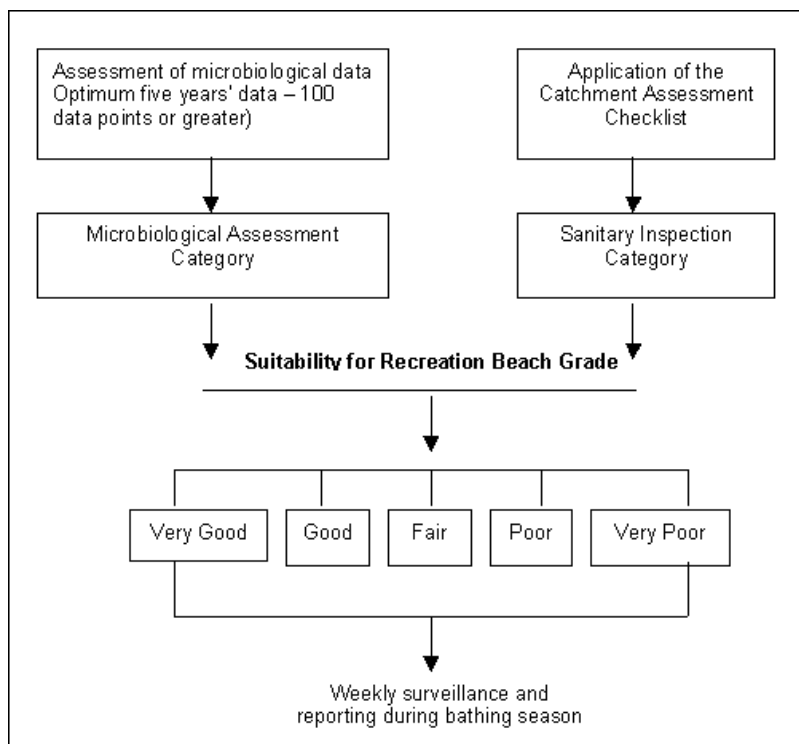


Figure 5: Requirements for grading swimming rivers (MfE, 2003)

5. Recreational Water Quality Results 2011-12

The results of the summer 2011-12 sampling are shown in Appendix 3. The results are graphed for each site and are shown in Appendix 4. The graphs show the enterococci or *E. coli* numbers alongside rainfall and are plotted against both the relevant alert and action level bathing water guideline standards as defined by MfE (2003).

5.1. Coastal

5.1.1. 2011-12 Summer Results

The percentage of time in which coastal sites were deemed safe or otherwise for swimming is shown in figure 6. Thirteen of the eighteen sites were deemed safe for swimming for more than 95% of the time, whilst six were deemed safe for swimming for 100% of the time. This is an increase from eight and three respectively in 2010-11 and is more comparable with 2009-10. The summer of 2010-11 was a particularly wet summer which led to multiple exceedances of the guidelines.

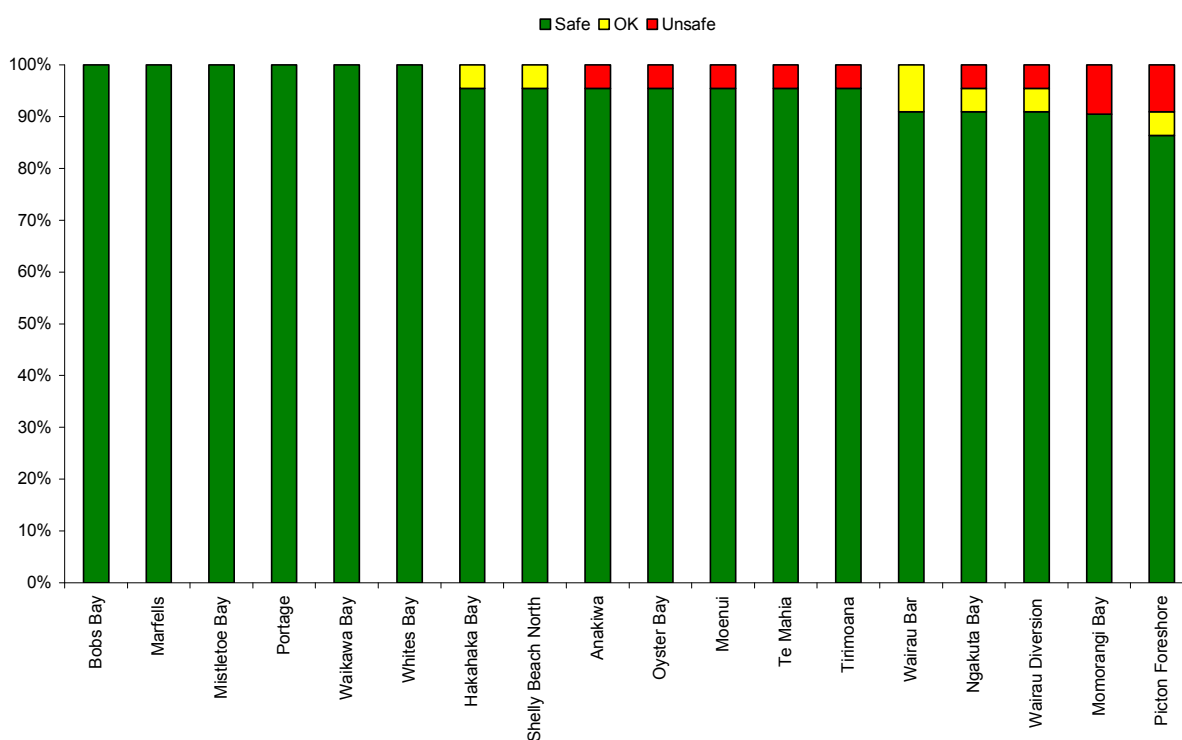


Figure 6: Coastal water bathing sites ranked according to the percentage of time they were suitable for contact recreation.

Picton Foreshore, Momorangi, the Wairau Diversion and Ngakuta had the poorest water quality. Exceedances at Picton Foreshore are predominately associated with heavy rainfall. Sewage overflows and stormwater can lead to increased bacteria loads to the foreshore. Momorangi has had consistently poor water quality over the last few years. Microbial source tracking shows that the primary source of faecal contamination is likely to be from wildlife (predominately ducks and other birds in the area) sources (Cornelisen *et al.*, 2012; MDC, 2009). The cause of exceedances are less well understood for the Wairau Diversion as exceedances are not always associated with heavy rainfall. Water quality is generally very good for Ngakuta Bay but water quality during the 2010-11 summer was poor due to the exceptional rainfall events encountered over summer, it is less clear what led to the exceedances in 2011-12.

5.1.2. Recent Trends

Overall there is an improvement with compliance with the bathing water guidelines over the last nine years (figure 7). Slight declines are observed for the 2007-08 and 2010-11 summers, most probably as a result of wetter summers in the region during that time. Excellent water quality, in terms of compliance with the bathing water guidelines, was achieved in 2006-07, 2009-10 and 2011-12 when compliance with the guidelines was achieved 95% of the time. Maximum rainfall from year to year will have some influence on water quality but will not solely be responsible for bathing water quality from year to year.

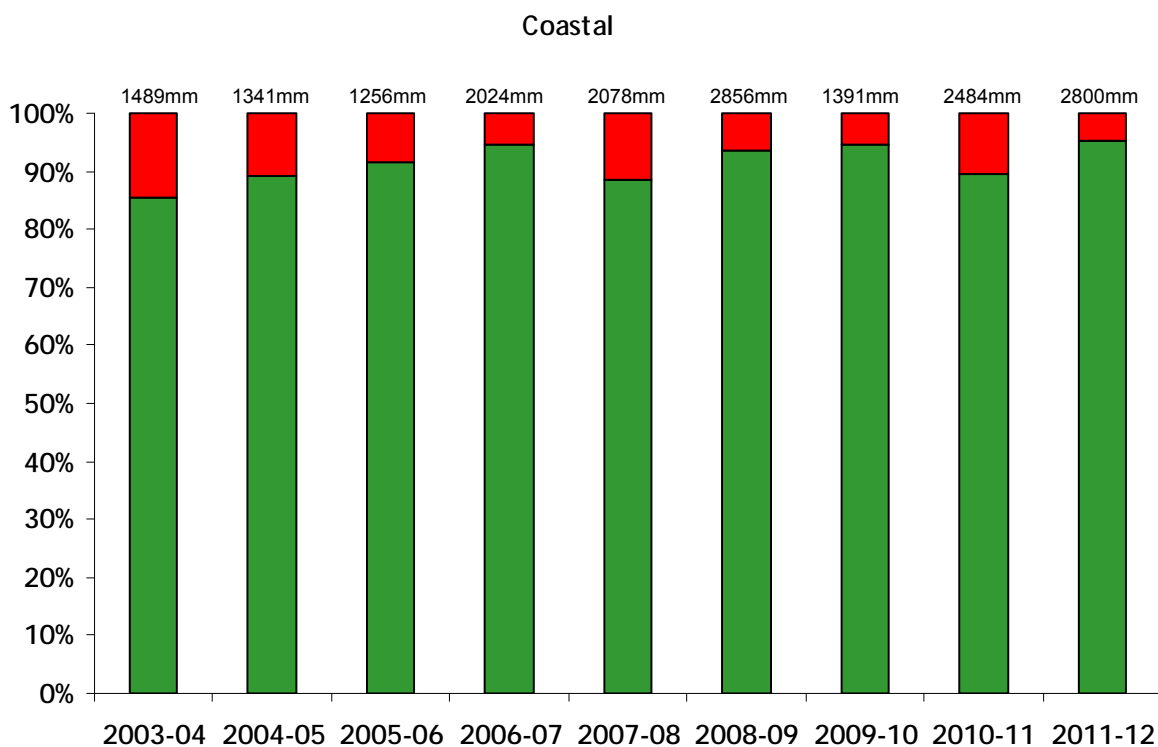


Figure 7: Percentage compliance with the bathing water guidelines from 2003 to 2012 at coastal sites. Compliance is denoted by the green bars and non-compliance with the red bars. Total summer rainfall from four key sites in Marlborough is shown above each bar for each summer.

Appendix 5 shows both the median and 95%ile for the last 9 years for each site. Trends in water quality for each site are shown in Figure 8. Water quality has significantly improved at Anakiwa, Picton Foreshore and Momorangi. There has been some improvement in water quality at Tirimoana, and Portage. Microbial source tracking carried out at Momorangi did not identify humans or ruminants as sources (Cornelisen *et al.*, 2012). The investigation did not look at birds as a source, however previous studies plus knowledge of the catchment indicates that birds such as ducks and seagulls at the site are the most likely cause of the contamination (MDC, 2008). Variations in duck and seagull populations can be attributed to the improvement shown at Momorangi. Water quality has significantly declined at Moenui. Oyster Bay also shows a decline in water quality. Ruminants have been identified as the main source of faecal contamination (Cornelisen *et al.*, 2012). Faecal contamination from ruminant is most likely from the Pelorus, Kaituna and Cullens Creek catchment where dairying and drystock are the dominant farm practices. The remainder of the sites show no discernible trends.

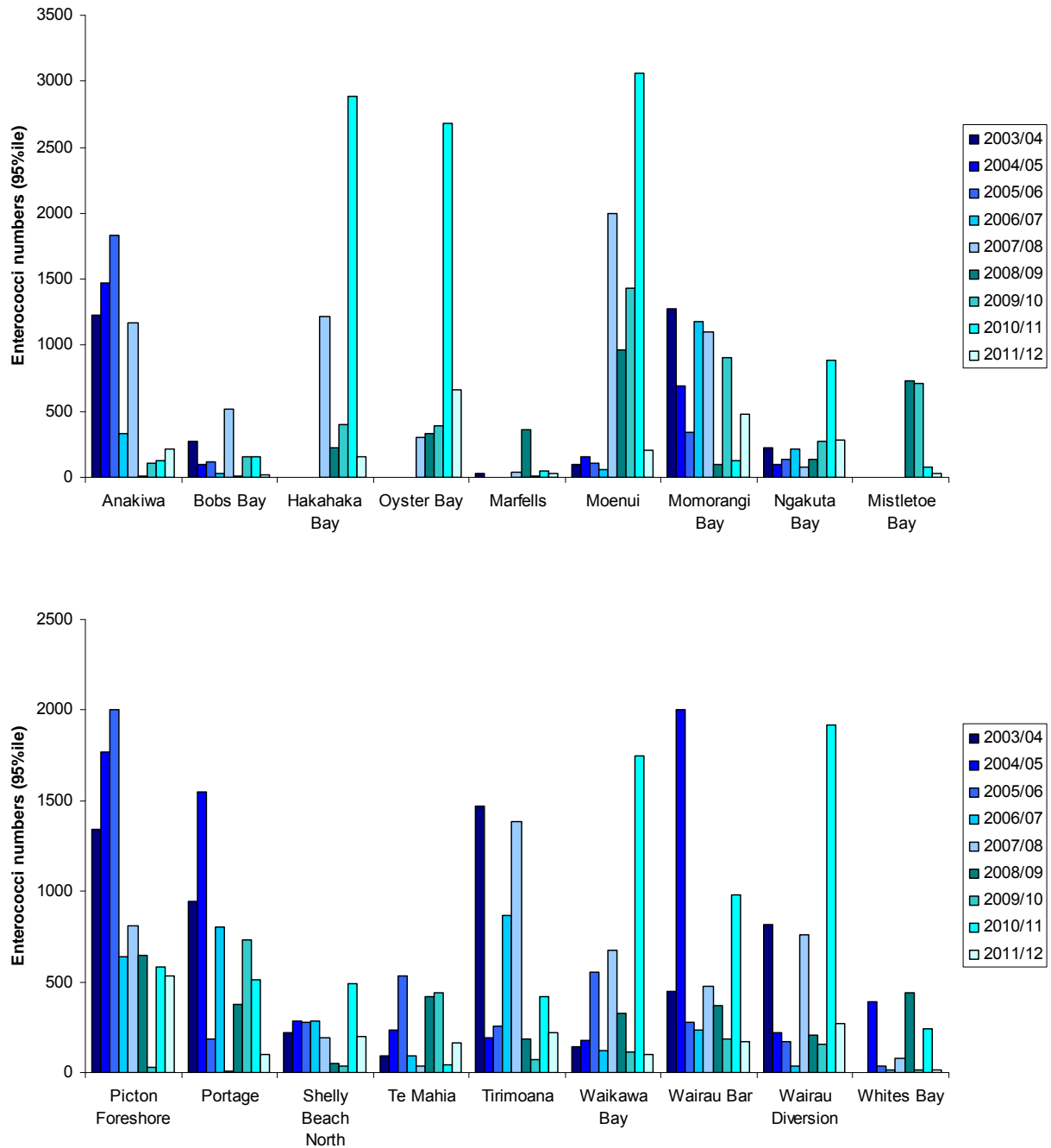


Figure 8: The 95%ile for each coastal site for each summer season from 2003 to 2012.

5.1.3. Suitability for Recreation Grades (SFRGs) 2011-12

The Suitability for Recreation Grades have been calculated using the latest five years of microbiological data and the SIC classes which were reassessed in 2009, 2011 and 2012. SIC classes for individual sites are updated when new information about the site becomes available e.g. microbial source tracking showed water quality at Moenui was heavily influenced by agriculture in the surrounding catchments (MDC, 2012). Complete results are shown in Appendix 6. Seventeen of the eighteen sites have complete datasets over the last five years for the calculation of the MAC grade. Mistletoe Bay requires one more year of data in order to have a complete dataset. The results are shown in Table 6.

There were four changes in beach grades from the previous year, all of which were improvements. Hakahaka Bay improved from 'Very Poor' to 'Poor'; Momorangi improved from 'Poor' to 'Fair'; Portage improved from 'Very Poor' to 'Good' and Tirimoana improved from 'Fair' to 'Good'.

Only three sites showed a deterioration in 2011-12 from their long term results, namely Anakiwa, Tirimoana and Ngakuta Bay. It is likely that the sources influencing water quality at Anakiwa and Tirimoana are similar. Dairying in the Linkwater catchment may influence water quality as far as Anakiwa and thus further investigations into the sources of bacterial contamination is recommended for these sites. Water quality at Ngakuta Bay is generally very good, thus a deterioration in water quality here is of concern.

Improvements against long term results were made at Bobs Bay, Hakahaka Bay, Mistletoe Bay, Moenui and the Wairau Bar.

Table 5: Suitability for Recreation Grades for Marlborough's Coastal Bathing water sites

Site	MAC Grade* Summer season 2011-12	MAC Grade** long term (5 years)	MAC** dataset	MAC Trend	SFRG	Status of SFRG grade
Anakiwa	C	B	Complete	↓	Good	Complete
Bobs Bay	A	B	Complete	↑	Very Good	Complete
Hakahaka Bay	B	C	Complete	↑	Poor	Complete
Marfells Beach	A	A	Complete	↔	Very Good	Complete
Mistletoe Bay	A	B	Interim	↑	Very Good	Complete
Moenui	C	D	Complete	↑	Very Poor	Complete
Momorangi Bay	C	C	Complete	↔	Fair	Complete
Ngakuta Bay	C	B	Complete	↓	Very Good	Complete
Oyster Bay	D	D	Complete	↔	Very Poor	Complete
Picton Foreshore	D	D	Complete	↔	Very Poor	Complete
Portage	B	B	Complete	↔	Good	Complete
Shelly Beach North	B	B	Complete	↔	Good	Complete
Te Mahia	B	B	Complete	↔	Very Good	Complete
Tirimoana	C	B	Complete	↓	Good	Complete
Waikawa Bay	B	B	Complete	↔	Good	Complete
Wairau Bar	B	C	Complete	↑	Fair	Complete
Wairau Diversion	C	C	Complete	↔	Fair	Complete
Whites Bay	A	A	Complete	↔	Very Good	Complete

* Based on the 95th percentile (Hazen) for the 2011-12 Bathing Water season.

** Calculated using MfEs' Bathewatch programme, includes the latest 5 years of microbiological data

Where there are apparent inconsistencies in the recorded microbiological data and the SIC, Bathewatch calculates the most conservative grade for the site and flags the grade as an 'Irreconcilable Follow-up Grade'. There were no inconsistencies in the microbiological data and the SIC for any of the sites.

Figure 9 shows the percentage of sites that fall within each SFRG grade. About a quarter of all sites are graded as 'Poor' or 'Very Poor' whilst nearly two thirds are graded as 'Good' or 'Very Good'.

Coastal Beach Grades

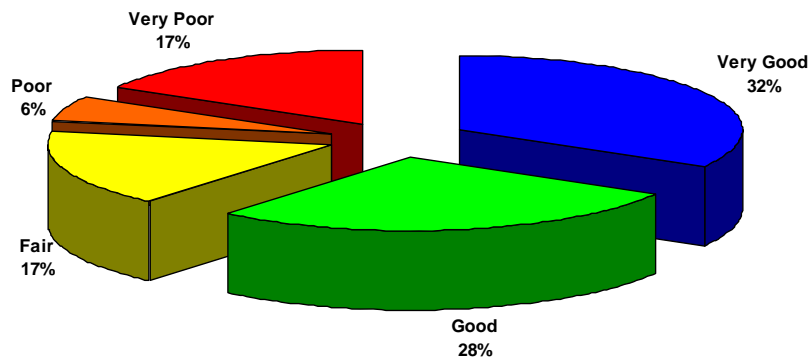


Figure 9: Pie-chart of SFRG's for the marine bathing water sites for the summer 2011-12.

5.2. Rivers

5.2.1. 2011-12 Summer Results

The percentage of time in which river sites were deemed safe or otherwise for swimming is shown in figure 10. About half of the thirteen sites were deemed safe for swimming for more than 95% of the time whilst five was deemed safe for swimming for 100% of the time. This is an improvement from the previous year. The best water quality is from the Wairau, Waihopai and upper Pelorus. Poorest water quality occurs in the Taylor River and Rai River. Whilst water quality is excellent for the Wairau River, the Wairau Diversion has poorer water quality, possibly as a result of land use practices in the direct vicinity.

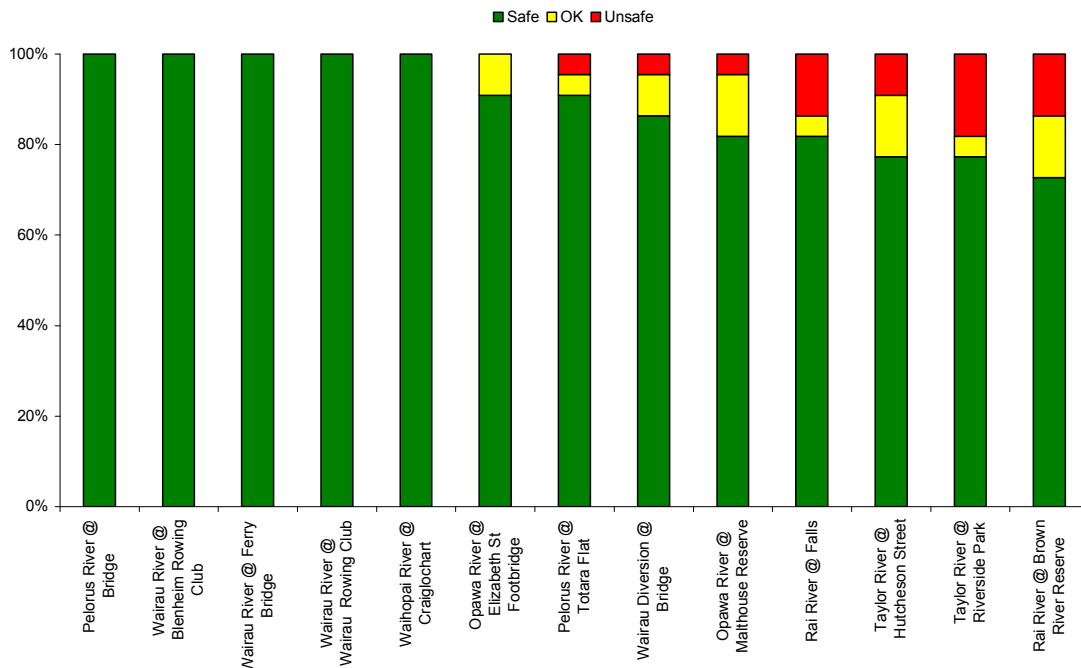


Figure 10: Freshwater bathing sites ranked according to the percentage of time they were suitable for contact recreation.

Water quality in the Rai River is affected by farming (predominately dairy farming) in the catchment (MDC, 2012). Poor water quality from the Rai River also has an effect downstream in the Pelorus River. The best water quality in the Rai/Pelorus catchment was recorded at the Pelorus Bridge. Bathing water quality did not exceed either the alert or action level guidelines at this site (figure 11). Even after rainfall, exceedances are rare at this site. The remaining sites in the Pelorus catchment (Rai Falls, the Rai at Brown River Reserve and the Pelorus at Totara Flat) all exceeded the guidelines during heavy rain (figure 11). Good water quality at the Pelorus Bridge site will be as a result of low development within the catchment and also good land management practices being used at both the campground and on farmland located upstream.

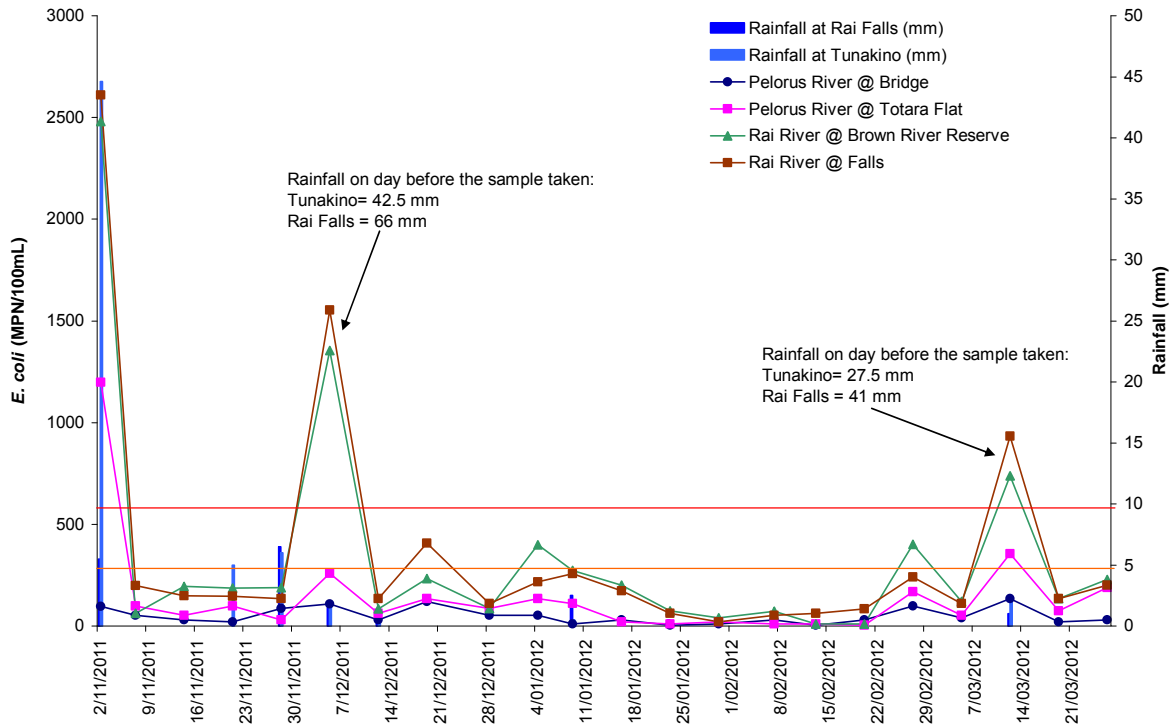


Figure 11: *E. coli* numbers recorded in the Rai/Pelorus catchment.

5.2.2. Recent Trends

An overall improvement is observed in freshwater recreational water quality over a nine year period (figure 12). Improvements in land management practices, such as the elimination of stream crossings in the Rai Catchment, have helped to improve overall bathing water quality in rivers. Diffuse pollution is the biggest contributor to bacteria loads in Marlborough’s rivers and therefore land management practices need to be improved in order to see improvements in river water quality. Rainfall from year to year will have some influence on water quality but will not be solely responsible for bathing water quality.

