



Water Safety and Auckland's West Coast Fishers – 2011



Preface and Acknowledgements

This report is an evaluation of the 2011 collaborative project between the Auckland Council, Surf Life Saving Northern Region (SLSN), Safe Waitakere, and Watersafe Auckland Incorporated (WAI).

The *West Coast Rock Fishing Safety Pilot Project* was originally set up in October 2005 in response to a spate of rock-fishing fatalities on Auckland's rugged west coast in the previous six months (5 fatalities in 4 months). Because of the success of the pilot project in 2006-2008, recommendations to continue the rock fishing safety initiative were acted upon and the safety advisory service was re-established for the summer seasons of 2009 and 2010. In addition, a 2 year trial of the installation of angel rings to provide another layer of protection at high risk sites was also initiated. In the 6 years that the safety project has been in place, 5 fishers have drowned.

This year was the first year that the project has been run under the newly amalgamated Auckland Council. The project team is again grateful for the contribution of Cr Sandra Coney and the Parks and Heritage Committee, whose advocacy and support for the project has been pivotal to both the success of the venture and its sustainability by achieving a Council 'Legends Project' status.

Our thanks to the New Zealand Chinese Youth Trust for promotion of the project within the Chinese community. Our thanks to Michael Jones for his commitment to promoting water safety within the Pasifika community.

We would also like to thank the Iwi of Te Kawerau a Maki and the Lusk family for allowing some of the Angel Rings to be installed on their land and allowing us access to maintain them.

The project would not have been possible without the enthusiasm and skills of Jo Davidson and Reg Phillips, Auckland Council; Andy Kent of Surf Life Saving Northern Region; Coral Timmins of Safe Waitakere, and Teresa Stanley, WaterSafe Auckland. As was the case in previous years, Stuart Leighton, Auckland Council parks ranger again deserves recognition for his significant contribution and leadership of the project in the field.

Finally, a very special vote of thanks to the field officers, John Yoo, Steve Chen, and Nancy Cao. They again were the public face of the project and their importance in making fishers aware of the rock fishing safety project has been critical to the success of the campaign

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www.watersafe.org.nz/page.asp?page=342

Executive Summary

1. Background

The *West Coast Rock Fishing Safety Pilot Project* was originally set up in October 2005 in response to a spate of rock-fishing fatalities on Auckland's rugged west coast in the previous six months (5 fatalities in 4 months). Because of the success of the pilot project in 2006-2008, recommendations to continue the rock fishing safety initiative were acted upon and the safety advisory service was re-established for the summer seasons of 2009 and 2010. In addition, a 2 year trial of the installation of angel rings to provide another layer of protection at high risk sites was also initiated. In the 6 years that the safety project has been in place, 5 fishers have drowned. In 2010, the outgoing Auckland Regional Council (ARC) recommended to the incoming Auckland Council that the Project be given 'Legends project' status in order to sustain the funding for future water safety promotion. Thus, personnel from the Auckland Council, WaterSafe Auckland Inc (WAI), Safe Waitakere, and Surf Life Saving Northern Region (SLSNR) jointly conducted the rock fishing safety campaign entitled *West Coast Fishing Safety* that addressed concerns over the number of fishing fatalities on Auckland's west coast.

2. Purpose

The purposes of this sixth year of the project were threefold:

- 1) To continue the on-site rock fishing safety education promotion initiated in 2006
- 2) To determine the effect of the project on Auckland's west coast fishers' safety practices and beliefs
- 3) To make recommendations for future rock fishing safety promotion based on the information obtained

3. Methods

A cross sectional study of fishers at high risk locations on Auckland's west coast was undertaken at the end of the summer safety campaign in 2011. A sample of 144 fishers voluntarily completed a written questionnaire that sought information

on whether they had taken part in the previous campaigns and if they were aware of the follow-up 2011 fishing safety promotion. The structured written questionnaire (see Appendix 1) was anonymous, designed to be completed on site and take a maximum of 10 minutes to complete. The questionnaire contained 14 questions, all of which had been included in the 2010 survey. Further information was sought on fishers opinion on the angel rings (flotation aids) at 8 high-risk west coast sites.

4. Key Findings

4.1 Participant demographics:

- As was the case in 2006-2009, the sample was predominantly males (males 88%) and most fishers were aged between 20-44 years (66%).
- Proportionally more Asian peoples (61%), proportionally less European (16%), Maori (3%) and Pasifika (11%) peoples took part in the survey.
- More than one fifth (20%) of fishers were of recent residency (<5 years).
- Almost three quarters (71%) had visited the site where they were interviewed <5 times. For one fifth (22%), it was their first visit to the site.

4.2 Awareness of the West Coast Fishing Safety Project

- On half of fishers (54%) reported that they were aware of the previous West Coast Fishing Safety Projects 2006-2010.
- Of those who had taken part, most thought that the campaign had been highly successful/successful (70%), one quarter (27%) felt that it had been slightly/not successful or did not know (2%).
- Most fishers (71%) were aware of the current 2011 West Coast Fishing Safety Project.
- Of these, more than one third (41%) identified the fishing advisors as their source of information. Other sources included newspapers (20%), television (15%), radio (10%), magazines (7%) and retail outlets (1%).

4.3. Angel ring installation

- Two thirds (69%) of fishers had seen the new on-site angel rings and, of these, 44% considered them to be *essential*.
- Most fishers (72%) thought that the angel rings were accompanied with clear instructions, 27% were *unsure*.

- Two thirds of the fishers (66%) *agreed/strongly agreed* that angel rings were the best source of public rescue equipment (PRE), one third (34%) were *unsure*.
- Two thirds (69%) of fishers thought that they were located in the most needed sites, 35% were unsure.
- In a reported rescue (22nd Dec 2010), South Piha lifeguards responded to an incident south of the beach at Dawson's ledge where a fisher had fallen into the water. When lifeguards arrived his friend had used the angel ring to pull him back on to the rocks. Victim had suffered injuries to his thighs and legs and taken to hospital and made full recovery. At a second incident at Bethell's Beach (22nd April) lifeguards responded to a fisher in water call, victim was found facedown in water, pronounced dead by ambulance staff after 30 minutes of CPR by lifeguards. No angel ring was available at this location.

4.4. Perceptions of Drowning Risk

- Almost three quarters of fishers (72%) agreed that getting swept off rocks was likely to result in their drowning.
- More believed that drowning was a constant threat to life when fishing from rocks (2011, 69%; 2010 66%). This would suggest a beneficial shift in fishers' attitudes over the 5 years to one of having a greater appreciation of the risk of drowning.
- More than one quarter (29%) thought that others were at greater risk than themselves and one third (31%) considered that they were strong swimmers compared with others (2010, 50%)
- More than one third (36%) thought that their swimming ability would get them out of trouble
- More than one third (35%) thought that their local knowledge would keep them out of trouble

4.5. Water Safety Behaviours of Fishers

- Again the most noticeable positive change in self-reported behaviour relates to the use of life jackets/buoyancy aids. While approximately the same proportion of fishers reported *never* wearing a life jacket/buoyancy aid

(2011, 37%; 2010, 35%), **more reporting wearing them *often/always* (2011, 50%; 2010, 31%).**

- However, it is still a concern that one third of fishers (37%) report *never* wearing any life jacket/flotation aid.
- More than one third (38%) of fishers in 2011 reported *sometimes/often* consuming alcohol when fishing. Further promotional work on the folly of mixing alcohol with fishing from rocks is required, or even an extension of alcohol bans currently on many city beaches
- One third of fishers reported *sometimes/often* wearing gumboots/waders (36%), one half (51%) reported going down rocks to retrieve snagged lines (53%), both of these dangerous practices need to be targeted in future safety promotion.
- The contributing factors that may explain persistent risky practices in the 2011 survey results include the predominance of males among fishers (88%), the transience of the fisher population (only one half (54%) had taken part in previous surveys), one fifth (22%) were first time users of the sites, one fifth (20%) had lived in New Zealand for less than 5 years, and more than half (56%) of the survey respondents had completed the non-English version of the questionnaire).

4.6 Self-reported Changes in Fishers' Knowledge, Attitudes and Behaviours

- Three quarters (74%) of fishers considered that their safety knowledge had improved in the past year
- Almost three quarters (71%) considered that their safety attitudes had improved, though some (6%) thought that their attitude had not improved.
- Almost three quarters (73%) of the fishers in 2011 thought that their safety behaviour when fishing had improved.
- Half of the fishers thought that the safety behaviour of their mates (52%) or other fishers (56%) had improved.
- Improvements were reported by fishers in their personal safety knowledge (2011, 74%; 2010, 63%), safety attitudes (2011, 71%; 2010, 61%), and safety behaviour (2011, 73%; 2010, 62%)

5. Recommendations

In light of these findings, several recommendations are made. These are:

1. To the Auckland Council:

- Retain the services of the safety advisors for a 2012 summer campaign and on a permanent basis thereafter.
- Retain the multilingual advisory service and look to ways of presenting safety information in multiple languages.
- Continue to provide regional leadership via the inaugural super-city governance structure to support future fishing safety promotion, including the installation of angel rings, and safety signage at high risk sites thereby affirming the Council's commitment to maintain harbour and coastal safety.
- Consider the implementation of legislation through local by-laws of the compulsory use of life jackets at high-risk west coast fishing sites.
- Consider the implementation of legislation through local by-laws to prohibit the consumption of alcohol at high risk west coast fishing sites.

2. **To WaterSafe Auckland, Surf Life Saving Northern Region and other safety organizations:**

- Consider ways of addressing the concerns highlighted in this Report by reinforcing and extending the current provision of public safety information and resources.
- Commit resources and personnel to the ongoing work collaboratively with all partners to promote best practice for West Coast fishing safety education beyond 2011.
- Disseminate the findings of the study to member organizations, national water safety organisations, community organisations (especially migrant community organisations), recreational fishing groups and businesses and the public at large.
- Consider adopting similar messages and water safety promotion methods successfully used in Auckland's West Coast fishing safety project 2006-2011 in known high-risk fishing spots throughout New Zealand.

