The Royal Life Saving Society – NSW (RLSSA- NSW)

Royal Life Saving NSW believes anyone can be a lifesaver. Members, volunteers, trainers, employees and lifesavers are found in almost all communities. Lifesavers are everywhere. They can be teachers, students, mums, dads, firemen, plumbers or accountants. They patrol the houses, streets, workplaces and parks of the communities in which they live. They don’t always wear a uniform but they can and do save lives. The Royal Life Saving approach is inclusive and some of their biggest achievements occur away from large capital cities.

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EXECUTIVE SUMMARY

Fishing is a popular recreational activity in Australia. This is due to the surrounding coast, a love of water based activities and a wide variety of fish available. However, all too often recreational fishing can become a dangerous and sometimes deadly experience if appropriate safety precautions are not undertaken.

Since the last report on recreational rock fishing [4], there have been a number of collaborative education programs undertaken to decrease recreational rock fishing fatalities including those funded by the NSW Government and other voluntary organisations. The NSW Government has contributed ongoing funding support for many of these programs in various phases. NSW has lead the development and implementation of rock fishing safety initiatives in Australia over the past decade. However recreational rock fishing fatalities continue to occur in NSW. For this reason an examination of recreational fishing fatalities was undertaken.

Examination of Recreational Fishing Fatalities

A lack of information on current demographics and practices of recreational fishers in NSW has limited the prevention of drowning related recreational fishing fatalities. Therefore, the NSW Water Safety Advisory Council recommended that research into all drowning related recreational fishing fatalities that have occurred in NSW since 2000 should be undertaken. This research was then undertaken by Royal Life Saving Society- NSW Branch (RLSSA- NSW) thanks to funding from NSW Recreational Fishing Trusts.

Summary

In this study there was an average of 17 drowning related recreational fishing fatalities per year over the period 1 July 2000 to 30 June 2007.

Key issues were:

- 2001-2002 and 2002-2003 were the years that had the most (19%) fishing fatalities.
- Males aged 35-64 years made up 60% of all drowning related fishing fatalities.
- Males aged 45-74 years represented 64% of all drowning related fishing from a watercraft fatalities.
- Rock fishing fatalities represented almost half of all drowning related fishing fatalities.
- Rock fishers of Asian backgrounds accounted for 59% of all rock fishing drowning related fatalities.
- Being swept off feet or capsized by a wave contributed to 38% of all drowning related fatalities.
- There is not one main season in which drowning related fishing fatalities occur.
• The majority of drowning related fatalities occurred during the day, particularly in the morning and on a Saturday.

• The majority (61%) of fatalities occurred when the wind was light.

• Most (31%) fatalities occurred when the temperature was 20-24°C and 64% of fatalities occurred when there was no rainfall.

• Only 15% of overall drowning related fishing fatalities were tourists. That is 85% of all drowning related fishing fatalities were not tourists to the area they were fishing at; most lived within 50km.

• Safety equipment is not used by fishers as 87% of all drowning related fishing fatalities were not using any kind of safety device or equipment whilst fishing.

• Potentially 63% of all fishing drowning related fatalities could have been prevented if some kind of safety was used.

• Most (31%) fatalities occurred when fishing alone.

• Sydney region represented over one third of fishing fatalities, but per 100 000 population the South Eastern region represented the most (1.29 per 100 000 population) drowning related fishing fatalities.

**Online Recreational Fishing Survey**

An online recreational fishing survey was developed to explore exposure and attitudes around recreational fishing. This survey was created in order to understand current perceptions and practices of recreational fishers. A reference group was also established to assist with input into data collection items, the creation of the online survey and potential recommendations from this research.

**Summary**

There were 466 responses to the online recreational fishing survey. The key issues found were:

• Three quarters of respondents were male and approximately a third of respondents were aged between 35-54 years.

• Other than English, the most common language spoken at home by respondents was a language from Asian countries.

• Almost three quarters of respondents were born and have lived in Australia their whole lives.

• Fishing off rocks and from a watercraft were the two most popular types of fishing.

• Almost all respondents drove a car to their fishing location and 10% climbed over rocks to get to their actual fishing spot.

• Almost a quarter of all respondents fish at their chosen locations because they believe them to be safe to fish at. This indicates that 75% of respondents do not factor in safety when choosing a fishing location. Half of all respondents’ fish in rough waters and strong winds and alarmingly, 37% fished during thunder/lightning storms.
• There was no one preferred day to fish, however almost half of respondents preferred to fish either at dawn or during the day.
• Fishing alone is still undertaken by 15% of respondents who rock fish and fishers identified that almost a quarter of other fishers at their locations are by themselves.
• Life jacket use while fishing is quite poor as 80% of respondent’s fish off a boat and almost 75% of respondent’s fish off rocks, however 40% of respondents never wear a life jacket/buoyancy aid whilst fishing.
• Fishers are not well prepared for an emergency as almost a quarter of respondents had to rescue someone else whilst they were fishing and almost two thirds of respondents do not have a current first aid certificate.
• Over 70% of respondents always inform people where they are going fishing, always check sea and weather conditions before and whilst fishing and always take a mobile phone with them.
• Over 50% of respondents had not stated or heard about any fishing safety materials/campaigns. Of the respondents who had heard any fishing safety materials/campaigns, rock fishing and angel rings were the most common topics.
• Over 50% of respondents would go to the internet for safety information but interestingly only 6% would go to a lifeguard/lifesaver for safety information.
• A quarter of respondents were members of fishing clubs.
• At the locations commonly fished, less than a quarter of respondents stated that there were angel rings there. This may be because at this stage angel rings are only installed at “black spot” locations.

Recommendations
Several recommendations were made including:
• Funding should be provided to Royal Life Saving NSW over the next four years to support data collection on recreational fishing fatalities which can then be reported via the Royal Life Saving NSW Drowning Report.
• Expand the NSW Fatality Police Form to collect information on recreational fishing fatalities.
• Ensure fishing safety resources and materials are culturally specific and targeted at males aged between 35-64 years be developed and utilised appropriately.
• Ensure fishing safety programs are run all year round not just during the summer.
• Ensure fishing safety programs for locals are operating within NSW.
• Further investigation into the effectiveness of possible prevention strategies, including communication, their implementation and enforcement.
• Future surveys to be appropriately resourced to include people where English is not their first language.
• Future observational studies of recreational fishing behaviour should be undertaken.
• An exploration of exclusion zones should be undertaken to see how it may be implemented at NSW rock fishing “black spots”.
Fishing safety programs should encourage people to fish in groups.

Ensure there are appropriate fishing safety programs delivered to people from Asian backgrounds.

Explore the possibility of life jackets being made mandatory when rock fishing including how this may be enforced.

Information should be provided on safe locations to catch different types of fish.

Develop PPE in consultation and engagement with industry and user groups/ stakeholders including life jackets and appropriate clothing specific to recreational fishing to facilitate increased use by fishers.

Promote the need for all fishers to have a current First Aid or CPR certificate and this should be supported and facilitated in the fishing community. RLSSA- NSW also recognises the RLS Bronze Medallion and proposes a pilot RLS Rock Fishing Rescue program as appropriate water safety and education programs to improve the water skills and abilities of fishers.

Explore the possibility of fishers providing their mobile phone numbers to receive updates or creating a mobile phone application/ direct telephone number where fishers can access sea and weather conditions at any location in NSW by organisations such as the Bureau of Meteorology (BoM).

Increase the number and type of fishing safety materials/ campaigns.

Delivery mechanisms for fishing safety materials/ campaigns should reflect current trends such as through the internet and radio.

Awareness and prevention materials should incorporate recreational fishing risk factors and how they can reduce their risk of drowning.

A multi dimensional approach to the prevention of recreational fishing deaths should be undertaken including ensuring people are receptive to the message.

**Conclusion**

Recreational fishing is part of Australian culture and should be a safe and fun activity to participate in. Too many lives have been lost and many lives continue to be lost each and every year as a result of drowning related recreational fishing. Therefore, safety and prevention of these fatalities is paramount.

This study has aimed to provide an overview of drowning related recreational fishing fatalities and outline current perceptions, exposure and attitudes of recreational fishers. The recommendations are aimed at all involved in recreational fishing safety, but should be noted by recreational fishing organisations, NSW Government and those not-for-profit organisation with an interest in preventing the deaths of recreational fishers. The Royal Life Saving Society will continue to report on recreational fishing deaths in its annual NSW Drowning Report, as well as undertaking research and prevention programs to reduce drowning related recreational fishing fatalities.
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INTRODUCTION

Fishing is a popular recreational activity in Australia. This is due to the surrounding coast, a love of water based activities and a wide variety of fish available. However, all too often recreational fishing can become a dangerous and sometimes deadly experience, if appropriate safety precautions are not undertaken.

It is estimated that an average of one million people in NSW fish annually [15]. There are a range of locations where people fish including oceans, rivers and lakes. While there is an inherent danger posed to fishing at any location, there appears to be some locations such as from rock ledges along the coast where this risk is increased by the convergence of a range of conditions unique to this setting. This issue has long been recognised with the NSW coroner in 1993 stating “…rock fishing has the highest fatality rate of any sport in NSW…” [2](p 426).

A lack of information on current demographics and practices of recreational fishers in NSW has limited the prevention of drowning related recreational fishing fatalities. Therefore, the NSW Water Safety Advisory Council\(^a\) recommended that research into all drowning related recreational fishing fatalities that have occurred in NSW since 2000 should be undertaken. This research was then undertaken by Royal Life Saving Society NSW (RLSSA- NSW) thanks to funding from NSW Recreational Fishing Trusts. The outcomes of this research will then be used to assist the NSW Water Safety Advisory Council and its members in developing appropriate prevention strategies and campaigns to address the safety of recreational fishing in NSW.

The aims of this study were:

- To undertake a review of literature on recreational fishing related drowning fatalities.
- To undertake an investigation into recreational fishing drowning related fatalities.
- To undertake a survey into recreational fishers exposure, attitudes and risks taken.

This report is broken into the following sections:

a) Literature review.
b) Recreational fishing related fatalities.
c) Survey of recreational fishing.
d) Discussion, conclusion and recommendations.

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\(^a\) NSW Water Safety Advisory Council consists of members from: NSW Maritime, Industry and Investment NSW, APOLA NSW Department of Health, NSW Department of Local Government, NSW Department of Sport and Recreation, NSW Local Government and Shires Association, Surf Life Saving New South Wales and The Royal Life Saving Society Australia.
LITERATURE REVIEW

Information related to recreational fishing was reviewed and collated into historical perspectives, international studies, current and past drowning deaths and safety/prevention.

Aim

This literature review sought to examine the circumstances surrounding drowning deaths of recreational fishers and issues relating to recreational fishing in NSW. Information in this literature review is presented as follows:

- Methods.
- Historical perspectives.
- International studies.
- Statement of problem.
- Drowning deaths.
- Cost of drowning.
- Risk factors.
- Safety.
- Injury prevention.

Methods

A review of literature was undertaken to attain information on drowning deaths due to recreational fishing. Searches were undertaken using media and RLSSA- NSW databases and a search on Medline on the 7th of June, 2009 using the words ‘fishing’ and ‘occupation’ brought up 108 cases in which five were relevant to this study. Information was also sought through subsequent searches in Google and Google scholar using words such as recreational fishing, fishing, drowning, rock fishing and coastal rock platforms. Papers were also used from Surf Life Saving Australia (SLSA) and NSW Maritime websites. A representative from the Water Research Laboratory, School of Civil and Environmental Engineering at the University of New South Wales was contacted in regards to coastal rock platforms and hazardous conditions and this paper was then made available to RLSSA- NSW. Two papers were also used from the 2010 Australian Water Safety Conference program and one paper was used from the 2008 Australian Water Safety Conference program.

Historical Perspectives

There have been two previous examinations of drowning related rock fishing fatalities in NSW [3, 4]. Due to a high number of rock fishing fatalities and a series of high profile rescues in NSW in 1992 a
Rock fishing Sub-Committee was convened\(^b\). This Sub-Committee provided information to the Inter-Departmental Committee on Water Safety who then prepared a paper titled *Rockfishing Report* [3]. The major findings of this report were that there was an average of seven deaths per year from 1969-1991 with the majority being males, there was no state government department responsible for rock fishing in NSW, people of non-English speaking backgrounds were at greater risk of drowning when rock fishing, safety rules were not followed by the majority of rock fishers and angler education was recommended by rock fishers to reduce drowning deaths.