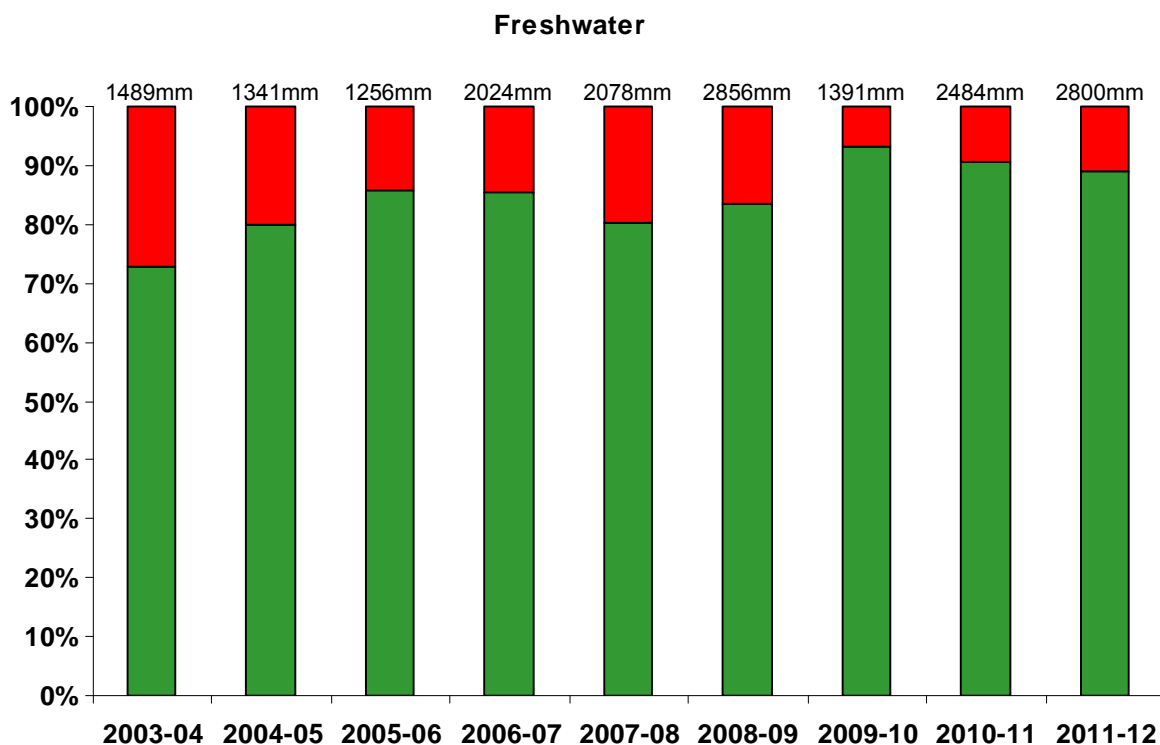


Figure 12: Percentage compliance with the bathing water guidelines from 2003 to 2012 at freshwater sites. Compliance is denoted by the green bars and non-compliance with the red bars. Total summer rainfall from four key sites in Marlborough is shown above each bar for each summer.

Appendix 5 shows both the median and 95%ile for the last 9 years for each site. Trends in water quality for each site are shown in Figures 13 and 14. A decrease in the 95%ile is observed for the Opawa at Elizabeth Street footbridge and for Pelorus Bridge, a slight decrease is seen at the Taylor at Hutcheson Street. An increase in the 95%ile is observed at the Taylor River at Riverside, despite a decrease being observed at Hutcheson. There is no discernible trend for the remaining sites. Trends in 95%ile numbers may be difficult to detect as the upper detection limits have changed over the years.

The median numbers show slightly different trends. There is a slight decrease in the median numbers at the Opawa at Elizabeth Street footbridge but the trend is not as apparent as for the 95%ile. Pelorus Bridge shows no change in median numbers; however this is likely a reflection of low median numbers that are not subject to change much. Decreases in the median number are observed at the Waihopai River, Wairau River at Ferry Bridge, Wairau River at the Wairau Rowing Club. A slight decrease is observed at the Rai River sites. There are no increases in median numbers observed at any of the sites.

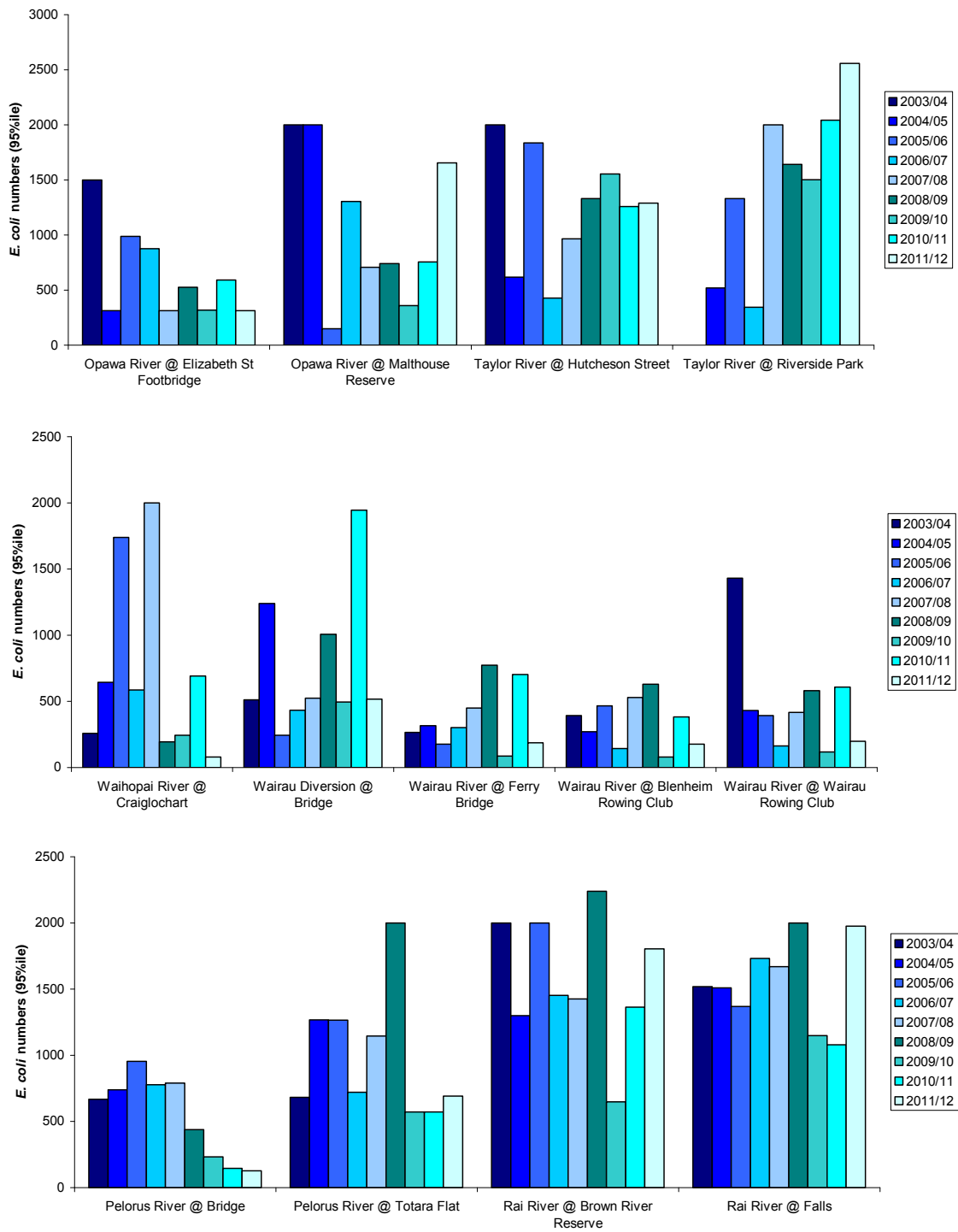


Figure 13: The 95%ile for each river site for each summer season from 2003 to 2012.

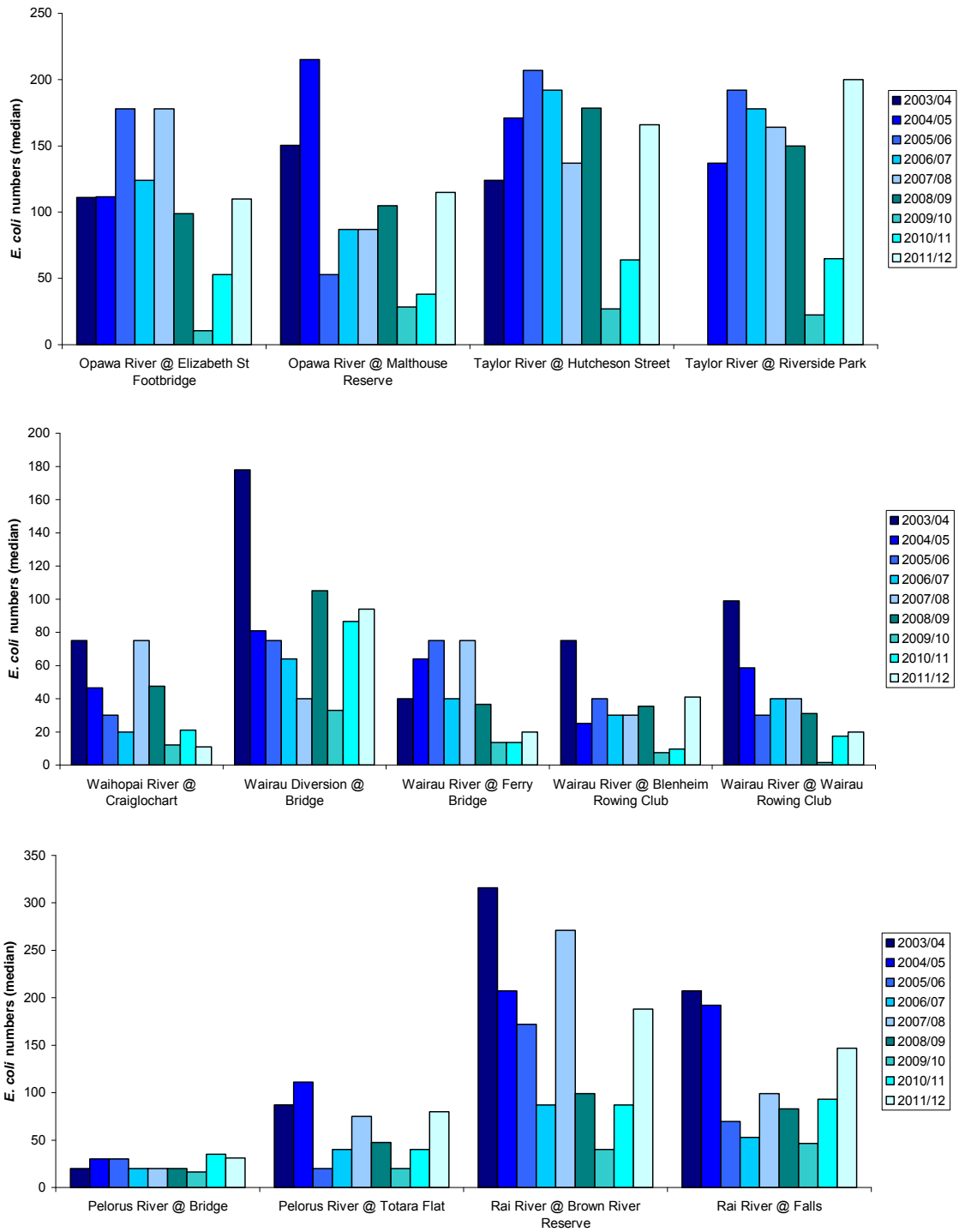


Figure 14: The median for each river site for each summer season from 2003 to 2012.

Over this nine year period the worst sites are located on the Rai and the Taylor rivers (Figure 15).

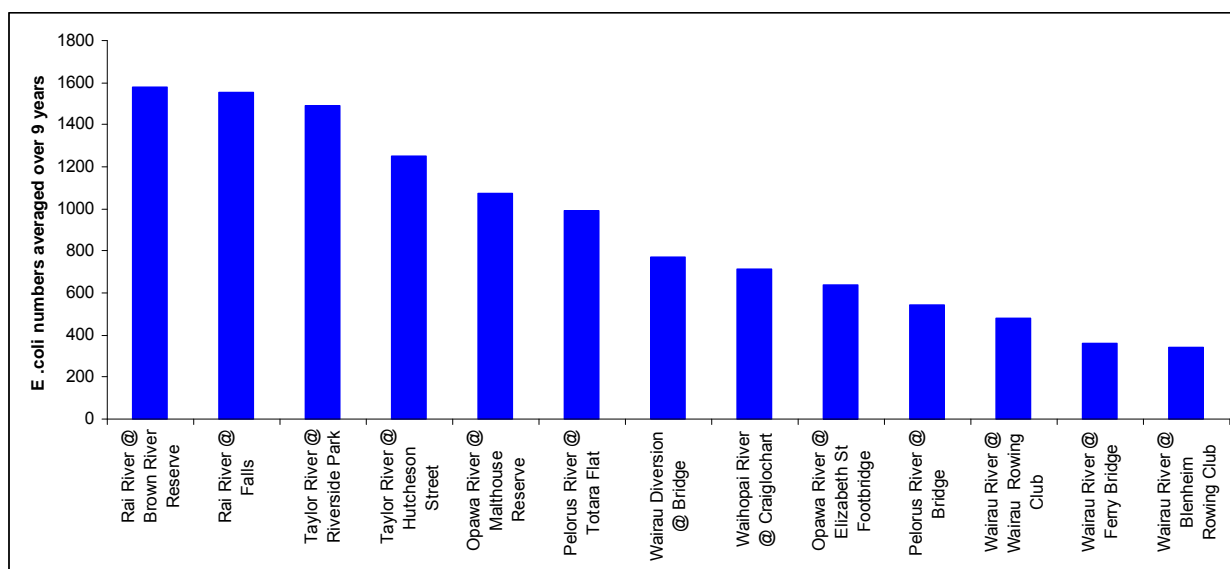


Figure 15: Freshwater sites ranked according to average *E. coli* numbers over 9 years

5.2.3. Suitability for Recreation Grades (SFRGs) 2011-12

The Suitability for Recreation Grades have been calculated using the latest five years of microbiological data and the SIC classes which were reassessed in 2009; complete results are shown in Appendix 6. Long term data exists for all sites sampled and thus it is possible to calculate the SFRG grade for all sites. SFRG's are complete for all sites. The results are shown in Table 6.

Table 6: Suitability for Recreation Grades for Marlborough's Freshwater recreation sites

Site	MAC Grade* Summer season 2011-12	MAC Grade** long term (5 years)	MAC ** dataset	Trend	SFRG	Status of SFRG grade
Opawa at Elizabeth St Footbridge	C	C	Complete	↔	Fair	Complete
Opawa at Malthouse Reserve	D	D	Complete	↔	Poor	Complete
Pelorus Bridge	A	B	Complete	↑	Good	Complete
Pelorus at Totara Flat	D	D	Complete	↔	Very Poor	Complete
Rai at Brown River Reserve	D	D	Complete	↔	Very Poor	Complete
Rai at Rai Falls	D	D	Complete	↔	Very Poor	Complete
Taylor at Hutcheson	D	D	Complete	↔	Very Poor	Complete
Taylor at Riverside	D	D	Complete	↔	Very Poor	Complete
Waihopai at Craiglochart	A	D	Complete	↑	Poor	Complete
Wairau at Blenheim Rowing Club	B	C	Complete	↑	Fair	Complete
Wairau at Ferry Bridge	B	C	Complete	↑	Fair	Complete
Wairau at Wairau Rowing Club	B	C	Complete	↑	Fair	Complete
Wairau Diversion at Neals Road	C	D	Complete	↑	Poor	Complete

* Based on the 95th percentile (Hazen) for the 2009-10 Bathing Water season.

** Calculated using MfEs' Bathewatch programme, includes the latest 5 years of microbiological data

About half of sites show an improvement and half show no change in the MAC grade for the 2010-11 over the long term. The beach grade (SFRG) for the Pelorus at the state highway bridge improved from 'Fair' to 'Good', however the Wairau at Wairau Rowing Club deteriorated from 'Good' to 'Fair', thus there is no net change in the number of sites classed as 'Good'.

Figure 16 shows the percentage of sites that fall within each SFRG grade. Last year the grade at Pelorus Bridge improved from 'Poor' to 'Fair', this year it has improved from 'Fair' to 'Good'. Just over 60% of sites are graded as 'Poor' or 'Very Poor', this is the same as last year but an improvement on 3 years ago.

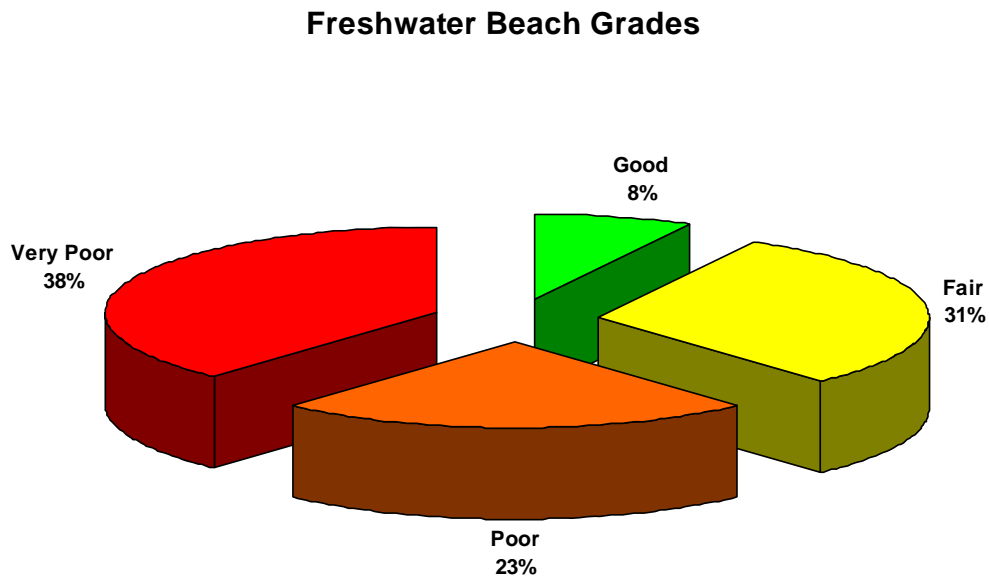


Figure 16: Pie-chart of SFRG's for the freshwater bathing water sites for the summer 2011-12.

6. Bathing Water Survey

A review of the number and location of recreational water quality sites was required in order to ensure that the most popular and frequently used sites were included in the routine monitoring programme. Over the years the number and location of sites has changed, however this change has not always reflected the popularity/use of the site. Weekly monitoring during the summer months is based on MfE's guidelines for assessing the risk of contracting illness/infection from polluted waters; this risk is based on the number of people estimated to use the site, therefore the primary driver for including a site in the recreational water quality monitoring programme should be frequency/popularity of use.

A bathing water survey was carried out in January/February 2012. The survey consisted of:

- An aerial flight of the region over what was perceived to be a high use weekend i.e. the weekend was warm and fine and followed a week of hot sunny weather.
- Onsite questionnaires carried out over a period of 6 weeks at numerous river and coastal spots (Appendix 8).

The primary focus of the survey was to assess the locations most popular for contact recreation activities, the numbers of people using these areas, main activities carried out at these areas and the factors that contribute to the enjoyment of these areas. Routine monitoring of beaches and rivers during the summer months includes making a note of the number of individuals at a site and the activities being carried out. However routine monitoring occurs during weekdays and generally between 8am and 3pm (to allow for water samples to be collected and dropped to the laboratory for analysis within 24hrs of collection) and these times do not correspond to peak use periods which tend to be weekends from 1pm to 7pm and during the week from 3pm to 7pm.

New Years weekend was cold and wet for most of Marlborough, however hot sunny weather returned from the 3rd January. Routine monitoring was carried out on the 4th, 5th and 6th of January, which although not weekend days would probably still be a period when most people were on holidays. The numbers of people at each of the current bathing water sites were counted (Table 7) and the results taken into account for this survey. Water quality monitoring is usually carried out between 8am and 3pm, which falls outside of the peak hours for contact recreation (deemed to be between 1pm and 6pm, (Tasman 2011)). However the resource involved in being at all sites during peak times of the day and for peak weather conditions was prohibitive.

Table 7: Individuals counted during routine monitoring of sites from 4th to 6th January

Site name	Time at site	Number of people at beach
Anakiwa	2:45pm	20 swimmers, 4 kayakers, beach very busy
Bobs Bay	11:15am	2 swimmers, 4 picnickers
Hakahaka Bay	10:00am	0, several boats moored offshore
Marfells Beach	11:10	5 swimmers, camp ground full
Mistletoe Bay	2:00pm	12 swimmers, campground full
Moenui	11:35am	2 swimmers, 1 boat
Momorangi Bay	3:15pm	16 swimmers, 3 jet skis, campsite full
Ngakuta Bay	3:30pm	26 swimmers, 4 kayakers, 2 jet skis
Oyster Bay	10:15am	0, a floating 'cabin' moored on beach
Picton Foreshore	12:15pm	22 picnickers
Portage	1:40pm	1 swimmer, 1 kayaker, car park full, mostly with boat trailers
Shelly Beach North	12:00pm	15 picnickers, youth yacht club sailing
Te Mahia	1:00pm	4 swimmers, 6 picnickers, 1 boat
Tirimoana	3:00pm	3 walkers
Waikawa Bay	10:30am	3 people fishing, 2 picnickers
Wairau Bar	1:50	1 windsurfer, 3 boat trailers parked

Site name	Time at site	Number of people at beach
Wairau Diversion	1:00pm	8 fishermen, 3 swimmers
Whites Bay	1:00pm	Approx 100 people on beach, 20 swimmers, 2 kayakers
Taylor @ Hutcheson Street Bridge	9:25pm	4 walkers, 1 dog swimming
Taylor @ Riverside	9:45am	0
Opawa @ Malthouse Reserve	12:10pm	2 kayakers, 1 motor boat
Opawa @ Elizabeth Street Footbridge	9:35am	0
Wairau @ Blenheim Rowing Club	2:45pm	3 picnickers, 1 jet skier, 1 swimmer
Wairau @ Wairau Rowing Club	2:20pm	0
Wairau @ Ferry Bridge	1:30pm	2 picnickers, 3 swimmers
Wairau Diversion @ Neals Road	12:40pm	0
Pelorus @ Totara Flat	11:00am	20 picnickers
Rai @ Brown River Reserve	10:00am	2 picnickers
Rai @ Rai Falls	10:30am	0
Pelorus @ Pelorus Bridge	10:45am	10 swimmers
Waihopai @ Craiglochart Bridge # 2	8:45am	0

6.1. Aerial Survey

The aerial survey was carried out on what was a moderately peak summers weekend (21 January 2012). The peak periods are acknowledged to be Christmas/New Years and Waitangi weekend, however even these weekends depend on good weather to entice crowds to the beaches and swimming spots.

A four passenger jet ranger from Marlborough Helicopters Ltd was hired for the survey. The flight left Omaka airfield at 1pm and returned by 4pm. The day of the aerial survey was predominately sunny with some high cloud. The top temperature recorded for Blenheim was 25.8°C with a NW breeze. The wind picked up later in the afternoon. The day of the survey followed a week of hot, sunny weather for the Marlborough region and so can be considered to be a moderately peak day in terms of contact recreation at rivers and beaches. There were two events held that weekend, the Picton Maritime Annual Festival and the rowing club regatta on the lower Wairau. The flight path taken is shown in Appendix 7. It was not possible to carry out the survey on the East coast of the region due to time constraints on the day, a follow up flight did not eventuate as the weather deteriorated from that week onwards. The 2011-12 summer was colder with less sunshine hours than typical for Marlborough which made it a less than ideal summer in which to carry out the survey; however the results can still be considered meaningful.

The aerial survey showed that the most popular swimming beaches and river spots were Whites Bay, Robin Hood Bay, Picton Foreshore and Pelorus Bridge. Moderately busy sites included Governors Bay, Ngakuta Bay, Momorangi Bay, Anakiwa, Mistletoe Bay, Moetapu Bay, Titirangi Bay, French Pass, Okiwi Bay and the Wairau River between SH1 bridge and the Waihopai confluence. The Pelorus and Wairau rivers differed in their use, where the Pelorus River had people concentrated around the Pelorus Bridge and the Wairau had people evenly spread out from the SH1 bridge to the Waihopai confluence.

Swimming, boating, fishing, diving was noted throughout the Sounds to a greater or lesser degree. Many beaches/bays in the Sounds are difficult to access, either there is no road access or there is no or difficult public access. Kayaking was a popular activity noted in the Sounds during the flight and probably reflects the ability and desire to visit secluded, uncrowded beaches and bays. Small boats were also widely observed; fishing, diving and snorkelling were the main activities observed from small boats.