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1. Background

Rock-based fishing continues to be one of New Zealand's most dangerous pastimes. In the five years from 2005-2009, land-based fishing accounted for 25 drowning fatalities in New Zealand, 10% of all drowning incidents nationwide, and 29% of all beach-related fatalities (Water Safety New Zealand, Drownbase™, 2010). New Zealand is not alone in its high fatal drowning toll. New Zealand's nearest neighbour, Australia, has recently reported similar incidents and concerns with 101 recreational fishing fatalities from 2000-2007, of which 62 fatalities occurred at beach/coastal locations (Crosariol, Vasica, & Franklin, 2010). This represents 10% of all Australian coastal drowning fatalities. Several Sydney black spots around Randwick and Sutherland (NSW) have been identified (Thompson, 2010).

In 2006, a fisher safety campaign was launched in the Auckland region of New Zealand to combat a spate of surf-related drowning incidents associated with fishing from rocky foreshores. The Auckland Regional Council (ARC), WaterSafe Auckland Inc (WAI), and Surf Life Saving Northern Region (SLSNR) jointly conducted a fishing safety campaign entitled the *West Coast Fishing Safety Project* in the summer of 2006. The purpose of that campaign was twofold. First, the campaign piloted a fishing safety education program that would help fishers identify and manage the risks associated with fishing on Auckland's rugged west coast. Second, a survey of fishers was conducted to enhance understanding of their fishing safety knowledge, beliefs, and behaviours.

The 2006 survey revealed new and alarming statistics about risky behaviours that predisposed many fishers to harm in the highly dangerous locations in which they fished. Many had limited safety skills and an overly optimistic view of their survival skills in a high-risk fishing environment (Moran, 2008). In terms of survival ability, one third (n = 81; 32%) of fishers estimated that they could swim non-stop 25 m or less. Most fishers reported limited/no ability to perform CPR (n = 155; 62%). Many took unnecessary risks

when fishing from rocks. For example, almost one half (n = 120; 48%) had gone to the water's edge to retrieve a snagged line and one fifth (n = 50; 20%) admitted having consumed alcohol while fishing from rocks. Most fishers agreed that always wearing a life jacket made fishing a lot safer (n = 177; 71%), yet almost three quarters (n = 180; 72%) admitted that they never wore a life jacket. Fishing safety messages that address the twin dangers of overestimation of ability and underestimation of risk, especially at high-risk fishing locations, were recommended (Moran, 2008). The survey also revealed that the fishing population was culturally and linguistically diverse, was of recent residency, and were not frequent visitors to the sites where surveyed (Moran, 2006). The implications of this diversity, the transience of the population, and the remoteness of the site of activity were recognized barriers to be overcome in subsequent safety promotion.

The Auckland-based project is unique in that the fishing safety education programme was conducted on-site at high-risk fishing locations with supplementary promotion of safety messages via relevant media outlets of television and radio, newspapers and magazines as well as through retail outlets and community organizations. Static displays of fishing safety, written material and verbal advice from the trained field officers were the educational tools used for on-site promotion of fishing safety. The findings of the initial study were reported back to the participating organizations who decided that the project would be continued for an additional two years (Moran, 2006). At the end of the 3-year period in 2008, the project was extended for another two years and the information obtained from annual surveys conducted from 2006-2010 provided the data for a paper published in 2011 entitled *Rock-based fishers safety promotion: Five years on* (Moran, 2011). This paper provided data from surveys of fishers from 2006-10 to determine if preventive behaviours have been adopted after five years of safety promotion. The most significant change in self-reported behaviour related to the increased use of life jackets with 34% (95%CI = 0.25-0.44) of fishers in 2010 compared to 72% (95%CI = 0.66-0.77) in 2006 reporting never wearing a life jacket. Significant differences

were also evident in a reduced number of fishers wearing gumboots or waders with 45% (95%CI = 0.36-0.54) in 2006 compared with 64% (95%CI = 0.63-0.76) in 2006. One negative change in behaviour was reported in alcohol use with 54% (95% CI = 0.49-0.67) of fishers never drinking alcohol when fishing in 2010 compared with 80% (95%CI = 0.75-0.85) in 2006.

Some risky behaviours (such as consuming alcohol) and at-risk attitudes (such as overconfidence in their local knowledge) persisted. No significant changes were reported in behaviours such as turning your back to the sea when fishing, taking a cell-phone when fishing, and checking weather/water conditions before setting out.

The cultural and linguistic diversity of fishers, together with their transient participation, made them a difficult group to reach with education interventions, although changes in life jacket use were encouraging. Continuation of the safety campaign was recommended and ways to further enhance fisher safety were discussed.

This paper is the first published study to report from five years of annual data collection on an intervention aimed at reducing death by drowning among a high-risk group of recreational fishers – those that fish from rocky coastlines around surf coasts. The paper concluded that further observational studies were required to verify improvements reported anecdotally by lifeguards, park rangers, and by annual surveys, especially with regard to the reported increases in life jacket use. In its final comment, the author suggested that “Paradoxically, the limited, but positive changes observed across the years suggests a strong need to continue funding for the fishing safety interventions that are part of this project rather than curtailing them” (Moran, 2011, p.172).

At its final meeting prior to disestablishment, the Auckland Regional Council Parks and Heritage Committee received the report entitled *Water safety and Auckland's West Coast fishers 2010* (Moran, 2010), and unanimously voted to recommend to the incoming Auckland Council that this project be recognised as a ‘legends project’ in order to be retained as an ongoing project with ensuing Council funding and support.

2. Purpose and Outcomes of the Study

2.1 Purpose

The purposes of this sixth phase of the project were threefold:

- 1) To continue the on-site rock fishing safety education promotion initiated in 2006
- 2) To determine the effect of the project on Auckland's west coast fishers' safety practices and beliefs, and
- 3) To make recommendations for future rock fishing safety promotion based on the information obtained.

2.2 Outcomes

The specific outcomes of this report are:

1. Ascertain the effect of on-site rock fishing safety promotion via the deployment of field officers during the summer months of 2011,
2. Survey fishers to ascertain whether they had taken part in the previous surveys and, if so, what effect that safety campaign had had on their current understanding and practice of water safety when fishing from rocks,
3. Survey fishers opinions on the value of safety signage and angel ring floatation devices currently being piloted at high risk west coast fishing locations,
4. Compare and contrast:
 - a. fishers' perception of drowning risk,
 - b. their safety behaviour and
 - c. self-reported changes in knowledge, attitudes and behaviours, and,
5. Make recommendations and suggest future strategies that enhance fishers' understanding and practice of safety when fishing from rocks on Auckland's west coast.

3. Methods

3.1 Procedures

As was the case in previous years, the field officers (n = 3) were trained to conduct all aspects of the fieldwork process from education to data collection and management. The participants in the survey were all those who were either fishing from the chosen sites or in transit to and from the site. Rock fishing was again defined as not only fishing with rod and reel but also included activities that used other devices such as baskets or hand lines as well as those gathering shellfish from the rocks. Potential participants were approached, the purpose of the Project explained and a request to voluntarily participate in an anonymous written survey was made to all adult fishers over 16 years of age.

Given the large proportion of fishers of Asian origins previously reported (Moran, 2006, 2007, 2008, 2009, 2010), the questionnaire was again produced in English, Mandarin and Korean. To further assist non-English speaking Chinese/Taiwanese fishers, two of the field officers were fluent Korean speakers and the third was fluent in Chinese.

The water safety advice and survey data gathering took place from December 28th - January, 28th 2011 and included several peak holiday weekdays and weekends. The sites were chosen at random and included six popular and high risk west coast sites at Muriwai, Piha, Karekare, Bethells (including Whites beach), and Whatipu. The sample did not include fishers who used the sites at times outside 'peak' hours (such as night fishing) or fishers who frequented other high-risk west coast locations.

3.2 Measures

The structured written questionnaire (see Appendix 1) was anonymous, designed to be completed on site, and take a maximum of 10 minutes to complete. The questionnaire contained 14 questions, eleven of which had been included in the 2008 survey. Five questions sought socio-demographic information on gender, length of residency, age, ethnicity, and their previous rock fishing activity.

Two questions on at-risk fishing behaviours and perceptions of drowning risk from the earlier surveys were again included so as to compare fishing safety behaviours and attitudes. The question on behaviours asked fishers to self-report on six behaviours (for example, *when rock fishing, do you wear a life jacket/buoyancy aid*) using four response categories *never, sometimes, often* and *always*. The question on attitudes consisted of 12 statements and required fishers to state whether they *strongly agreed, agreed, were unsure, disagreed, or strongly disagreed* with the statement. A five-part

question asked fishers to estimate whether their knowledge, attitudes and behaviours (as well as that of fishing mates and other fishers) had improved in the intervening year by using three response categories - *agree*, *disagree* or *don't know*.

As was the case in 2010, three questions were included that sought information on whether fishers had seen new angel rings in five high risk locations and what they thought about them using four response categories ranging from *essential* to *waste of money*. Fishers were also asked to suggest other locations they would like to see angel rings on the west coast. They were also asked to comment on the clarity of instruction for their use, whether they were the best source of assistance and whether they were located at the most suitable sites, using five response categories ranging from *strongly agree* to *strongly disagree*.

3.3 Data analysis

Data from the completed questionnaires were entered into Microsoft Excel 2003 for statistical analysis using SPSS Version 18.0 in Windows. Descriptive statistics such as means and proportions were used to describe the baseline characteristics of the population. Frequency tables were generated for all questions and, unless otherwise stated, percentages are expressed in terms of the number of respondents to each survey question within groups.

Data were analysed using several socio-demographic variables including gender, age length of residency and ethnicity. Mann-Whitney *U* tests and Chi-square analyses were used to determine significant differences between dependent variables (such as behaviour and attitudes) and independent variables (such as gender and ethnicity).

4. Key Findings

The results of the 2011 survey are presented in six related sections:

4.1 Demographics of Fishers

All fishers at the sites chosen to survey were invited to take part in the survey but several declined. A total of 144 questionnaires were returned from participants in rock fishing activity at six popular locations on the west coast of Auckland during the summer season of 2011. Analysis of respondents' age, gender, length of residency, and ethnicity indicated that the demographic structure of the sample reflected previous findings (Moran, 2006, 2007, 2008, 2009, 2010).