Recommendations included the development of an angler/community education program, safety signage and lifebuoy facilities at “black spots” on the NSW Coast, development of a code of practice, rock fishing safety component of Year 6 School Education Syllabus and phasing-in emergency outpost alarm and communication control centre’s at key safety locations across the NSW Coast.

Five options were discussed for the prevention of rock fishing drowning related fatalities. These were:

1. **Education and public awareness.** As there was limited rock fishing specific education material available in NSW, education was identified as the single most important and potentially effective means of significantly reducing fishing related accidents and injury.

2. **Safety garments.** The Sub-Committee while originally favouring the introduction of some form of compulsory use of flotation device felt that it would be impossible to enforce.

3. **Outpost alarms linked to emergency and rescue bases in the area.** Although costly, the Sub-Committee felt that this would be most beneficial in high risk, high usage areas on the NSW coast.

4. **Jervis Bay pilot.** Rock fishing safety program commenced by the Shoalhaven Rock Fishing Safety Awareness Committee. Eight lifebuoys attached to galvanized steel mounted signs, each with a plaque indicating what to do in case someone is swept off rocks and provides a generic warning message to rock fishers.

5. **User pays.** Any fisher/s needing assistance would be liable to pay for any costs incurred by the rescue. Sub-Committee dismissed this idea due to several issues such as consistency and financial hardship for family members.

These recommendations were made 18 years ago and to this day three of the five above mentioned strategies (points one, two and three) have not yet been fully implemented or are currently under review. Following these recommendations, the Jones’ 2003 report [4] updated the data on rock fishing drowning related fatalities. For the period 1992-2000 there was an average of eight rock fishing fatalities per year, which is an increase in the number of deaths compared with the previous study by the Inter-Departmental Committee on Water Safety [3].

International Studies

International studies on drowning related recreational fishing fatalities and practices are very limited. A review of literature determined New Zealand was the only other country where rock fishing information could be found [5-8]. In New Zealand, Kevin Moran conducted a three year study examining the current issues and practices of New Zealand rock fishers and is highlighted below:

**Study Title:** Water Safety and Auckland’s West Coast Rock Fishers in 2006 [5].

- **Aim:** To pilot a rock fishing safety program that would help rock fishers manage the risks associated with rock fishing on Auckland’s west coast.
- **Methods:** A survey of rock fishing participants was conducted during the summer of 2006 to enhance understanding of their water safety knowledge, beliefs and behaviours when rock fishing.
- **Key Findings:** Most participants recognised the value of wearing buoyancy aids when fishing at high-risk locations but most never wore one.

**Study Title:** Water Safety and Auckland’s West Coast Rock Fishers - Follow Up in 2007 [6].

- **Aim:** To follow up on the 2006 study to ascertain the fishers awareness of the current on-site fishing safety promotion, to survey fishers to find out the effect the survey had on them in terms of their understanding and practice of water safety, to compare and contrast fishers’ perceptions of drowning risk, safety behaviour and self-reported changes in knowledge, attitudes and behaviours from 2006-2007 and to make recommendations and suggest future strategies of fishers’ safety from rocks on Auckland’s west coast.
- **Methods:** As part of the second year, an education campaign (CALD appropriate) and coupons were distributed onsite to fishers to redeem for an inflatable jacket. A follow up survey was also conducted.
- **Key Findings:** Participants’ knowledge and practices of fishing safety increased and the pilot program was successful and should continue beyond the final pilot year.

**Study Title:** Staying on Top- Changing Rock Fishers Use of, and Behaviour Towards, Buoyancy Aids in 2008 [7].

- **Aim:** To present preliminary findings of the final phase and to determine the success of the three year study.
- **Methods:** An All Black rugby player was chosen as the spokesperson, $20.00 redeemable voucher was given to all fishers seen wearing a life jacket, monthly rock fishing workshops were held for the Chinese community throughout summer where inflatable life jackets were given away as prizes and at promotional events.
- **Key Findings:** The project had a positive effect on fisher safety especially with regard to the use of buoyancy aids. The success of the program was measured in lives saved. In 2005
there were five deaths in two months; however since the project was implemented there was one fatality in 2006, two in 2007 and one in 2008 to date (May, 2008). Moran noted that a possible reason to the success of this project was due to all three organisations involved combining resources and utilising individual strengths.

**Study Title:** Water Safety and Auckland’s West Coast Fishers in 2009 [8].

- **Aim:** To evaluate the 2009 collaborative project on West Coast Rock Fishers. In specific to continue the onsite rock fishing safety education promotion, to determine the effect of the project on west coast fishers’ safety practices and beliefs and to make recommendations for future rock fishing safety promotion based on information received.

- **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 April, 2009. An anonymous questionnaire was completed by 128 fishers that sought information on whether they had taken part in the 2006-2008 campaign and if they were aware of the follow up 2009 fishing safety promotion.

- **Key Findings:**
  - Most participants were males and most were between 20-44 years of age.
  - Almost half of fishers were aware of the previous project and over two thirds thought it was successful/ highly successful. Just under half of fishers were also aware of the current project.
  - Most fishers who were unsure if angel rings were accompanied by clear instructions were recent immigrants and English was a second language which suggests further multilingual signage is necessary. Nearly half of fishers were unsure if angel rings were the best source of public rescue equipment (PRE) or located in the most needed sites.
  - Almost three quarters of fishers agreed that getting swept off rocks is likely to result in drowning deaths and there was an 11% increase in the belief that fishing off rocks was a threat to life.
  - There was a 22% increase in the number of fishers who reported wearing a life jacket/ buoyancy aid and a 38% decrease in the number of fishers who reported never wearing a life jacket/ buoyancy aid. One third still report to never wear a life jacket/ buoyancy aid.
  - More than half of fishers considered their safety knowledge had improved from the previous year.

- **Recommendations to Auckland Regional Council:** Retain the safety advisors for a 2010 summer campaign and look into ways to present safety information in multiple languages. Also allocate funds to support future fishing safety promotion including installing angel rings and signage at high risk sites.

- **Recommendations to WaterSafe Auckland, Surf Life Saving Northern and other safety organisations:** Commit resources and personnel to ongoing work with all partners to
promote best practice for West Coast fishing safety education beyond 2009. Disseminate findings of the study to member organisations water safety organisations, community organisations, recreational fishing groups/ businesses and the public.

- **Recommendations to recreational fishers, fishing clubs and organisations:** Learn and implement the fishing safety messages and also encourage other fishers to adopt safe practices, especially the wearing of inflatable life jackets. Also support frontline fishing advisors and lifeguards to make fishing a safe and happy experience.

**Statement of Problem**

Rates of drowning related recreational fishing fatalities in NSW are unknown since the last investigation was conducted for the period 1992-2000 [4]. However, anecdotal evidence (media) suggests that too many recreational fishers are losing their lives while partaking in recreational fishing. The NSW Water Safety Taskforce recommended an analysis of fatality data and information be collected on current demographics, practices and safety precautions to help develop strategies to prevent further recreational fishing related deaths.

**Drowning Deaths**


- In 2009-10, there were 27 drowning related recreational fishing fatalities in NSW which almost doubled from 14 in 2008-09.
- NSW accounted for one third of all drowning related recreational fishing deaths in Australia.
- As an activity, fishing represented 15% of all drowning deaths in NSW in 2009-10.
- In particular, rock fishing is one of the most dangerous types of recreational fishing as 14 (52%) of the 27 drowning related fishing fatalities in NSW in 2009-10 were due to recreational rock fishing which increased by 64% from the previous year.

It should be noted that these figures are interim and require further analysis.

A previous report in NSW examined drowning related rock fishing fatalities between 1992 and 2000 and was published in 2003 [4]. This report found that there were 74 drowning related rock fishing fatalities from 1992- 2000, approximately eight drowning related fatalities per year. Furthermore, the NSW Coroner in 1993 stated that “…rock fishing has the highest fatality rate of any sport in NSW...” [4] (p 426).

From 1992-2007 there were 125 rock fishing drowning deaths, an average of 7.8 fatalities per year (Figure 1). There have been four years in the past 16 where the number of rock fishing drowning related fatalities has risen above ten. 1992 was the year where most (14; 11%) drowning related rock fishing fatalities occurred, followed by 1999 (13; 10%), 2004 (12; 10%) and 2006 (11; 9%). Drowning
related fatalities were the lowest in the years 1993 and 2003 (4; 3%). Interestingly, for every year that there was an increase in drowning related fatalities, a noticeable drop in drowning related fatalities was recorded the following year. A reason for this may be due to media and awareness driven by the high number of drowning related fatalities the previous year. If this assumption holds true then consistent media awareness and safety programs are needed in order to reduce drowning related fatalities each and every year. However seasonal and other factors need to be explored in greater detail to determine underlying causes.

Figure 1: Drowning related rock fishing fatalities from 1992-2007

![Figure 1: Drowning related rock fishing fatalities from 1992-2007](image.png)

Cost of Drowning

There have been a few studies in Australia examining the lifetime cost of a drowning death [11-13]. These studies show a death due to drowning comes at a cost ranging between $370,000 and $610,467 to the broader community. However, this dollar figure does not include the emotional impact that a drowning death or disability has on families and the community.

In 1998-1999, the direct cost of drowning included a high proportion of hospitalisation costs and the average direct cost was $3,580 overall - $4,180 for males and $2,360 for females. However, indirect costs (mortality and morbidity) reach $55 million for males and $16 million for females - a total of $71 million overall [11] (p103).

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C Trends from 1992-2000 were from the report by Jones 4. Jones, M., *Investigation into the coronial files of rock fishing fatalities that have occurred in NSW between 1992 and 2000, 2003, NSW Water Safety Taskforce.* p. 37., and trends from 2001-2007 have been taken from RLSSA- NSW data and are provisional. As RLSSA- NSW usually collates data using financial years, the data from 2001 onwards has been altered to fit with the collation methods of the previous study (January to December the same year).
Risk Factors

There are a range of risk factors proposed in the literature which are purported to increase the probability of a person drowning while fishing. McClure, Stevenson and McEvoy [14] (p 125) described risk factors as measurable characteristics (e.g. alcohol) associated with a higher probability of a person sustaining an injury. Risk factors may include environmental exposures, ethnicity, fishing locations and weather conditions [14].

Exposure

Injuries are not the result of randomly occurring accidents, exposure to risk factors is also not random [14]. Data from the Department of Agriculture, Fisheries and Forestry (DAFF) National Recreational and Indigenous Fishing Survey [15] showed that in the 2000-01 national survey of recreational fishing, 3.4 million Australians (2.3 million males and 1.1 million females) over the age of five years had been fishing at least once in that period which represented a national participation rate of 19.5%. Therefore, based on this proportion of Australians who fish and in 2006 the Australian resident population was 19,855,288 [16], we estimate that there would be approximately 3.87 million people who had participated in recreational fishing in 2006.

Furthermore, the ABS [17] estimated that 4% of international tourists visiting Australia had engaged in recreational fishing and there were 5,061,000 international tourists in 2000-01. Therefore an estimated 202,440 tourists had fished in Australia during that period. Data on recreational fishing was not available from any Year Book Australia after 2005. This may be due to the fact that obtaining information on recreational fishing is a large scale task [15].

Information provided by Industry & Investment NSW (I&I NSW) estimated that there are approximately half a million fishing licences purchased in NSW every year [1]. In specific, in 2001-02 there were 465,420 fishing licences purchased in NSW and in 2007-08 there were 488,086 fishing licences purchased in NSW. However it should be noted that actual numbers of recreational fishers will be higher than the numbers presented as not all recreational fishers are required to purchase a fishing licence (i.e. some exemptions do apply). It should also be further noted that some of these licences are for short periods of time (3 days or 1 month) and others for a longer period (1 year or three years) [18].