Photo 1



Photos 1 and 2: Whites Bay, approx 70 people counted on the beach

Photo 2:



Photos 3 and 4: Rowers at the Blenheim Rowing Club on the lower Wairau River



Photo 4



Photo 5: Robin Hood Bay, a popular camping spot used by swimmers, surfers and kayakers



Photo 6: Waikawa Bay with swimming markers and platform



Photo 7: Busy weekend at Picton Foreshore



Photo 8: Governors Bay with approximately 40 people on the beach



Photo 9



Photos 9 and 10: Snorkelers and picnickers at Ngakuta Bay

Photo 10



Photos 11- 14: Secluded beaches and bays throughout the Sounds were popular with boaties and kayakers; fishing, swimming, diving and snorkelling were popular activities observed

Photo 11

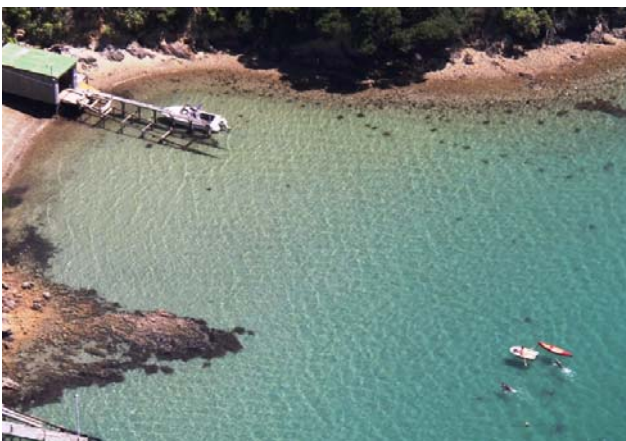


Photo 12

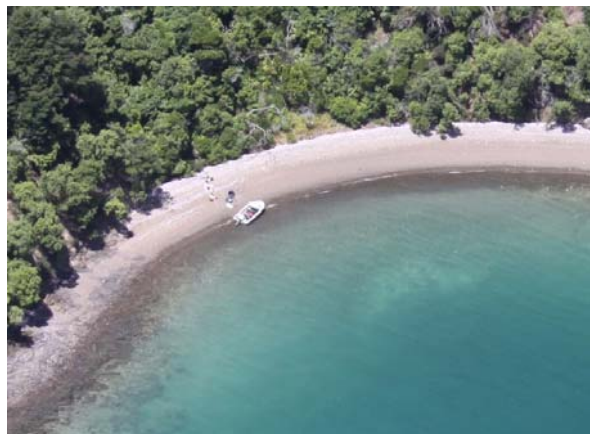


Photo 13

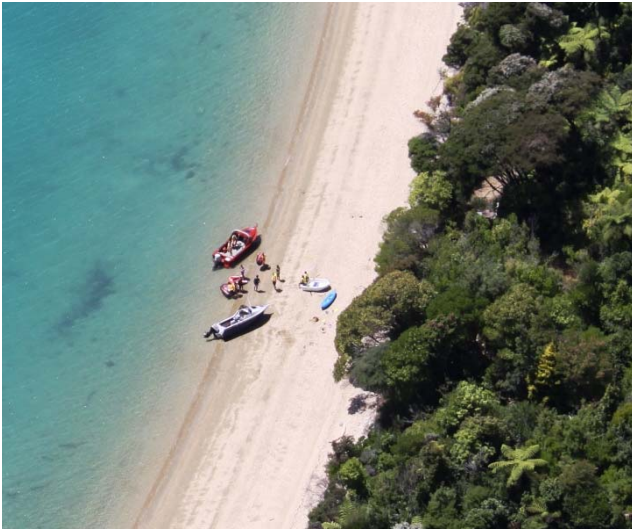


Photo 14

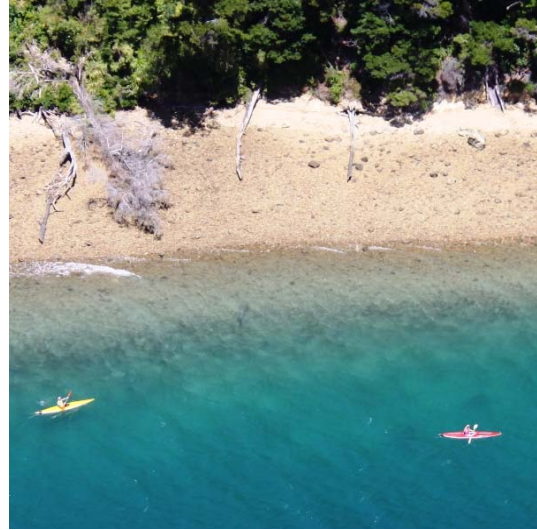


Photo 15: Kayakers at Davies Bay, Queen Charlotte Sound



Photo 16: Titirangi Beach, approximately 10 people observed on the beach, camp site moderately busy



Photo 17: French Pass



Photo 18: French Pass Beach



Photo 19: Children swimming in the Ronga River



Photos 20 and 21: Swimmers in the Pelorus River at Totara Flat



Photo 21



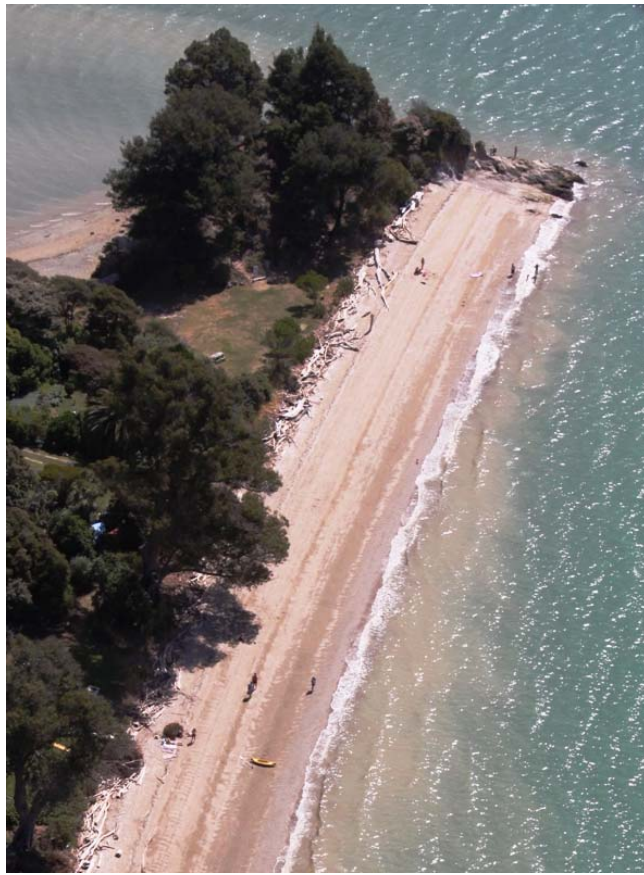
Photos 22-25: Swimmers in the Pelorus River at the Pelorus Bridge. Close to 100 people were observed between Totara Flat and the Pelorus Bridge campground.



Photos 26-27: Wairau River, a couple of the many swimming holes from the Waihopai confluence to SH1



Photos 28-29: Moetapu Beach



Conclusions which can be drawn include:

1. Sites where monitoring occurs should be confined to *high use areas*
2. There is an expectation that water quality (coastal and freshwater) is of a high enough quality to allow contact recreation and shellfish gathering throughout the region. Investigative studies e.g. using MST at selected sites should occur to ensure coastal and surface waters are safe for contact recreation, where problems are known or suspected to occur. Such investigative studies should be set up when required and should have objectives specific to the investigation. It is not possible to monitor every bay or river and thus monitoring will be confined to the high use sites.
3. The predominate activity in the Sounds, away from the main swimming beaches was kayaking and boating/diving.
4. Two main river spots were identified, the Pelorus at SH6 bridge and the Waihopai at Craiglochart bridge number 2. The Wairau had no main swimming spots but swimmers were noted along its length from SH1 bridge to the Waihopai confluence. This is probably a result of the many access points along the river and the ability to drive along the stopbanks to find uncrowded spots. This was backed up by the questionnaires where people often named various swimming holes along the Wairau but specifically named the Pelorus Bridge and the Waihopai at Craiglochart as swimming spots.

It is not possible to monitor all locations on all rivers/coastal areas but yet there is an expectation that water quality is of a standard where it is safe to swim/kayak etc. Rules in the plans should state that there shall be no direct discharges into these waterways and land management practices should ensure there is no runoff of effluent which will impact on water quality, such practices include but are not limited to ensuring adequate storage, assimilative capacity, buffers etc. The causes of faecal pollution are well known as are the management practices to mitigate against it (McKergow *et al.*, 2007).

6.2. On-site Questionnaires

A total of 111 questionnaires were filled out over a period of six weekends from January to February 2012. Five staff from council (comprising of students and permanent staff) and three volunteers from a number of Sounds residents groups carried out the surveys. The questionnaires were carried out between 1pm and 6pm to coincide with peak use periods. Where groups were approached, only one member of the group answered the questions. Overall people were happy to answers the questions and were appreciative that there feedback was important. Every effort was made to include as many locations as possible to ensure a representative response. All of the current sites were monitored, however many of these had such few numbers of people at them that it was not productive to spend too much time there.

6.2.1. Demographics

Coastal areas are more represented (Figure 17) and reflect the fact that greater numbers of people congregate at coastal sites in comparison to river sites, the one exception being the Pelorus River at Pelorus Bridge. Pelorus Bridge is well represented by the survey as the survey was carried out on a very popular day and coincided with the aerial survey. The Pelorus Bridge had the largest count for any river area for the aerial survey.

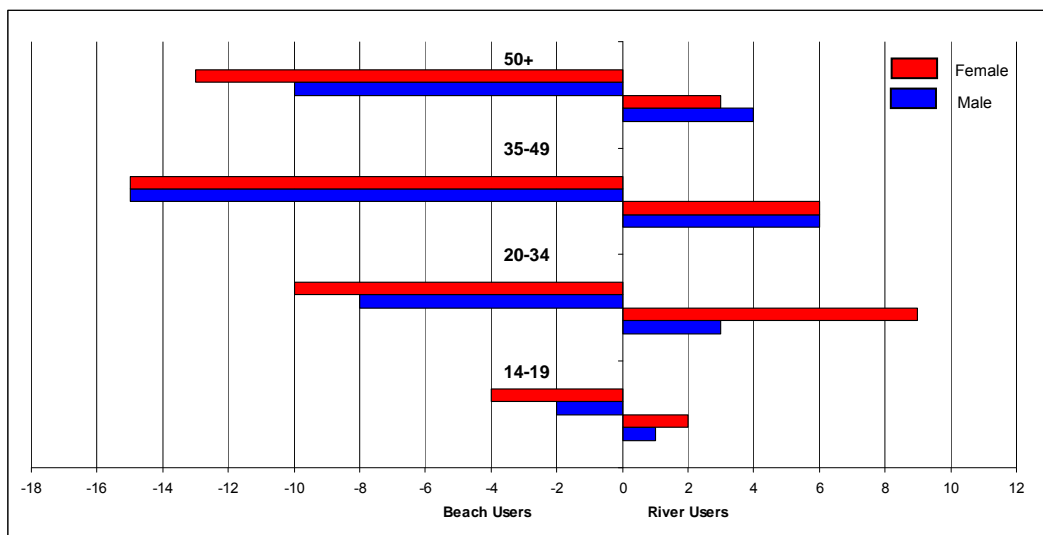


Figure 17: Distribution of respondents with respect to age, sex and location from the onsite questionnaires.

A greater number of females responded to the questionnaires with the exception of males over 50 at river sites. The youngest age group (14-19) had the least number of respondents; this may reflect the reluctance of this group to answer questions or the inherent bias of surveyors to approach older people/groups.

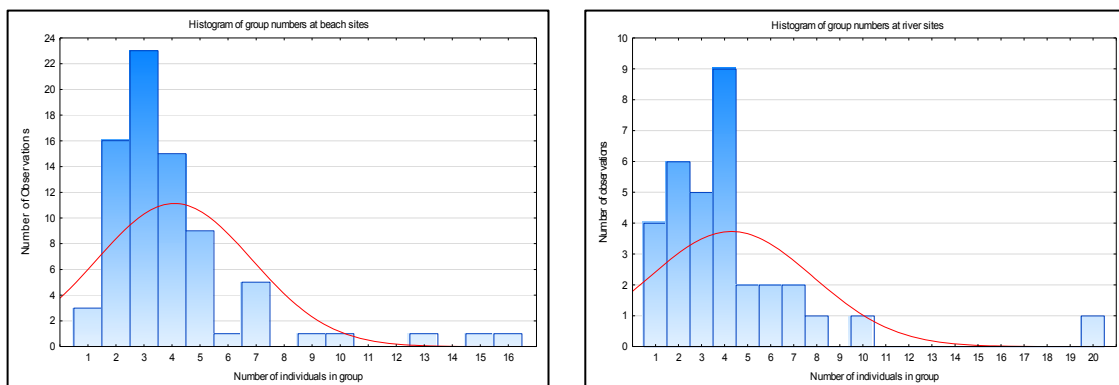


Figure 18: Histogram of group sizes for coastal beaches and river sites.

The size of groups for beach and river sites is shown in figure 18. In general the group size observed was similar for both beach and river sites. More single people were observed at river sites and slightly larger group sizes were observed at beach sites. The most common group size for beach sites was 3 individuals and for river sites was 4 individuals. Approximately a third of both coastal and river groups had children. The number of children at river sites ranged from 1 to 3 whilst slightly larger groups of children (up to seven) were observed for coastal sites.

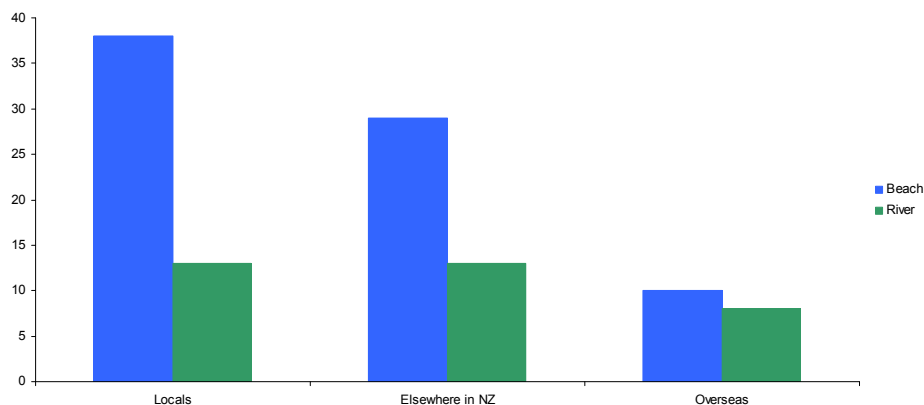


Figure 19: Origin of respondents; from Marlborough, outside of Marlborough and overseas

The origin of respondents was markedly different for river and coastal sites. At river sites the number of locals was very similar to the number of visitors from outside the region and was only marginally higher than the number of overseas visitors (Figure 19). In contrast most of the respondents from coastal locations were locals, the number of visitors from outside the region was marginally less but the number of overseas visitors was markedly less. This was somewhat surprising as it was assumed that coastal areas e.g. the Sounds would be more widely known outside of the region than river swimming sites. It is acknowledged that the sample size was small and therefore future surveys would be best carried out throughout the summer months to obtain a larger sample size, the results could then be compared to determine significance.

6.2.2. Favourite swimming spots and activities

Favourite swimming spots that were named tended to be in the vicinity of where the questionnaire was carried out e.g. those spoken to on the Wairau would mention Whites Bay and those spoken to at Picton Foreshore would also mention Waikawa and Bobs Bay. By far the most common place named was the Pelorus Bridge at SH1. Figure 20 shows the most frequently named sites

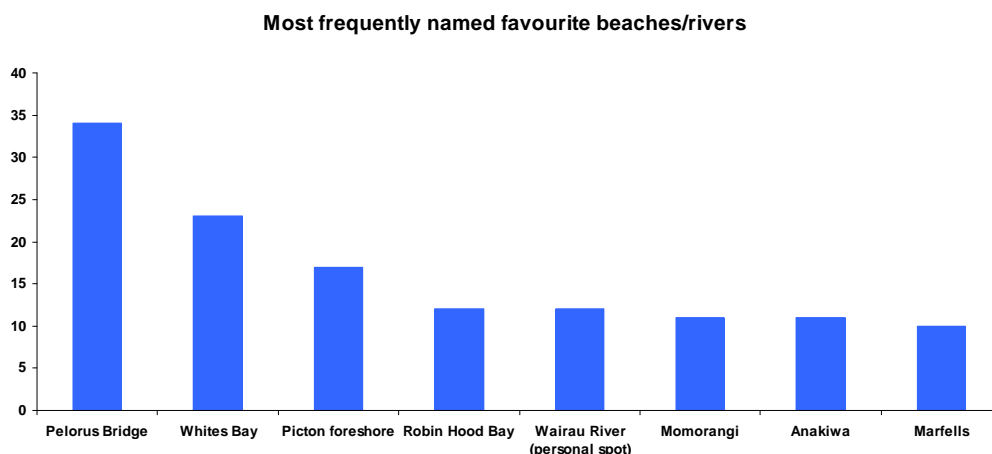


Figure 20: The most frequently named sites from the survey.

Numerous bays around the Sounds were mentioned, many of which were not accessible by road and were assumed to be accessed via private boats/kayaks or water taxi. Some beaches such as Ward and Rarangi

were also mentioned moderately frequently; however these beaches are not generally regarded as swimming beaches due to dangers associated with waves/swells. There were a number of surprising areas mentioned too, such as Lake Chalice and Seddon beach. The most popular activity at the sites was swimming followed by socialising/camping, picnicking, fishing, sunbathing and kayaking.

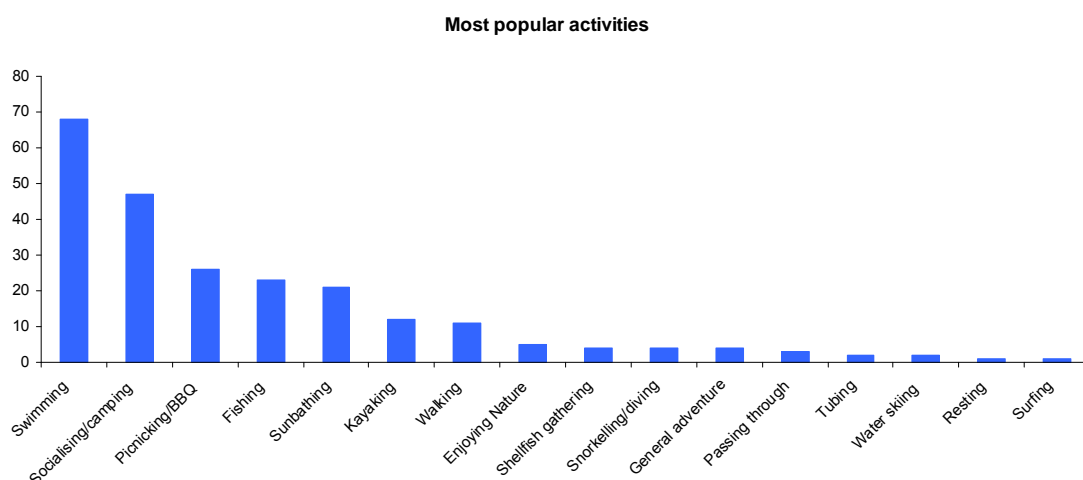


Figure 21: The most popular activities named

Swimming was most often named as the primary reason for being at a site, socialising/camping was second and fishing third.

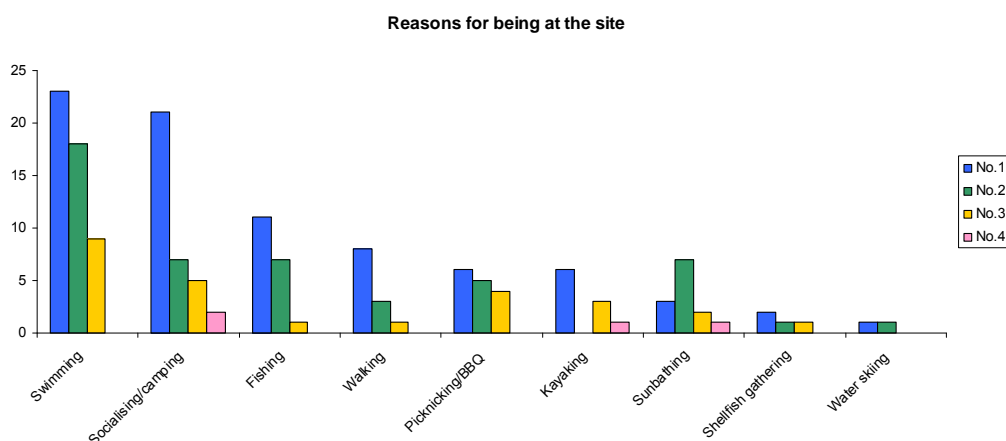


Figure 22: The most popular activities in order of preference.

From the information above it was assumed that whilst swimming was often the reason for being at a site, socialising/camping came a close second, perhaps because sometimes people opt not to go swimming due to the water being too cold, tide being too high/low etc. but still make the effort to go out for the day/weekend etc.

6.2.3. Factors affecting peoples enjoyment at a site

People were asked to rate a number of conditions on a scale of 1 to 5, with 1 being completely unimportant (or irrelevant) and 5 being very important, as to how it influenced the quality of their experience at a site. The 'cleanliness' of a site was the most important factor for people with the levels of disease causing organisms, presence of scums/foams/odour/slimes and the presence of rubbish being the most important factors. Scenery and water clarity were the next most important factors for people at a site. The least important factors were the presence of rope swings/places to jump; being able to take dogs and erosion. About a quarter of respondents said they objected to dogs being on a beach; this increased to just over a third when the respondents who stated they did not mind dogs being present as long as they were controlled and cleaned up after, were taken

into account. Water temperature; deep water; too many other people and the presence of power boats had the most neutral responses. Figures 23 to 41 show the responses amongst the different groups.

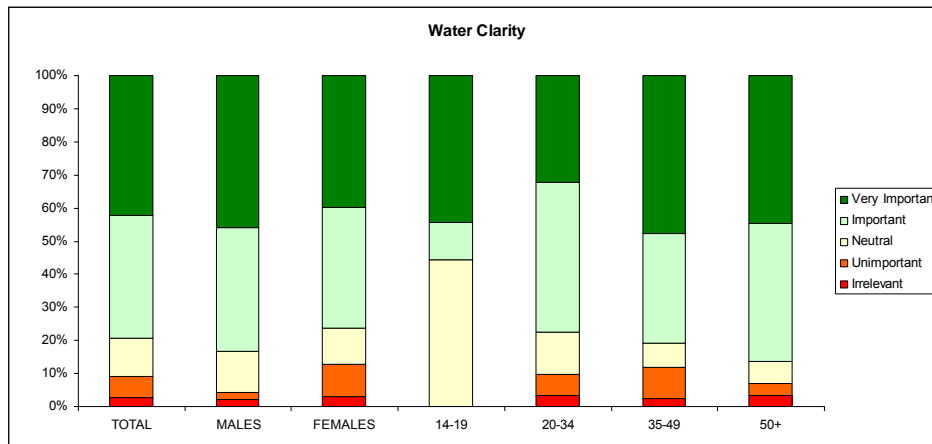


Figure 23: The importance of water clarity among different groups

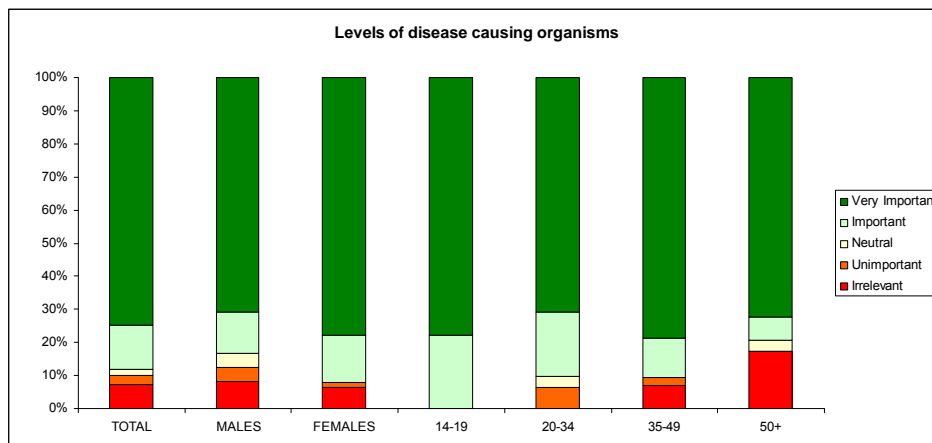


Figure 24: The importance of the presence of disease causing organisms among different groups

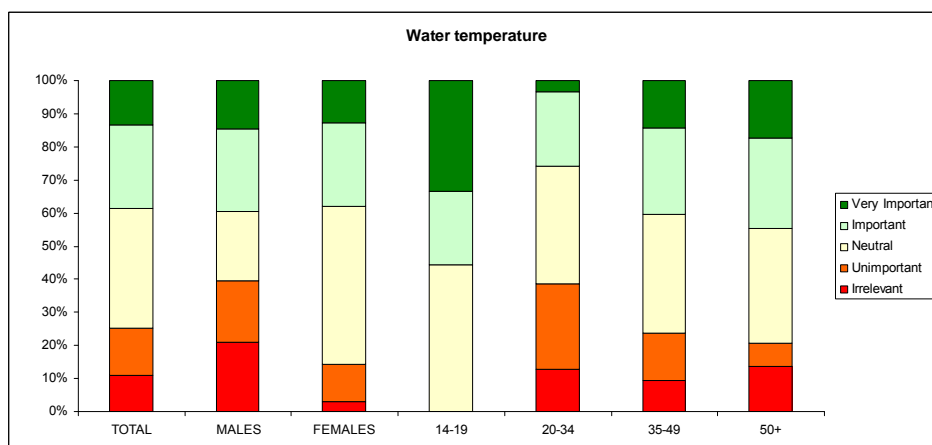


Figure 25: The importance of water temperature among different groups

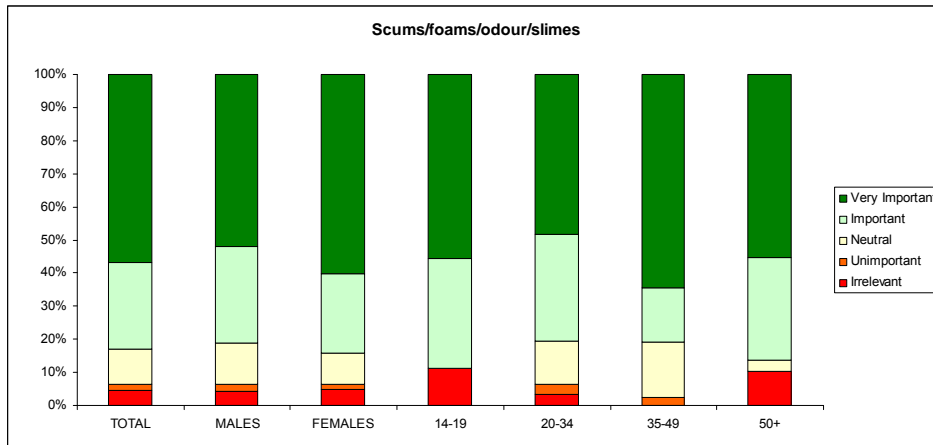


Figure 26: The importance of scums/foams/odours/slimes among different groups

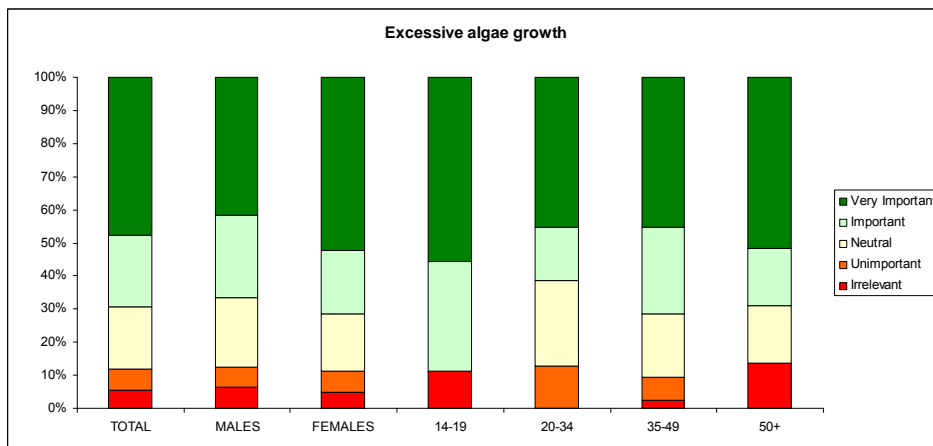


Figure 27: The importance of the presence of excessive algae among different groups