Table 1. *Demographic Characteristics of Fishers*

Demographic Characteristic		<i>n</i>	%	Total
Gender	Male	126	88.2	144 (100%)
	Female	17	11.8	
Ethnicity	European	29	20.1	144 (100%)
	Maori	6	4.2	
	Pasifika	18	12.5	
	Asian	88	61.1	
	Other	3	2.1	
Age group	15-19 years	3	2.1	144 (100%)
	20-29 years	43	29.9	
	30-44 years	43	29.9	
	45-64 years	52	36.1	
	65+ years	3	2.1	
Length of residency	< 1 year	5	3.5	144 (100%)
	1-4 years	23	16.0	
	5-9 years	49	34.0	
	>10 years	44	30.6	
	All my life	23	16.0	

As was the case in previous years, the sample population was predominantly male (88% male; 12% female) and most were aged between 20-44 years (60%; $n = 86$). In terms of ethnicity, proportionally more Asian peoples (61%; $n = 88$) were included in the study, whereas proportionally less European (20%; $n = 29$) and Maori (4%; $n = 6$) New Zealanders were included. One fifth (20%; $n = 38$) of those surveyed were of recent residency (< 4 years) and more than half (54%) had lived in New Zealand less than 10 years. Further analysis of the ethnicity of respondents revealed a diverse range of backgrounds among Auckland's west coast rock fishers. Those who were broadly categorised as of Asian ethnicity, self-identified with six Asian region countries (see

Table 2). The English language version of the 2011 survey was completed by more half of the fishers (56%; $n = 80$), 33 (23%) fishers completed the Korean version, and 31 (22%) fishers opted to complete the Mandarin language version of the survey.

Table 2. *Self-identified Ethnicity of Fishers*

Ethnic group	<i>n</i>	%
Chinese/Taiwanese	36	25.0
Korean	41	28.5
Indian	5	3.5
Filipino	2	1.4
Papua New Guinean	2	1.4
Japanese	2	1.4
Total	88	61.1%

Fishers were asked to describe how often they had fished at the location where they completed the questionnaire (see survey question 8, Appendix 1). Table 3 shows that, as was the case in previous surveys, many of the fishers were not frequent visitors to the site, with one fifth (22.2%; $n = 32$) reporting that this was their first visit and almost one half (48.6%; $n = 70$) reporting that they had visited the site 2-5 times.

Table 3. *Fishing Frequency at Site where Interviewed and Other Places Fished*

How often have you fished at this site?	<i>n</i>	%	Cumulative %
First time at site	32	22.2	22.2
2-5 times	70	48.6	70.8
6-10 times	28	19.4	90.3
11-20 times	11	7.6	97.9
>20 times	3	2.1	100.0
Where else have you fished?	<i>n</i>		
Other Auckland west coast sites	51		
Northland	2		
Auckland Harbours (inc. Manukau, Waitemata)	19		
Inner Hauraki Gulf (inc. Whangaparoa, Maraetai etc)	3		
Outer Hauraki Gulf (inc. Coromandel, Great Barrier Island)	3		
Other New Zealand sites	1		

Cumulatively, almost three quarters (71%; $n = 102$) had visited the site less than five times, a frequency unlikely for them to accumulate an extensive knowledge and experience of the hazards associated with the site in a range of environmental conditions (i.e. variable state of tides, swell, and weather conditions). Collectively, only one tenth (9.7%; $n = 14$) of the fishers had visited the site more than 10 times, with only three fishers (2%) having visited the site (where they completed the survey) more than 20 times.

Figure 1. Percentage of fishers who had visited the site where interviewed 2006-2011

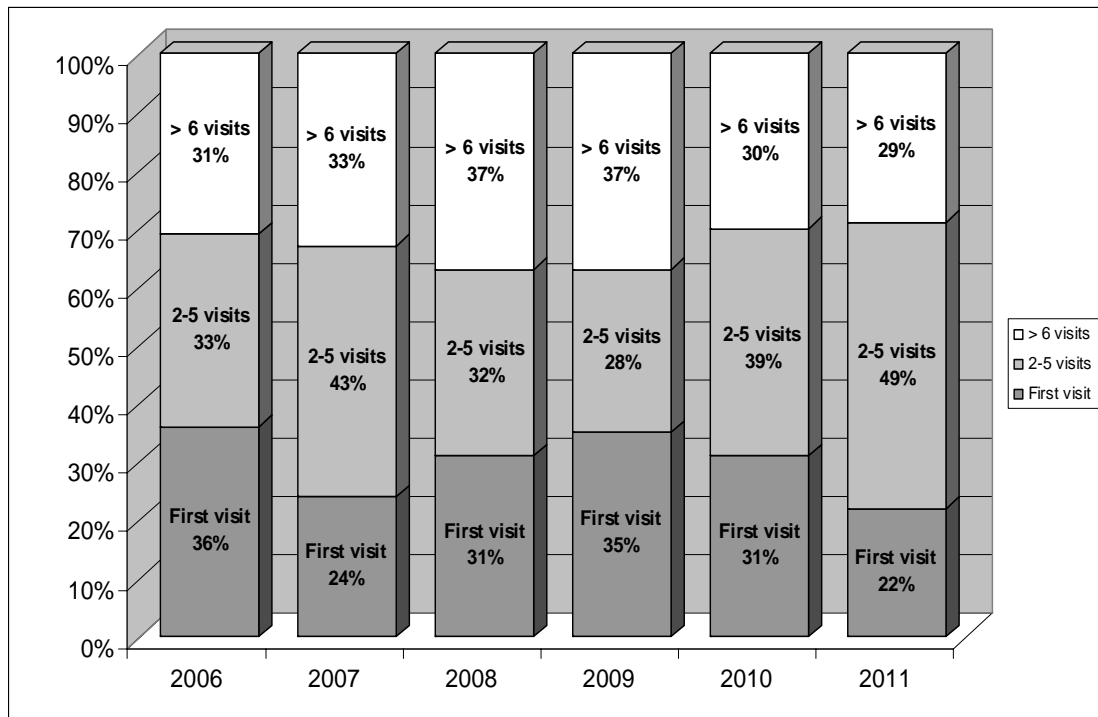


Figure 1 shows that the pattern of infrequent visits to the sites where interviewed in previous year was again apparent in 2011 most fishers, although the number of first time visitors was less than in previous years. This consistency in the pattern of infrequency of fisher visits to west coast high risk sites over the 6-year duration of the Project reinforces concerns previously expressed in annual reports from 2006-2010 of a reality gap between the actual number of visits to a site and fishers perception that their local knowledge of the site will keep them safe.

4.2 Awareness of West Coast Rock Fishing Safety Project

More than half (53.5%; $n = 77$) of fishers surveyed reported that they had taken part in any west coast rock fishing safety surveys (see survey question 1, Appendix1). This is the first year since the inception of the Project in 2006 that a majority of fishers have reported that they were aware of the fisher water safety project (see figure1).

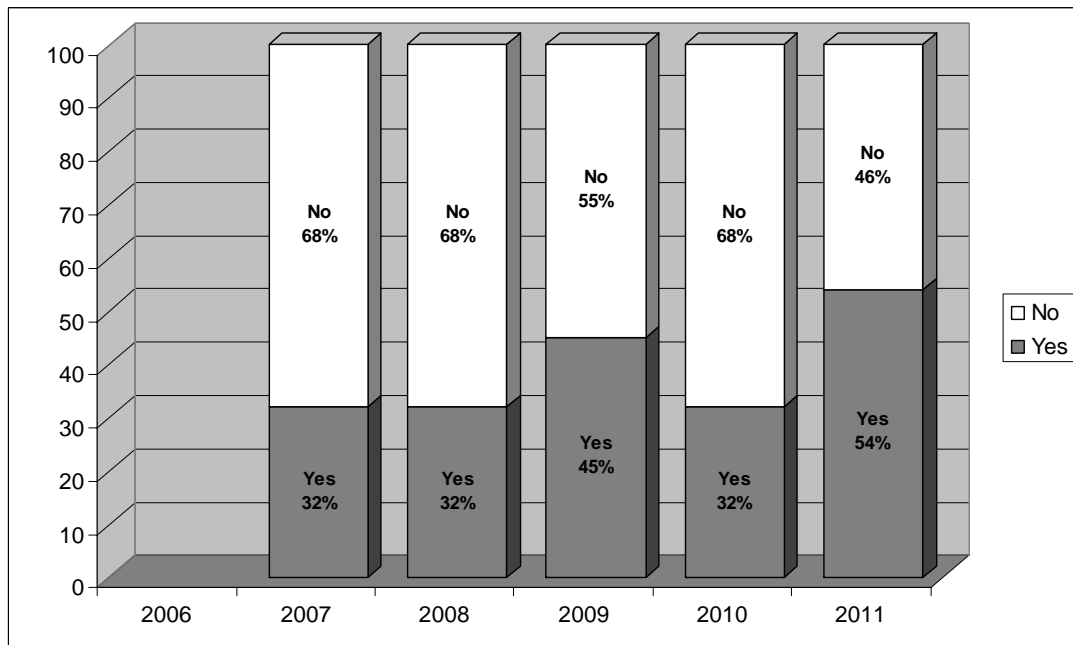
Table 4. *Participation in, and estimation of success of, the previous fisher safety projects*

Did you take part in the previous rock fishing projects?	<i>n</i>	%
Yes	77	53.5
No	67	46.5
Total	144	100.0
If Yes, how successful do you think it was?	<i>n</i>	%
Highly successful	11	14.3
Successful	43	55.8
Slightly successful	15	19.5
Not successful	6	7.8
Don't know	2	2.3
Total	34	100.0

Table 4 shows that, of the 77 fishers who had taken part in the previous surveys, slightly less than three-quarters (70%; $n = 54$) considered that the campaign had been *highly successful/successful* compared with one quarter who either considered it *slightly/not successful* (17.3%; $n = 21$) or who *did not know* (2.3%; $n = 2$).

Figure 2 shows the fisher recall of previous west coast fishing safety projects initiated in 2006. In the 5 years since the inception of the Project, most fishers surveyed were not aware of previous safety projects ($M = 64.8\%$) and it was suggested the reasons for this might be the transience of the fisher population from year to year or a reflection of the difficulty of raising awareness of the campaign in remote sites. Whatever the reasons, it would appear prudent to continue to explore ways of effectively reaching this sub-population in order to maximise the preventive effect of the safe fishing messages currently being promoted.