Ethnicity

People from culturally and linguistically diverse (CALD) backgrounds and tourists to Australia have been identified as two population groups with an increased risk of drowning while undertaking rock fishing in Australia [19]. Rock fishing as an activity is popular amongst the Chinese community, particularly males. Chinese people often rock fish with friends to socialise after work and male participants enjoyed and thrived on the sporting aspect of rock fishing “attracted by the risk associated with this type of fishing”[19].
This is consistent with data from Jones (2003) who found fishers of Asian backgrounds are an at risk group as they accounted for 19.7% of recreational rock fishing drowning related fatalities from 1992-2000 [4]. In a recent survey performed in New Zealand [5], 49% of rock fishers surveyed on site were of Asian background and more than other ethnic groups, Asian fishers thought it likely that they would drown if swept off rocks.

**Fishing Locations**

Thompson (2010) highlighted that there are a number of national “black spots” that can be attributed to rock fishing, such as Randwick and Sutherland in NSW [20]. However, Bondi, Dee Why and Manly which are also in NSW have an over representation of incidents relating to rock fishing [20]. A NSW and Victorian coastal survey found that apart from some demographic differences there appeared to be little difference in the behaviours and knowledge of rock fishing safety between rock fishers in NSW and Victoria [21]. This may be an indication that the NSW coastline is more dangerous and unpredictable than the Victorian coastline. However, these rock platforms may also experience calm/low swell conditions throughout the year.

**Weather Conditions**

Information from NSW Maritime [22] (p 23) highlighted that some fishing is undertaken very safely from the rocks, “especially in sheltered bays and inlets. But some rock platforms are on high energy exposed coastline where large waves can break unpredictably”. A study by Tsai, Su and Huang (2003) found large waves seem to strike without any forewarnings and there is a connection to large waves through high seas [23]. They also found that incidents mostly occurred at shore cliffs with vertical front face and at breakwaters.

A research program undertaken by Shand, Peirson, Cox and Banner from the University of NSW in 2008 and 2009 [24] modelled the processes that lead to waves overtopping and sweeping people off rock platforms for potential use in future warning forecasting. They found that on rising tide levels, overtopping of a rock platform rapidly increases to a point at which hazardous conditions are reached [24]. They also noted that a change in 0.25 m tide level can occur in less than 30 minutes on the Sydney coastline and more rapidly on coasts subject to larger tidal ranges [24].

There has been considerable recent effort in understanding the weather and wave conditions leading to drowning deaths along the exposed eastern coast of Australia [25]. Evans (2007) found that long period swell conditions, even of low amplitude, can be extremely dangerous to rock fishers as deep water swell formation does not appear on local weather charts, but as they approach shallow water, wave height increases and they can become dangerous [25]. It is due to this reason that the Bureau of Meteorology (BOM) has developed thresholds for offshore wave heights and if conditions are met, dangerous surf is now forecasted [25].
Safety

RLSSA- NSW believes that all drowning deaths are preventable with appropriate knowledge, experience and skills. This is why, to prevent the drowning deaths of recreational fishers we need to ensure that they are aware of safety practices whilst fishing. A previous study [19] found a “low level of awareness of safety measures related to rock fishing among enthusiasts and non-participants alike”. There are a number of strategies which have been proposed to prevent drowning deaths of recreational fishers. These include:

- Wearing PPE. This includes wearing a life jacket, appropriate clothing, footwear and head protection. Footwear designed for rock fishing such as non-slip soles or cleats are essential as they prevent loss of footing due to wet, slippery and weedy rocks. Wearing head protection is also encouraged as it has been found that many people who have drowned received some kind of head injury.
- Education.
- Signage.
- Angel rings. Shaw [26] highlighted that along with educating fishers, funding by the NSW Government will facilitate the installation of more life buoys by the Australian National Sports Fishing Association (ANSA) along the NSW coast.
- Never fishing alone. Roberts [27] (p 47) found that “since the 1970s, there has been a sharp increase in the mortality rate for lone fishing accidents”. This is primarily due to the fact that there is no help available in the event of falling into the water.
- Observing sea and weather conditions before and whilst fishing. Choose the safest possible location to fish.
- Informing people where you are going and when you intend to return.
- Undertaking a lifesaving course such as the Royal Life Saving First Aid or Bronze Medallion courses.
- Not consuming alcohol before or whilst fishing.

Following 14 rock fishing drowning related fatalities in NSW in the past year (2010), a joint inquest was announced in December 2010 as authorities are concerned with the high number of fishers drowning on the NSW Coast [28]. Deputy State Coroner Elaine Truscott announced the coronial inquest which will examine ways of saving lives [28].

Injury Prevention

There are a number of strategies which have been proposed for the prevention of injuries and deaths, for the purpose of this study the authors are going to use the Three E’s from McClure, Stevenson and McEvoy [14]. The Three E’s of injury prevention are education, enforcement and engineering.
Education

Education plays a central role in both the prevention of injuries and the promotion of good health. Education and how people learn is diverse and can include a range of strategies which are primarily designed to facilitate the uptake of knowledge, thus helping a person to change their behaviour to be healthier and safer.

Education is seen as a key component in reducing recreational fishing drowning related fatalities. The International Lifesaving Federation (ILS) Rescue and Education Committees identified four factors that lead to a drowning death [29]. The first factor is a lack of knowledge, disregard or misjudgement of the hazard. This highlights the need for providing knowledge on safe fishing to the appropriate communities. Education can be delivered in a number of ways such as through signage, print or electronic media and face to face workshops or seminars.

There have been a number of collaborative education programs undertaken including those funded by the NSW Government and other voluntary organisations. It is important to acknowledge the significant in-kind and voluntary contributions from various organisations, including the NSW Branch of ANSA, Recreational Fishing Alliance of NSW (RFA NSW), SLSA, NSW Department of Sport and Recreation and I&I NSW. The NSW Government has contributed ongoing funding support (over half a million dollars since 2001) for many of these programs in various phases. NSW has lead the development and implementation of rock fishing safety initiatives in Australia over the past decade and some of these programs are being extended/adopted in other states.

A brief summary of these NSW educational programs are provided below:

- The NSW Rock Fishing Safety Awareness program commenced in 2004 and was overseen by the NSW Department of Sport and Recreation in collaboration with ANSA, RFA, I&I NSW and SLSA. This included the development and distribution of a rock fishing safety resource folder and production of a safety DVD which were distributed free of charge to anglers and were translated into Korean, Chinese and Vietnamese.
- The NSW ‘Don’t put your life on the line’ education campaign [20] included refining the above resource kit into a more user friendly format for anglers by the RFA. In 2010, Thompson highlighted that the ‘Don’t put your life on the line’ campaign provided multilingual educational resources, community workshops and additional angel ring installations [20]. Over 50,000 kits have been distributed to anglers since 2006 through various media, including online, through fishing clubs, formal safety events, Fishcare Volunteers and Fisheries Officers. SLSA, Sports Fishing Associations and the NSW Government worked together to conduct the workshops over Sydney, Melbourne and Perth. A workshop for Vietnamese rock fishers was held at Port Kembla in August, 2010 as part of this program [20]. Shaw [30] stated that at this workshop, 45 Vietnamese rock fishermen received intensive training at Port Kembla in the hope they will spread the safety message in their communities. On site surveys were also given as part of the education/ awareness campaign.
• The Asian Awareness Project was undertaken in 2009 by ANSA in collaboration with SLSA and involved a series of rock fishing safety advertisements in a range of Asian newspapers.

• A multilingual safety information program was designed in 2010 and I&I NSW began distributing a tri-fold rock fishing safety brochure (based on the ‘Don’t put your life on the line’ education campaign) to recreational fishing licence holders (around 250,000 per year).

• A series of workshops in 2010 and 2011 have been run by the RFA in collaboration with ANSA, SLSA, I&I NSW and other organisations to educate rock fishers, especially of non-English speaking backgrounds, on simple fishing safety measures.

In Australia there has only been one evaluation of a rock fishing education program and this was for the ‘Don’t Put Your Life on the Line’ campaign [31]. This evaluation found that there was success in generating a strong unprompted recall rate (33%)\(^d\) of all education media used and more than half of the interviewees indicated a willingness to change their behaviour after viewing the campaign [31]. However, it should be noted that the education program in New Zealand has been shown to be effective [7].

**Enforcement/ Legislation**

The second and third factors that lead to a drowning death were an uninformed, unprotected or unrestricted access to the hazard and a lack of supervision or surveillance. Implementation of legislation needs to be completed in order for enforcement to be effective. It is commonly recognised that for injury prevention programs to be effective the programs need to be evidence based, well supported (both financially and by the community), widespread and backed-up by legislation and enforcement (where people are penalised for non-compliance) [14].

Examples of safety legislation include the compulsory wearing of life jackets whilst boating and restricting access of fishers to dangerous fishing locations. The issue of life jacket use has been likened to the introduction of helmet use when bike riding, which after its introduction saw a decrease in injuries. Therefore it is proposed that the wearing of a life jacket while rock fishing will reduce the number of rock fishing fatalities. Enforcement of the proposed legislations includes penalties for non-compliance such as on the spot fines and watercraft surveillance. Also camera/video recording of fishers fishing in restricted locations could be utilised for compliance rates.

The introduction of legislation to change rock fishing behaviour is seen as being difficult to enforce as people rock fish in locations which are difficult to reach and place the person undertaking the enforcing at risk. This issue needs to be explored in greater detail.

**Engineering**

The final factor that leads to a drowning death is an inability to cope once in difficulty. Therefore, there is a need to modify the built environment, equipment, clothes and the natural world to make it safer.

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\(^d\) Over an industry average of proven recall norm of 22%.
This would increase the safety for fishers in NSW as they would have the appropriate equipment and measures to use if they get into difficulty. An example is the installation of angel rings at rock fishing locations to aid fishers in flotation if they find themselves in the water. Other examples for rock fishing could be building infrastructure to restrict access to NSW fishing “black spots” and angler implemented rock anchors to prevent getting swept off the rocks. For fishing from a watercraft, examples of engineering include wearing life jackets and having sufficient lighting of the watercraft at night.

**Rescue Devices**

There are a range of rescue devices which have been proposed to prevent fishermen from drowning. The most common is the angel ring but others such as Emergency Position Indicating Radio Beacons (EPIRBs), Silent Sentry and Longreach have also been proposed. An angel ring is a life buoy that is installed at popular rock fishing spots to prevent the drowning deaths of fishers by aiding in flotation. Angel ring installation has been led by ANSA and is supported by the NSW Water Safety Advisory Council, I&I NSW, various local councils and rescue services including the Westpac Rescue Helicopter Service, the Water Police and SLSA.

According to the Angel Rings website (www.angelrings.com.au) the installation of angel rings are at no cost to the public, as supply, installation and maintenance is fully funded through state and federal community grants. To date (March, 2011) ANSA have installed a total of 111 angel rings through their Angel Ring Project to at risk NSW coastal fishing sites [32]. The program began in 1994 and is being expanded in other states. So far 44 lives have been confirmed saved using angel rings [1]. However, issues have been raised due to rings going missing (either through sea conditions or from being stolen from sites).

In June 2010, former Minister Steve Whan [33] announced that the NSW Government will spend $90 000 on the expansion of current rock fishing safety programs to further educate and assist rock fishers in NSW. This will provide additional safety information ($30 000 to multilingual safety information) for recreational fishers, building on the existing comprehensive rock fishing safety programs. In an article in the Illawarra Mercury [34] Gary Wade stated that “angel rings have proved their lifesaving value, in the rescues of another five people washed off NSW coastal rocks during the last five weeks alone”. However, if a person was fishing alone an angel ring would have little impact as there would be no one to activate the device.

EPIRBs, a type of distress beacon used in ships and boats, are “small electronic devices that, when activated in a life-threatening situation, assists rescue authorities in their search to locate those in distress” [34]. EPIRB’s are required to operate for a minimum of 48 hours continuously once activated and they are designed to float in the water to optimise the signal to the satellite [34]. From 30 March 2009, it became a requirement for all registered vessels navigating two nautical miles or more offshore to carry an EPIRB [34].
A new invention called the ‘Silent Sentry’ which was developed in 2004 by West Australian Graeme Drew is a safety device that allows three balls attached to ropes to be thrown down a cliff to keep the person afloat if they find themselves in the water. Once the lever on the device is activated an EPIRB sends a signal to emergency services. Another device similar to this is the ‘Longreach’ grenade which was developed by Sam Adeloju. An emergency flotation device is shot 150 metres out to sea and expands up to 40 times its size once contact with water is made.