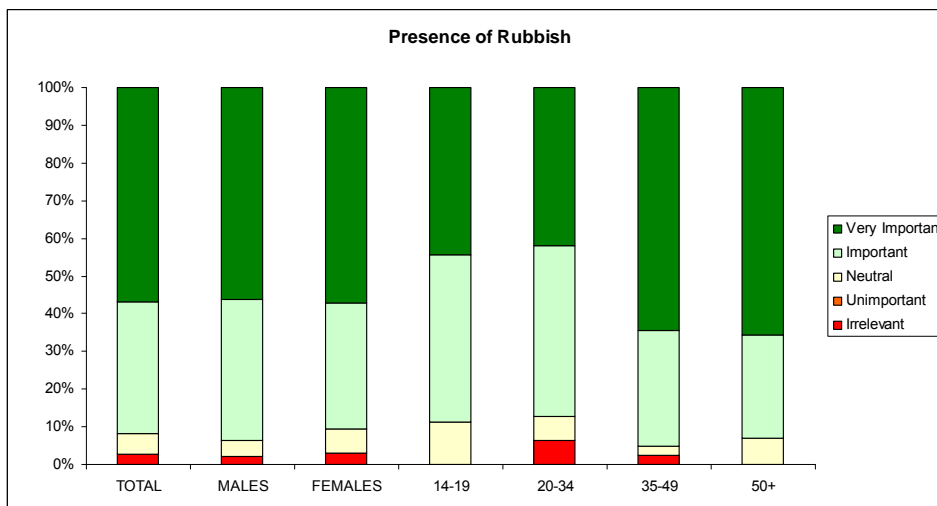


Figure 28: The importance of the presence of rubbish among different groups

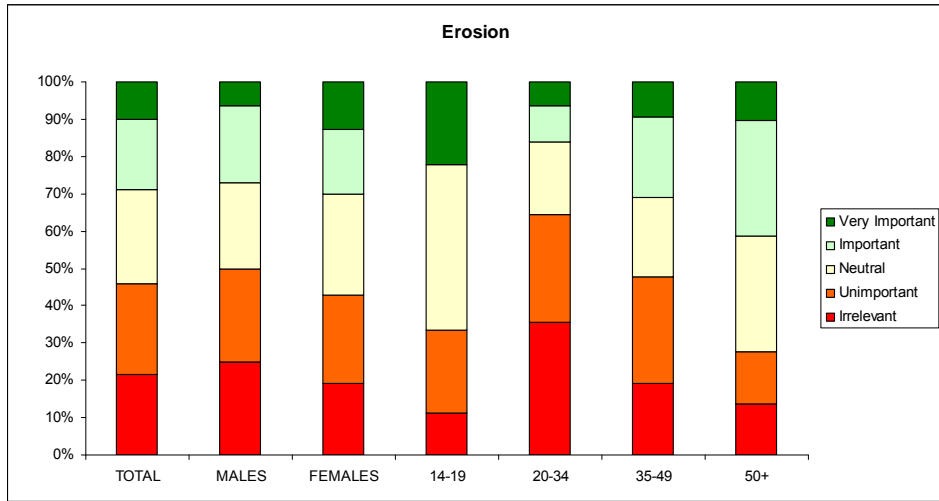


Figure 29: The importance of the presence of rubbish among different groups

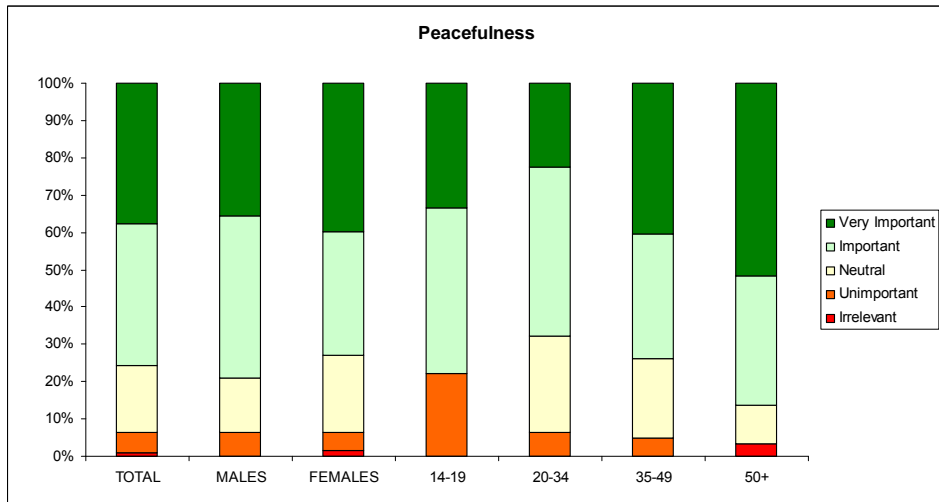


Figure 30: The importance of the peacefulness among different groups

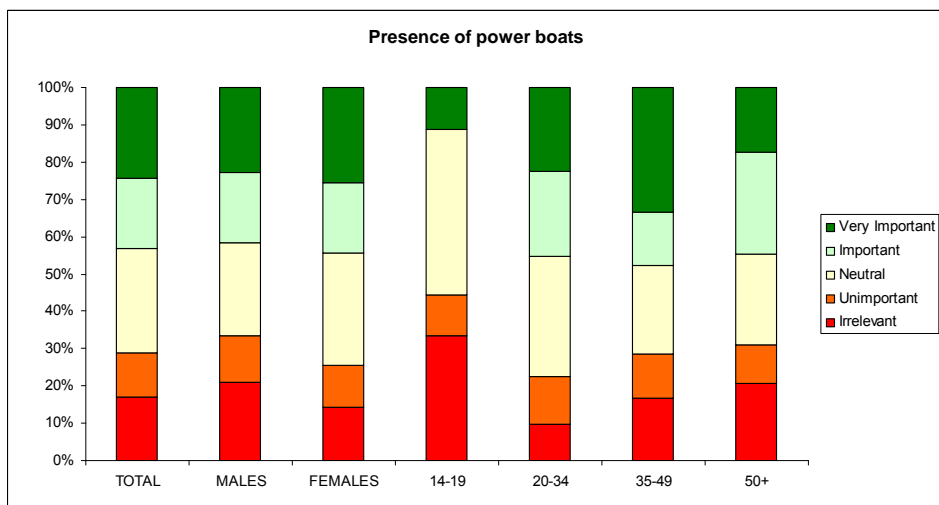


Figure 31: The importance of the presence of power boats among different groups

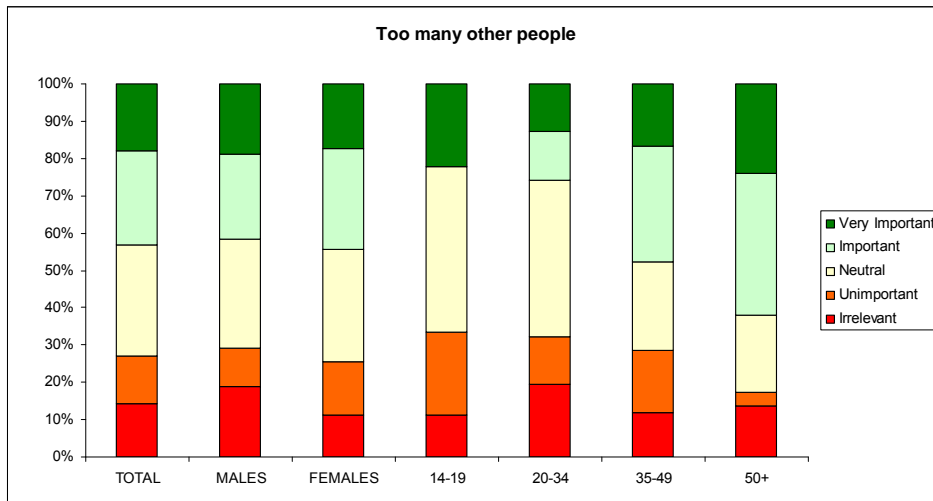


Figure 32: The importance of the presence of too many other people among different groups

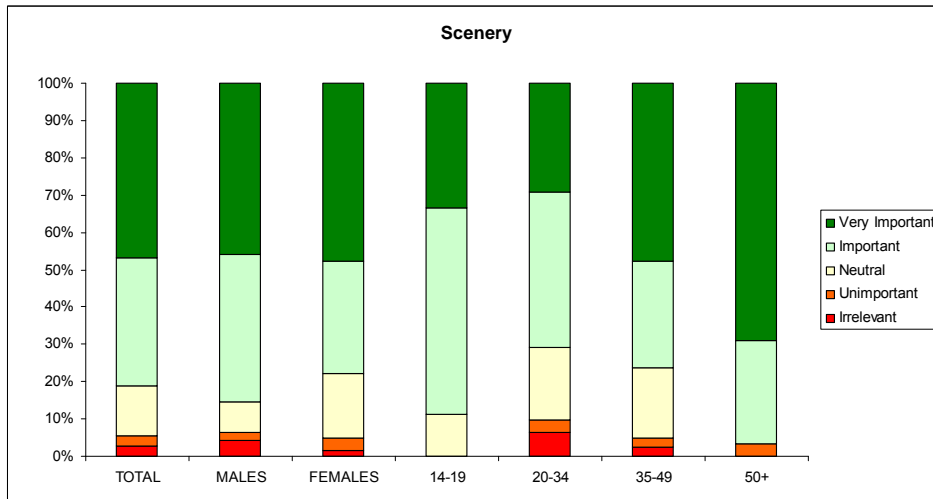


Figure 33: The importance of scenery among different groups

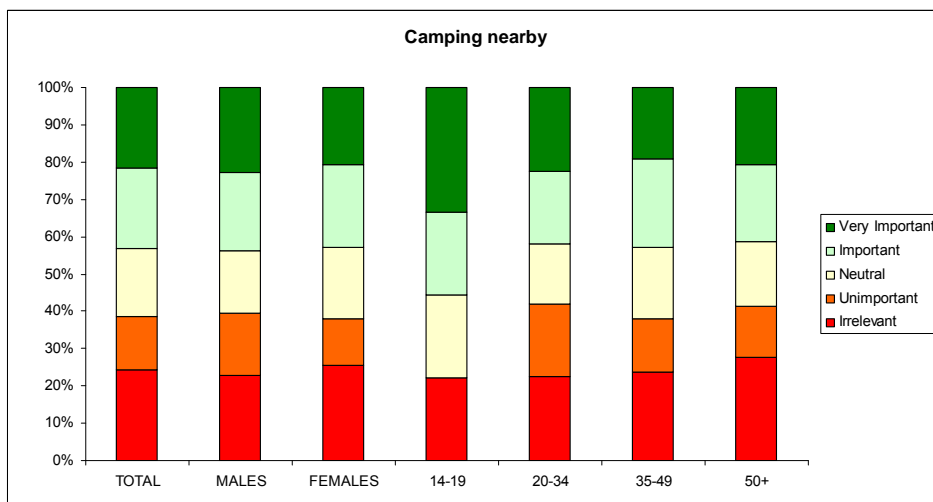


Figure 34: The importance of camping nearby among different groups

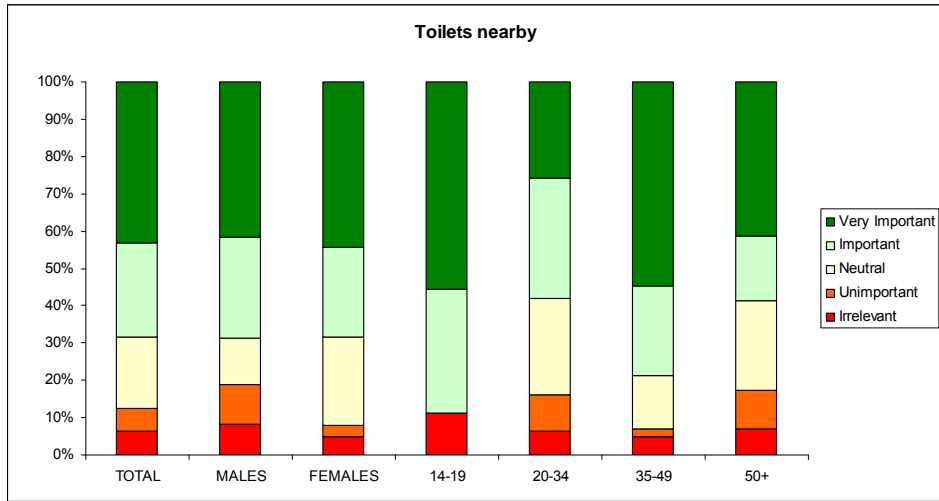


Figure 35: The importance of toilets nearby among different groups

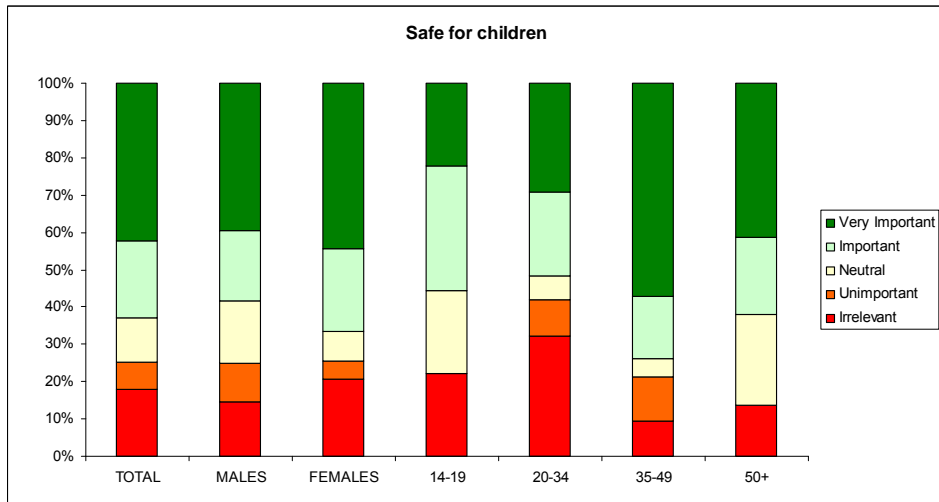


Figure 36: The importance of toilets nearby among different groups

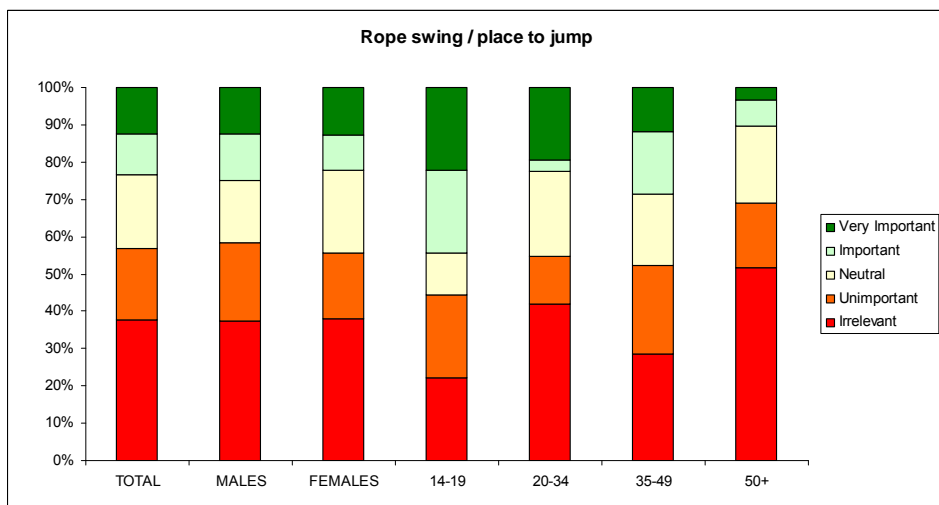


Figure 37: The importance of rope swings/places to jump among different groups

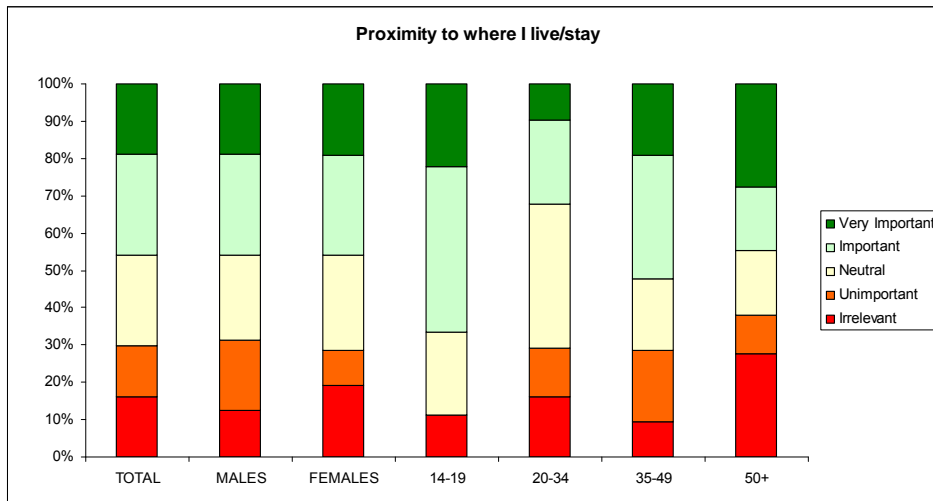


Figure 38: The importance of proximity to swimming spots among different groups

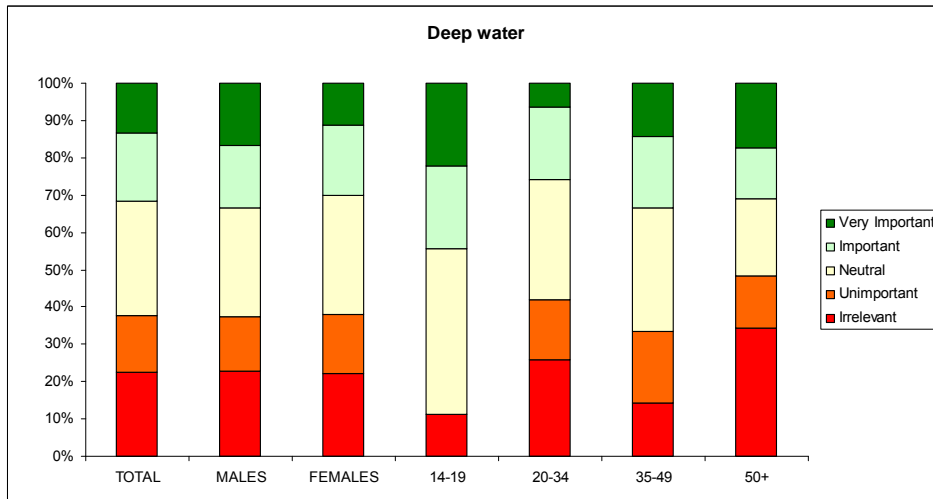


Figure 39: The importance of deep water among different groups

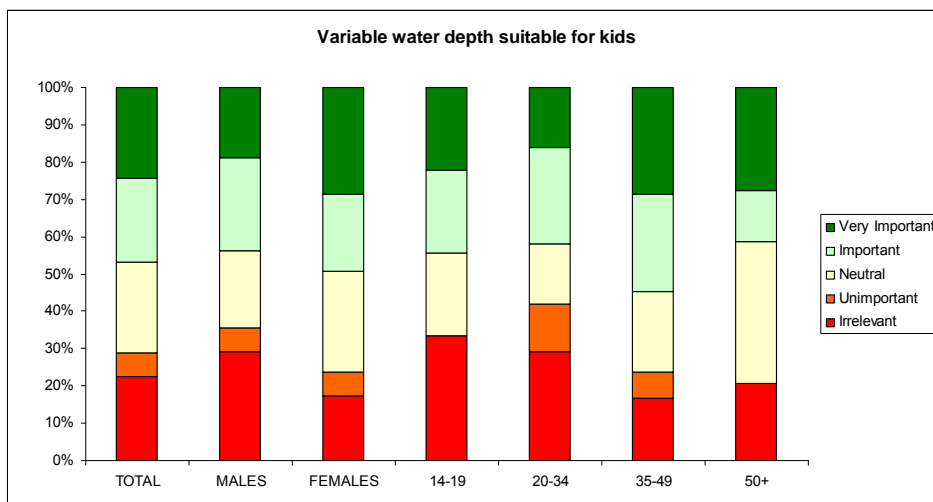


Figure 40: The importance of variable water depth suitable for children among different groups

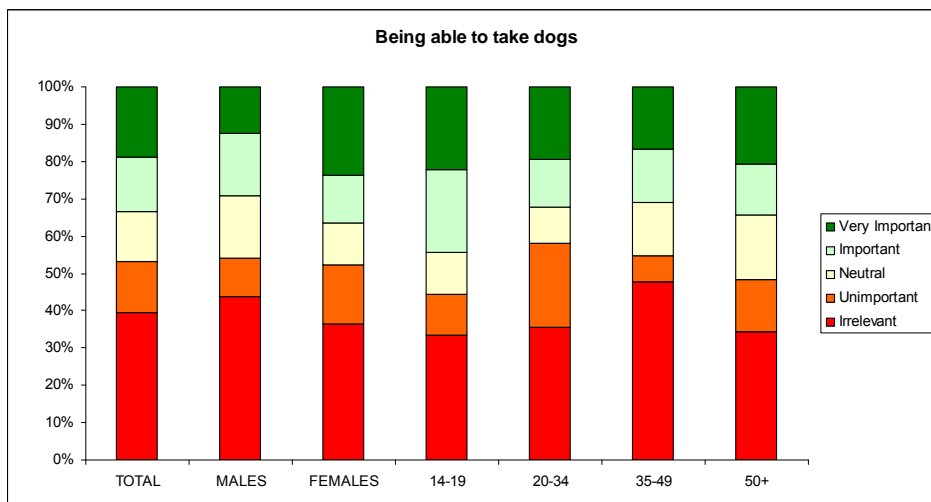


Figure 41: The importance of being able to take dogs among different groups

None of the respondents reported being ill or having had rashes/skin infections from swimming in the regions beaches/ivers (or having known anyone who had). A number responded having had bad experiences abroad (Canada and Ecuador!) and in Wellington and Queenstown (Lake Wakatipu). This is a positive response as it affirms the monitoring results which suggest that the regions beaches and rivers are safe for swimming most of the time. However it is noted that the sample size (111) is small and may not necessarily pick up incidences of illnesses/infection, also it is possible that people getting sick/having infections several days after being in contact with water may not attribute it to being in poor quality water.

6.2.4. Public access to information on water quality

People were asked to state their preference for accessing information on water quality for beaches/ivers in Marlborough. It is not surprising that signs were the most preferential method as it requires no forethought when going to a beach/river. The absence of a sign for most people was an indication that the water quality was good and safe to swim at. Surprisingly the Councils website was the next most favoured method; this is most likely an overall trend for the access of information via the internet.

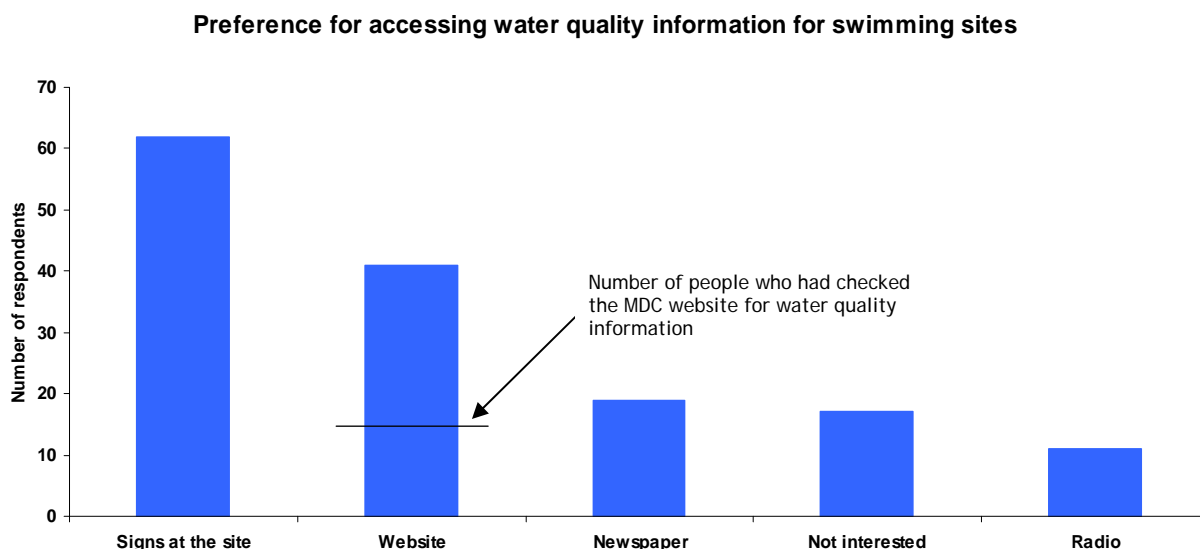


Figure 42: Methods by which the public would like to access information on water quality at recreational water quality sites.

People were also asked to name other information they would like to see on the Councils website in relation to contact recreation sites. Below is a list of the responses:

- Safe swimming (although this is often more in relation to the physical nature of the site e.g. strong currents, woody debris etc., rather than in relation to water quality. However the general perception of the public was that if there was no sign to say 'Don't swim, poor water quality' then the water was clean and safe).
- Areas where dogs are allowed
- Places to freedom camp
- The location of swimming sites
- If it's a good swimming spot
- Weather forecast
- Tide times
- Water temperature
- Info on swimming beaches collated on website
- Rips or other dangers to be aware of
- Water quality
- Photos of sites, accessibility of areas
- Quiet or busy beach
- Sand or cobble beach
- Alerts/pollution notices
- If you can camp, if there are toilet facilities
- Surf/sea conditions
- Dangers
- Depth

6.2.5. Comments made by respondents

Concerns regarding development

- Litter from freedom campers
- Didymo
- Landslides
- Cattle access to streams and rivers
- Amount of glass on beaches
- Trustpower development in Wairau
- Dairy effluent in rivers

- Marine farming getting out of hand
- No, clean and green, not too much development around rivers
- Bartletts Creek because of logging around the river
- Taking irrigation water in an eco-friendly way
- Fish farms
- Over commercialisation
- Don't want overdevelopment, need to balance environment with number of people
- Logging forests resulting in sediment in waters
- Some beaches/bays becoming drinking/hoon spots
- Degree of development such fit the area, the Sounds are quite special so need to preserve that
- Boaties dumping effluent
- Would hate overdevelopment of the Sounds
- Pollution
- Noise pollution
- Rubbish on beaches from boats
- Increased development limiting access to the beach/coast
- Lack of access and freedom
- Cod laws suck
- Dairy farms st rivers edge
- Gravel removal ripping up Awatere river bed
- Development/housing along waterways that inhibit access to beaches or waterways
- Rivers need to be kept clean, no industrial discharge
- No, so long as development doesn't take away too much more
- Interislander terminal shifting mooring business away from Picton and Blenheim
- Wairau Bar needs some attention to keep the river mouth open
- The least amount of development the better
- Erosion in the Sounds
- Leave natural sites undisturbed
- keep the region as it is
- Clifford Bay terminal a bad idea

- Land clearing
- Farming - discharge of waste
- Don't want big corporate developments
- Noisy commercial water sports e.g. jet skis, hovercraft that detract from peacefulness
- Keep as it is, no more major developments like in UK
- Yes, like to remain as pristine as possible
- Poor water quality and rubbish
- Don't love jet skis or power boats at beaches where children are swimming but are ok at wharf
- Trees a mess at Snake Point
- Wake with fast ferry, better without them
- Cow poos
- Jet skis highly irritating
- Against Clifford Bay development
- Runoff from dairy farms
- Water quality, erosion
- The after fix of logging
- Not enough weed control (pine, old mans beard)
- Poor water quality due to effluent from animals, MDC should be tougher /proactive regarding mandatory regulations

Sites people wouldn't go back to

- Crowded areas
- Butchers Flat, campers using generators make it too noisy
- Titirangi - too long a drive
- Craiglochart - nearly drowned
- Wairau Diversion during busy season
- Butchers Flat - river cold and bluffs unsafe for kids
- Aussie Bay, locals drinking, poor/aggressive behaviour. Also as it is on the campervan trail you get vans coming and going at all hours, lights noise etc ruins the tranquillity
- Mistletoe Bay, tends to cater to larger groups now rather than families
- Oyster bay, toilets smelly and messy
- Queen Charlotte Sound at Christmas, too busy

- Good experiences only
- Momorangi during Christmas, too many people and boats

Other Comments

- Love Marlborough!
- Hate the sandflies!
- Its nice
- Fantastic
- Beautiful
- Some difficulty accessing some beaches
- Quality very good compared to Australian rivers
- Playgrounds around swimming areas lacking
- More paddling pools around Blenheim for children
- Need places to get away from people
- Taylor River needs cleaning up in terms of weed
- Proper toilet at Robin Hood Bay, current one smells.
- More free/cheap places to stay in the Sounds
- Sometimes too cold
- Impressed with pine removal in Sounds
- Sounds are a lovely/superb place in NZ
- Too cold
- Nice region
- Would be useful to know which beaches have life guards
- The Sounds best part of New Zealand
- Clean beautiful environment is what sets NZ apart from rest of world, don't have to worry about pollution like you do in other parts of the world
- We live in a beautiful place, very lucky. Council does a good job with maintenance of facilities, toilets always clean and playgrounds well maintained and safe
- A lot of seaweed at the beach (Marfells)
- Love Queen Charlotte Sound
- Waikawa bay very clean except for scallop and paua shells on seafloor
- Freshwater shower at Waikawa Bay and doggy bags for dog waste

- No rubbish bin at Bobs Bay, picnic table also missing
- Picton marina water very dirty and a lot of oil slicks
- Picton aquarium very cool
- Water very nice and clean
- Rubbish bins for dogs
- Enjoy current state of rivers
- Good to have info about other beaches
- Rope swing (Ferry Bridge)
- Platform (Ferry Bridge)
- Toilet (Craiglochart)
- More signage/warnings for new swimmers
- Concern about noise and damage to aquatic life done by hovercraft
- Still good
- Not too many rules, good, very accessible for boating
- Lucky with our environment and our people, its very tidy
- Keep the public informed about the water quality
- Its very important that people have the opportunity to swim in clear water
- Information about water quality
- Concerned about safety and use of boats, speeding and skills/experience of boaties
- Coastal areas look very clean
- Great website!