Figure 2. Percentage of fishers who took part in previous rock fishing safety projects, 2007-2011



Fishers were asked whether they were aware of the current fisher safety campaign. Almost three quarters (71%; $n = 102$) reported that they were aware of the current campaign, a much improved proportion compared with the previous year where slightly less than half of the fishers (48%; $n = 51$) reported that they were aware of the current project (Moran, 2010). Table 5 shows that, when those who were aware of the current project were asked how they had found out about the project, most fishers (41%; $n = 48$) identified the fishing safety advisors as their source of information. Other sources of information, in descending order of frequency, included newspapers (20%), television (15%), radio (10%), magazines (7%), other sources such as friends (6%), and retail outlets (1%).

As was the case in the previous years, many fishers had heard of the current safety promotion through the advisors, which again suggests the benefit of engaging staff for on-site safety promotion to a group that is characteristically diverse and who may be difficult to reach through traditional channels such as television, radio and magazines as indicated by the lesser recall of the current project via these channels.

Table 5. *Are you aware of, and how did you find out about, the current (2011) project?*

Are you aware of the current (2010) project?	<i>n</i>	%
Yes	102	70.8
No	42	29.2
Total	144	100.0
If Yes, how did you find out about the current project?*	<i>n</i>	%
Fishing safety advisors	48	40.7
Newspapers	24	20.3
Television	18	15.3
Radio	12	10.2
Magazines	8	6.8
Retail outlets	1	0.8
Other sources (friends)	7	5.9
Total	118	100.0

*respondents were able to tick more than source of information

4.3 The Installation and Usage of Angel rings

As was the case in the previous two years, angel rings were installed at eight dangerous fishing sites at five west coast beaches. During the summer months, weekly checks of the angel rings were made by lifeguards at the local surf clubs and parks staff would complete any necessary maintenance. The exception was Whatipu, which was checked year round by parks staff because there is no surf club at that location. Only one angel rings had to be replaced, assumed lost due to adverse weather and surf conditions.

Fishers were again asked whether they had seen the new angel rings recently installed and being trialled on dangerous fishing sites (see survey question 9, Appendix 1) and asked their opinion of how effective they considered them to be. More than two thirds of the respondents (69.4%; $n = 100$) reported having seen the angel rings, compared with slightly more than one half of the respondents (57%; $n = 61$) in 2010 who reported having seen the angel rings. Slightly less than half 44% ($n = 44$) of the fisher considered them to be *essential*, 54% ($n = 54$) considered them to be *useful*, and 2% ($n = 2$) reported that they were *not very useful*.

Table 6. Awareness and success of the angel rings, 2011

Have you seen the angel rings?	<i>n</i>	%
Yes	100	69.4
No	44	30.6
Total	144	100.0
If YES, how effective do you think they are?*	<i>n</i>	%
Essential	44	44.0
Useful	54	54.0
Not very useful	2	2.0
Don't know	-	-
Total	100	100.0

Fishers were also asked to comment on the clarity of the instruction for their use, whether they were considered to be the best source of assistance and whether they were located in the most suitable sites (see question 10, Appendix 2). Table 7 shows that almost three-quarters (70%; $n = 75$) *agreed/strongly agreed* that the angel rings were accompanied with clear instructions, 10% *disagreed/strongly disagreed* and 20% ($n = 21$)

were *unsure*. Table 7 shows that these figures are a considerable improvement on the approval ratings received from fishers in the 2009 survey after the initial year of installation. As was the case in 2009, most of those who were unsure about the clarity of instructions were recent immigrants for whom English was a second language (70%; $n = 75$), which suggests that further multilingual signage may be necessary for the angel rings.

Table 7 also shows that more fishers (66% in 2010 vs. 45% in 2009) *agreed/strongly agreed* that angel rings were the best source of public rescue equipment (PRE). More fishers agreed that the angel rings were located in the best possible sites (59% in 2010 vs. 43% in 2009). In response to each of the three questions about the value of the angel rings, fewer fishers were *unsure* as to whether they had the clearest instruction (21% in 2010 vs. 47% in 2009), whether they were the best form of assistance (27% in 2010 vs. 47% in 2009), or whether they were located in the best possible sites (35% in 2010 vs. 46% in 2009).

Table 7. Comparisons of fisher opinions on the angel rings, 2010 and 2011

Do you think that-	Year	Strongly agree/ Agree		Unsure		Strongly disagree/ Disagree	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
-the angel rings have clear instructions	2011	104	72.2	39	27.1	1	0.7
	2010	75	70.1	21	19.6	11	10.3
- the angel rings are the best source of assistance	2011	95	66.0	49	34.0	0	-
	2010	71	66.4	29	27.1	7	6.5
- the angel rings are located at the most suitable sites	2011	100	69.4	43	29.9	1	0.7
	2010	63	58.9	37	34.6	7	6.5

The greater acceptance of the angel rings as a part of the chain of drowning prevention in the form of Public Rescue Equipment (PRE) reported above is encouraging because, in the event of an emergency use of such equipment, familiarity and acceptance of their value are important precursors to their deployment by bystanders. With one fifth of fishers (20%) still unsure about the clarity of instructions, further work is required to make sure that all potential users have clear instructions on how best to use the angel rings.

Angel ring usage

In a reported rescue (22nd Dec 2010), South Piha lifeguards responded to an incident south of the beach at Dawson's ledge where a fisher had fallen into the water. When lifeguards arrived his friend had used the angel ring to pull him back on to the rocks. Victim had suffered injuries to his thighs and legs and taken to hospital and made full recovery. At a second incident at Bethell's Beach (22nd April) lifeguards responded to a fisher in water call, victim was found facedown in water, pronounced dead by ambulance staff after 30 minutes of CPR by lifeguards. No angel ring was available at this location.

These two incidents illustrate the potential lifesaving capacity of the angel rings in very dangerous conditions necessitating surf life saving rescue craft and rescue helicopter recovery. The likelihood of either victim surviving without flotation long enough for rescuers to arrive at the remote sites was minimal. There have been other anecdotal reports of angel ring use when the fishers extricated themselves from the situation without the need for official intervention. One regular west coast fisher claims that he has seen angel rings used several time since they were introduced on a trial basis in 2009. A review of the economic and social costs of drowning fatalities and water-related injuries compared to prevention conducted in 2009 by Price Waterhouse Coopers for the New Zealand Drowning Prevention Council and the Accident Compensation Corporation (ACC) conservatively estimated the economic cost of a fatal drowning as \$3.4 million (ACC, 2009). On this basis alone, the saving of one life by use of angel rings in extreme conditions makes this drowning prevention initiative highly cost effective.



Illustration 1. Angel rings at Muriwai's Flat Rock with Project leader Stu Leighton, Auckland Council Parks Ranger

4.4 Fisher perceptions of drowning risk

As in previous years, fishers were asked to respond to a series of 12 statements relating to their perception of the risk of drowning associated with fishing from rocks (see survey question 12, Appendix 1). The question consisted of a 5-point scale that included the categories *strongly agree*, *agree*, *unsure*, *disagree* and *strongly disagree*. For ease of interpretation, the *strongly agree/agree* and *disagree/strongly disagree* responses were aggregated.

Table 8. *Fishers' Perceptions of Risk of Drowning, 2011*

Do you think that-	Strongly agree/ Agree		Unsure		Strongly disagree/ Disagree	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1. Getting swept off the rocks is likely to result in my drowning	103	71.5	20	13.9	21	14.6
2. Rock fishing is no more risky than other water activities	35	24.3	37	25.7	72	50.0
3. Drowning is a constant threat to my life when rock fishing	99	68.8	24	16.7	21	14.6
4. I am not concerned about the risks of rock fishing	31	21.5	45	31.3	68	47.3
5. Others rock fishers are at greater risk of drowning than me	41	28.5	69	47.9	34	23.6
6. I am a strong swimmer compared with most other people	44	30.6	51	35.4	49	34.0
7. I avoid fishing in bad conditions to reduce the risk of drowning	112	77.8	27	18.8	5	3.5
8. Always wearing a life jacket makes fishing a lot safer	100	69.4	25	17.4	19	13.2
9. Turning my back to the waves when rock fishing is very dangerous	109	75.7	24	16.7	11	7.7
10. My local knowledge of this site means I'm unlikely to get caught out	51	35.4	59	41.0	34	23.6
11. My experience of the sea will keep me safe when rock fishing	77	53.5	39	27.1	28	19.5
12. My swimming ability means I can get myself out of trouble	52	36.1	51	35.4	41	28.5

Table 8 shows responses to statements 1-3 (Question 12) that relate to fisher perceptions of the severity of the risk of drowning when fishing from rocks (see Appendix 1 – survey questionnaire). Almost three quarters of fishers (72%) agreed that getting

swept off rocks was likely to result in drowning, one half (50%) disagreed that fishing from rocks was no more risky than other water activities, and more than two thirds (69%) agreed that drowning was a constant threat to their life when rock fishing. More fishers disagreed that rock fishing was no more risky than other aquatic activities (2010, 38%) and more believed that drowning was a constant threat to life when fishing from rocks (2009, 61%). This would suggest a beneficial shift in fishers' attitudes to one of having a greater appreciation of the risk of drowning associated with fishing from rocks off Auckland's west coast.

No significant differences were evident when the responses to statements on the severity of the risk of drowning was analysed by gender and age, with the exception of responses to the first statements that getting swept off rocks was likely to result in drowning, where significantly more fishers <29 years thought that it did not ($\chi^2 = 27.792$, $df = 8$, $p = 0.033$). When analysed by ethnicity, significantly more Asian fishers than non-Asian fishers (64% and 36%, respectively) thought it likely that they would drown if swept off rocks ($\chi^2 = 36.828$, $df = 8$, $p = 0.046$). When analysed by residency, significantly more recent residents (<5 years) than longer term residents thought it likely that they would drown if swept off rocks ($\chi^2 = 33.988$, $df = 8$, $p = 0.005$).