Personal Protection Equipment (PPE)

A number of PPE have been identified as potentially useful as a means of reducing drowning deaths from unexpected entry into the water while fishing. These include life jackets, clothing and footwear specific to fishing.

The wearing of a life jacket while fishing has been found to be poor [8, 31]. A life jacket is designed to assist the wearer to float when in the water, the higher the rating of the life jacket the greater the buoyancy. The purpose of a life jacket for a rock fisher is to provide the fisher with support in the water and thus help them swim away from the rocks and wait for rescue.

There are three types of life jackets. The first type is designed to support the wearer in a safe, head up position with the nose and mouth well clear of the water. The second has less buoyancy, is closer fitting, has no collar, and has more freedom of movement for active water sports. The third is an alternative to the second and has buoyancy material distributed evenly front and back, makes swimming possible for the wearer, zips up and has three or four straps. Whilst there is no life jacket specific to rock fishing, the first one is the most appropriate for the nature of the sport. There are also a number of devices which inflate in the water, either automatically when immersed or by the user.

Several recommendations have been made by NSW coroners to make life jacket use compulsory while partaking in recreational rock fishing [4]. Part 5 of the Marine Safety (General) Regulation 2009 [35] details current law on life jacket use which requires life jackets to be compulsory to wear while boating when crossing coastal bars, when more than 400m from shore on a canoe/kayak or windsurfer/ kiteboard, when operating a Personal Water Craft (PWC) at any speed (both the driver and passengers) and for children under twelve years of age. For rock fishing though, life jacket use is only recommended.

There has also been much debate on the compulsory wearing of a life jacket while rock fishing due to the high risk locations associated with rock fishing. In a recent article in Illawarra Mercury [26] a spokesman for NSW Primary Industries former Minister Steve Whan highlighted that the NSW Government’s view remains that “life jackets should not be made mandatory for rock fishers based on advice received from peak stakeholder groups” which include ANSA and the Recreational Fishing Alliance of NSW.

A study examining safer work clothing for fishermen found that one important feature to prevent drowning deaths was an integrated buoyancy aid [36]. They also mentioned that the use of this integrated buoyancy aid saved the life of a fisherman in northern Norway in June 2006 as it allowed
the fisherman to pick up the mobile phone and call for help after his fishing vessel sank [36]. Another study found that for prevention of commercial fishing drowning related fatalities in Australia there needed to be greater use of life jackets and there was also need for the development of improved clothing and life jackets [37] which can also be attributed to recreational fishing. Many fishers do not want to wear life jackets due to the fact that they may interfere with the process of fishing; therefore new designs need to be constructed specific to wear whilst fishing. This has also been confirmed in the United Kingdom where some drowning related commercial fishing fatalities would have been prevented if life jackets had been worn [27].

Clothing worn is also a factor in fishing drowning incidents (or deaths) due to a lack of buoyancy and added weight caused by wet clothing which makes it harder to stay afloat. It is important to wear protection against rocks, lightweight clothing or a wetsuit so if you do find yourself in the water you are not weighed down by heavy clothing. However a lack of appropriate clothing for fishers needs to be addressed.

**Conclusion**

Drowning related fishing fatalities continue to occur in NSW and there has been no reduction in drowning related fatalities over the past 40 years. Alarmingly, in the 2009-10 financial year, there were 27 drowning related fishing fatalities which is almost double from the previous year. There is a lack of information and data on recreational fishing demographics and practices. For prevention materials to be effective, they must include all of the E’s of injury prevention (enforcement and engineering), not solely education based, however further work needs to examine the effectiveness of all safety initiatives and new and novel ways developed. From the literature it also appears that work is required to prevent rock fishing related deaths of people from Asian backgrounds in NSW.
RECREATIONAL FISHING FATALITIES

This section of the report is an examination of drowning related recreational fishing fatalities from 1 July 2000 to 30 June 2007. This was undertaken to provide current demographics and practices of recreational fishers in NSW. This section is set out as follows:

- Aims.
- Methods.
- Results.
- Discussion.

Aims

The aims of the examination of drowning related recreational fishing fatalities were:

- To identify and describe all drowning related recreational fishing fatalities in NSW from 2000 –2007.
- To compare changes in rock fishing drowning fatalities to the previous study by Jones (2003) [4].

Methods

Data Collection

An examination of the demographics and contributing factors of all drowning related recreational fishing fatalities that occurred in NSW for the period 1 July 2000 to 30 June 2007 was undertaken. These drowning deaths were identified in the National Coroners Information System (NCIS) and supplementary information was provided via media and RLSSA- NSW databases to address a lack of information available on recreational fishing drowning related fatalities in NSW. The last search on NCIS was 15 November 2010.

Information was compiled in a Microsoft Excel 2007 spreadsheet using categories relating to personal information (NCIS number, NCIS Status, Age, Sex, Residence Location, Country of Birth, Tourist Status, Local Case Number); Incident Information (Date of Death, Day of Week, Time of Incident, Time Location, Distance from Residence to Time Location, Local Government Area, Activity, Number of People Fishing, Access and Transport to Fishing Spot); Contributory Information (Toxicology, Swimming Ability, Fishing Frequency, Personal Protection Equipment/ Clothes Worn At Time, Season, Weekend/ Public Holiday/ School Holiday, Action of Deceased After Entering the Water, Use
Definitions

For the purpose of this study, recreational fishing includes fishing from inland and coastal waterways for leisure purposes. Fishing from a watercraft includes fishing from a watercraft in inland or coastal waterways for leisure purposes, recreational rock fishing includes fishing from a rock platform/outcrop for leisure purposes and other fishing includes fishing from a shoreline, wharf, river, lake, bridge or spear fishing for leisure purposes. It should be noted that any drowning related fatality where recreational fishing was either intended or completed (accessing or departing the fishing spot and water submersion resulted) or a natural death occurred whilst fishing (heart attack and water submersion resulted) was included in this analysis.

For tourist status, cases were identified using four categories which consisted of intrastate (travelled more than 50km from residence to time location); interstate (residence was in another state), international (held a work visa or international residence); or not a tourist (i.e. lived within 50km from residence to time location).

Any case found to be drug related refers to both illegal and legal drugs found in the body at the time of autopsy except alcohol. Please note that this may also include any drugs administered by emergency services and hospital staff.

Data Coding

Once all coronial files were completed in July 2010, this information was collected and collated in a Microsoft Excel 2007 Spreadsheet and analysed using SPSS Version 19.0.0 [38]. The following items were grouped in the spreadsheet for analysis: times of day, any organisation attendance data, clothes worn at the time and contributory factors.

In terms of time of day, night time was classified as any time after sunset to first light and day time was classified as any time after sunrise to last light. Sunset was classified as any time between sunset and last light and sunrise was classified as any time between first light and sunrise.

Information on organisations that attended was classified into nine categories (due to over 50 organisations being involved in the rescue and subsequent treatment). These categories consisted of
police, ambulance, rescue helicopter, surf lifesaver/ rescue squad, private vessel, rescue watercraft, fixed wing aircraft, SES crew and fishing club/ organisation.

For number of people fishing, one person meant that they were fishing by themselves.

In terms of clothes worn at the time, information was grouped according to light, heavy and protective. Light clothing meant that clothing worn was made using thin material. Examples of light clothing included t-shirts, shorts and long sleeved shirts. Heavy clothing meant that clothing was made using thick materials, particularly for keeping warm but heavy when soaked with water. Examples of heavy clothing included track pants, jumpers, jackets and jeans. Protective clothing meant that safety gear specific to fishing was worn such as cleats, waders, life jackets and rock fishing pants.

Other contributing factors to the fatality were grouped into the following:

- Medical conditions. These included organ failure, heart attack/problems and hypoxic blackouts/seizures.
- Lack of PPE. No safety equipment was used whilst or after fishing.
- Swept or capsized. Swept off feet or capsized watercraft by a wave.
- Collision. Watercraft has collided with another watercraft or object.
- Fell-in. Either slipped into water or fell from the rocks.

A question was devised to ascertain whether safety would have saved any of the drowning related fishing fatalities. To determine this, each case was reviewed according to the principles of the Haddon matrix [14]. This model analyses potential risk factors for a specified activity where environment (weather and sea conditions on the day of fatality), personal (nature and type of fatality, number of people fishing at the time of fatality and the activity of each after entering the water) and equipment (any PPE already worn or being used at the time of fatality) risk factors are identified. Information was then judged as to the likelihood of the fatality occurring if safety devices/equipment had been used.

**Data Analysis**

BoM provided information on air temperature, wind speed, rainfall, first light, last light, sunrise and sunset and MHL provided information on tidal data. However, caution should be used when interpreting results as readings at the nearest monitoring device used may have been up to 50km away, and as such the true conditions may vary from those at the actual location of the fatality. Information provided by BoM on air temperature, wind speed and wind direction were taken at the times of 9am and 3pm and for this report the time closest to the time of fatality was used.

Tidal data represents sea level. One tidal case was negative, which signifies that the predicted tide height is below the datum or baseline of the predictions (Michael Davis, Personal Communication, 10 November 2010). The actual observed sea levels can vary considerably depending on prevailing events such as wind. For a rise in air pressure of 1hPa the water level below the pressure system will
fall by 1 cm and there is a raised water level for a decrease in air pressure (Michael Davis, Personal Communication, 10 November 2010). The Beaufort Wind Scale was used to classify and determine wind speed information provided by BoM. Cases were rounded down to the nearest whole number where the wind level in km/h was not already a whole number. For example, 29.5km/h was rounded down to 29km/h to allow for classification.

**Ethics**

An ethics approval form obtained from the Royal Life Saving Society Australia was completed and approved before the commencement of this project (Number RLS09E01). Ethical permission was also granted by the Justice Human Research Ethics Committee from the Department of Justice (Project Reference Number: CF/07/13729) who manages ethical approval for the use of coronial data in Australia.

**Limitations**

The authors of the report identified the following limitations:

- For several cases information was not available or unknown on either NCIS or through the Coroners and thus any ‘unknown’ data in the spreadsheet relate to this.
- Some cases were still open which meant that there was missing information including toxicology analysis, which was often still being undertaken or because no body was found. Therefore, any cases related to this were labelled ‘unknown- toxicology in progress’ or ‘unknown- no body located’.

**Funding**

Funding for this project was supplied by NSW Recreational Fishing Trusts.
Results

There were 119 recreational fishing related drowning deaths over the period 1 July 2000 to 30 June 2007 (Figure 2). Of these, 54 (45%) were rock fishing, 44 (37%) were fishing from a watercraft and 21 (18%) were participating in other types of fishing. There was an average of 17 fishing related drowning deaths per annum.

The number of fishing related deaths for the period examined peaked in 2001-2002 and 2002-2003 (23; 19%) after which there was a decline with 2006-2007 having the smallest number (11; 9%) of recorded fishing related drowning deaths. For rock fishing, the highest number of drowning related fatalities occurred in 2005-2006 (10; 19%). For fishing from a watercraft, the highest number of drowning related fatalities occurred in 2002-2003 (10; 23%) and for other types of fishing the highest (7; 33%) number of drowning related fatalities occurred in 2001-2002.

Figure 2: Drowning fatalities by fishing type and financial year
The majority (83%) of NCIS cases were closed, however 20 (17%) cases were still open (Figure 3). Of these open cases, nine (20%) were fishing from a watercraft, eight (15%) were rock fishing and three (14%) were other types of fishing.

Figure 3: Drowning fatalities by NCIS status and fishing type

The results are divided into the following sections:

1) Overall fishing related drowning deaths - deceased information;
2) Overall fishing related drowning deaths - incident information.
Overall Fishing Related Drowning Deaths – Deceased Information

Age and Sex

Males accounted for all bar two (117; 98%) of the drowning related recreational fishing fatalities. The overall average age was 48.5 years (range 9-86 years), there was slight variation but not statistically significant in ages, with rock fishers on average the youngest (average = 45.5, range 9-76), followed by those fishing from a watercraft (average = 49.7, range 13-73 years) and other fishing (average = 53.8, 15-86 years).