6.3. Conclusions and Recommendations from the survey

The aims of the survey were 1) to determine the relative use of beaches and rivers with regard to contact recreation 2) to review the sites currently included in the Councils Recreational Water Quality Monitoring Programme 3) to determine the factors affecting peoples enjoyment at coastal/river sites with regard to contact recreation 4) to look at how information regarding water quality can be better conveyed to the public 5) to determine the issues/threats which the public are most concerned about with regard to beaches and rivers used for contact recreation.

The survey found that a number of beach/river sites popular with the public were not included in the Council's regular monitoring programme. The following changes are recommended based on numbers observed at sites and comments from the public:

Cease sampling at the following sites:

Wairau Bar
Wairau Diversion
Portage
Shelly Beach North
Tirimoana
Hakahaka Bay
Bobs Bay
Te Mahia
Moenui
Oyster Bay
Wairau at Wairau Rowing Club
Opawa at Malthouse Reserve
Wairau Diversion at Neals Road Bridge
Rai at Brown River Reserve
Taylor at Hutcheson

Begin sampling at the following sites

Moetapu Bay
Robin Hood Bay South
Robin Hood Bay North
Governors Bay
Wairau at Renwick Bridge

This reduces the number of sites from the current number of 31 to 21 i.e. a reduction of about a third.

It is recommended that the Councils webpage is updated to include more information regarding bathing water sites and to make the information more accessible to the public via a direct link on the home page. Information to be included includes access to the sites, photos of the sites, camping/toilet facilities, dangers (rip tides etc.), whether dogs are allowed etc. In addition the use of radio and newspaper advertisements should be explored as a way to update the public weekly on water quality in the region.

The most important factors for people were scenery and 'pristineness' of the site. This is useful information as it can be used to ensure that popular swimming spots are protected to ensure water clarity is preserved, water quality is kept to a high standard, nuisance algae/scums/odours etc are kept to a minimum and the surrounding areas are not subject to over-development. Improved access to some swimming sites could also be explored.

It is recommended that the survey is repeated every 3-5 years to allow for comparisons over time to ensure the relevancy of Councils Recreational Water Quality Monitoring Programme. In addition it is recommended that the sample size for the questionnaire part be increased to approximately 300. This would require a targeted approach from December through to March and include public holidays (Christmas and New Years) in addition to weekends.

7. Recommendations for Summer Sampling 2012-13

- Revise the number of sites undergoing routine monitoring based on results from the beach survey as described in section 6.3
- Maintain routine monitoring for all sites included in the 'Recreational Water Quality Programme' to allow for the assessment of beach grades, the assessment of trends over time and for a comparison of Marlborough's recreational water quality with sites across the country. Routine monitoring of these sites also ensures that the public are kept informed as to the quality of water at Marlborough's most popular sites.
- Use microbial source tracking (MST) to identify sources of faecal contamination at poorly performing sites. These include the Wairau Diversion at Neals Road, The Taylor River at Riverside, the Opawa at Malthouse Lane, Hakahaka Bay, Trimoana and Picton Foreshore. Whilst not all of these will be routinely monitored as recreational water quality sites, MST investigations will help inform the sources of bacterial contamination and allow for measures to be undertaken to reduce bacterial contamination if necessary.
- Update the Councils webpage to better align with expectations from the public as described in section 6. Explore the use of radio and newspaper adverts to inform the public of water quality at monitored swimming sites
- Explore the use of signs at monitored sites to inform the public of water quality at the sites.

8. References

Cornelisen, C.D., Kirs, M., Gilpin, B. and Scholes, P. (2012) Microbial Source Tracking (MST) tools for water quality monitoring. Prepared for the Regional Councils and Coastal Special Interest Group. Cawthron Report No. 2047. 28 p. plus appendices.

McKergow, L. A., Tanner, C. C., Monaghan, R. M. and Anderson, G. (2007) Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems. NIWA client report HAM2007-161.

MDC (2008) *Marlborough's Coastal Bathing Water Quality, 2007-08*. May 2008. Marlborough District Council.

MDC (2009a) *Marlborough's Coastal Recreational Water Quality 2008-09*. Marlborough District Council.

MDC (2009b) *Marlborough's Freshwater Recreational Water Quality 2008-09*. Marlborough District Council.

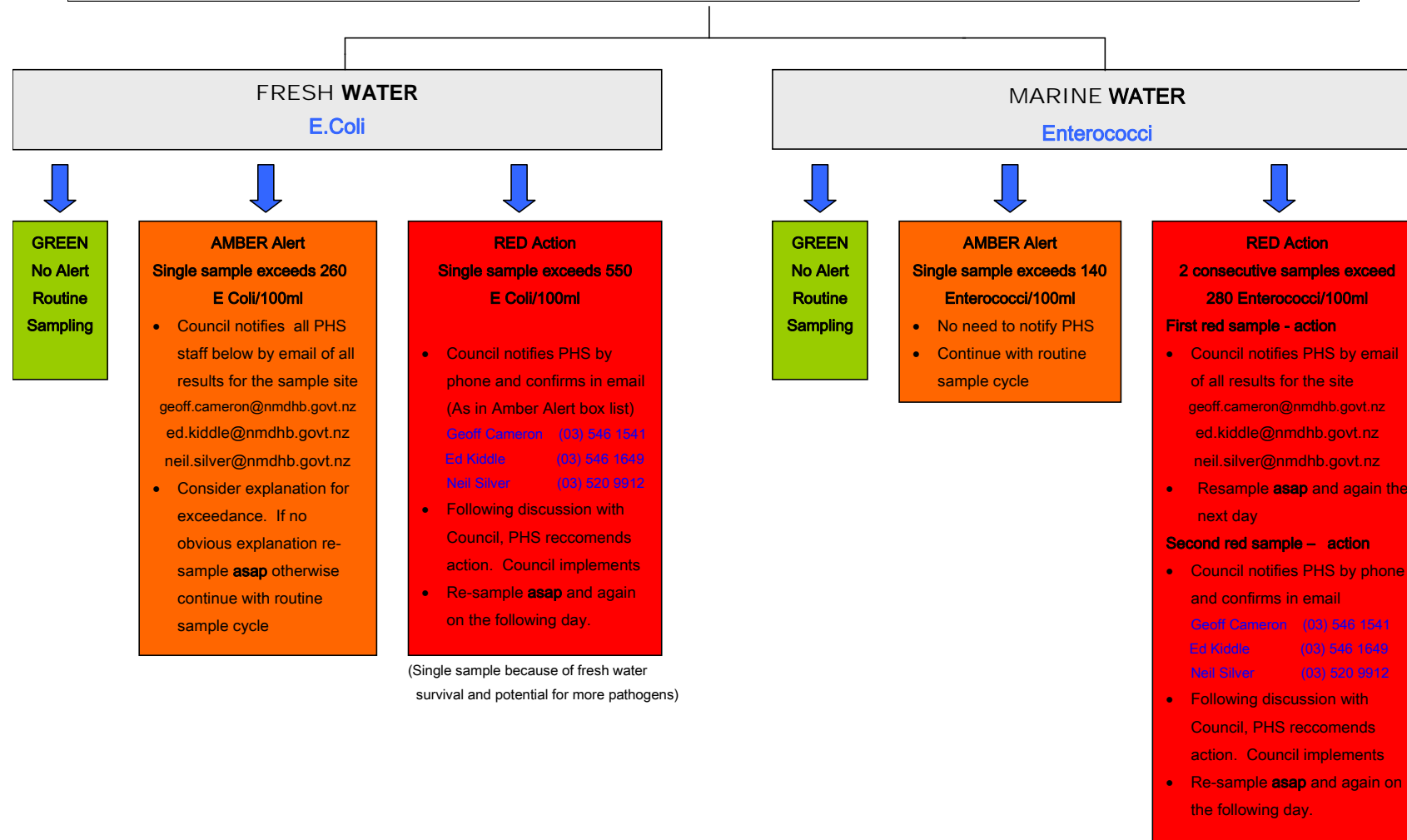
MfE (2003) *Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas*. Ministry for the Environment <http://www.mfe.govt.nz/publications/water/microbiological-quality-jun03/microbiological-quality-jun03.pdf>

Scarsbrook, M. and McBride, G. (2004) *Levels of E. coli in New Zealand's rivers*. NIWA Client Report: HAM2004-157. December 2004.

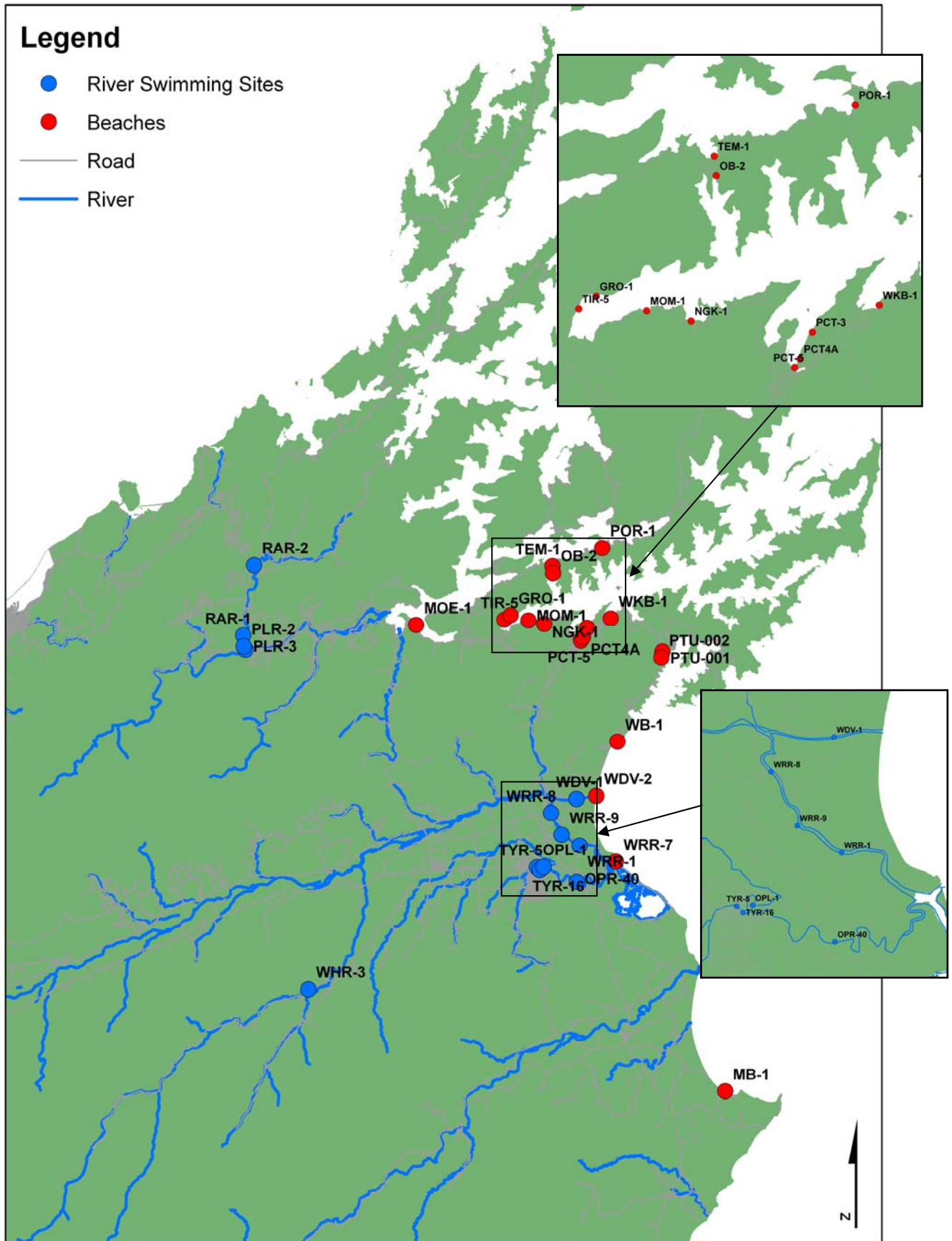
Appendix 1: Management procedure for exceedances of bathing water guidelines.

RECREATIONAL WATER SAMPLE EXCEEDANCES – RESPONSE PROCEDURE

Based on Microbial water Quality Guidelines Page D9 (Box 1) and E9 (Box 2)



Appendix 2: Locations of Recreational Water Quality Sites



Appendix 3: Recreational water quality results 2011-12.

COASTAL SITES			RIVER SITES		
Site ID	Time	Enterococci (MPN/100ml)	Site ID	Time	E. coli (number/100ml)
GRO-001	2/11/2011 13:41	323	OPL-1	3/11/2011 14:29	86
GRO-001	7/11/2011 13:29	5	OPL-1	8/11/2011 10:48	134
GRO-001	14/11/2011 13:26	10	OPL-1	15/11/2011 12:48	31
GRO-001	21/11/2011 13:24	10	OPL-1	22/11/2011 10:26	52
GRO-001	28/11/2011 13:44	10	OPL-1	29/11/2011 10:18	256
GRO-001	5/12/2011 13:30	10	OPL-1	6/12/2011 14:28	323
GRO-001	12/12/2011 14:54	10	OPL-1	13/12/2011 11:11	309
GRO-001	19/12/2011 14:28	41	OPL-1	20/12/2011 11:59	63
GRO-001	28/12/2011 14:40	10	OPL-1	29/12/2011 15:14	63
GRO-001	4/01/2012 13:43	10	OPL-1	5/01/2012 8:35	132
GRO-001	9/01/2012 14:30	135	OPL-1	10/01/2012 10:57	201
GRO-001	16/01/2012 14:40	10	OPL-1	17/01/2012 10:55	187
GRO-001	23/01/2012 12:33	10	OPL-1	24/01/2012 9:42	110
GRO-001	30/01/2012 13:02	10	OPL-1	31/01/2012 9:12	63
GRO-001	7/02/2012 10:06	10	OPL-1	8/02/2012 9:10	74
GRO-001	13/02/2012 12:38	10	OPL-1	14/02/2012 9:08	110
GRO-001	20/02/2012 12:21	10	OPL-1	21/02/2012 9:21	107
GRO-001	27/02/2012 12:43	10	OPL-1	28/02/2012 8:56	110
GRO-001	5/03/2012 12:58	10	OPL-1	6/03/2012 9:27	122
GRO-001	12/03/2012 12:07	41	OPL-1	13/03/2012 8:57	216
GRO-001	19/03/2012 12:52	5	OPL-1	20/03/2012 9:35	122
GRO-001	26/03/2012 13:11	20	OPL-1	27/03/2012 9:04	22
MB-1	1/11/2011 13:25	5	OPR-40	3/11/2011 15:06	85
MB-1	8/11/2011 9:03	10	OPR-40	8/11/2011 9:45	75
MB-1	15/11/2011 8:50	10	OPR-40	15/11/2011 9:50	211
MB-1	22/11/2011 9:03	10	OPR-40	22/11/2011 9:49	41
MB-1	29/11/2011 8:59	10	OPR-40	29/11/2011 9:43	122
MB-1	6/12/2011 9:45	10	OPR-40	6/12/2011 10:26	63
MB-1	13/12/2011 9:53	10	OPR-40	13/12/2011 10:37	85
MB-1	20/12/2011 10:41	10	OPR-40	20/12/2011 11:21	75
MB-1	5/01/2012 10:10	10	OPR-40	29/12/2011 15:43	459
MB-1	10/01/2012 9:44	20	OPR-40	5/01/2012 11:07	110
MB-1	17/01/2012 9:44	10	OPR-40	10/01/2012 10:25	41
MB-1	24/01/2012 7:51	10	OPR-40	17/01/2012 10:23	52
MB-1	31/01/2012 7:54	10	OPR-40	24/01/2012 8:43	231
MB-1	8/02/2012 7:43	10	OPR-40	31/01/2012 8:37	295
MB-1	14/02/2012 7:40	10	OPR-40	8/02/2012 8:25	3450
MB-1	21/02/2012 7:40	30	OPR-40	14/02/2012 8:26	109
MB-1	28/02/2012 7:36	10	OPR-40	21/02/2012 8:45	213
MB-1	6/03/2012 7:40	10	OPR-40	28/02/2012 8:17	185
MB-1	13/03/2012 7:41	10	OPR-40	6/03/2012 8:43	318
MB-1	20/03/2012 7:45	10	OPR-40	13/03/2012 8:24	134
MB-1	27/03/2012 7:49	5	OPR-40	20/03/2012 8:55	86
MOE-1	2/11/2011 10:46	5	OPR-40	27/03/2012 8:32	120
MOE-1	7/11/2011 10:39	10	PLR-2	2/11/2011 9:48	97
MOE-1	14/11/2011 10:27	10	PLR-2	7/11/2011 9:42	52
MOE-1	21/11/2011 10:28	10	PLR-2	14/11/2011 9:49	31
MOE-1	28/11/2011 10:35	10	PLR-2	21/11/2011 9:39	20

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MOE-1	5/12/2011 10:28	63	PLR-2	28/11/2011 9:45	86
MOE-1	12/12/2011 11:41	10	PLR-2	5/12/2011 9:46	108
MOE-1	19/12/2011 11:18	10	PLR-2	12/12/2011 10:53	31
MOE-1	28/12/2011 11:53	110	PLR-2	19/12/2011 10:39	121
MOE-1	4/01/2012 10:35	10	PLR-2	28/12/2011 11:01	52
MOE-1	9/01/2012 11:45	5	PLR-2	4/01/2012 9:46	52
MOE-1	16/01/2012 11:43	5	PLR-2	9/01/2012 10:57	10
MOE-1	23/01/2012 9:47	135	PLR-2	16/01/2012 10:52	31
MOE-1	30/01/2012 10:01	10	PLR-2	23/01/2012 8:52	5
MOE-1	7/02/2012 7:56	31	PLR-2	30/01/2012 9:04	10
MOE-1	13/02/2012 9:26	10	PLR-2	7/02/2012 7:15	30
MOE-1	20/02/2012 9:26	10	PLR-2	13/02/2012 8:31	5
MOE-1	27/02/2012 9:32	10	PLR-2	20/02/2012 8:37	31
MOE-1	5/03/2012 10:06	10	PLR-2	27/02/2012 8:38	98
MOE-1	12/03/2012 9:41	317	PLR-2	5/03/2012 9:07	41
MOE-1	19/03/2012 9:58	5	PLR-2	12/03/2012 8:58	135
MOE-1	26/03/2012 9:32	109	PLR-2	19/03/2012 9:07	20
MOM-001	2/11/2011 14:08	474	PLR-2	26/03/2012 8:41	31
MOM-001	7/11/2011 13:59	5	PLR-3	2/11/2011 10:03	1198
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MOM-001	21/11/2011 13:49	10	PLR-3	14/11/2011 9:59	52
MOM-001	28/11/2011 14:12	10	PLR-3	21/11/2011 9:53	98
MOM-001	5/12/2011 13:57	10	PLR-3	28/11/2011 9:57	31
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MOM-001	28/12/2011 15:05	31	PLR-3	19/12/2011 10:51	135
MOM-001	4/01/2012 14:15	10	PLR-3	28/12/2011 11:15	86
MOM-001	9/01/2012 14:57	5	PLR-3	4/01/2012 9:59	135
MOM-001	16/01/2012 15:04	5	PLR-3	9/01/2012 11:10	110
MOM-001	23/01/2012 12:27	10	PLR-3	16/01/2012 11:11	20
MOM-001	30/01/2012 13:31	10	PLR-3	23/01/2012 9:12	10
MOM-001	7/02/2012 10:27	10	PLR-3	30/01/2012 9:15	20
MOM-001	13/02/2012 13:06	10	PLR-3	7/02/2012 7:26	10
MOM-001	20/02/2012 12:50	10	PLR-3	13/02/2012 8:44	10
MOM-001	27/02/2012 13:10	10	PLR-3	20/02/2012 8:50	5
MOM-001	5/03/2012 13:27	5	PLR-3	27/02/2012 8:51	169
MOM-001	12/03/2012 12:28	480	PLR-3	5/03/2012 9:20	52
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MOM-001	26/03/2012 13:34	10	PLR-3	19/03/2012 9:23	74
NGK-001	2/11/2011 14:22	132	PLR-3	26/03/2012 8:54	189
NGK-001	7/11/2011 14:17	10	RAR-1	2/11/2011 9:37	2610
NGK-001	14/11/2011 13:59	5	RAR-1	7/11/2011 9:31	199
NGK-001	21/11/2011 14:14	10	RAR-1	14/11/2011 9:38	148
NGK-001	28/11/2011 14:24	10	RAR-1	21/11/2011 9:27	146
NGK-001	5/12/2011 14:10	20	RAR-1	28/11/2011 9:34	135
NGK-001	12/12/2011 15:41	171	RAR-1	5/12/2011 9:38	1553
NGK-001	19/12/2011 15:05	10	RAR-1	12/12/2011 10:42	134
NGK-001	28/12/2011 15:19	448	RAR-1	19/12/2011 10:29	408
NGK-001	4/01/2012 14:29	20	RAR-1	28/12/2011 10:51	110
NGK-001	9/01/2012 15:14	10	RAR-1	4/01/2012 9:24	216
NGK-001	16/01/2012 15:22	10	RAR-1	9/01/2012 10:45	256
NGK-001	23/01/2012 13:18	10	RAR-1	16/01/2012 10:42	173
NGK-001	30/01/2012 13:49	10	RAR-1	23/01/2012 8:40	63
NGK-001	7/02/2012 10:40	10	RAR-1	30/01/2012 8:51	20

NGK-001	13/02/2012 13:25	10	RAR-1	7/02/2012 7:07	52
NGK-001	20/02/2012 13:02	10	RAR-1	13/02/2012 8:18	62
NGK-001	27/02/2012 13:24	10	RAR-1	20/02/2012 8:29	85
NGK-001	5/03/2012 13:47	10	RAR-1	27/02/2012 8:29	241
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NGK-001	19/03/2012 13:40	5	RAR-1	12/03/2012 8:51	933
NGK-001	26/03/2012 13:45	31	RAR-1	19/03/2012 8:58	134
OB-2	2/11/2011 12:35	10	RAR-1	26/03/2012 8:31	201
OB-2	7/11/2011 12:10	5	RAR-2	2/11/2011 9:23	2480
OB-2	14/11/2011 12:04	10	RAR-2	7/11/2011 9:17	63
OB-2	21/11/2011 12:14	10	RAR-2	14/11/2011 9:27	195
OB-2	28/11/2011 12:26	10	RAR-2	21/11/2011 9:14	187
OB-2	5/12/2011 12:10	10	RAR-2	28/11/2011 9:19	189
OB-2	12/12/2011 13:16	10	RAR-2	5/12/2011 9:24	1354
OB-2	19/12/2011 13:04	10	RAR-2	12/12/2011 10:27	85
OB-2	28/12/2011 13:29	10	RAR-2	19/12/2011 10:12	233
OB-2	4/01/2012 13:00	10	RAR-2	28/12/2011 10:34	86
OB-2	9/01/2012 13:14	52	RAR-2	4/01/2012 9:09	399
OB-2	16/01/2012 13:18	10	RAR-2	9/01/2012 10:29	272
OB-2	23/01/2012 11:38	20	RAR-2	16/01/2012 10:26	201
OB-2	30/01/2012 11:39	10	RAR-2	23/01/2012 8:26	75
OB-2	7/02/2012 9:22	10	RAR-2	30/01/2012 8:38	41
OB-2	13/02/2012 11:09	10	RAR-2	7/02/2012 6:50	73
OB-2	20/02/2012 10:57	10	RAR-2	13/02/2012 8:03	10
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OB-2	5/03/2012 11:35	10	RAR-2	27/02/2012 8:12	402
OB-2	12/03/2012 11:04	10	RAR-2	5/03/2012 8:38	121
OB-2	19/03/2012 11:34	10	RAR-2	12/03/2012 8:38	738
OB-2	26/03/2012 11:45	5	RAR-2	19/03/2012 8:32	135
PCT-3	3/11/2011 10:49	5	RAR-2	26/03/2012 8:14	228
PCT-3	9/11/2011 11:19	10	TYR-16	3/11/2011 14:53	96
PCT-3	16/11/2011 10:22	10	TYR-16	8/11/2011 10:25	211
PCT-3	23/11/2011 11:31	10	TYR-16	15/11/2011 10:07	187
PCT-3	30/11/2011 11:21	10	TYR-16	22/11/2011 10:07	269
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PCT-3	6/01/2012 10:15	10	TYR-16	20/12/2011 11:36	211
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PCT-3	18/01/2012 11:33	10	TYR-16	5/01/2012 8:45	85
PCT-3	25/01/2012 10:54	20	TYR-16	10/01/2012 10:39	231
PCT-3	1/02/2012 11:01	10	TYR-16	17/01/2012 10:38	158
PCT-3	7/02/2012 12:53	10	TYR-16	24/01/2012 8:56	148
PCT-3	15/02/2012 9:40	10	TYR-16	31/01/2012 8:54	134
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PCT-3	29/02/2012 10:53	10	TYR-16	14/02/2012 8:48	857
PCT-3	7/03/2012 10:18	20	TYR-16	21/02/2012 9:00	156
PCT-3	14/03/2012 9:41	10	TYR-16	28/02/2012 8:33	243
PCT-3	21/03/2012 9:49	10	TYR-16	6/03/2012 9:00	231
PCT-3	28/03/2012 9:26	5	TYR-16	13/03/2012 8:39	199
PCT-4A	2/11/2011 15:01	132	TYR-16	20/03/2012 9:15	120
PCT-4A	9/11/2011 11:41	5	TYR-16	27/03/2012 8:45	36
PCT-4A	16/11/2011 10:45	10	TYR-5	3/11/2011 14:43	161