Responses to statements 4-6 (Question 12) related to fisher perceptions of their vulnerability to drowning when fishing from rocks (see Appendix 1 – survey questionnaire). Almost half (47%) of the fishers disagreed that they were not concerned about the risk of drowning (2010, 52%), one quarter (24%) disagreed that other fishers were at greater risk of drowning than themselves, and one third (34%) disagreed that they were strong swimmers compared with other fishers. However, almost a third (31%) thought they were stronger swimmers than other fishers and a similar proportion (29%) thought others were at greater risk of drowning when fishing from rocks. Fewer fishers in 2011 considered that: they were strong swimmers compared with others (2011, 34%; 2010, 50%); other fishers were at greater risk of drowning (2011, 29%; 2010, 43%), and fewer agreed that they were not concerned about the risks of drowning when fishing from rocks (2011, 22%; 2010, 32%). These slight shifts in attitudes are typical of the shift in attitude reported from 2006 (Moran, 2011) and suggest an enhanced perception of vulnerability that, in turn, may reflect a more realistic appraisal of the magnitude of the risk of drowning when fishing.

No significant differences were evident when the responses to statements on the vulnerability to the risk of drowning was analysed by gender and age, with the exception of responses to the statement six that the respondent was comparatively stronger swimmer than other fishers where significantly more fishers <29 years thought that they were ($\chi^2 =$

28.125, $df = 8$, $p = 0.031$). When perceptions of vulnerability to drowning were analysed by ethnicity, significantly more Asian fishers (74%) considered themselves not to be strong swimmers ($\chi^2 = 58.226$, $df = 8$, $p = <0.001$). When perceptions of vulnerability to drowning were analysed by length of residency, significantly more fishers with residency of less than 5 years than longer term residents considered themselves not to be strong swimmers ($\chi^2 = 29.478$, $df = 8$, $p = 0.021$).

Responses to statements 7-9 (Question 12) related to fisher perceptions of the efficacy of preventive action in reducing drowning risk when fishing from rocks (see Appendix 1 – survey questionnaire). As was the case in previous surveys, most fishers taking part in the 2011 survey responded positively to all three statements of the efficacy of preventive actions to reduce drowning risk (See Table 8). Most fishers agreed that they avoided fishing in condition were bad (78%), that wearing a life jacket made fishing a lot safer (69%) and that turning your back to the sea when fishing from rocks was very dangerous (76%).

No significant differences were evident when the responses to statements on the efficacy of preventive actions was analysed by gender and age. When perceptions of the efficacy of preventive actions to reduce the risk of drowning were analysed by ethnicity, significantly more Asian than non-Asian fishers (65% v 35%) thought that wearing a life jacket would reduce the risk of drowning ($\chi^2 = 47.133$, $df = 8$, $p = 0.003$). When perceptions of the efficacy of preventive actions to reduce the risk of drowning were analysed by residency significantly more fishers with recent residency (<5 years) than longer term residents thought that wearing a life jacket would reduce the risk of drowning ($\chi^2 = 26.637$, $df = 8$, $p = 0.046$).

Responses to statements 10-12 (Question 12) related to fisher perceptions of the self-efficacy of their preventive behaviours in reducing drowning risk when fishing from rocks (see Appendix 1 – survey questionnaire). Responses from the participants in 2011 to each of these three statements were similar to those of the fisher who took part in the 2010 survey. Slightly more than one third (35%) believed that their local knowledge of the site would keep them out of trouble (2010, 40%) but more than half (54%) believed that their knowledge of the sea would keep them safe (2010, 41%). The same proportion thought that their swimming ability would get them out of trouble (2011, 36%; 2010, 36%).

No significant differences were evident when the responses to statements on self-efficacy to manage the risk of drowning was analysed by gender and age, with the exception of responses to the final statement that the respondents swimming ability was likely to get them out of trouble where significantly more fishers <29 years thought that it

would ($\chi^2 = 37.890$, $df = 8$, $p = 0.002$). When perceptions of self-efficacy to manage the risk of drowning when fishing from rocks were analysed by ethnicity, significantly more Asian fishers than non-Asian fishers (78% v 22%) thought that their swimming ability would get them out of trouble ($\chi^2 = 39.168$, $df = 8$, $p = 0.006$). When perceptions of self-efficacy to manage the risk of drowning when fishing from rocks were analysed by residency, significantly more recent residents (<5 years) than longer term residents thought that their swimming ability would get them out of trouble ($\chi^2 = 38.446$, $df = 8$, $p = 0.001$). Given the relative infrequencies of site visits - almost three quarters had visited the site where interviewed < 5 times (see Table 4), and the recency of residency - one fifth (20%) had <4 years of residency in New Zealand (see Table 1), it appears that some fishers still have an unrealistic estimation of their ability to cope with the risk of fishing at high risk sites.

Whether the attitudinal shifts towards a more realistic appreciation of the dangers leads to a concomitant shift towards safer behaviour is difficult to determine, especially given the male propensity to underestimate risk and overestimate ability to cope with that risk in an aquatic context, as previously reported among fishers (Moran, 2009), among American males (Howland, Hingson, Mangione, Bell, & Bak, 1996), New Zealand male beachgoers (McCool, Moran, Ameratunga & Robinson, 2009; McCool et al., 2008) and New Zealand male youth (Moran, 2009; Langley, Warner, Smith, & Wright, 2001; Langley, & Smeijers, 1997).

4.5 Water Safety Behaviours of Fishers

Fishers were asked to report their previous water safety behaviours (see survey question 13, Appendix 1) using a four-point frequency scale including *never*, *sometimes*, *often* and *always* in order to describe whether they had performed at-risk behaviours when fishing from rocks. The latter two responses were aggregated and are reported in the tables and text as *often/always* (see Table 9).

Table 9. *Fishers' Self-reported Water Safety Behaviours, 2011*

When rock fishing, do you -	Never		Sometimes		Often/Always	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1. Wear a life jacket or other flotation device	53	36.8	19	13.2	72	50.0
2. Check weather/water conditions first	3	2.1	20	13.9	121	84.0
3. Drink alcohol when you are fishing	89	61.8	44	30.6	11	7.6
4. Wear gumboots or waders	92	63.9	32	22.2	20	13.9
5. Turn your back to the sea when fishing	77	53.5	47	32.6	20	13.9
6. Take a cell phone in case of emergencies	9	6.3	18	12.5	117	81.3
7. Go down rocks to retrieve snagged line	77	53.5	52	36.1	15	10.4

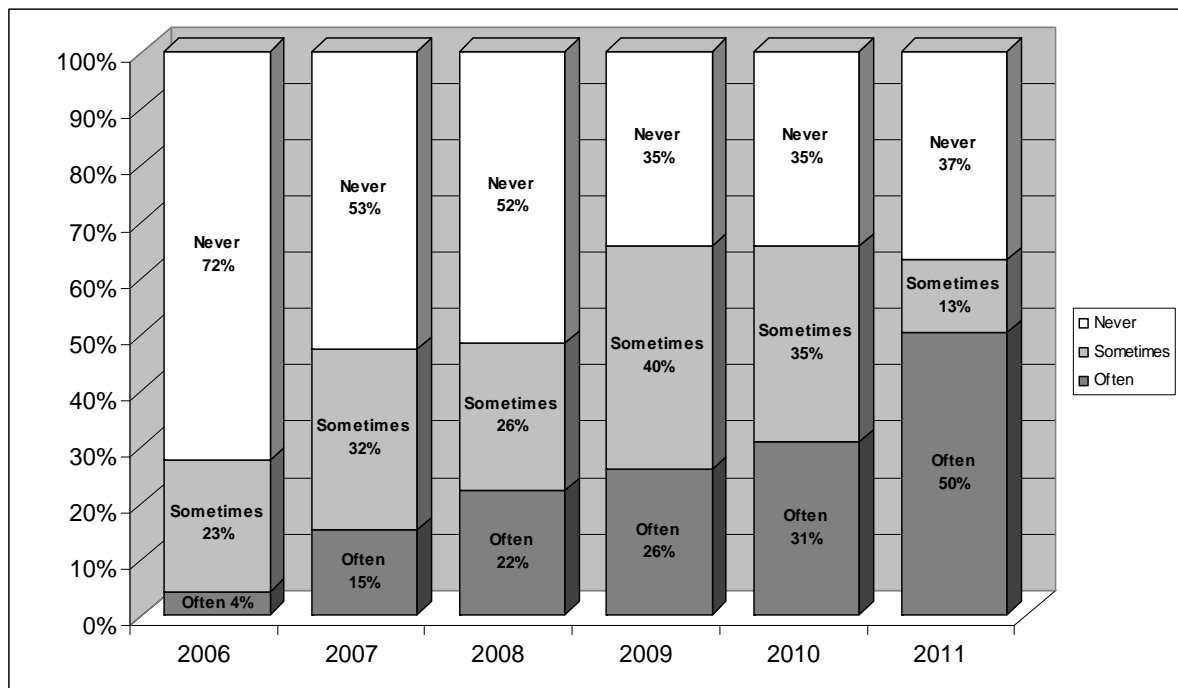
As was the case in the previous 5 years of the project, the most noticeable positive change in self-reported behaviour relates to the use of life jackets or buoyancy aids. While slightly more fishers in 2011 than 2010 reported *never* wearing a life-jacket/buoyancy aid (2011, 37%; 2010, 35%), substantially more reported wearing them *often/always* (2011, 50%; 2010, 31%). Even more importantly, a third (34%; $n = 49$) of fishers reported *always* wearing a life jacket. This positive change in self-reported behaviour was again reinforced by anecdotal evidence from fishing advisors and lifeguards of greater use of buoyancy aids at the end of the 2011 summer season.

While the positive change in behaviour related to the use of life jackets/flotation devices is gratifying, it is still a concern that more than one third of fishers (37%) report *never* wearing any life jacket/buoyancy aid. Significantly fewer females than males (females 29%: males 38%) reported never wearing a life jacket ($\chi^2 = 8.259$, $df = 3$, $p =$

0.041). No significant differences were reported when life jacket use was analysed by age, ethnicity, and length of residency.

When analysed over the 6-year duration of the project to date, the increase in use of life jackets has been very consistent and pronounced (see Figure 2). One documented rescue incident (22nd Dec at Whites Beach, North Piha) was recorded in the 2010-2011 season of a fisher wearing life jackets and falling into the surf from rocks. The fisher was able to stay afloat until surf lifeguards arrived to perform a successful rescue. The fisher was a non-swimmer and conditions were reported by lifeguards as very hazardous. As previously noted with regard to the use of angel rings (see page 14), the economic cost of a fatal drowning has been estimated at \$3.4 million (ACC, 2009), so the value of the project in promoting the use of life jackets when fishing from rocks on Auckland’s rugged west coast would appear to be highly cost effective.