The majority (60%) of people who drowned while fishing were aged between 35 and 64 years and there were only two (2%) people aged 5-14 years who drowned (Figure 4). For rock fishing this was accentuated with 70% of the fishers aged between 35-64 years. For those who drowned while fishing from a watercraft, 64% were aged between 45 and 74 years.

Figure 4: Drowning fatalities by age groupings and fishing type
Tourist Status

Most (80; 67%) drowning related recreational fishing fatalities were not tourists to the area. There were 33 (28%) fishing fatalities to people who were tourists to the location and the majority (28; 85%) of these were to people who travelled intrastate (Figure 5). Of the 28 that travelled intrastate, the majority (43%) drowned while fishing from a watercraft, nine (32%) drowned while rock fishing and seven (25%) drowned while participating in other types of fishing. The two (2%) that travelled interstate drowned while fishing from a watercraft and the three (3%) that were working in Australia but were international visitors drowned while rock fishing.

![Figure 5: Drowning fatalities by tourist status and fishing type](image)

Country of Origin

Just over half (53%) of all drowning related fatalities were of people born in Australia (Figure 6). People born in the Asia Pacific region represented 34 (29%) drowning related fatalities and the European Non-English region represented eleven (9%) drowning related fatalities. Nearly all (94%) drowning related fatalities of people born in the Asia Pacific region were due to rock fishing and they represented 59% of overall drowning related rock fishing fatalities. Just over half of all drowning related fatalities for people born in Australia (52%) were due to fishing from a watercraft followed by other types of fishing (29%) and then rock fishing (19%). The majority (55%) of drowning related fatalities for people from European non-English countries were due to fishing from a watercraft and the majority (64%) of cases where country of origin was unknown were due to rock fishing.
Swimming Ability

Only 27 (23%) drowning related fishing fatalities had a known swimming ability (Figure 7). Of these, 14 (12%) were good swimmers, seven (6%) were not good swimmers, one was a very good swimmer and five (4%) had no swimming ability.

For drowning related rock fishing fatalities where swimming ability was known, the majority (56%) were classified as good swimmers whilst only three (17%) had no ability to swim. For those fishing from a watercraft drowning related fatalities where swimming ability was known, an equal number (2; 40%) were classified as good and not good swimmers and for other types of fishing where swimming ability was known, two (50%) were classified as good swimmers and one (5%) had no ability to swim.

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<td></td>
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<td>54</td>
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<td>7</td>
<td>1</td>
<td>5</td>
<td>92</td>
<td>119</td>
</tr>
</tbody>
</table>
Rural and Remote Residence Location

Almost three quarters (71%) of all drowning related fatalities resided in Major Cities of Australia and just under a quarter of all drowning related fatalities (23%) resided in Inner Regional Australia (Figure 8). Rock fishing represented the highest (44; 52%) number of drowning related fatalities for people residing in Major Cities of Australia and fishing from a watercraft represented the highest (18; 67%) number of drowning related fatalities for people residing in Inner Regional Australia.

Figure 8: Drowning fatalities by rural and remote residence location and fishing type

Alcohol

Half (59; 50%) of all drowning related fatalities were not alcohol related and the majority (54%) of these related to rock fishing. There were 20 (17%) fishing related drowning deaths where alcohol was present at the time of death (Figure 9). Of these, almost half (45%) were participating in other types of fishing, almost a third (30%) were fishing from a watercraft and a quarter (25%) were rock fishing.

*p Overseas’ represented the one fatality that occurred in Australia while on a Work Visa.
**Drugs**

Just over half (55%) of all drowning deaths were not drug related. Of these, the majority (34; 52%) were due to rock fishing, 22 (34%) were due to fishing from a watercraft and nine (14%) were due to participating in other types of fishing.

There were twelve (10%) drowning deaths where drugs were present (Figure 10). Of these, five (42%) were fishing from a watercraft, one third (33%) were participating in other types of fishing and a quarter (25%) were rock fishing.
Overall Fishing Related Drowning Deaths – Incident Information

Time of Day

The majority (65; 65%) of drowning related fishing fatalities occurred during the day between 9:01 to 18:00 (Figure 11). Specifically, between 9:01 to midday there were 23 (23%) drowning related fatalities and during 12:01 to 15:00 and 15:01 to 18:00 there were 21 (21%) drowning related fatalities. The least amount of drowning related fatalities occurred during night time (11; 11%).

In terms of types of recreational fishing, drowning related rock fishing fatalities were the highest during 12:01 to 18:00 (25; 46%). For fishing from a watercraft, the most number of drowning related fatalities occurred during 6:01 to 12:00 (22; 50%) and for other types of fishing the most drowning related fishing fatalities occurred during 12:01 to 18:00 (9; 43%).

![Figure 11: Drowning fatalities by time of day and fishing type](image)

Day of Week

Almost three quarters (86; 72%) of all drowning related fatalities occurred between Thursday and Sunday, with Saturday (28; 23%) having the highest number of drowning related fatalities per day (Figure 12).

For rock fishing, Saturday represented the highest (13; 24%) number of drowning related fatalities followed by Friday (12; 22%). For fishing from a watercraft, Saturday also represented the most (13; 30%) drowning related fatalities followed by Thursday (11; 25%) and for other types of fishing the most (6; 29%) drowning related fatalities occurred on a Friday followed by Monday (4; 19%).
There were 56 drowning related recreational fishing fatalities where tidal level was known at the fishing location (Figure 13). Of these, the majority (35; 63%) of fatalities occurred when the tidal level was less than one metre. For rock fishing, 18 (62%) fatalities occurred when the tidal level was 1- 1.5 metres and the least (1; 3%) fatalities occurred when the tidal level was 2- 2.5 metres. For fishing from a watercraft, the most (11; 65%) fatalities occurred when the tide was less than one metre and the least (1; 6%) fatalities occurred when the tide was 2- 2.5 metres. For other types of fishing, the majority (6; 60%) of fatalities occurred when the tide was less than one metre and there were no fatalities when the tide was 2- 2.5 metres.

Figure 13: Drowning fatalities by day of the week and fishing type

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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</tr>
</thead>
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<td>6</td>
<td>2</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
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<td>2</td>
<td>5</td>
<td>11</td>
<td>2</td>
<td>13</td>
<td>6</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>12</td>
<td>13</td>
<td>9</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>10</td>
<td>9</td>
<td>20</td>
<td>20</td>
<td>28</td>
<td>18</td>
<td>119</td>
</tr>
</tbody>
</table>

Figure 13: Drowning fatalities by tidal level and fishing type
There were 55 drowning related recreational fishing fatalities where temperature at the fishing location was known (Figure 14). Of these, the majority (31%) of fatalities occurred when the temperature was 20-24°C followed by a quarter of fatalities where the temperature was 15-19°C.

For rock fishing, the most fatalities occurred when the temperature was 20-24°C. For fishing from a watercraft, the most fatalities occurred when the temperature was 20-24°C and for other types of fishing, the most fatalities occurred when the temperature was 25-29°C.

**Figure 14: Drowning fatalities by temperature (°C) and fishing type**

There were 75 drowning related recreational fishing fatalities where wind conditions at the fishing location were known (Figure 15). The majority (21; 28%) of fatalities occurred when the wind speed was 5-9km/h. For rock fishing, there was an equal (7; 19%) amount of fatalities when the wind speed was 5-9km/h and 15-19km/h and the least (1; 3%) fatalities occurred when the wind speed was greater than 30km/h. For fishing from a watercraft, the most (10; 37%) fatalities occurred when the winds speed was 20-24km/h and there were no fatalities when the wind speed was greater than 40km/h. For other types of fishing, half (6; 50%) of the fatalities occurred when the wind speed was 5-9km/h.
Wind speed was also classified using the Beaufort Wind Scale (Figure 16) where the majority (46; 61%) of fatalities occurred during light winds. For rock fishing, the most (22; 61%) fatalities occurred during light winds. For fishing from a watercraft, the most (14; 54%) fatalities occurred during light winds followed closely (12; 46%) by moderate winds. For other fishing, nearly all (10; 83%) fatalities occurred during light winds.

Figure 17 highlights the fatalities where wind direction was known. The majority (10; 13%) of fatalities occurred when the wind direction was NE followed by SSE with 9 (12%) fatalities. The least fatalities occurred when the wind direction was NNW (1; 1%) and WSW (1; 1%).
For rock fishing, the majority (7; 19%) of fatalities occurred when the wind direction was SSE. For fishing from a watercraft, the wind directions where the most (4; 15%) fatalities occurred were N, NW and SW and for other types of fishing, the most (4; 33%) fatalities occurred when the wind direction was NE.

**Figure 17: Drowning fatalities by wind direction and fishing type**

There were 76 fatalities where rainfall at the fishing location was known (Figure 18). For the majority (49; 64%) of fatalities there was no rainfall at the fishing location on the day of fatality.
Figure 18: Drowning fatalities by rainfall (mm) and fishing type

There were 73 (61%) drowning deaths that occurred on a week day and 46 (39%) which occurred on a weekend (Figure 19). Of the 46 that occurred on a weekend, 22 (48%) were due to rock fishing, 19 (41%) were due to fishing from a watercraft and 5 (11%) were due to other types of fishing.

In terms of fishing type, 43% of fishing from a watercraft fatalities occurred on a weekend. For overall rock fishing drowning deaths, 41% occurred on a weekend and for other types of drowning related fishing fatalities, 24% occurred on a weekend.

Figure 19: Drowning fatalities by weekend and fishing type
The majority (94%) of drowning related recreational fishing fatalities did not occur on a public holiday. Of the seven (6%) drowning related fishing fatalities that did, three (43%) were due to rock fishing and two (29%) were each due to fishing from a watercraft and other types of fishing (Figure 20).

In terms of fishing type, 6% of rock fishing drowning related fatalities occurred on a public holiday. For fishing from a watercraft drowning related fatalities, 5% occurred on a public holiday and for overall other types of fishing, 10% occurred on a public holiday.

**Figure 20: Drowning fatalities by public holiday and fishing type**

Three quarters (75%) of all fishing related drowning deaths did not occur on a school holiday (Figure 21). Of the quarter (25%) of drowning related fishing fatalities which occurred on a school holiday, 14 (47%) were due to rock fishing, 11 (37%) were due to fishing from a watercraft and five (17%) were due to other types of fishing (Figure 21).

In terms of fishing type, 26% of drowning related rock fishing fatalities occurred on a school holiday. For fishing from a watercraft fatalities, 25% occurred on a school holiday and for other types of fishing fatalities, 24% occurred on a school holiday.
Season

Drowning related fishing deaths occurred all year round (Figure 22). Summer had the most (34; 29%) drowning related fatalities, but there was little difference in fatality numbers over the four seasons.

In terms of fishing type, rock fishing represented the highest number of drowning related fatalities in each season with 15 (44%) fatalities in summer, 15 (48%) fatalities in autumn, 14 (48%) fatalities in winter and ten (40%) fatalities in spring. The highest number of drowning related fatalities for fishing from a watercraft occurred in summer (13; 38%) and winter (12; 41%).

Figure 22: Drowning fatalities by season and fishing type
Drowning Fatalities by Month and Fishing Type

Drowning related fishing fatalities occurred all year around (Figure 23). April had the most (14; 12%) drowning related fatalities followed closely by February (13; 11%) and July (12; 10%), however there was a dip in drowning related fatalities in September (4; 3%) and August (6; 5%).

In terms of fishing type, the most drowning related fatalities for rock fishing occurred in February (10; 19%) and April (9; 17%). For fishing from a watercraft, the most drowning related fatalities occurred in June (7; 16%) and March (6; 14%) and for other types of fishing the most drowning related fatalities occurred in November (5; 24%) and January (4; 19%).