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PCT-4A	23/11/2011 11:57	10	TYR-5	8/11/2011 10:38	120
PCT-4A	30/11/2011 11:40	10	TYR-5	15/11/2011 12:40	134
PCT-4A	7/12/2011 12:02	134	TYR-5	22/11/2011 10:16	201
PCT-4A	14/12/2011 12:59	83	TYR-5	29/11/2011 10:08	749
PCT-4A	21/12/2011 11:33	10	TYR-5	1/12/2011 13:19	173
PCT-4A	28/12/2011 15:53	20	TYR-5	6/12/2011 14:40	2100
PCT-4A	6/01/2012 10:50	10	TYR-5	13/12/2011 11:03	116
PCT-4A	11/01/2012 12:10	10	TYR-5	20/12/2011 11:48	161
PCT-4A	18/01/2012 11:56	10	TYR-5	29/12/2011 15:24	488
PCT-4A	25/01/2012 11:17	10	TYR-5	5/01/2012 8:25	109
PCT-4A	1/02/2012 11:23	10	TYR-5	10/01/2012 10:47	203
PCT-4A	7/02/2012 13:21	10	TYR-5	17/01/2012 10:46	235
PCT-4A	15/02/2012 10:02	10	TYR-5	24/01/2012 9:17	144
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PCT-5	21/12/2011 11:50	10	WDV-1	29/11/2011 11:39	135
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PCT-5	6/01/2012 11:12	63	WDV-1	13/12/2011 12:34	41
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PCT-5	11/01/2012 12:25	31	WDV-1	29/12/2011 12:51	63
PCT-5	18/01/2012 12:23	10	WDV-1	5/01/2012 11:41	96
PCT-5	25/01/2012 11:34	10	WDV-1	10/01/2012 12:13	156
PCT-5	1/02/2012 11:36	10	WDV-1	17/01/2012 12:15	51
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PCT-5	15/02/2012 10:23	5	WDV-1	31/01/2012 10:48	31
PCT-5	22/02/2012 9:57	860	WDV-1	8/02/2012 10:44	428
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PCT-5	14/03/2012 10:29	313	WDV-1	28/02/2012 9:43	131
PCT-5	21/03/2012 10:37	10	WDV-1	6/03/2012 10:13	63
POR-1	2/11/2011 12:06	5	WDV-1	13/03/2012 9:57	51
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POR-1	14/11/2011 11:39	10	WDV-1	27/03/2012 9:37	92
POR-1	21/11/2011 11:47	10	WHR-3	1/11/2011 11:50	10
POR-1	28/11/2011 11:47	73	WHR-3	8/11/2011 11:25	5
POR-1	5/12/2011 11:42	10	WHR-3	15/11/2011 14:52	31
POR-1	12/12/2011 12:54	134	WHR-3	22/11/2011 11:13	20
POR-1	19/12/2011 12:40	10	WHR-3	29/11/2011 13:48	10
POR-1	28/12/2011 13:02	10	WHR-3	6/12/2011 12:03	98
POR-1	4/01/2012 12:37	10	WHR-3	13/12/2011 14:46	31
POR-1	9/01/2012 12:50	20	WHR-3	20/12/2011 15:38	20
POR-1	16/01/2012 12:53	10	WHR-3	5/01/2012 7:44	63
POR-1	23/01/2012 10:54	10	WHR-3	10/01/2012 14:13	52

POR-1	30/01/2012 11:14	10	WHR-3	17/01/2012 13:56	20
POR-1	7/02/2012 8:58	10	WHR-3	24/01/2012 13:06	10
POR-1	13/02/2012 10:45	10	WHR-3	31/01/2012 12:30	20
POR-1	20/02/2012 10:35	10	WHR-3	8/02/2012 13:09	10
POR-1	27/02/2012 10:47	10	WHR-3	14/02/2012 14:10	10
POR-1	5/03/2012 11:12	10	WHR-3	21/02/2012 13:31	10
POR-1	12/03/2012 10:41	10	WHR-3	28/02/2012 12:46	31
POR-1	19/03/2012 11:11	5	WHR-3	6/03/2012 13:15	10
POR-1	26/03/2012 11:19	10	WHR-3	13/03/2012 13:20	10
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PTU-001	9/11/2011 9:42	52	WHR-3	27/03/2012 11:34	11
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PTU-001	30/11/2011 9:06	10	WRR-1	15/11/2011 13:06	10
PTU-001	7/12/2011 10:24	73	WRR-1	22/11/2011 14:38	259
PTU-001	14/12/2011 10:31	10	WRR-1	29/11/2011 10:39	20
PTU-001	21/12/2011 9:54	10	WRR-1	6/12/2011 14:11	86
PTU-001	29/12/2011 9:59	10	WRR-1	13/12/2011 11:29	31
PTU-001	6/01/2012 8:53	41	WRR-1	20/12/2011 12:25	52
PTU-001	11/01/2012 10:24	5	WRR-1	29/12/2011 13:53	20
PTU-001	18/01/2012 10:06	5	WRR-1	5/01/2012 13:45	63
PTU-001	25/01/2012 8:01	31	WRR-1	10/01/2012 11:13	41
PTU-001	1/02/2012 9:22	10	WRR-1	17/01/2012 11:11	41
PTU-001	7/02/2012 11:40	10	WRR-1	24/01/2012 9:59	20
PTU-001	15/02/2012 8:10	10	WRR-1	31/01/2012 9:30	10
PTU-001	22/02/2012 7:53	10	WRR-1	8/02/2012 9:24	20
PTU-001	29/02/2012 9:27	10	WRR-1	14/02/2012 11:32	5
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PTU-001	21/03/2012 8:40	10	WRR-1	6/03/2012 11:18	72
PTU-001	28/03/2012 8:54	5	WRR-1	13/03/2012 10:56	63
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PTU-002	18/01/2012 10:15	10	WRR-8	5/01/2012 12:26	10
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PTU-002	1/02/2012 10:00	10	WRR-8	17/01/2012 11:44	63
PTU-002	7/02/2012 11:51	10	WRR-8	24/01/2012 10:32	10
PTU-002	15/02/2012 8:23	10	WRR-8	31/01/2012 10:03	10
PTU-002	22/02/2012 8:04	10	WRR-8	8/02/2012 11:18	20
PTU-002	29/02/2012 9:40	41	WRR-8	14/02/2012 11:04	10
PTU-002	7/03/2012 9:01	5	WRR-8	21/02/2012 10:43	41
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PTU-002	21/03/2012 8:52	10	WRR-8	6/03/2012 10:50	20
PTU-002	28/03/2012 8:08	10	WRR-8	13/03/2012 10:32	31
TEM-1	2/11/2011 11:39	5	WRR-8	20/03/2012 10:59	5

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TEM-1	7/11/2011 11:20	10	WRR-8	27/03/2012 10:10	36
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TEM-1	21/11/2011 11:20	10	WRR-9	8/11/2011 14:39	5
TEM-1	28/11/2011 11:21	10	WRR-9	15/11/2011 13:17	20
TEM-1	5/12/2011 11:13	10	WRR-9	22/11/2011 14:13	218
TEM-1	12/12/2011 12:32	292	WRR-9	29/11/2011 10:55	63
TEM-1	19/12/2011 12:14	10	WRR-9	6/12/2011 13:54	98
TEM-1	28/12/2011 12:37	31	WRR-9	13/12/2011 11:43	10
TEM-1	4/01/2012 11:59	10	WRR-9	20/12/2011 12:44	10
TEM-1	9/01/2012 12:24	75	WRR-9	29/12/2011 13:39	20
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TEM-1	27/02/2012 10:20	10	WRR-9	14/02/2012 11:19	5
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TEM-1	12/03/2012 10:18	10	WRR-9	28/02/2012 10:37	185
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TIR-5	21/11/2011 13:34	20			
TIR-5	28/11/2011 13:52	52			
TIR-5	5/12/2011 13:40	10			
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TIR-5	4/01/2012 13:56	10			
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TIR-5	16/01/2012 14:50	10			
TIR-5	23/01/2012 12:41	10			
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TIR-5	7/02/2012 10:15	10			
TIR-5	13/02/2012 12:53	10			
TIR-5	20/02/2012 12:34	10			
TIR-5	27/02/2012 12:53	63			
TIR-5	5/03/2012 13:11	10			
TIR-5	12/03/2012 12:15	10			
TIR-5	19/03/2012 13:01	10			
TIR-5	26/03/2012 13:21	5			
WB-1	3/11/2011 12:04	5			
WB-1	9/11/2011 12:26	10			
WB-1	16/11/2011 11:47	10			
WB-1	23/11/2011 13:22	10			
WB-1	30/11/2011 12:35	10			
WB-1	7/12/2011 13:59	20			
WB-1	14/12/2011 13:43	10			
WB-1	21/12/2011 12:28	10			
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WB-1	6/01/2012 12:03	10			
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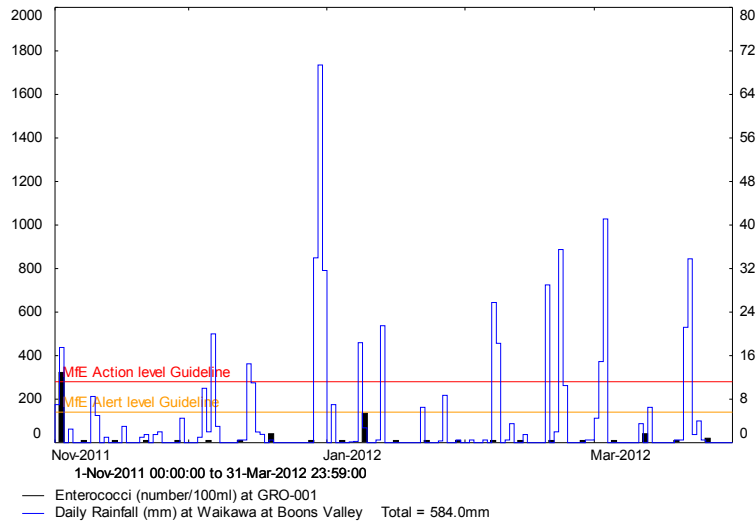
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WB-1	1/02/2012 12:17	10
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WB-1	29/02/2012 12:14	10
WB-1	7/03/2012 11:31	10
WB-1	14/03/2012 11:17	10
WB-1	21/03/2012 11:18	5
WDV-2	3/11/2011 13:03	132
WDV-2	8/11/2011 13:35	10
WDV-2	15/11/2011 14:05	5
WDV-2	22/11/2011 13:14	110
WDV-2	29/11/2011 11:48	10
WDV-2	6/12/2011 12:51	63
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WDV-2	29/12/2011 12:42	160
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WDV-2	10/01/2012 12:21	31
WDV-2	17/01/2012 12:26	20
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WDV-2	31/01/2012 11:01	10
WDV-2	8/02/2012 10:33	10
WDV-2	14/02/2012 10:14	10
WDV-2	21/02/2012 9:54	10
WDV-2	28/02/2012 9:28	97
WDV-2	6/03/2012 9:54	10
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WDV-2	20/03/2012 10:01	5
WDV-2	27/03/2012 9:26	52
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WKB-1	9/11/2011 10:36	10
WKB-1	16/11/2011 9:48	20
WKB-1	23/11/2011 10:50	20
WKB-1	30/11/2011 9:47	5
WKB-1	7/12/2011 11:03	132
WKB-1	14/12/2011 12:02	31
WKB-1	21/12/2011 10:33	10
WKB-1	29/12/2011 10:39	20
WKB-1	6/01/2012 9:40	10
WKB-1	11/01/2012 11:03	10
WKB-1	18/01/2012 11:00	10
WKB-1	25/01/2012 10:19	10
WKB-1	1/02/2012 10:29	10
WKB-1	7/02/2012 12:20	10
WKB-1	15/02/2012 8:54	10
WKB-1	22/02/2012 8:31	10
WKB-1	29/02/2012 10:17	10
WKB-1	7/03/2012 9:32	10
WKB-1	14/03/2012 9:04	10
WKB-1	21/03/2012 9:19	73

WKB-1	28/03/2012 8:40	5
WRR-7	3/11/2011 13:33	185
WRR-7	8/11/2011 14:06	5
WRR-7	15/11/2011 13:39	10
WRR-7	22/11/2011 13:43	160
WRR-7	29/11/2011 11:21	20
WRR-7	6/12/2011 13:26	63
WRR-7	13/12/2011 12:16	10
WRR-7	20/12/2011 13:17	10
WRR-7	29/12/2011 13:07	63
WRR-7	5/01/2012 12:50	10
WRR-7	10/01/2012 11:55	20
WRR-7	17/01/2012 11:58	10
WRR-7	24/01/2012 10:47	10
WRR-7	31/01/2012 10:23	10
WRR-7	8/02/2012 11:03	10
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WRR-7	21/02/2012 10:29	5
WRR-7	28/02/2012 10:04	122
WRR-7	6/03/2012 10:32	10
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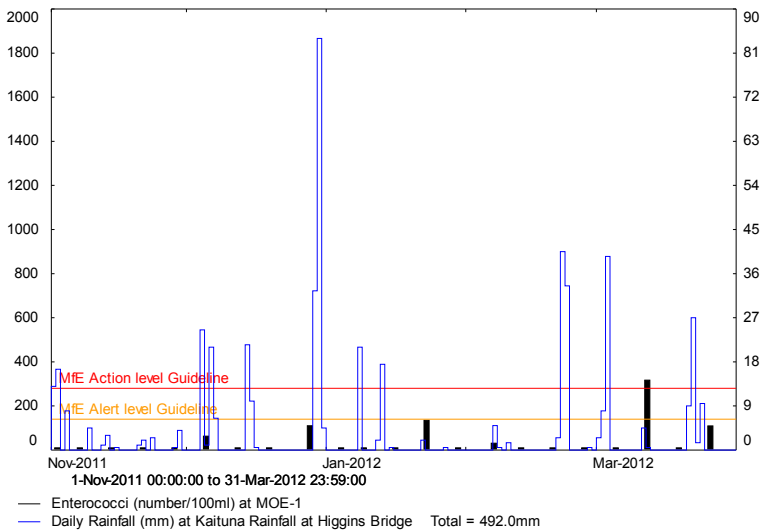
Appendix 4: Graphed results showing daily rainfall for the summer period 2011-2012