Figure 3. Self-reported safety behaviours, 2006-2011
- When fishing from rocks do you wear a life jacket? (Q13, part 1)

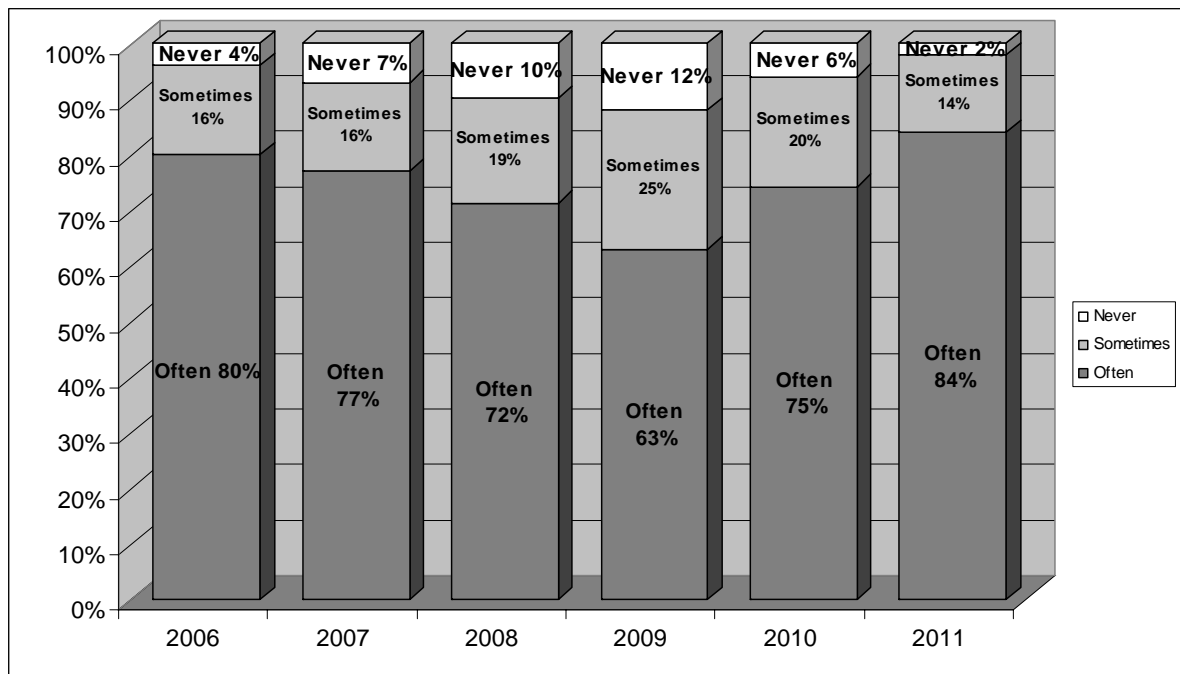


As previously stated (Moran, 2011), changing behaviours among such a transient and difficult to reach sub-population has always been a challenge in west coast fisher drowning prevention but this result over a 6-year period suggests that the education intervention has shifted a traditionally intransigent behaviour. As was suggested in the 2007 Report (Moran, 2007), further exposure to the sight of fishers wearing inflatable jackets at high-risk locations, publicity about the convenience and survival benefits of

such jackets, and the sale of jackets at reduced prices should all continue to be strategies in future on-site fishing safety campaigns. In contrast to this success, recent evidence from Australia suggest that, as was the case in New Zealand at the start of this campaign in 2006, over 80% of Australian fishers recently surveyed never or only sometimes wore life jackets (Mathews, Thompson, & Bracchi, 2010).

The second self-reported behaviour – checking the weather a before fishing – was again well in evidence with 84% of fishers *often /always* checking beforehand, and of these 62% *always* checked weather conditions. No significant differences in the checking of weather before fishing were reported when data was analysed by gender, age, ethnicity and length of residency. Figure 3 shows a consistent pattern of compliance with this important safety behaviour from 2006 when most fishers (80%) also reported *often/always* checking the weather beforehand. Figure 3 shows from 2006 -2011, that approximately three-quarters of fishers (range 72-84%) often checked the weather beforehand and a small proportion (range 2-12%) consistently *never* checked the weather.

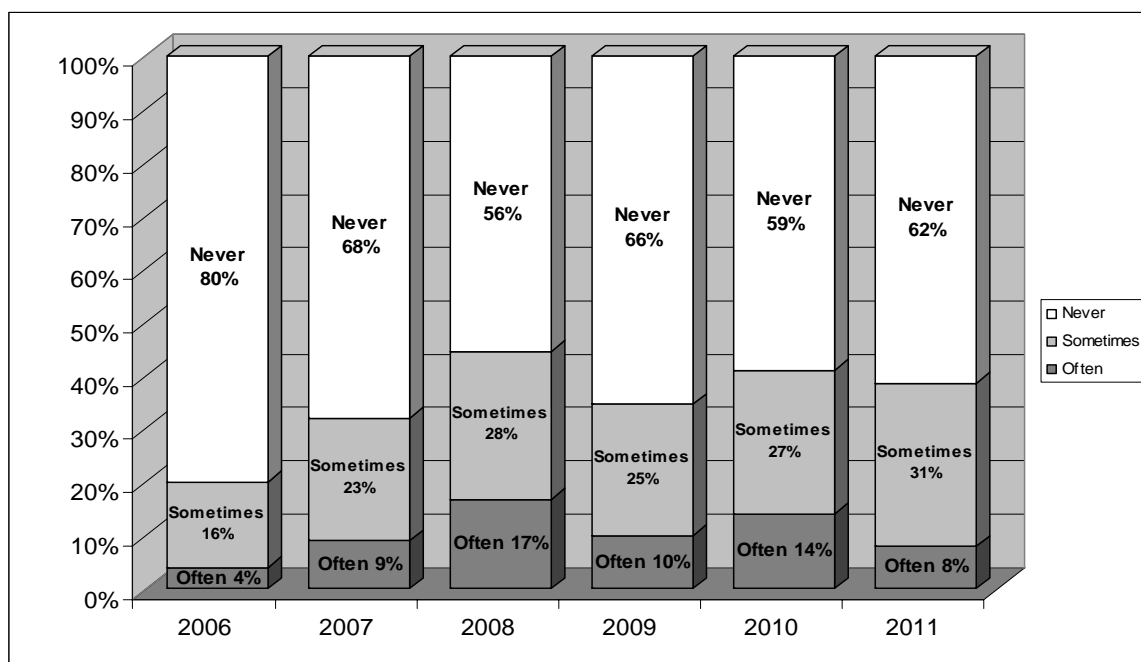
Figure 4. Self-reported safety behaviours, 2006-2011
- When fishing from rocks do you check weather beforehand? (Q13, part 2)



The third self-reported safety behaviour related to the consumption of alcohol when fishing from rocks. Almost two thirds (62%) of fishers reported that they never mixed alcohol and fishing but more than one third (38%) of fishers either *sometimes* (30.6%) or *often* (7.6%) engaged in this risky behaviour. No significant differences in the consumption of alcohol when fishing from rocks were reported when data was analysed

by gender, age, ethnicity and length of residency. The debilitating effects of even small quantities of alcohol on balance and coordination make this behaviour especially problematic in a hazardous environment made more precarious by uneven, slippery, wet and often wave-swept surfaces that typify most west coast fishing locations. Furthermore, Figure 4 shows that while most fishers did not mix alcohol with fishing, consistently over the five-year period, one third of fishers *sometimes* or *often* consumed alcohol when fishing at these high risk site, and the proportion abstaining from alcohol consumption appeared to drop slightly (2006, 80%; 2010, 62%). The persistence of this problem over the 6 years of the Project suggests that behaviour modification through education may not be as effective as prohibition through alcohol bans, common on many popular beaches in New Zealand, which may be extended to high-risk fishing sites.

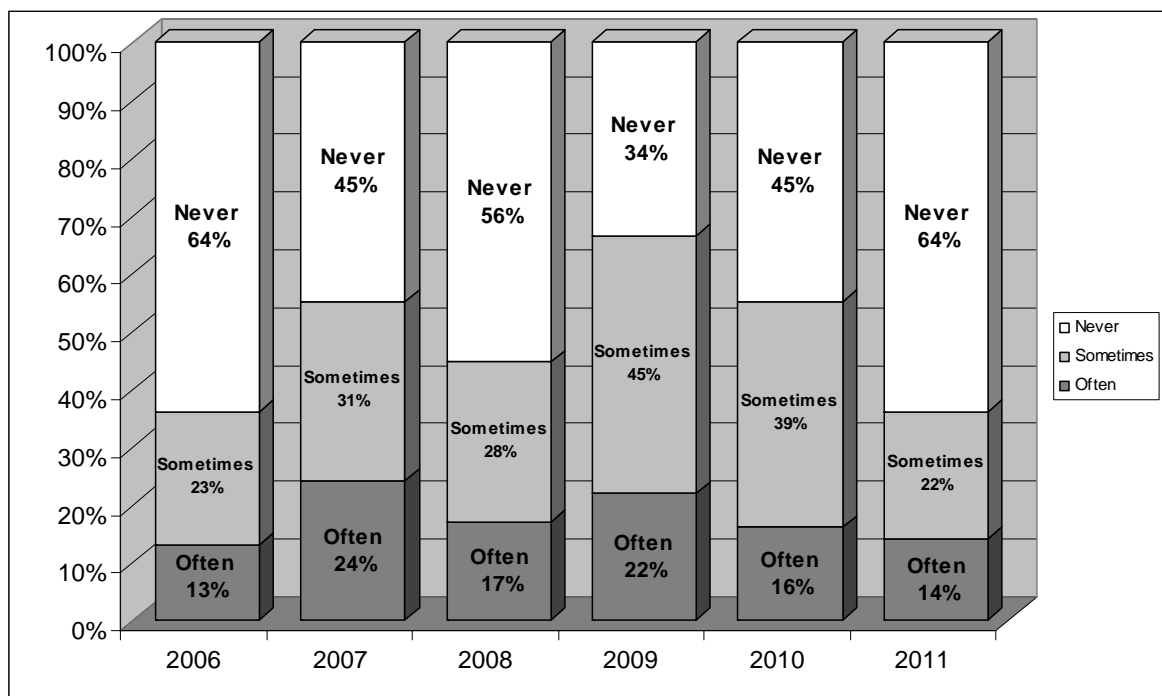
Figure 5. Self-reported safety behaviours, 2006-2011
- When fishing from rocks do you drink alcohol? (Q13, part 3)



Almost two thirds (64%) of fishers reported that they *never* wore gumboots or wader, but more than one third (36%) did, with one fifth (22%) *sometimes* and 14% *often* wearing gumboots or waders. No significant differences were reported when gumboots or wader use was analysed by gender, age, ethnicity, and length of residency. Figure 5 shows that, in spite of safety messaging throughout the campaign, many fishers *often* (range 13-24%) or *sometimes* (range 22-45%) wore waders or gumboots.