Figure 23: Drowning fatalities by month and fishing type

Rural and Remote Time Location

Just over half (61; 51%) of all drowning related fatalities occurred in Major Cities of Australia, 45 (38%) drowning related fatalities occurred in Inner Regional Australia and ten (8%) drowning related fatalities occurred in Outer Regional Australia (Figure 24). For Major Cities of Australia, the highest (40; 66%) number of drowning related fatalities were due to rock fishing and for Inner Regional Australia the highest (27; 60%) number of drowning related fatalities were due to fishing from a watercraft.
Figure 24: Drowning fatalities by rural and remote time location and fishing type

RLSSA Region

The Sydney region represented over one third (36%) of all drowning related fatalities, followed by the Illawarra region with a quarter (25%) of all drowning related fatalities (Figure 25). Western region had the least (1; 1%) amount of fishing drowning related fatalities which was expected due to the limited availability of aquatic locations related to recreational fishing.

Sydney had the highest (30; 56%) number of rock fishing drowning related fatalities. Illawarra region had the highest (15; 34%) number of drowning related fatalities due to fishing from a watercraft and Western region had the least (2%) with only one. Hunter, Illawarra and Northern regions shared the highest (5; 24%) number of drowning related fatalities for other types of fishing and Western region had the least with no drowning related fatalities.

Figure 25: Drowning fatalities by RLSSA region

<table>
<thead>
<tr>
<th>Hunter</th>
<th>Illawarra</th>
<th>Northern</th>
<th>Riverina</th>
<th>Sydney</th>
<th>Western</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>5</td>
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<td>4</td>
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<tr>
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<td>9</td>
<td>9</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
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<td>3</td>
<td>0</td>
<td>30</td>
<td>0</td>
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<td>14</td>
<td>11</td>
<td>43</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 26 represents overall drowning related recreational fishing fatalities on a map of NSW.

Figure 26: Drowning related recreational fishing fatalities
Drowning related recreational fishing fatalities were also represented based on fatality type. Fishing from a watercraft drowning related fatalities were concentrated in the lower East of NSW (Figure 27).

**Figure 27: Fishing from a watercraft drowning fatalities**
Drowning related rock fishing fatalities were concentrated through the lower middle section of the East Coast of NSW (Figure 28). One particular area known as Randwick in Sydney had 18 (15%) drowning related fishing fatalities alone, of which all were due to rock fishing. This area represented one third (33%) of all drowning related rock fishing fatalities in NSW.

Figure 28: Rock fishing drowning fatalities
Other types of drowning related recreational fishing fatalities were quite spread out down the NSW Eastern coast (Figure 29).

**Figure 29: Other fishing drowning fatalities**
Council Boundaries

In terms of council boundaries, the majority (47; 39%) of drowning related fatalities occurred in Sydney and the least (1; <1%) amount of drowning related fatalities occurred in the Murray and Northern boundaries (Figure 30).

The most drowning related fatalities for fishing from a watercraft occurred in Illawarra (13; 30%) and South Eastern (11; 25%). Sydney had the highest number of drowning related fatalities for rock fishing (34; 63%) and other fishing (5; 24%).

Figure 30: Drowning fatalities by council boundaries and fishing type

<table>
<thead>
<tr>
<th></th>
<th>Hunter</th>
<th>Illawarra</th>
<th>Mid North Coast</th>
<th>Murray</th>
<th>Northern</th>
<th>Richmond /Tweed</th>
<th>South Eastern</th>
<th>Sydney</th>
<th>Unknown</th>
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</thead>
<tbody>
<tr>
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<td>8</td>
<td>0</td>
<td>44</td>
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<td>0</td>
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<td>4</td>
<td>34</td>
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<td>54</td>
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<tr>
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<td>1</td>
<td>4</td>
<td>18</td>
<td>47</td>
<td>1</td>
<td>119</td>
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</tbody>
</table>

The rate of drowning deaths per 100 000 population by year and council boundaries is displayed in Figure 31. The highest number of fishing related drowning deaths per 100 000 population occurred in 2002-2003 in the South Eastern region with 4.51 drowning deaths per 100 000 population. On average, the most number of fishing related drowning deaths occurred in the South Eastern region with 1.29 drowning deaths per 100 000 population followed by the Illawarra region with 0.81 drowning deaths per 100 000 population. On average, the least number of fishing related drowning deaths occurred in the Northern region with 0.08 drowning deaths per 100 000 population.
Figure 31: Rate of drowning deaths per 100 000 population using council boundaries

<table>
<thead>
<tr>
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<td>0.16</td>
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<td>0.32</td>
<td>0.31</td>
<td>0.31</td>
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<td>0.72</td>
<td>0.81</td>
<td>0.81</td>
</tr>
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<td>Richmond /Tweed</td>
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<td>0</td>
<td>0.26</td>
<td>0.26</td>
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<td>Mid-North Coast</td>
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<td>0.5</td>
<td>1.02</td>
<td>0.34</td>
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<td>0.24</td>
<td>0.21</td>
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</tbody>
</table>

Location

The majority (80; 67%) of drowning related fishing fatalities occurred in the ocean (Figure 32). In terms of type of fishing, the ocean was also the location that had the highest number of drowning related fatalities for rock fishing (52; 96%) and fishing from a watercraft (24; 55%). For other types of fishing fatalities, the most (8; 38%) drowning related fatalities occurred in a river.

Figure 32: Drowning fatalities by location

<table>
<thead>
<tr>
<th>Location</th>
<th>Beach</th>
<th>Dam</th>
<th>Harbour</th>
<th>Harbour/Bay/Inlet</th>
<th>Lake</th>
<th>Ocean</th>
<th>River</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Other Fishing</td>
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<td>0</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
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<td>0</td>
<td>0</td>
<td>9</td>
<td>24</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
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<td>2</td>
<td>0</td>
<td>52</td>
<td>0</td>
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<tr>
<td>Total</td>
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<td>1</td>
<td>2</td>
<td>12</td>
<td>80</td>
<td>15</td>
<td>119</td>
</tr>
</tbody>
</table>
Safety

There were 13 (11%) drowning deaths where some type of personal protective equipment was used at the time of fatality. Of these, five (38%) were wearing life jackets (but one took it off after becoming trapped under boat), three (23%) were wearing a wetsuit (one also had spear fishing equipment and one was also wearing rock fishing boots with steel spikes), two (15%) were wearing bib or brace waders and one (8%) was wearing a fishing vest with flotation, spray jacket and waterproof pants. No personal protective equipment was evident for 87% of drowning related fishing fatalities (rock fishing- 49; 91%, other types of fishing- 19; 90% and fishing from a watercraft- 36; 82%).

Clothing

There were 44 (37%) drowning related fishing fatalities where clothing type was known. Of these, 21 (48%) were wearing light clothing, 13 (30%) were wearing protective clothing and ten (23%) were wearing heavy clothing (Figure 33).

In terms of fishing type, just over half (14; 54%) of rock fishing drowning related fatalities were wearing light clothing and five (38%) were wearing protective clothing. Half (6; 50%) of those fishing from a watercraft were wearing protective clothing.

Figure 33: Drowning fatalities by type of clothing worn

<table>
<thead>
<tr>
<th></th>
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<th>Light</th>
<th>Protective</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
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<td>15</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
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<td>3</td>
<td>6</td>
<td>32</td>
<td>44</td>
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<tr>
<td>Rock Fishing</td>
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</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>21</td>
<td>13</td>
<td>75</td>
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</tbody>
</table>

Drowning Fatalities by Number of People Fishing

The majority (37; 31%) of drowning related fatalities occurred when people were fishing alone and the least amount of drowning related fatalities occurred when there were more than five (2%) people fishing (Figure 34). For rock fishing, the most (30; 56%) drowning related fatalities occurred when people were fishing by themselves or with one other person. For fishing from a watercraft, the most (24; 55%) drowning related fatalities occurred when fishing by themselves or with two other people and for other types of fishing, the most (10; 48%) drowning related fatalities occurred when fishing alone.
Figure 34: Drowning fatalities by number of people fishing

<table>
<thead>
<tr>
<th></th>
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<td>Other Fishing</td>
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<td>0</td>
<td>4</td>
<td>21</td>
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<td>12</td>
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<td>15</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td>54</td>
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<tr>
<td>Total</td>
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<td>23</td>
<td>8</td>
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<td>18</td>
<td>119</td>
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</tbody>
</table>

Activity after Entering the Water

For 34 (29%) cases it was known what happened after the person entered the water. Of these, just over a quarter (10; 29%) were unconscious. For rock fishing, activities after entering the water were known for 16 (47%) drowning related fatalities. These activities were:

- Attempted rescue by others (5; 24%). Devices used were an inflatable pool, fishing line, fishing rod, bucket and lifesaving ring which did not reach.
- Screaming for help (3; 18%). Two of these also swam away from the rocks and one was also thrown a bucket but it did not reach.
- Swimming (2; 12%). One of these swam back to the rocks and one of these swam away from shore.
- Fighting the waves and panicking (2; 12%). One could not swim.
- Attempting a rescue themselves (2; 12%).
- Nothing as was unconscious (1; 6%).
- Floating, attempting to get back to rocks (1; 6%).

For fishing from a watercraft, activities after entering the water were known for eleven (32%) drowning related fatalities. These activities were:

- Swimming (5; 45%). Three tried to swim to shore and two swam back to upturned vessel.
- Nothing as was unconscious (3; 27%).
- Being supported in water by another person (1; 9%).
- Clinging to capsized boat (1; 9%).
- Trapped under upturned boat that was towed to shore (1; 9%).

For other types of fishing, activities after entering the water were known for seven (21%) drowning related fatalities. Of these, the majority (86%) were due to the deceased being unconscious and one (14%) was due to the deceased, for unknown reasons, not assisting the person trying to rescue them.
Did a Medical Condition Contribute to Drowning Fatality?

A medical condition contributed to 26 (29%) drowning related fishing fatalities (Figure 35). The most (12; 46%) occurred whilst partaking in other types of fishing and the least (5; 19%) occurred whilst rock fishing.

Figure 35: Did a medical condition contribute to drowning fatality?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unknown</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Fishing</td>
<td>6</td>
<td>3</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
<td>21</td>
<td>14</td>
<td>9</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>38</td>
<td>11</td>
<td>5</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>28</td>
<td>26</td>
<td>119</td>
</tr>
</tbody>
</table>

Did Lack of Personal Protection Equipment Contribute to Drowning Fatality?

Lack of PPE did not contribute to 21 (18%) fishing drowning related fatalities (Figure 36). For the 67 (76%) drowning related fatalities where lack of PPE did contribute to the fatality, the most (41; 61%) occurred while rock fishing and the least (9; 13%) occurred while partaking in other types of fishing.

Figure 36: Did lack of personal protection equipment contribute to drowning fatality?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unknown</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Fishing</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
<td>12</td>
<td>15</td>
<td>17</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>2</td>
<td>11</td>
<td>41</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>31</td>
<td>67</td>
<td>119</td>
</tr>
</tbody>
</table>
Was Being Swept off or Capsized a Contributor to Drowning Fatality?

Being swept off feet or capsized by a wave was not a contributor to 41 (34%) drowning deaths (Figure 37). There were however, 45 (38%) drowning deaths where being swept off feet or capsized by a wave contributed to the fatality. Of these, the most (33; 73%) drowning related fatalities occurred while rock fishing. For fishing from a watercraft, almost a quarter (22%) of all drowning related fatalities were due to the watercraft being capsized by a wave.

Figure 37: Was being swept off feet or capsized a contributor to drowning fatality?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unknown</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Fishing</td>
<td>14</td>
<td>5</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
<td>18</td>
<td>16</td>
<td>10</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>9</td>
<td>12</td>
<td>33</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>33</td>
<td>45</td>
<td>119</td>
</tr>
</tbody>
</table>

Was a Collision a Contributor to Drowning Fatality?

For six (5%) drowning deaths, a collision did contribute to the drowning fatality (Figure 38). The majority (4; 67%) of these were due to fishing from a watercraft.

Figure 38: Was a collision a contributor to drowning fatality?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unknown</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Fishing</td>
<td>14</td>
<td>5</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
<td>25</td>
<td>15</td>
<td>4</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>43</td>
<td>11</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>31</td>
<td>6</td>
<td>119</td>
</tr>
</tbody>
</table>
Was Falling Into the Water a Contributor to Drowning Fatality?