COASTAL SITES

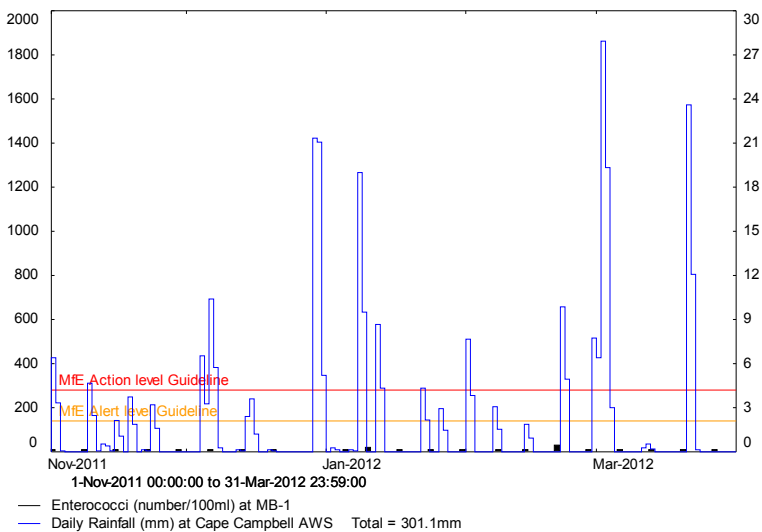
Anakiwa



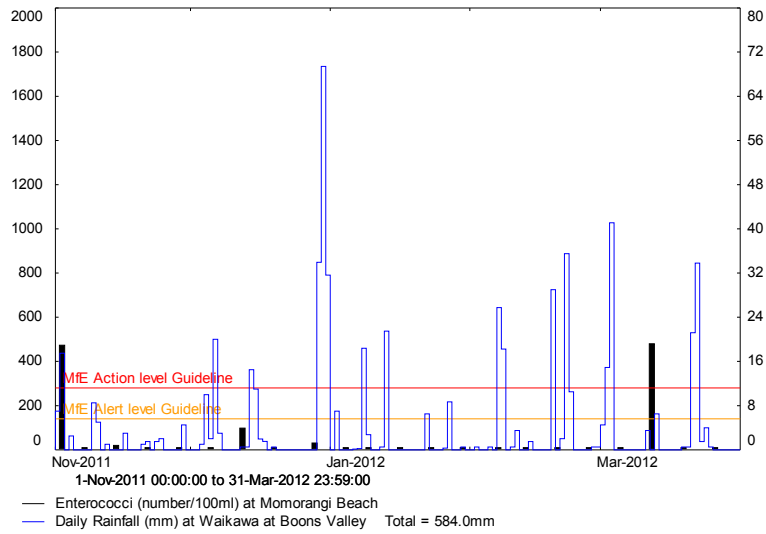
Moenui



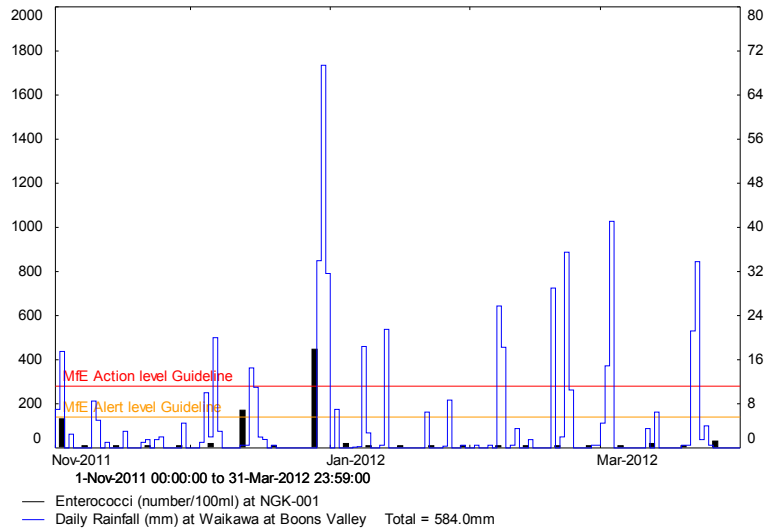
Marfells Beach



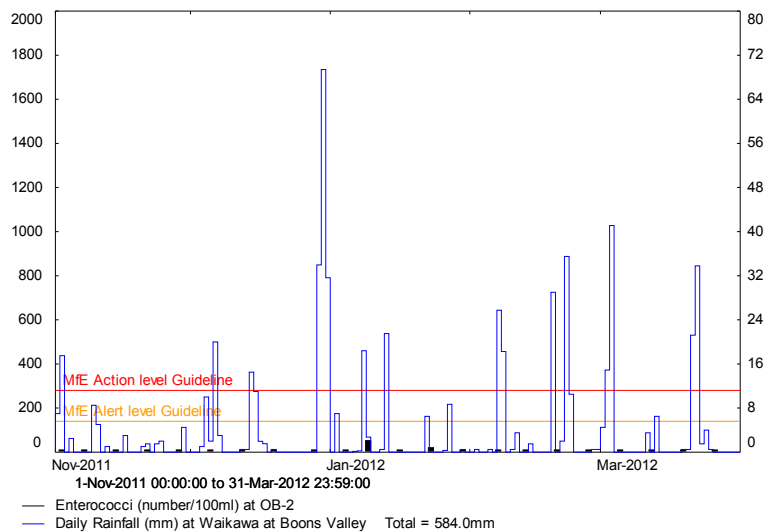
Momorangi Bay



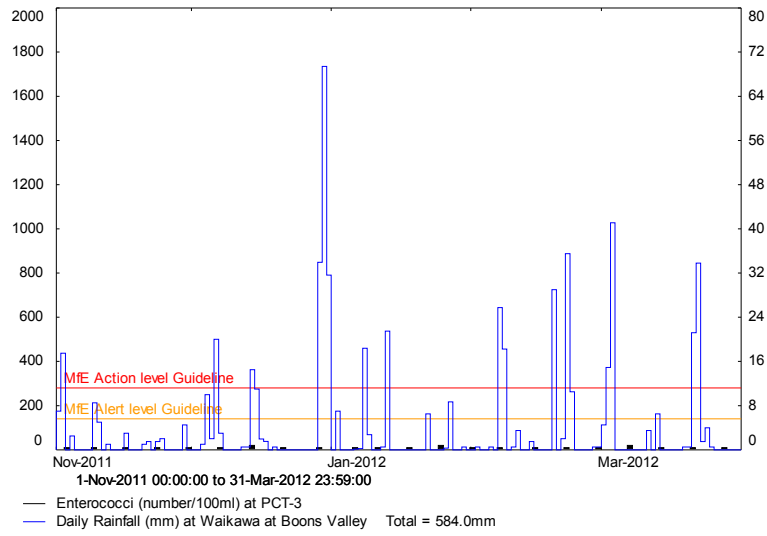
Ngakuta Bay



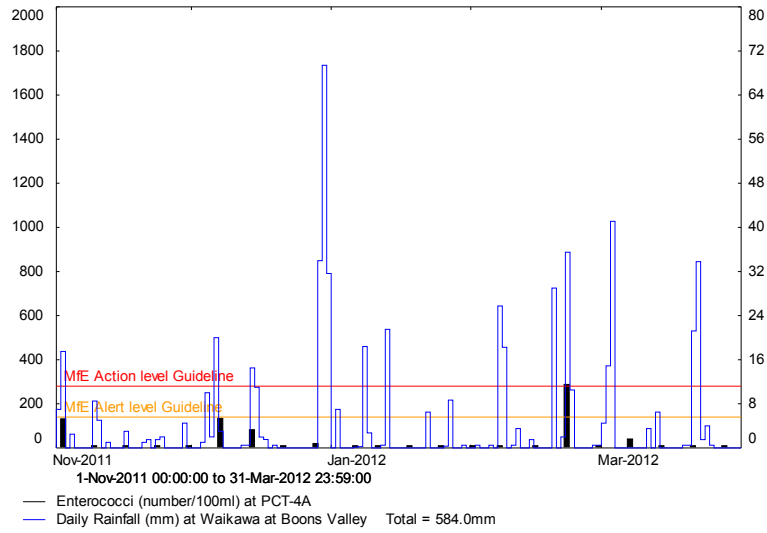
Mistletoe Bay



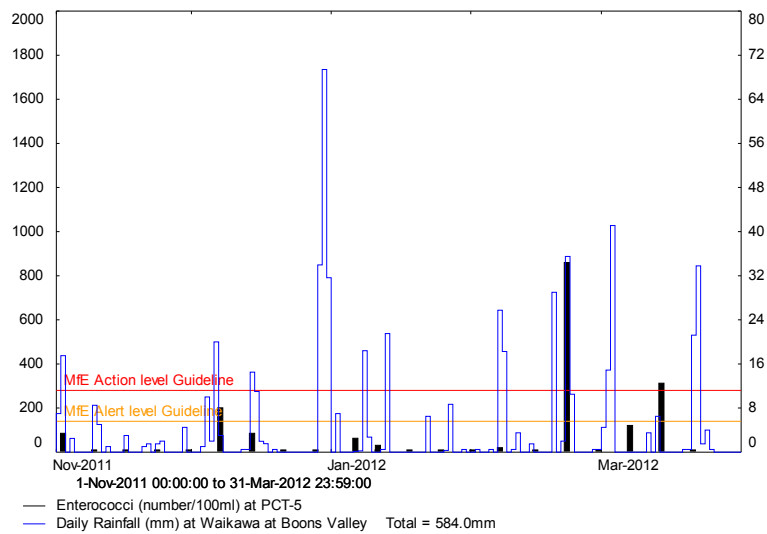
Bobs Bay



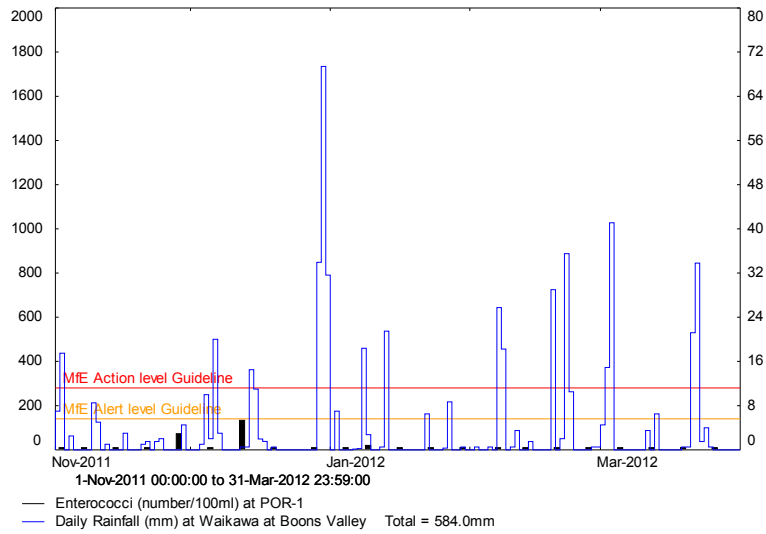
Shelly Beach



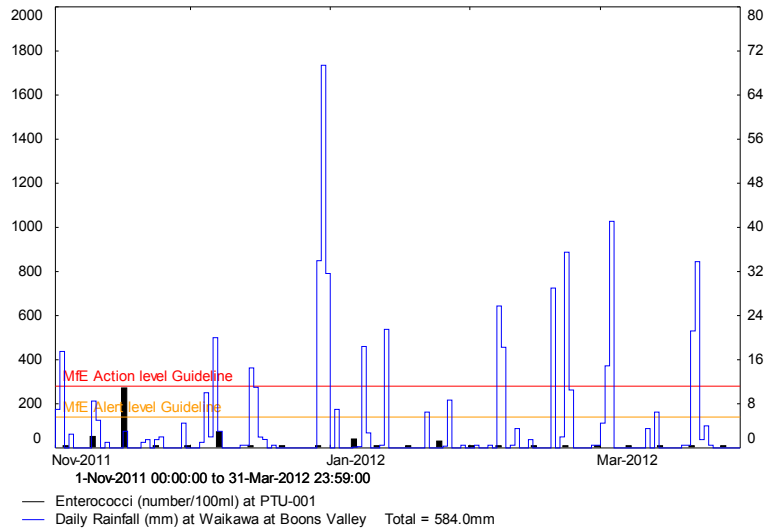
Picton Foreshore



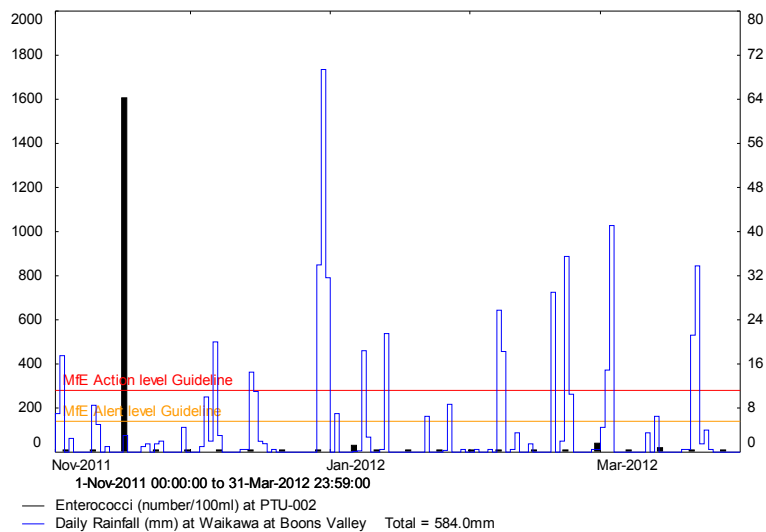
Portage Bay



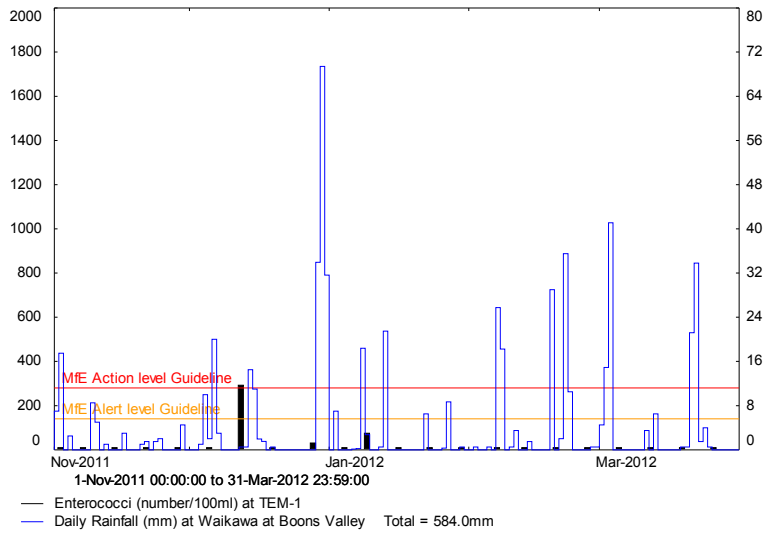
Hakahaka Bay



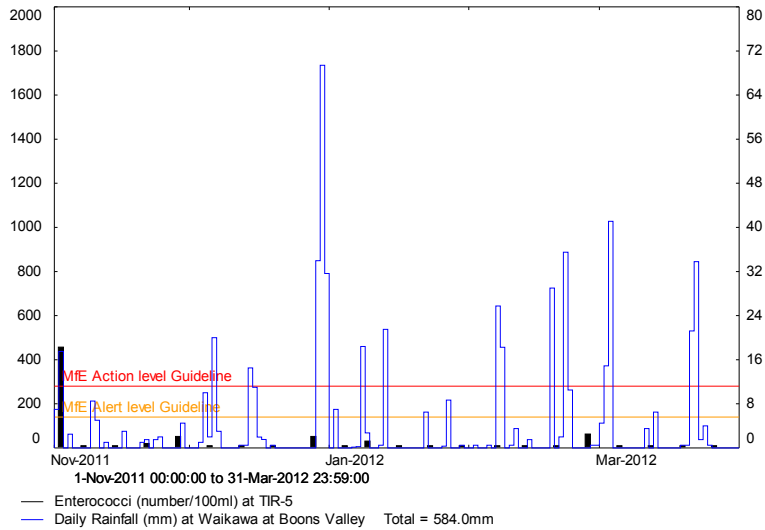
Oyster Bay



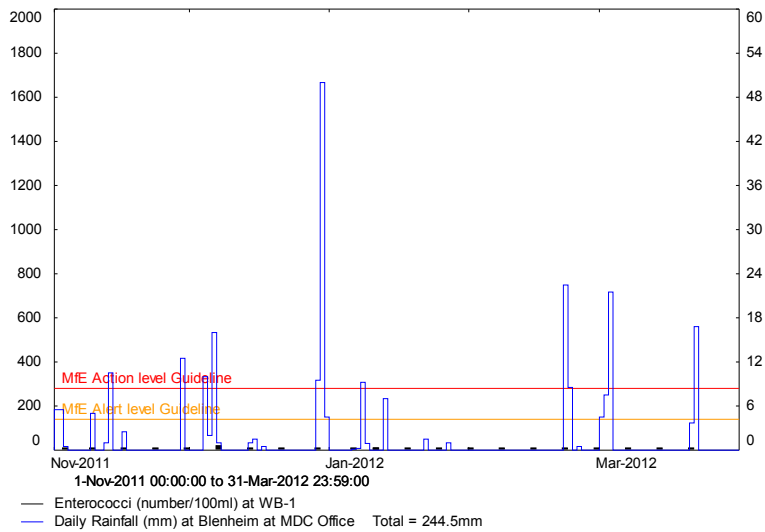
Te Mahia



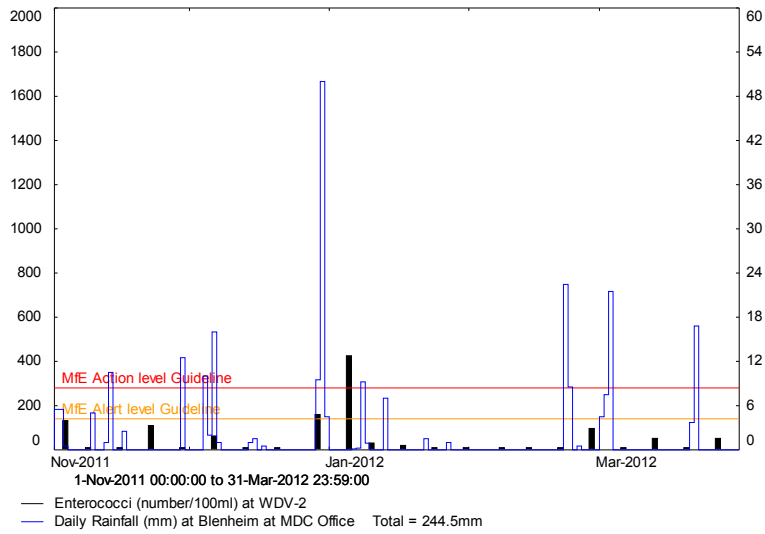
Tirimoana



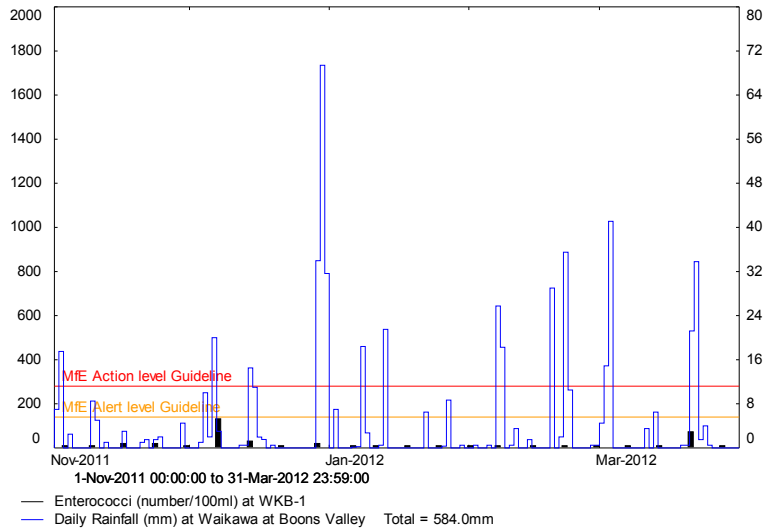
Whites Bay



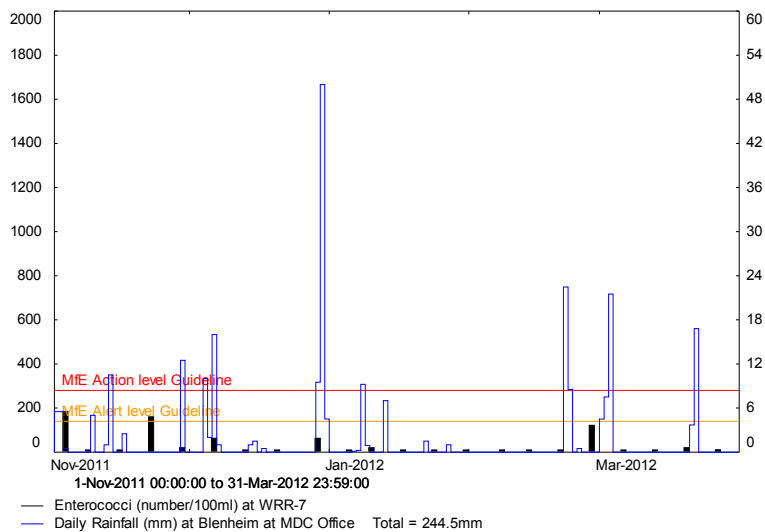
Wairau Diversion



Waikawa Bay

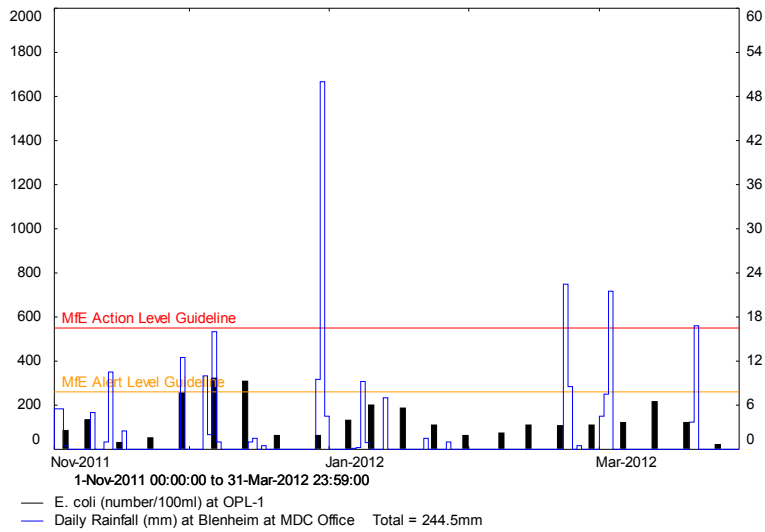


Wairau Bar

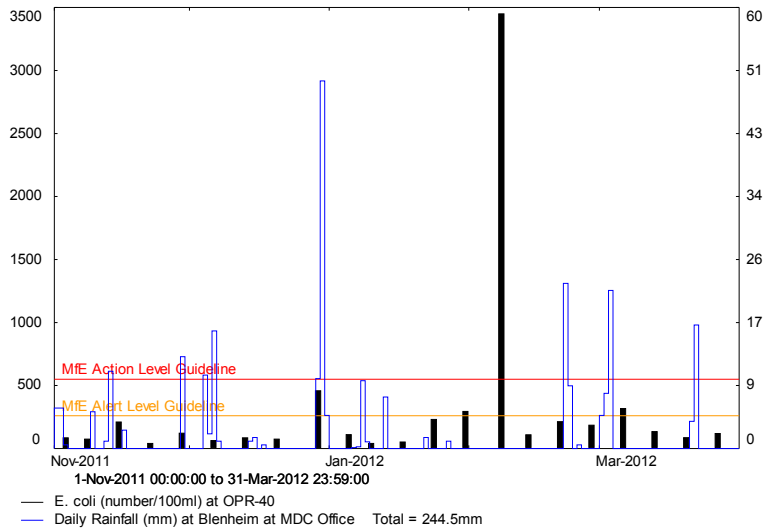


FRESHWATER SITES

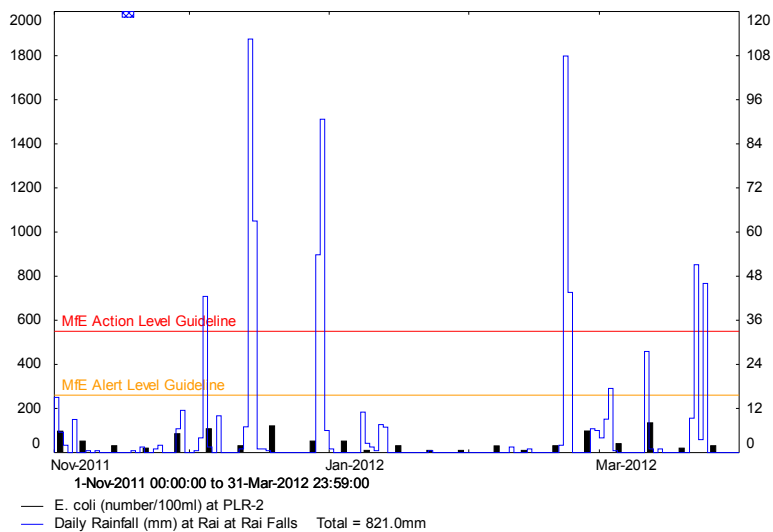
Opawa at Elizabeth Street Footbridge



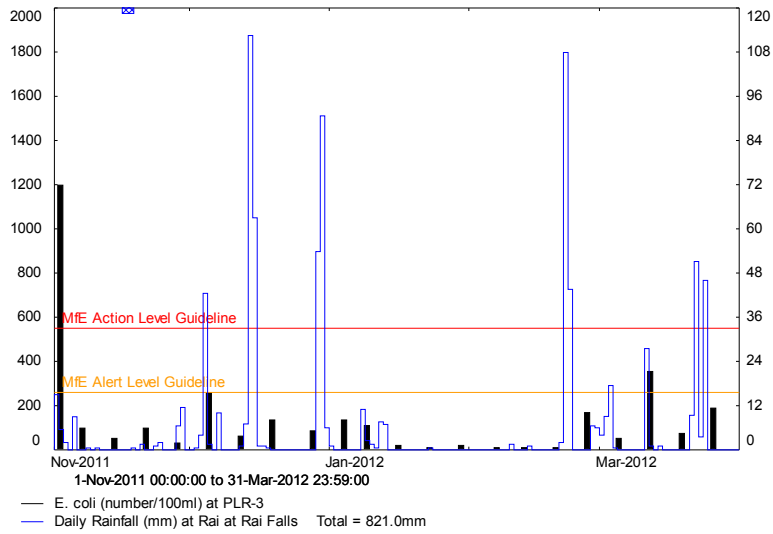
Opawa at Malthouse Reserve



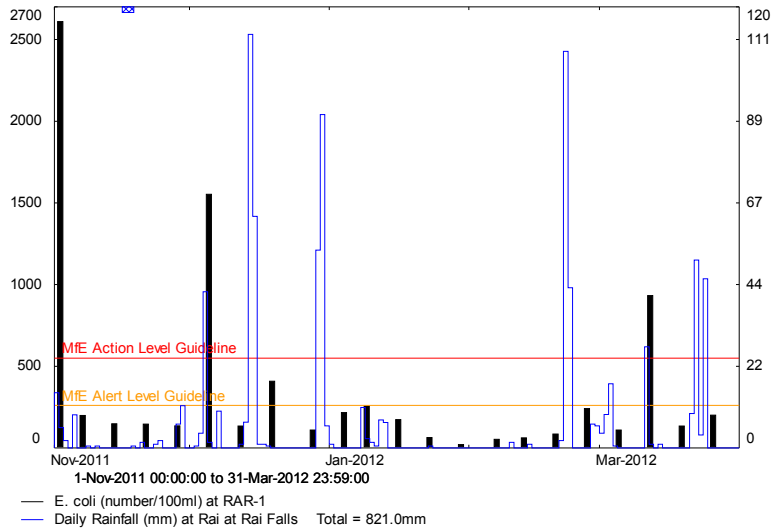
Pelorus at Pelorus Bridge



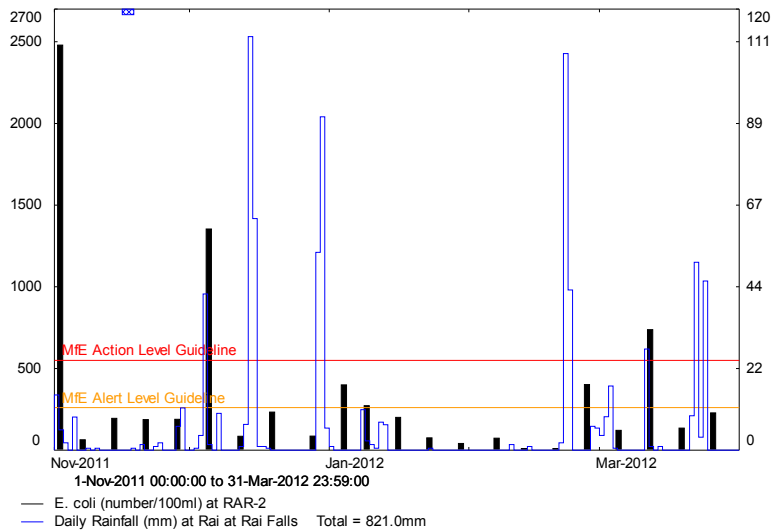
Pelorus at Totara Flat



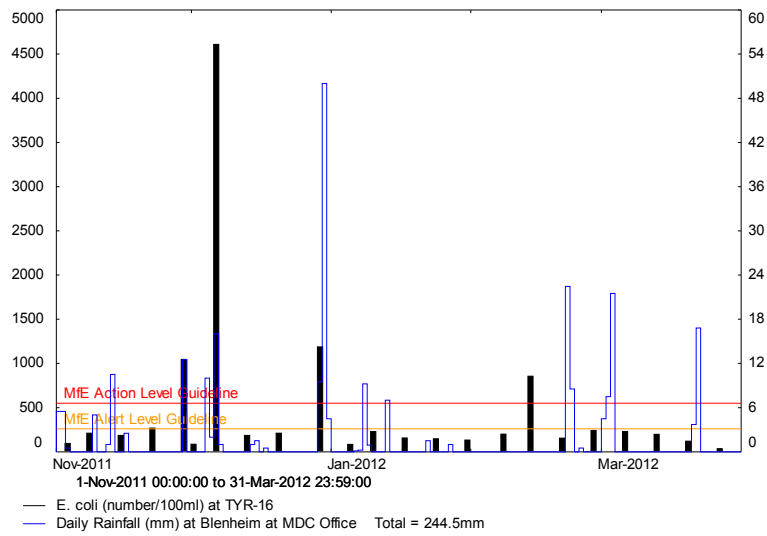
Rai at Rai Falls



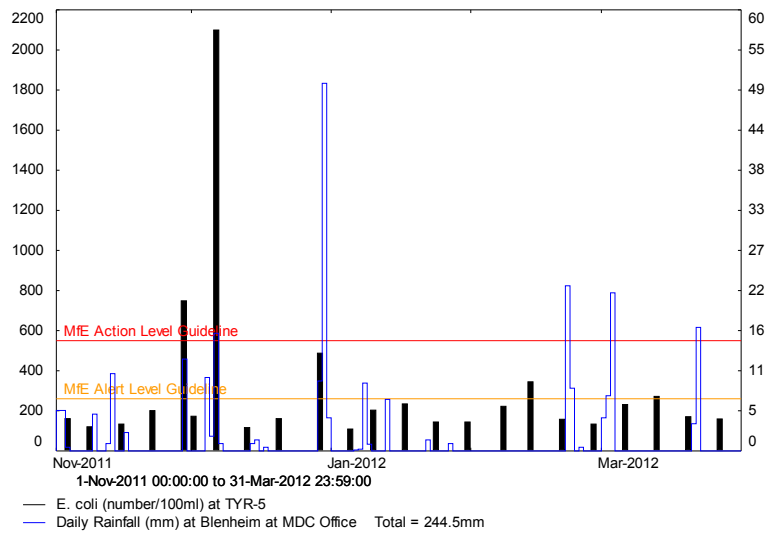
Rai at Brown River Reserve



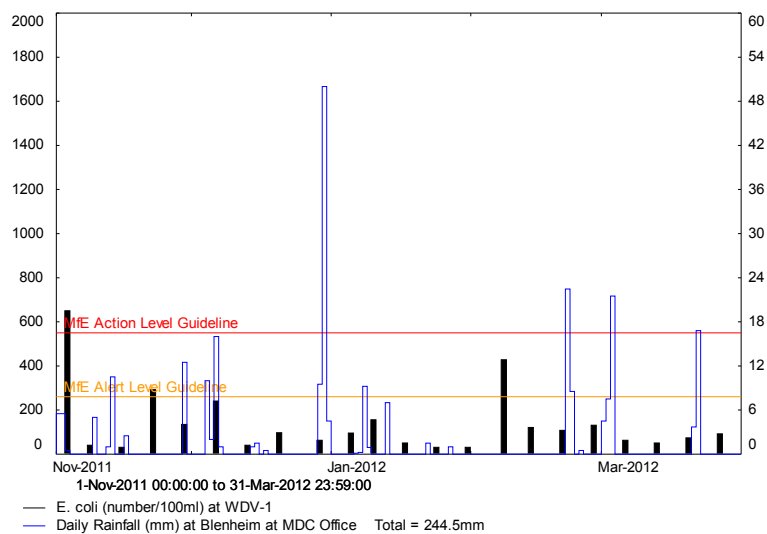
Taylor at Riverside



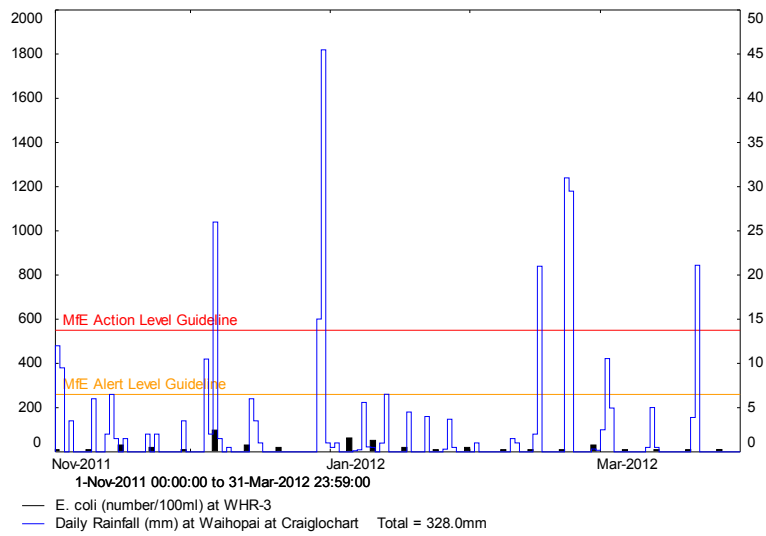
Taylor at Hutcheson



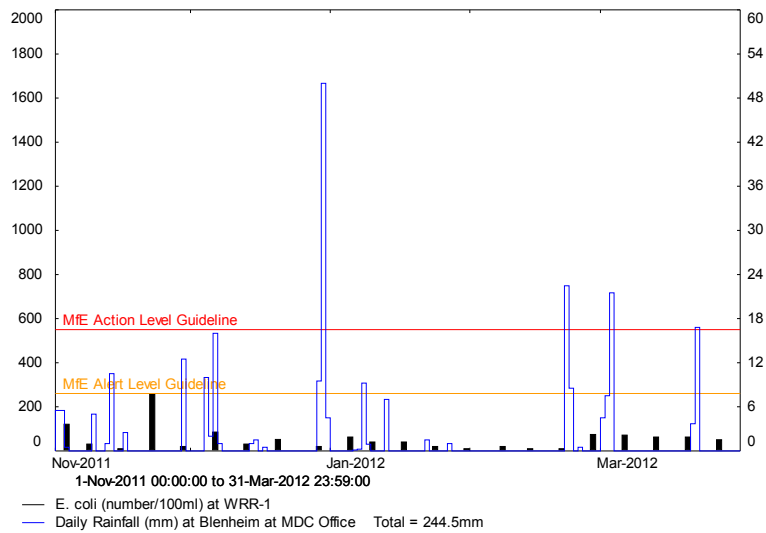
Wairau Diversion at Neals Road Bridge



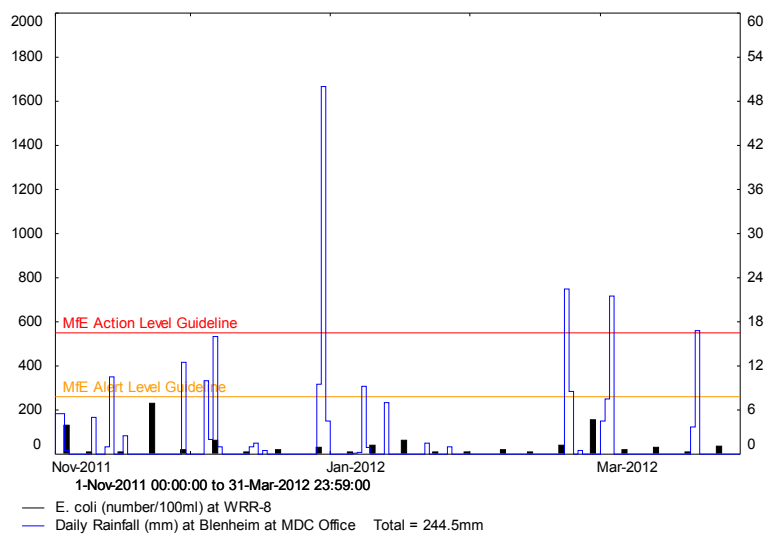
Waihopai at Craiglochart at Bridge no. 2



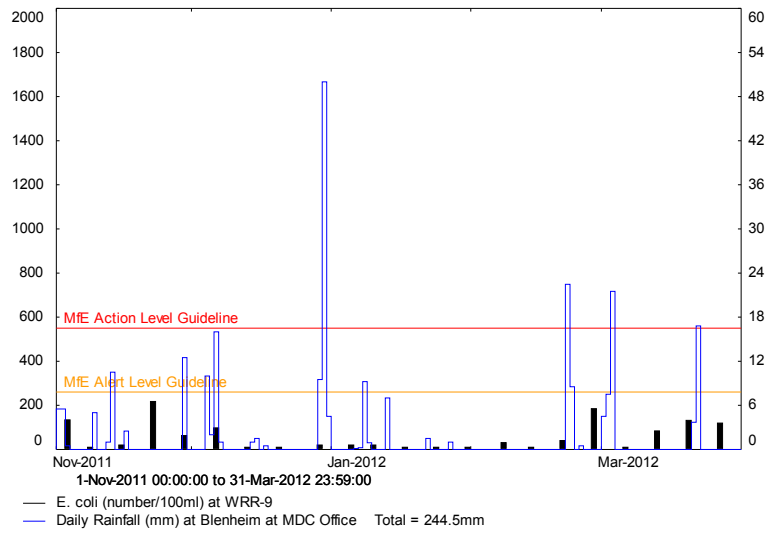
Wairau at Blenheim Rowing Club



Wairau at Ferry Road Bridge



Wairau at Wairau Rowing Club



Appendix 5: Summary statistics for recreational water quality sites 2003-12

The median and 95%ile for each coastal site for each summer season from 2003 to 2012.