Anecdotally, some fishers have expressed concern about their capacity to remain afloat when wearing gumboots or waders. However, gumboots or waders are neutrally buoyant when filled with water, and may actually assist flotation through air entrapment in the initial stages of immersion if appropriate techniques are employed. While one pilot study on training for wader use and immersion in river fishing has recently been reported (McElroy, Blitvich, Petrass & McKinley 2011), further work is required to determine whether these techniques should be advocated as part of a drowning prevention strategy for rock-based fishers and if so how the techniques might be best taught.

Figure 6. Self-reported safety behaviours, 2006-2011
- When fishing from rocks do you wear gumboots or waders? (Q13, part 4)

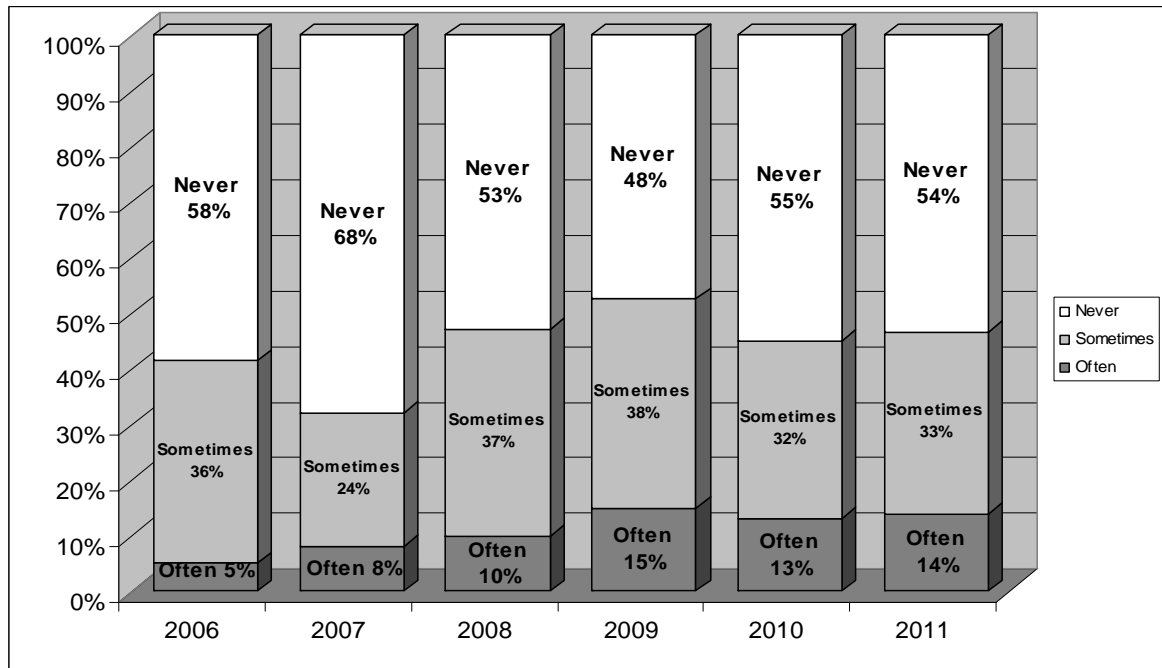


The fifth self-reported behaviour - the risky practice of turning your back to the sea – was reported by almost half (47%) of the fishers, with one third of fishers (33%) *sometimes* and 14% *often* turning their backs to the sea. Significantly fewer females than males (females 47%: males 54%) reported *never* turning their backs to the sea ($\chi^2 = 12.156, df = 3, p = 0.07$). No significant differences were reported when turning your back to the sea was analysed by age, ethnicity, and length of residency.

Figure 6 shows that more than half of participants (range 48-68%) *never* turned their back to the sea when fishing, but that many did *sometimes* (range 24-38%) or *often* (range 5-15%). That almost half of fishers persistently engage in this risky practice in

spite of strong messaging about this dangerous practice is an ongoing cause of concern, and one that should be highlighted yet again in future rock-based fishing campaigns.

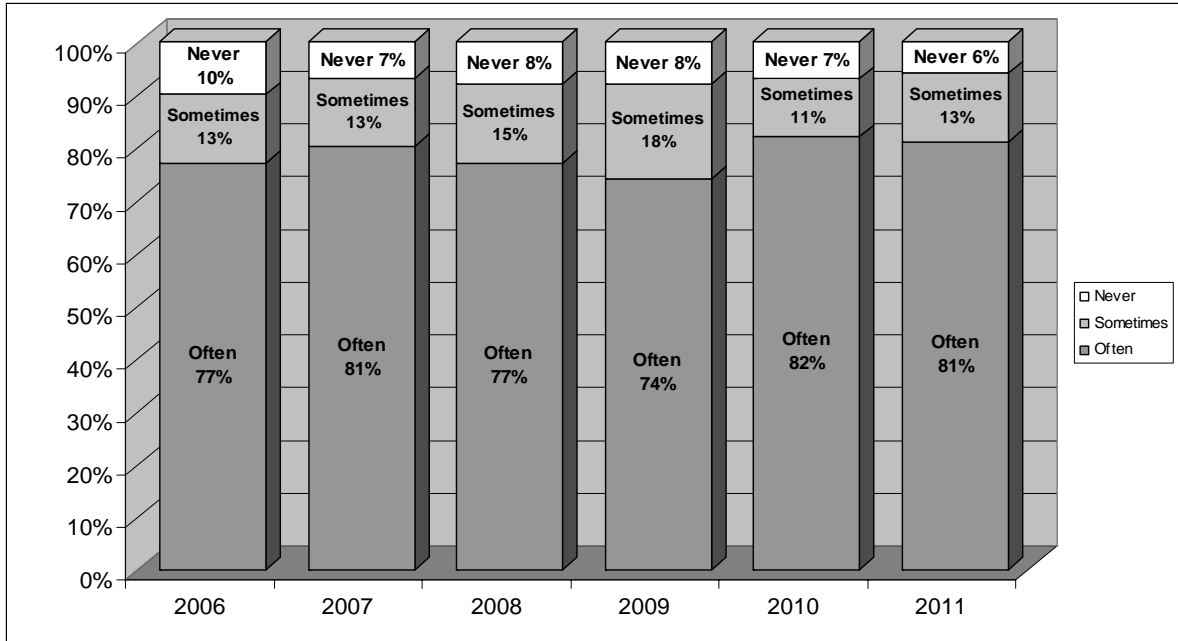
Figure 7. Self-reported safety behaviours, 2006-2011
-When fishing from rocks do you turn you back on the sea? (Q13, part 5)



Fishers were asked whether they carried a cell phone for emergency use. Eight out of ten fishers (81%) reported that they *often/always* carried a cell phone, with two thirds (67%) reporting that they *always* did and a further 15% that they *often* did. No significant differences were reported when cell phone availability was analysed by gender, age, ethnicity, and length of residency.

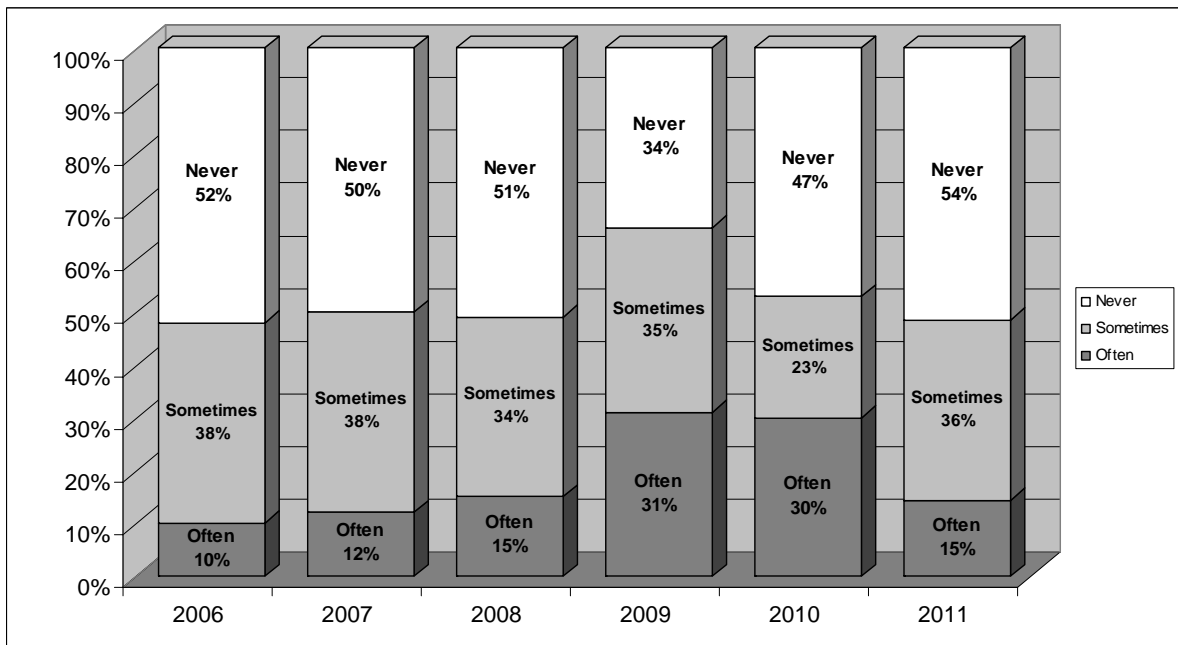
Figure 7 shows that from 2006-2011 most fishers carried cell phone when fishing (range 74-82%) and the availability of cell phones by fishers has increased slightly over the 6 years. More than three-quarters (range 74-82%) of fishers reported that they *often/always* carried a cell phone when fishing, whereas only a small proportion (range 7-10%) *never* carried a cell phone. Given the almost universal availability of cell phones and the much improved cell phone reception on the remote Auckland's west coast fishing sites, it may be prudent to ask fishers (and groups of fishers who may have different providers) to check reception upon arrival at the site in case the phone is required for an emergency call. In addition, it may be worth asking fishers in future surveys if they have used cell phones for emergency purposes when fishing and, given the number of fishers for whom English in their second language, if are they aware of emergency phone procedures.