For 27 (32%) drowning deaths, falling into the water was a contributing factor to the fatality (Figure 39). Almost half (48%) were fishing from a watercraft, seven (26%) were rock fishing and six (22%) were partaking in other types of fishing.

**Figure 39: Was falling into the water a contributor to drowning fatality?**

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unknown</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Fishing</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Fishing From a Watercraft</td>
<td>15</td>
<td>16</td>
<td>13</td>
<td>44</td>
</tr>
<tr>
<td>Rock Fishing</td>
<td>35</td>
<td>12</td>
<td>7</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>34</td>
<td>27</td>
<td>119</td>
</tr>
</tbody>
</table>

Would the Use of Safety Equipment/ Devices Have Saved Them?

Of the 95 (80%) drowning related fatalities where safety information was provided, eleven (12%) would have been saved if they were wearing a life jacket or had access to an angel ring (Figure 40). Potentially, 48 (51%) drowning related fatalities would have been saved if they were wearing a life jacket or had access to an angel ring. It would be unlikely for four (4%) of the drowning related fatalities to have been saved if safety equipment was used due to the nature of fatality. For example, heart problems contributed to 26 drowning deaths, therefore safety equipment would not have saved some of these as urgent medical attention was needed.

**Figure 40: Would safety have saved them?**

<table>
<thead>
<tr>
<th></th>
<th>Other Fishing</th>
<th>Fishing From a Watercraft</th>
<th>Rock Fishing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>16</td>
<td>13</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Potentially- Life jacket or angel ring</td>
<td>3</td>
<td>11</td>
<td>34</td>
<td>48</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>14</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Unlikely</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Yes- Life jacket or angel ring</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>44</td>
<td>54</td>
<td>119</td>
</tr>
</tbody>
</table>
Summary

In this study there was an average of 17 drowning related recreational fishing fatalities per year over the period 1 July 2000 to 30 June 2007.

Key issues were:

- 2001-2002 and 2002-2003 were the years that had the most (19%) fishing fatalities.
- Males aged 35-64 years made up 60% of all drowning related fishing fatalities.
- Males aged 45-74 years represented 64% of all drowning related fishing from a watercraft fatalities.
- Rock fishing fatalities represented almost half of all drowning related fishing fatalities.
- Being swept off feet or capsized by a wave contributed to 38% of all drowning related fatalities.
- Rock fishers of Asian backgrounds accounted for 59% of all rock fishing drowning related fatalities.
- There is not one main season in which drowning related fishing fatalities occur.
- The majority of drowning related fatalities occurred during the day, particularly in the morning and on a Saturday.
- The majority (61%) of fatalities occurred when the wind was light.
- Most (31%) fatalities occurred when the temperature was 20-24°C and 64% of fatalities occurred when there was no rainfall.
- Only 15% of overall drowning related fishing fatalities were tourists. That is 85% of all drowning related fishing fatalities were not tourists to the area they were fishing at; most lived within 50km.
- Safety equipment is not used by fishers as 87% of all drowning related fatalities were not using any kind of safety device or equipment whilst fishing.
- Potentially 63% of all fishing drowning related fatalities could have been prevented if some kind of safety was used.
- Most (31%) fatalities occur when fishing alone.
- Sydney region represented over one third of fishing fatalities, but per 100 000 population South Eastern region represented the most (1.29 per 100 000 population) drowning related fishing fatalities.
SURVEY OF FISHERS

Introduction
The third part of this study involved the development of an online recreational fishing survey to explore exposure and attitudes around recreational fishing. This survey was created in order to understand current perceptions and practices of fishers. This section is set out as follows:

- Aims.
- Methods.
- Results.
- Discussion.

Aims
To undertake a survey of fishers to gain further information about:

- Access to recreational fishing locations.
- Participation rates in recreational fishing.
- Precautionary measures taken.
- Past injuries sustained.
- Additional details about rock fishers.
- Demographic details of recreational fishers.

Methods
Development of Reference Group
A reference group was established to assist with input into data collection items, the creation of the online survey and potential recommendations from this research. The reference group comprised of representatives from RLSSA, I&I NSW, NSW Department of Health, NSW Department of Sport and Recreation, SLSA, APOLA, Recreational Fishing Alliance of NSW and NSW Maritime.

An initial reference group meeting was held on 29 May 2009 at Royal Life Saving National Branch to discuss the project background, previous research and to include any suggestions from reference group members in regards to survey questions and distribution. A draft of the survey was then emailed to all reference group members for their feedback. The reference group also suggested that all recreational fishing fatalities be included, instead of just recreational rock fishing fatalities as in the previous study by Jones [4]. The next reference group meeting was held on 18 August 2009 at Royal Life Saving National Branch to discuss data collection issues and any feedback reference group
members had on the survey. This feedback was then taken into consideration and appropriate changes made.

The reference group were then asked to pilot the survey amongst their colleagues and those who they have contact with who fish. Feedback from the participants was taken into consideration and appropriate changes made.

Development of Online Survey and Pilot

An account was created with Survey Monkey on 8 September, 2009 for the development of the online survey. Areas within the survey included demographics, access, exposure, safety and rock fishing specific. Once the survey was completed and approved by the reference group it was opened online in November, 2009 and sent to all reference group members for online distribution and promotion.

Survey Distribution

The survey link and an introduction letter was also mailed to every listed NSW fishing tackle and bait store in the Yellow Pages and Fishpo (fishing directory) guide online and a Media Release was emailed to NSW newspapers and fishing related Magazines through MediaNet. Approximately 250 letters were sent with 32 letters returned due to change of address or permanent close of business.

To help increase participation rates of the online survey, those who participated were eligible to go into the draw to win one of 20 fishing related prizes to the value of $1000. Winners were selected randomly.

Data Collection

In August 2010, an email was sent to all reference group members to inform them of the closing date for the online survey and to allow them to continue with online survey distribution. The survey was closed on 1 November, 2010, which meant that the survey was open for a period of twelve months. The information provided in the online survey was then downloaded into a Microsoft Excel spreadsheet, collated and analysed using SPSS software Version 19.0.0 [38]. Four survey responses were excluded from the analysis due to inappropriate answers to survey questions which showed the respondents did not take the survey seriously.

Results Coding

In terms of number of people fishing, for this data one person meant that they were fishing with one other person.

For the analysis of open ended survey results the following answers were coded:

- Question two related to access to fishing spot and responses were coded using walk/ follow trail, watercraft, bush walk, walk/ watercraft, walk/ climb rocks, follow trail/ climb rocks, drive/ follow trail, walk/ wade and any way.
• Question four asked whether the respondent rock fished and question five asked what type of fishing the respondent participated in. There were 22 additional respondents who stated they rock fish in the ‘other’ category of question five but did not state they rock fished in question four. Therefore, these 22 were added to the total number who stated they rock fish in question 4; however they did not get the opportunity to respond to the rock fishing specific questions as they did not answer yes to question four.

This survey identified over 100 different responses to fishing safety campaigns/materials seen or heard about. Therefore, these were grouped into Media (television, radio), DVD, Signage, Brochure/Magazine (including pamphlets, newsletters and booklets), Website and Other (Fishing Organisations, Councils, Publications and Safety Programs/Workshops).

Responses were also grouped for country of birth and languages other than English spoken at home. Any country/language part of Europe was grouped into either European Non-English Speaking (Croatia, Italy, Germany etc) or European English speaking (England, Ireland etc) and any country/language part of Asia was grouped as Asia (China, Korea etc).

Respondents were also asked to self rate their swimming ability by the length of time able to swim and float, however it is important to note that this method has not been validated.

Limitations

The limitations of the online survey were that:

• It was only available in English. Translation into other languages was not something that could be undertaken for this study.

• It was only available for completion on the internet. Hard copies were made available to anyone who requested them, however there were no requests.

• There was not large scale promotion of the survey due to the limited available resources. It should however be noted that all organisation involved in fishing in NSW were approached and asked to promote the survey, it was placed on a number of websites and mentioned in a range of newsletters.
Results from Survey

There were 466 responses to the survey (please note that not all questions were answered by all respondents). Of the responses, 77% were male, 8% were female and 15% did not provide their gender. There was a wide range of ages who participated, with approximately a third (39%) aged between 35-54 years (Figure 41).

Figure 41: Age of respondents (N=466)

The majority (73%) of respondents to the online survey were born in Australia (Figure 42) followed by respondents born in European English Speaking countries (6%) and European Non-English Speaking countries (2%).

Figure 42: Country of birth
The majority (71%) of people who participated in the survey have lived in Australia all of their life (Figure 43). For those who said they have lived in Australia for a number of years the mean length of time was 35.8 years (median = 39; range 1 to 69 years). There were no respondents who were tourists to Australia.

**Figure 43: Length of time living in Australia**

![Diagram showing the percentage of people who have lived in Australia all of their life, lived in Australia for some years, or have never lived in Australia.]

There were 31 (7%) people who said they spoke a language other than English at home. Of the people who did speak a language, the most (32%) spoke European Non-English followed by languages from any Asian country (29%) (Figure 44). Other language groupings included Middle Eastern, Spanish and Indian.

**Figure 44: Grouping of languages other than English spoken at home**

![Diagram showing the percentage of people who speak different languages other than English.]

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The majority (63%) of respondents stated that they lived in Major Cities of Australia (Figure 45) followed by less than a fifth (16%) of respondents who resided in Inner Regional Australia.

**Figure 45: Usual place of residence**

There were 219 (47%) people who said they were a member of a club. Of these, 34 (15%) were members of two clubs and 22 (10%) were members of three or more clubs (Figure 46).

**Figure 46: Member of a fishing club**
Access to fishing spot

The majority (89%) of respondents drove their own car to their recreational fishing location and only 1% of respondents took some kind of public transport to get to their fishing destination (Figure 47). Other methods included a combination of the above, riding a bike or using a watercraft.

Figure 47: Transport to fishing spot

Over half (59%) of respondents stated that they walked/ followed a trail to get to their fishing spot and almost one fifth used a watercraft to get to their fishing spot (Figure 48). There were 10% of respondents that walked or followed a trail and then climbed rocks to get to their fishing spot.

Figure 48: Access to fishing spot? (N=429)
The majority (61%) of respondents stated that they fished at a particular location because they were familiar with these places and almost half (49%) stated they fished at these locations because the fish were good and of quality size (Figure 49). A quarter (24%) stated that they fish at these places because they are safe to fish at and less than 5% stated they fish at these place because the weather conditions were always good there. Other reasons included convenience, fishing competitions, enjoy new locations, for sport, recommended by friends, to test fishing skills/ abilities and because of age.

Figure 49: Ranked order by percentage of why particular locations are fished at (N=466)
Fishing

There were 441 (95%) people who responded to this section of the survey which looked at exposure to recreational fishing.

Almost a third (32%) of all respondents stated that they had fished once a week or more in the last twelve months (Figure 50). Just over a quarter (26%) of respondents stated they had fished once a month and just under a quarter (23%) stated they had fished once a fortnight over the last twelve months. There were 6% of respondents that had fished once or twice in the last twelve months.

Figure 50: Fishing frequency in the last 12 months (N=441)

The majority (over 80%) of respondents had fished during high tide, slight wind and calm waters (Figure 51). Half of all respondents had fished during rough waters and strong wind and 37% of respondents stated that they had fished during a thunder or lightning storm.

Figure 51: Conditions fished in (N= 468)
Just over half (53%) of all respondents stated that they would normally spend three to five hours at their fishing location and almost a quarter (24%) stated that they would normally spend six or more hours at their fishing location (Figure 52).

Figure 52: Hours normally spent at fishing location (N= 468)

In terms of day of the week, there is no clear preferred day to fish as an equal (47%) number of respondents stated that they go fishing on either the weekend or on any day (Figure 53). Almost a quarter (24%) of respondents stated that they go fishing on weekdays and just over a quarter (29%) of respondents stated they go fishing on public holidays.

Figure 53: What day of the week do you go fishing? (N= 468)
The majority (50%) of respondents stated that they fish at dawn (Figure 54). Daytime was more popular than night time to go fishing as over 50% more respondents stated they fished during the day. There were 34% of respondents who did not have a specific time they went fishing.