Median	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Anakiwa	5	25	10	5	7.5	5	4	4	10
Bobs Bay	5	5	5	5	7.5	5	4	4	10
Hakahaka Bay					5	10	12	20	10
Oyster Bay					5	10	4	22	10
Marfells	5		5	5	5	5	4	4	10
Moenui	5	5	5	5	40	10	4	28	10
Momorangi Bay	40	46.5	20	40	87	7.5	12	12	10
Ngakuta Bay	5	7.5	5	5	5	5	4	12	10
Mistletoe Bay	91.5					5	4	4	10
Picton Foreshore	58.5	46.5	40	10	10	7.5	4	12	10
Portage	10	5	5	5	5	10	4	6	10
Shelly Beach North	15	5	5	5	10	5	4	6	10
Te Mahia	7.5	5	5	5	5	5	4	4	10
Tirimoana	10	10	5	5	5	5	4	16	10
Waikawa Bay	10	10	5	5	5	5	4	12	10
Wairau Bar	10	10	5	5	5	7.5	8	18	10
Wairau Diversion	64	10	5	10	10	20	22	22	10
Whites Bay	7.5	5	5	5	5	5	4	4	10
95%ile	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Anakiwa	1227	1473	1835.45	332	1174	10	109.60	124	210.2
Bobs Bay	271.25	99	119	27	519	5	152.80	156	20.0
Hakahaka Bay					1216.6	227.5	402.40	2890	152.6
Oyster Bay					301.05	335.25	390.40	2680	667.4
Marfells	28				34.3	364.2	13.60	50.4	24.5
Moenui	99.2	155.85	109	57.5	2001	969.7	1438.00	3060	207.8
Momorangi Bay	1273.35	694	344	1175	1100	98.4	911.20	122.4	476.4
Ngakuta Bay	223	94	135.7	212.5	74.35	135.6	276.80	886	281.8
Mistletoe Bay						736	712.00	74	32.8
Picton Foreshore	1343.1	1767	2001	639.45	810.45	648.8	29.60	582	531.8
Portage	947.3	1550.5	183.75	802.8	10	375.75	732.00	512	97.4
Shelly Beach North	223	281.15	276.9	286.75	192.35	49.6	37.60	492	195.6
Te Mahia	93.1	234	532.5	90.6	32	420.6	441.20	45	161.8
Tirimoana	1473	194.8	258.05	865	1387.2	185.4	72.00	418	220.6
Waikawa Bay	140.1	175.45	556.05	124	677.85	330.2	110.80	1744	96.6
Wairau Bar	450.3	2001	274	237.5	473.2	369.6	188.00	980	170.0
Wairau Diversion	814.8	217.3	173.8	32	762	208	156.80	1920	266.4
Whites Bay		392	36	15	77	442.3	12.00	242.4	14.0

The median and 95%ile for each river site for each summer season from 2003 to 2012.

Median	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Opawa River @ Elizabeth St Footbridge	111	111.5	178	124	178	99	10.5	53	110
Opawa River @ Malthouse Reserve	150.5	215	53	87	87	105	28.5	38	115
Pelorus River @ Bridge	20	30	30	20	20	20	16.5	35	31
Pelorus River @ Totara Flat	87	111	20	40	75	47.5	20	40	80
Rai River @ Brown River Reserve	316	207	172	87	271	99	40	87	188
Rai River @ Falls	207	192	69.5	53	99	83	46.5	93	147
Taylor River @ Hutcheson Street	124	171	207	192	137	178.5	27	64	166
Taylor River @ Riverside Park		137	192	178	164	150	22.5	65	200
Waihopai River @ Craiglochart	75	46.5	30	20	75	47.5	12	21	11
Wairau Diversion @ Bridge	178	81	75	64	40	105	33	86.5	94
Wairau River @ Blenheim Rowing Club	75	25	40	30	30	35.5	7.5	9.5	41
Wairau River @ Ferry Bridge	40	64	75	40	75	36.5	13.5	13.5	20
Wairau River @ Wairau Rowing Club	99	58.5	30	40	40	31	1.5	17.5	20
95%ile	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Opawa River @ Elizabeth St Footbridge	1498.8	314	988.3	877	312.85	526	318.4	591.2	314.60
Opawa River @ Malthouse Reserve	2001	2001	150	1306	706.2	742	358.6	756	1655.40
Pelorus River @ Bridge	666.65	740.1	955.05	778	789.15	438	232.2	145.8	126.60
Pelorus River @ Totara Flat	682.1	1267.1	1266	720	1145	2001	572	572.55	692.20
Rai River @ Brown River Reserve	2001	1300	2001	1452	1425	2240	648	1364	1804.40
Rai River @ Falls	1520	1510.3	1367.4	1731	1670.45	2001	1148	1080	1975.80
Taylor River @ Hutcheson Street	2001	617.5	1835.45	427	965.2	1331	1556	1260	1289.40
Taylor River @ Riverside Park		520.5	1330.55	344	2001	1640	1504	2044	2556.20
Waihopai River @ Craiglochart	257.8	644	1738.95	586	2001	194	245.2	692	78.75
Wairau Diversion @ Bridge	511.85	1239.5	245.2	432	524.85	1007	496	1944	516.80
Wairau River @ Blenheim Rowing Club	392.5	271	465.75	143	528.85	630	80	383.4	176.20
Wairau River @ Ferry Bridge	265.5	316	176	301	449.1	773	85.2	704	186.00
Wairau River @ Wairau Rowing Club	1430	431	393.15	162	416.35	582	118.2	608	198.20

Appendix 6: 2011-12 Suitability for Recreation Grade (SFRGs) Results

Coastal

ANAKIWA					
***** Microbiological Assessment Category *****					
Annual exceedance information					
	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	22	1	0	100
Year	2010	22	1	0	100
Year	2009	22	0	0	100
Year	2008	23	3	2	91
Total	0	111	5	3	97
Assessment Results					
Microbiological Assessment Grade - B					
Hazen Percentile Result - 188.5					
Complete Data Set (5 years with at least 100 samples)					
***** Suitability for Recreation Grade *****					
Suitability Assessment Results					
SFRG Assessment Grade - Good					
Primary Impact - ,13: River - agricultural activites/birds/feral animals					
Complete Data Set (5 years with at least 100 samples)					
***** Sanitary Inspection Category *****					
Catchment Assessment Checklist Results					
SIC Assessment Grade - Moderate					
Primary Impact:					
13: River - agricultural activites/birds/feral animals					

BOBS BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	0	100
Year	2011	22	1	0	100
Year	2010	22	1	0	100
Year	2009	22	0	0	100
Year	2008	20	1	1	95
Total	0	108	3	1	99

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 120.8

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

HAKAHAKA BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	1	0	100
Year	2011	25	1	3	88
Year	2010	24	0	1	95
Year	2009	21	1	1	95
Year	2008	18	0	1	94
Total	0	110	3	6	94

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 288

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Poor

Primary Impact - 10: River - untreated human effluent

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

10: River - untreated human effluent

MARFELLS BEACH

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	21	0	0	100
Year	2011	22	0	0	100
Year	2010	22	0	0	100
Year	2009	22	0	1	95
Year	2008	21	0	0	100
Total	0	108	0	1	99

Assessment Results

Microbiological Assessment Grade - A

Hazen Percentile Result - 32.3

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Complete Data Set (5 years with at least 100 samples)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

MISTLETOE BAY

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	0	100
Year	2011	22	0	0	100
Year	2010	22	0	1	95
Year	2009	22	0	1	95
Year	2008	0	0	0	0
Total	0	88	0	2	97

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 57.8

Interim Data Set (< 5 years or < 100 samples used)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Interim Data Set (< 5 years, or < 100 samples used)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

MOENUI

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	22	1	5	77
Year	2010	22	2	2	90

Year	2009	21	1	2	90
Year	2008	24	3	6	75
Total	0	111	7	16	85

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 1685

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Very Poor

Primary Impact - 7: Intensive agricultural use

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

7: Intensive agricultural use

MOMORANGI						
***** Microbiological Assessment Category *****						
Annual exceedance information						
	sample season	sample size	exceed 140 to 280	exceed >280	%days <280	
Year	2012	22	0	2	90	
Year	2011	22	1	0	100	
Year	2010	22	3	1	95	
Year	2009	22	1	0	100	
Year	2008	36	4	6	83	
Total	0	124	9	9	92	
Assessment Results						
Microbiological Assessment Grade - C						
Hazen Percentile Result - 475.8						
Complete Data Set (5 years with at least 100 samples)						
***** Suitability for Recreation Grade *****						
Suitability Assessment Results						
SFRG Assessment Grade - Fair						
Primary Impact - 13: River - agricultural activities/birds/feral animals						
Complete Data Set (5 years with at least 100 samples)						
***** Sanitary Inspection Category *****						
Catchment Assessment Checklist Results						
SIC Assessment Grade - Moderate						
Primary Impact:						
13: River - agricultural activities/birds/feral animals						

NGAKUTA BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	1	1	95
Year	2011	22	1	2	90
Year	2010	22	0	1	95
Year	2009	22	0	1	95
Year	2008	21	0	0	100
Total	0	109	2	5	95

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 187.2

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

OYSTER BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	25	1	2	92
Year	2010	22	2	1	95
Year	2009	21	0	1	95
Year	2008	19	0	1	94
Total	0	109	3	6	94

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 535.65

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Very Poor

Primary Impact - 16: Tidal/onshore winds carry untreated wastewater

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Very High

Primary Impact:

16: Tidal/onshore winds carry untreated wastewater

PICTON FORESHORE******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	1	2	90
Year	2011	22	0	3	86
Year	2010	22	0	0	100
Year	2009	22	0	2	90
Year	2008	23	0	3	86
Total	0	111	1	10	90

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 558.55

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Very Poor

Primary Impact - 2: Stormwater outlets

Complete Data Set (5 years with at least 100 samples)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

2: Stormwater outlets

PORTAGE******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	0	100
Year	2011	22	0	1	95
Year	2010	22	0	1	95
Year	2009	21	3	2	90
Year	2008	19	0	0	100
Total	0	106	3	4	96

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 193.2

Data Set Extent - Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Good

Primary Impact - 11: River - stormwater outlets

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****						
Catchment Assessment Checklist Results						
SIC Assessment Grade - Moderate						
Primary Impact:						
11: River - stormwater outlets						

SHELLEY BEACH

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	22	1	1	95
Year	2010	22	0	0	100
Year	2009	22	0	0	100
Year	2008	23	2	0	100
Total	0	111	3	2	98

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 133.9

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Good

Primary Impact - 3: Urban stormwater

Complete Data Set (5 years with at least 100 samples)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

3: Urban stormwater

TE MAHIA

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	22	0	0	100
Year	2010	22	1	1	95
Year	2009	21	0	1	95
Year	2008	18	0	0	100
Total	0	105	1	3	97

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 85.5

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

TIRIMOANA

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	1	95
Year	2011	22	0	3	86
Year	2010	22	0	0	100
Year	2009	22	0	1	95
Year	2008	21	0	4	80
Total	0	109	0	9	91

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 387.65

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Good

Primary Impact - 13: River - agricultural activities/birds/feral animals

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

13: River - agricultural activities/birds/feral animals

WAIKAWA BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	0	100
Year	2011	22	2	1	95
Year	2010	22	0	0	100
Year	2009	22	0	1	95
Year	2008	21	0	1	95
Total	0	109	2	3	97

Assessment Results

Microbiological Assessment Grade - B
Hazen Percentile Result - 132.9
Complete Data Set (5 years with at least 100 samples)
***** Suitability for Recreation Grade *****
Suitability Assessment Results
SFRG Assessment Grade - Good
Primary Impact - 14: River - focal points of drainage
Complete Data Set (5 years with at least 100 samples)
***** Sanitary Inspection Category *****
Catchment Assessment Checklist Results
SIC Assessment Grade - Low
Primary Impact:
14: River - focal points of drainage

WAIRAU BAR

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	2	0	100
Year	2011	22	0	2	90
Year	2010	22	0	1	95
Year	2009	22	0	1	95
Year	2008	22	0	2	90
Total	0	110	2	6	94

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 300

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Grade *******

Suitability Assessment Results

SFRG Assessment Grade - Fair

Primary Impact - ,13: River - agricultural activites/birds/feral animals

Complete Data Set (5 years with at least 100 samples)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

13: River - agricultural activites/birds/feral animals

WAIRAU DIVERSION

******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	1	1	95
Year	2011	22	2	3	86
Year	2010	22	1	0	100

Year	2009	22	0	1	95
Year	2008	20	0	1	95
Total	0	108	4	6	94
Assessment Results					
Microbiological Assessment Grade - C					
Hazen Percentile Result - 360.4					
Complete Data Set (5 years with at least 100 samples)					
***** Suitability for Recreation Grade *****					
Suitability Assessment Results					
SFRG Assessment Grade - Fair					
Primary Impact - 13: River - agricultural activities/birds/feral animals					
Complete Data Set (5 years with at least 100 samples)					
***** Sanitary Inspection Category *****					
Catchment Assessment Checklist Results					
SIC Assessment Grade - Moderate					
Primary Impact:					
13: River - agricultural activities/birds/feral animals					

WHITES BAY

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 140 to 280	exceed >280	%days <280
Year	2012	22	0	0	100
Year	2011	22	0	1	95
Year	2010	22	0	0	100
Year	2009	22	0	1	95
Year	2008	20	0	0	100
Total	0	108	0	2	98

Assessment Results

Microbiological Assessment Grade - A

Hazen Percentile Result - 31.5

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Grade *****

Suitability Assessment Results

SFRG Assessment Grade - Very Good

Primary Impact - 0: No significant source indicated.

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Very Low

Primary Impact:

0: No significant source indicated.

Freshwater

OPAWA AT ELIZABETH STREET FOOTBRIDGE					
***** Microbiological Assessment Category *****					
Annual exceedance information					
	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	2	0	100
Year	2011	22	1	1	95
Year	2010	22	1	0	100
Year	2009	22	2	1	95
Year	2008	21	2	0	100
Total	0	109	8	2	98
Assessment Results					
Microbiological Assessment Grade - C					
Hazen Percentile Result - 325.05					
Complete Data Set (5 years with at least 100 samples)					
***** Suitability for Recreation Class *****					
Suitability Assessment Results					
SFRC Assessment Grade - Fair					
Primary Impact - 5: Primary or secondary treatment facilities					
Complete Data Set (5 years with at least 100 samples)					
***** Sanitary Inspection Category *****					
Catchment Assessment Checklist Results					
SIC Assessment Grade - Moderate					
Primary Impact:					
3: Urban stormwater					

OPAWA AT MALTHOUSE RESERVE

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	3	1	95
Year	2011	22	0	2	90
Year	2010	22	0	1	95
Year	2009	22	2	1	95
Year	2008	21	2	1	95
Total	0	109	7	6	94

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 741

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Poor

Primary Impact - 5: Primary or secondary treatment facilities
 Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

8: Run-off from low intensity agriculture

PELORUS BRIDGE

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	0	0	100
Year	2011	22	0	0	100
Year	2010	22	1	0	100
Year	2009	22	0	1	95
Year	2008	21	1	1	95
Total	0	109	2	2	98

Assessment Results

Microbiological Assessment Grade - B

Hazen Percentile Result - 151.95

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Good

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

8: Run-off from low intensity agriculture

PELORUS AT TOTARA FLAT

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	1	1	95
Year	2011	21	0	1	95
Year	2010	22	1	1	95
Year	2009	22	1	4	81
Year	2008	21	3	2	90
Total	0	108	6	9	91

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 1109.8
 Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results
SFRC Assessment Grade - Very Poor
 Primary Impact - 5: Primary or secondary treatment facilities
 Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results
SIC Assessment Grade - High
 Primary Impact:
 7: Intensive agricultural use

RAI AT BROWN RIVER RESERVE

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	3	3	86
Year	2011	21	0	2	90
Year	2010	22	1	1	95
Year	2009	22	2	3	86
Year	2008	21	8	3	85
Total	0	108	14	12	88

Assessment Results

Microbiological Assessment Grade - D
 Hazen Percentile Result - 1215.4
 Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results
SFRC Assessment Grade - Very Poor
 Primary Impact - 5: Primary or secondary treatment facilities
 Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results
SIC Assessment Grade - High
 Primary Impact:
 7: Intensive agricultural use

RAI AT RAI FALLS

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	1	3	86
Year	2011	22	0	2	90
Year	2010	22	1	3	86

Year	2009	22	1	4	81
Year	2008	21	3	3	85
Total	0	109	6	15	86

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 1905

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Very Poor

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

7: Intensive agricultural use

TAYLOR AT HUTCHESON STREET BRIDGE

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	3	2	90
Year	2011	22	1	2	90
Year	2010	22	1	1	95
Year	2009	22	5	2	90
Year	2008	21	2	1	95
Total	0	109	12	8	92

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 1050

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Very Poor

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

2: Stormwater outlets

TAYLOR AT RIVERSIDE

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	1	4	81
Year	2011	22	2	2	90
Year	2010	22	0	2	90
Year	2009	22	3	3	86
Year	2008	21	6	2	90
Total	0	109	12	13	88

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 2000

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Very Poor

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - High

Primary Impact:

2: Stormwater outlets

WAIHOPAI AT CRAIGLOCHART

***** Microbiological Assessment Category *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	21	0	0	100
Year	2011	22	1	1	95
Year	2010	22	1	0	100
Year	2009	22	0	0	100
Year	2008	21	0	4	80
Total	0	108	2	5	95

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 559.8

Complete Data Set (5 years with at least 100 samples)

***** Suitability for Recreation Class *****

Suitability Assessment Results

SFRC Assessment Grade - Poor

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** Sanitary Inspection Category *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:
8: Run-off from low intensity agriculture

WAIRAU AT BLENHEIM ROWING CLUB******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	0	0	100
Year	2011	22	0	1	95
Year	2010	22	0	0	100
Year	2009	22	1	1	95
Year	2008	21	1	1	95
Total	0	109	2	3	97

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 265.25

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Class *******

Suitability Assessment Results

SFRC Assessment Grade - Fair

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

******* Sanitary Inspection Category *******

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

8: Run-off from low intensity agriculture

WAIRAU AT FERRY BRIDGE******* Microbiological Assessment Category *******

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	0	0	100
Year	2011	22	0	2	90
Year	2010	22	0	0	100
Year	2009	22	1	2	90
Year	2008	21	2	1	95
Total	0	109	3	5	95

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 321.9

Complete Data Set (5 years with at least 100 samples)

******* Suitability for Recreation Class *******

Suitability Assessment Results

SFRC Assessment Grade - Fair

Primary Impact - 5: Primary or secondary treatment facilities
 Complete Data Set (5 years with at least 100 samples)

***** **Sanitary Inspection Category** *****

Catchment Assessment Checklist Results
SIC Assessment Grade - Moderate

Primary Impact:
 8: Run-off from low intensity agriculture

WAIRAU AT WAIRAU ROWING CLUB

***** **Microbiological Assessment Category** *****

Annual exceedance information

	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	0	0	100
Year	2011	22	1	1	95
Year	2010	22	0	0	100
Year	2009	22	1	1	95
Year	2008	21	3	0	100
Total	0	109	5	2	98

Assessment Results

Microbiological Assessment Grade - C

Hazen Percentile Result - 407.15

Complete Data Set (5 years with at least 100 samples)

***** **Suitability for Recreation Class** *****

Suitability Assessment Results

SFRC Assessment Grade - Fair

Primary Impact - 5: Primary or secondary treatment facilities

Complete Data Set (5 years with at least 100 samples)

***** **Sanitary Inspection Category** *****

Catchment Assessment Checklist Results

SIC Assessment Grade - Moderate

Primary Impact:

8: Run-off from low intensity agriculture

WAIRAU DIVERSION AT NEALS ROAD BRIDGE

***** **Microbiological Assessment Category** *****

Annual exceedance information

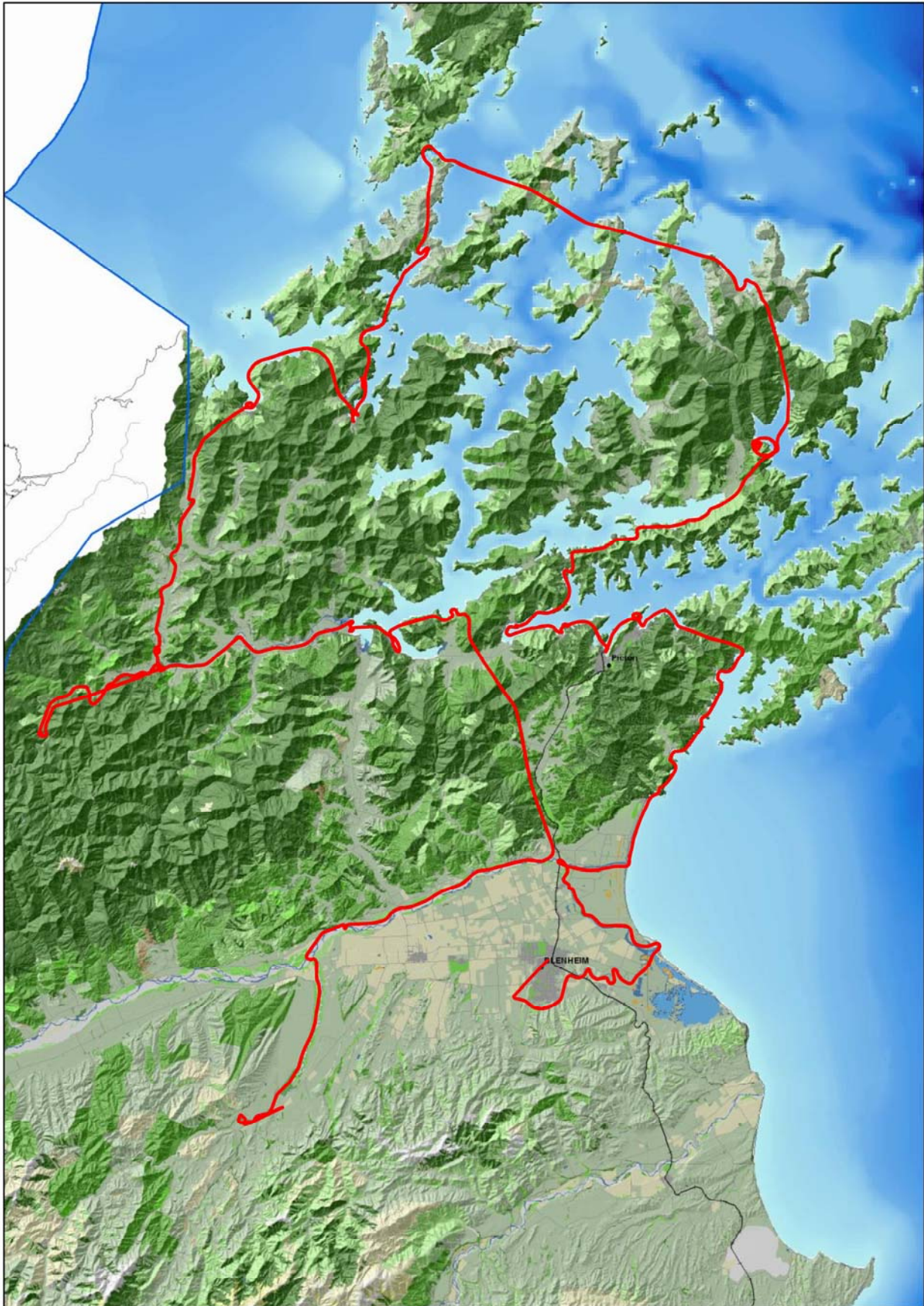
	sample season	sample size	exceed 260 to 550	exceed >550	%days <550
Year	2012	22	2	1	95
Year	2011	22	3	2	90
Year	2010	23	3	0	100
Year	2009	22	1	4	81
Year	2008	21	1	1	95
Total	0	110	10	8	92

Assessment Results

Microbiological Assessment Grade - D

Hazen Percentile Result - 697			
Complete Data Set (5 years with at least 100 samples)			
***** Suitability for Recreation Class *****			
Suitability Assessment Results			
SFRC Assessment Grade - Poor			
Primary Impact - 5: Primary or secondary treatment facilities			
Complete Data Set (5 years with at least 100 samples)			
***** Sanitary Inspection Category *****			
Catchment Assessment Checklist Results			
SIC Assessment Grade - Moderate			
Primary Impact:			
16: Indirect influences - High intensity agriculture or feral animals/birds			

Appendix 7: Flight path of helicopter on 21st January 2012



Appendix 8: Onsite questionnaire

Personal Profile:		On a scale of 1-5, 1 being completely unimportant and 5 is absolutely critical, what influences the quality of your experience for your main activity? (circle)					
Age	14-19 20-34 35-49 50+	Water Clarity	1	2	3	4	5
Sex	Female Male	Levels of disease causing organisms	1	2	3	4	5
No. of people you came with?	.....	Water temperature	1	2	3	4	5
No. of children under 14 yrs?	.....	Scums/foams/odour/slimes	1	2	3	4	5
Where do you normally live?	Marlborough	Excessive algae growth	1	2	3	4	5
	Overseas	Presence of Rubbish	1	2	3	4	5
	Elsewhere in NZ	Erosion	1	2	3	4	5
Level of Effort to get here:		Peacefulness	1	2	3	4	5
Where did you come from today?	.....	Presence of power boats	1	2	3	4	5
How did you get here?	Bike Walk Car	Too many other people	1	2	3	4	5
What is the main reason for visiting this site today? What are the remaining reasons (if any) for visiting this site? (in order from 2 for the second reason, 3 for the third reason etc.)		Scenery	1	2	3	4	5
Swimming	.....	Camping nearby	1	2	3	4	5
Picnicking/BBQ	.....	Toilets nearby	1	2	3	4	5
Socialising/camping	.....	Safe for children	1	2	3	4	5
Sunbathing	.....	Rope swing / place to jump	1	2	3	4	5
Kayaking	.....	Proximity to where I live/stay	1	2	3	4	5
Tubing	.....	Deep water	1	2	3	4	5
Fishing	.....	Variable water depth suitable for kids	1	2	3	4	5
Shellfish gathering	.....	Being able to take dogs	1	2	3	4	5
Other (i) e.g. surfing	.....	Other	1	2	3	4	5
Other (ii)	.....					
Did you check any of the following before coming today?		Do you mind dogs on the beach/river site?	YES	NO			
River flow or level	.....	Do you mind the presence of powerboats and jet skis?	YES	NO			
Tidal state	.....	What beach/river sites in Marlborough have you visited in the last year? How many times? How long did you stay? How many people on average do you see there?					
Water Quality	.....	Name of Site 1:	.....	Length of stay:	.....	
Have you ever checked the MDC website for information on water quality at beaches/swimming sites?	YES NO	# visits per year:	.....	Length of stay:	.....	
What information would you like to see on the MDC website in relation to beaches/swimming sites?		# people at site:	0-5 6-20 21-50 50+				
		Name of Site 2:	.....	Length of stay:	.....	
		# visits per year:	.....	Length of stay:	.....	
		# people at site:	0-5 6-20 21-50 50+				
How would you like to access information on water quality at this site? (circle or rank preference)		Name of Site 3:	.....	Length of stay:	.....	
Not interested	Signs at the site Website	# visits per year:	.....	Length of stay:	.....	
Newspaper	Radio	# people at site:	0-5 6-20 21-50 50+				
Have you ever been ill or had rashes/skin infections after swimming here or at any other site (or do you know anyone who has) ?	YES: NO	Name of Site 4:	.....	Length of stay:	.....	
If yes, where?	.....	# visits per year:	.....	Length of stay:	.....	
		# people at site:	0-5 6-20 21-50 50+				

Are there any sites you will not go back to due to something affecting your experience? Why?

Do you have any concerns about development or disturbance along the coast or rivers?

Any other comments about swimming/contact recreation in rivers and coastal areas in Marlborough?

Survey locality:	_____
Surveyor:	_____
Date:	_____
Time:	_____

THANK YOU FOR YOUR PARTICIPATION

List your favourite sites (if any) from these areas:

Rai / Pelorus catchment:

Pelorus Sound:

Queen Charlotte Sound:

Wairau River:

Other: e.g. Whites Bay, Port Underwood, Waihopai River, Goulet River etc.