Figure 8. Self-reported safety behaviours, 2006-2011
- When fishing from rocks do you carry a cell phone (Q13, part 6)



The final self-reported behaviour related to the dangerous practice of going down the rocks to the waters edge to retrieve a snagged line.

Figure 9. Self-reported safety behaviours, 2006-2011
- Do you go down the rocks to retrieve snagged line? (Q13, part 7)



Significantly fewer females than males (females 41%; males 55%) reported going down to the water's edge to retrieve snagged lines ($\chi^2 = 8.605$, $df = 3$, $p = 0.035$). No significant differences were reported when dangerous line retrieval practice was analysed by age, ethnicity, and length of residency.

Figure 8 shows that approximately half of the fishers from 2006-2011 reported that they *never* did this (range 34-52%). However, many fishers reported that they *sometimes* (range 23-38%) or *often* (range 10-31%) did engage in this risky practice.

With the exception of the non-use of life jackets, other at-risk behaviours have not diminished over the years. The contributing factors that may explain this persistence into 2011 include the predominance of males among fishers (88%), the transience of the fisher population only one half of respondents (54%) had taken part in previous surveys, and the culturally and linguistically diverse population with nearly half (45%) of the survey respondents having completed the non-English version of the questionnaire). In addition, almost one quarter (22%) of the respondents were also first time users of the site where interviewed and thus may not have seen the recently installed safety signage or angel rings. Finally, many of the respondents in each year of the study had lived for less than 4 years in New Zealand (2010, 36%). As stated in the previous (Moran, 2008, 2009), any one of the above factors may make the task of changing risky attitudes and behaviour challenging. Taken collectively, the combined effects of a predominantly male population, transitory participation, infrequent visits to the fishing sites, English as a second language, and recent residency, offer strong reasons why changes in attitude and behaviour appear resistant to change.

4.6. Changes in Fishers' Knowledge, Attitudes and Behaviours

Fishers were asked to estimate whether their fishing safety knowledge, attitudes and behaviour and that of their mates and other fishers had improved since the inception of the Project in 2006 (see question 14, Appendix 1). Table 10 shows that three quarters of fishers (74%) considered that their safety knowledge had improved in the past four years, a small proportion (5%) thought that it had not improved and one fifth (22%) didn't know whether it had improved, a slight improvement on the 2010 findings.

Table 10. Comparison of Self-Reported Changes in Fishers' Safety Knowledge, Attitudes and Behaviours, 2010-2011

Do you think that -	Year	Agree		Disagree		Don't know		Total	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Your rock fishing safety knowledge has improved?	2011	106	73.6	7	4.9	31	21.5	144	100.0
	2010	71	66.4	15	4.0	21	19.6	107	100.0
Your rock fishing safety attitude has improved?	2011	102	70.8	9	6.3	33	22.9	144	100.0
	2010	66	61.7	13	12.1	28	26.2	107	100.0
Your rock fishing safety behaviour has improved?	2011	105	72.9	6	4.2	33	22.9	144	100.0
	2010	66	61.7	14	13.1	27	25.2	107	100.0
Your mates rock fishing behaviour has improved?	2011	75	52.1	9	6.3	60	41.7	144	100.0
	2010	50	46.7	17	15.9	40	37.4	107	100.0
Other rock fisher's behaviour has improved?	2011	80	55.6	9	6.3	55	38.2	144	100.0
	2010	45	42.1	18	163.8	44	41.1	107	100.0

Almost three quarters (71%) also believed that their safety attitudes had improved, though some (6%) considered that their attitude had not improved. Most fishers (73%) also considered that their safety behaviour had improved, an improvement on the previous year when 62% of the fishers thought that their safety behaviour when fishing had improved

To ascertain whether there had been an overall improvement in safety behaviour among the fishing community, fishers were asked to indicate whether they thought the safety behaviour of friends or other rock fishers had improved. Table 10 shows that half (52%) of the fishers thought that the safety behaviour of their mates had improved,

slightly up on the previous year (47%). More than half (56%) considered that the safety behaviour of other fishers had improved, again slightly more than 2010 (42%). In both instances, a large proportion of fishers were unsure as to whether there had been any change in their mates (42%) or other fishers (38%) behaviour.

5. Recommendations

In light of these findings, several recommendations are made. These are:

1. To the Auckland Council:

- Retain the services of the safety advisors for a 2012 summer campaign and on a permanent basis thereafter.
- Retain the multilingual advisory service and look to ways of presenting safety information in multiple languages
- Continue to provide regional leadership via the inaugural super-city governance structure to support future fishing safety promotion, including the installation of angel rings, and safety signage at high risk sites thereby affirming the Council's commitment to maintain harbour and coastal safety
- Consider the implementation of legislation through local by-laws of the compulsory use of life jackets at high-risk west coast fishing sites
- Consider the implementation of legislation through local by-laws to prohibit the consumption of alcohol at high risk west coast fishing sites

2. To WaterSafe Auckland, Surf Life Saving Northern Region and other safety organizations:

- Consider ways of addressing the concerns highlighted in this Report by reinforcing and extending the current provision of public safety information and resources.
- Commit resources and personnel to the ongoing work collaboratively with all partners to promote best practice for West Coast fishing safety education beyond 2011.
- Disseminate the findings of the study to member organizations, national water safety organisations, community organisations (especially migrant community organisations), recreational fishing groups and businesses and the public at large.
- Consider adopting similar messages and water safety promotion methods successfully used in Auckland's West Coast fishing safety project 2006-2011 in known high-risk fishing spots throughout New Zealand

3. To recreational fishers, fishing clubs and fishing organizations:

- Adopt and endorse the fishing safety messages promoted by the West Coast Fishing Safety Project.
- Encourage others in the rock fishing fraternity to adopt safe practices - especially the wearing of life jackets when fishing at Auckland's high-risk west coast locations.
- Support the work of frontline fishing advisors and lifeguards in their efforts to make rock fishing a safe and happy experience without undue risk for all concerned.

4. To life jacket manufacturers and distributors

- Continue to support the West Coast Fishing Safety Project.
- Advocate for the promotion of rock fishing safety with retailers.

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7. Appendix

7.1 Appendix 1 - The survey questionnaire



Rock-Fishing in Auckland: 2011

From 2006-10, Auckland’s west coast rock fishers have been asked their opinions on rock fishing water safety. This follow-up survey is designed to gather further information from you about your current views. Many of the questions ask you about the possible dangers of fishing from rocks and your opinions on rock fishing safety. Most questions offer a range of responses, for these questions there are no right or wrong answers –an answer is correct if it is true for you.

Please do not take too long over each question – normally your first answer is best. Please be honest in your responses, the survey is voluntary and anonymous so no names will ever be known.

If you have any queries about the survey please ask the researcher who will be happy to assist you.

1. Did you take part in the Auckland west coast rock-fishing project in the past?

- Yes No

If Yes, do you think the project was:

- Highly successful
- Successful
- Slightly successful
- Not successful
- Don't know

2. Are you aware of the current rock fishing safety promotion in Auckland?

- Yes No

If Yes, how do you know about it?

- Radio
 - Television
 - Rock fishing advisors
 - Newspapers
 - Magazines
 - Retail outlets (eg fishing shops, gas stations)
 - Other
-

3. Are you?

- Male Female

4. How old are you?

- 15-19 years
- 20-29 years
- 30-44 years
- 45-64 years
- 65+years

5. Where else have you fished in the last year?

6. How would you best describe yourself?

- European New Zealander
 - Maori
 - Pasifika
 - Chinese/Taiwanese
 - Korean
 - Indian
 - Other,
-

7. How long have you lived in New Zealand?

- Less than 1 year
- Between 1-4 years
- Between 5-9 years
- More than 10 years
- All my life

8. How often have you fished at this location?

- This my first time
- Between 2-5 times
- Between 6-10 times
- Between 11-20 times
- More than 20 times

9. Have you seen the new angel rings on the west coast?

- Yes No **If Yes, do you think they are-**

- Essential
- Useful
- Not very useful

Why? _____

10. Can you suggest other dangerous sites without angel rings on the west coast -

11. Do you think that the angel rings	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1 – Have clear instructions on how to use them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 – Are the best source of assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 – Are located in the most suitable sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Do you think that-	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1 - Getting swept off the rocks while fishing is likely to result in my drowning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 - Rock fishing is no more risky than other water activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 –Drowning is a constant threat to my life when rock fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 - I am not concerned about the risks of rock fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 - Other fishers are at greater risk of drowning than me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 - I am a strong swimmer compared with most other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 – I avoid fishing in bad conditions to reduce the risk of drowning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 - Always wearing a life jacket makes rock fishing a lot safer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 - Turning my back to the waves when rock-fishing is very dangerous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 - My local knowledge of this site means I'm unlikely to get caught out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 - My experience of the sea will keep me safe when rock fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 - My swimming ability means I can get myself out of trouble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. When rock fishing, do you –	Never	Sometimes	Often	Always
1 Wear a life jacket/buoyancy aid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Check weather forecast beforehand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Drink alcohol when fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Wear gumboots or waders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Turn your back on the sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Take a cell phone in case of emergencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Go down the rocks to retrieve snagged line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Do you believe that:	Agree	Disagree	Don't know
1 My knowledge of rock fishing safety has improved in the past 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 My practice of rock fishing safety has improved in the past 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 My attitudes towards rock fishing safety have improved in the past 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 My rock fishing mates seem more safety conscious in the past 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Other rock fishers around me seem more safety conscious in the past 5 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for taking part in the survey, please return this form to the Fishing Safety Advisor