Figure 54: What time of the day do you go fishing? (N= 468)

The majority (40%) of respondents stated that they fished with one other person and just over a quarter (26%) of respondents stated that they fish with two or more people (Figure 55). Almost one quarter (22%) of respondents stated that they fished by themselves.

Figure 55: How many people do you fish with? (N= 468)
There were 20% of respondents who stated that there were always other people fishing at their most frequented fishing location (Figure 56). The majority (65%) of respondents stated that only sometimes other people were fishing at their location and 3% of respondents stated that there were never other people fishing at their location.

**Figure 56: Are there other people fishing at your location? (N= 468)**

The majority (364; 78%) of respondents stated that they fish off a boat (Figure 57). A high number (322; 69%) of respondents also stated that they fish off rocks and considerably less (163; 35%) respondents stated that they fish off a wharf/bridge. Examples of other locations respondent’s fish at include break walls, harbour side, spear fishing and sand banks. There were also 22 respondents that stated they rock fish in the other category, therefore, in total there were 344 (74%) respondents who stated they fish off rocks.

**Figure 57: Locations where people fish (N= 468)**
Rock Fishing

This section reflects the views of the 322 people who answered yes to fishing off rocks in the online survey. Participants would not have seen these questions unless they answered yes to fishing off rocks. As a result, the 22 people who stated they fish off rocks in the other location category were not directed to these questions.

Almost three quarters (74%) of the 322 respondents stated that there was usually other people rock fishing at their location. There were 10% of respondents who did not answer this question or were not sure if there were other people rock fishing at their location (Figure 58).

Figure 58: Are there people usually fishing at your location? (N=322)

![Pie chart showing 74% yes, 16% no, 7% unsure, 3% didn't answer.]

Just over a third (35%) of all respondents’ rock fished with two or more people and 31% of respondents usually only rock fished with one other person (Figure 59). There were 15% of respondents who rock fished by themselves.

Figure 59: How many people are there usually rock fishing with you? (N=322)

![Pie chart showing 30% 1, 21% 2, 14% 3+, 20% didn't answer, 15% 0.]

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Over half (52%) of all respondents stated that they usually spend three to five hours at their rock fishing location and a quarter (25%) stated that they usually spend two hours or less at their rock fishing location (Figure 60). There were 14% of respondents that stated they rock fished for six or more hours.

Figure 60: How many hours on average do they spend at the location? (N=322)

The majority (40%) of respondents stated they never saw other rock fishers get swept off their feet by waves or the swell but 39% sometimes saw other rock fishers get swept off their feet by a wave or the swell (Figure 61). There were 59% of respondents who stated they never saw other rock fishers wearing a life jacket/buoyancy aid and 3% stated that they always saw other rock fishers wearing a life jacket/buoyancy aid. There were 72% of respondents that stated they always or sometimes saw rock fishers turn their backs to the sea and 72% saw other rock fishermen always or sometimes wearing shoes with non slip soles or cleats. There were 39% of respondents who stated they never saw other rock fishers drink alcohol whilst rock fishing, however 35% stated they sometimes saw other rock fishers drink alcohol whilst fishing.
Figure 61: Proportion of people they see undertaking the following safety responses (N=322)

Personal Safety and Rescues

There were 109 (23%) respondents who stated that they had rescued a person while they were fishing and 40 (9%) respondents had needed to be rescued whilst fishing. The majority of people (83%) were able to identify that 000 was the main emergency number in Australia.

The majority (72%) of respondents stated that they always inform people where they are going fishing and 58% of respondents always informed people of the time they intend to return home from fishing (Figure 62). There were 42% of respondents who stated they never wear a life jacket/buoyancy aid whilst fishing, 37% sometimes turned their back on the sea, 40% sometimes or never wear shoes with non-slip soles or cleats and 13% stated they sometimes get swept off their feet by waves or the swell.

The majority (75%) of respondents stated they always check sea and weather conditions before fishing and 45% sometimes speak with locals about sea and weather conditions. Almost three quarters (74%) of respondents stated that they always take a mobile phone with them and 61% always charge it before they go fishing. Over two thirds (66%) of respondents stated that they know the nearest escape route at their fishing location and 23% of respondents stated that they sometimes drink alcohol before or whilst fishing. Just over a third (35%) of respondents said they have a current first aid certificate.
The majority (143; 39%) of respondents stated that they can comfortably float and gently swim for up to 60 minutes. There were 26 (7%) respondents that stated they can float for over one minute and swim a little distance and three (<1%) respondents could not float or swim (Figure 63).
Figure 63: Swimming ability

<table>
<thead>
<tr>
<th>Swimming Ability</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can comfortably float and gently swim for about 15 minutes</td>
<td>115</td>
</tr>
<tr>
<td>I can comfortably float and gently swim for up to 60 minutes</td>
<td>143</td>
</tr>
<tr>
<td>I can comfortably float for over 1 minute and swim a little distance</td>
<td>26</td>
</tr>
<tr>
<td>I can float as long as I wish and swim constantly for over one hour</td>
<td>115</td>
</tr>
<tr>
<td>I cannot float or swim</td>
<td>3</td>
</tr>
<tr>
<td>Unsure</td>
<td>4</td>
</tr>
<tr>
<td>Didn't Answer</td>
<td>60</td>
</tr>
</tbody>
</table>

Safety Campaigns

There were 227 (49%) people who responded to the survey and had heard about or noticed any fishing safety campaigns/materials. In regards to obtaining safety information, the majority (54%) stated that they would go to the internet and 3% stated that they would go to a library. (Figure 64). There were 6% of respondents who stated that they would go to a lifeguard/lifesaver to obtain fishing safety information.

Figure 64: Where would you go to get fishing safety information from?
There were 133 respondents who identified fishing safety campaigns / materials available (Figure 65). The most common response was about rock fishing (45%) followed by angel rings (44%).

**Figure 65: What fishing safety information have you heard about?**

![Bar chart showing the frequency of different fishing safety information.](chart)

Angel rings

Of the respondents, 46 (10%) said they did not know what an angel ring was. When asked if angel rings were at their three most common fishing locations, one fifth of respondents said angel rings were at their first fishing location and 13% said angel rings were at their second and third fishing locations (Figure 66).

**Figure 66: Angel rings at locations fished at**

![Bar chart showing the percentage of respondents who reported angel rings at different fishing locations.](chart)
How did you hear about the survey

Just over one quarter (123; 26%) of respondents stated that they heard about the online survey through their fishing club followed by a website including the Royal Life Saving NSW website (121; 25%) and Fishcare volunteers/ fisheries (60; 13%).

Figure 67: How did you hear about the survey?
Summary

There were 466 responses to the online recreational fishing survey. Key issues found were:

- Three quarters of respondents were male and approximately a third of respondents were aged between 35-54 years.
- Other than English, the most common language spoken at home by respondents was a language from any Asian country.
- Almost three quarters of respondents were born and have lived in Australia their whole lives.
- Fishing off rocks and from a watercraft were the two most popular types of fishing.
- Almost all respondents drove a car to their fishing location and 10% climbed over rocks to get to their actual fishing spot.
- Almost a quarter of all respondents fish at their chosen locations because they believe them to be safe to fish at. This indicates that 75% of respondents do not factor in safety when choosing a fishing location. Half of all respondents’ fish in rough waters and strong winds and alarmingly, 37% fished during thunder/lightning storms.
- There was no one preferred day to fish, however almost half of respondents preferred to fish either at dawn or during the day.
- Fishing alone is still undertaken by 15% of respondents who rock fish and fishers identified that almost a quarter of other fishers at their locations are by themselves.
- Life jacket use while fishing is quite poor as 80% of respondent’s fish off a boat and almost 75% of respondent’s fish off rocks, however 40% of respondents never wear a life jacket/buoyancy aid whilst fishing.
- Fishers are not well prepared for an emergency as almost a quarter of respondents had to rescue someone else whilst they were fishing and almost two thirds of respondents do not have a current first aid certificate.
- Over 70% of respondents always inform people where they are going fishing, always check sea and weather conditions before and whilst fishing and always take a mobile phone with them.
- Over 50% of respondents had not stated or heard about any fishing safety materials/campaigns. Of the respondents who had heard any fishing safety materials/campaigns, rock fishing and angel rings were the most common topics.
- Over 50% of respondents would go to the internet for safety information but interestingly only 6% would go to a lifeguard/lifesaver for safety information.
- A quarter of respondents were members of fishing clubs.
- At the locations commonly fished, less than a quarter of respondents stated that there were angel rings there. This may be because at this stage angel rings are only installed at “black spot” locations.
DISCUSSION / RECOMMENDATIONS

Literature Review

It is evident from the literature review that there has been limited work undertaken in exploring the safety and prevention of recreational rock fishing fatalities both internationally and in Australia. People drowning while rock fishing continues to be a significant issue in NSW and as such warrants ongoing monitoring. There is also a need to continue to increase understanding of the prevention of rock fishing fatalities and the effectiveness of programs.

**Recommendation:** Funding should be provided to Royal Life Saving NSW over the next four years to support data collection on recreational fishing fatalities which can then be reported via the Royal Life Saving NSW Drowning Report.

Drowning Related Fatalities

The Royal Life Saving NSW 2010 Drowning Report [10] showed that in the 2009-10 financial year, there were 27 drowning related recreational fishing fatalities, which is well beyond the five year average of 14.8 fatalities.

A ten year overview of drowning related recreational fishing fatalities (Figure 68) showed that from 2001-02 to 2007-08 there was a decrease in fatalities, however an increase in fatalities in then seen from 2008-2009 to 2009-2010. The increase in recreational fishing fatalities makes 2009-10 the year with the highest number of fatalities over the decade.

**Figure 68: Ten year overview of drowning related recreational fishing fatalities**

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A lack of reduction is also evident for drowning related rock fishing fatalities. The report from the Inter-departmental Committee on Water Safety [3] showed that there was an average of seven fatalities per year from 1969-1991 and the Jones [4] report highlighted that from 1992-2000 there were an average of eight drowning related rock fishing fatalities. However, provisional data from RLSSA- NSW (Figure 69) showed that from 2000-2010 there was an average of 8.3 rock fishing drowning related fatalities.

**Figure 69: Ten year overview of drowning related rock fishing fatalities**

Internationally, New Zealand is the only other country to have research in the field of rock fishing fatalities. Moran [7] noted that in 2005 there were five deaths in two months; however since their rock fishing prevention project was implemented there was one fatality in 2006, two in 2007 and one in 2008 to date (May, 2008). While this information should not be seen as irrefutable proof of the success of their program it is compelling and demonstrates that it is possible to prevent rock fishing deaths.

While rock fishing fatalities has been explored, there was a lack of available data relating to recreational fishing fatalities in NSW of which rock fishing is a subset. The current drowning related NSW Police Report Form 530 is intended for private pool drowning and thus does not include relevant questions for recreational fishing fatalities such as type of clothing worn and weather conditions at the time of fatality. Consideration should be given for expanding this form to include questions related to all drowning deaths, particularly recreational fishing, thus allowing for more comprehensive collection of data to enable the appropriate targeting of fishing safety programs.

**Recommendation:** Expand the NSW Fatality Police Form to collect information on recreational fishing fatalities.
Nearly all of the drowning related recreational fishing fatalities were males aged between 35-64 years. Fishers of Asian backgrounds represented the most rock fishing fatalities and fishers of Australian background represented the most fatalities due to fishing from a watercraft. It should be noted that being of Asian background means the person could be from a range of countries with differing culture and languages. Also, all except three people from Asian backgrounds were residents of Australia not visitors from overseas.

**Recommendation:** Ensure fishing safety resources and materials are culturally specific and targeted at males aged between 35-64 years be developed and utilised appropriately.

Fishing related drowning deaths occurred all year with summer only having slightly more drowning deaths than other seasons. This was even more dramatic for rock fishing where summer and autumn had the same number and winter only had one less fatality. This highlights that recreational fishing is an all year round activity and prevention should emphasise this.

**Recommendation:** Ensure fishing safety programs are run all year round not just during the summer.

While tourists should be made aware of safe fishing practices, it is people who are local to where fishing occurs who more commonly drown in fishing related incidence. For those who are tourists they are predominately from within the state (intrastate visitor). Thus fishing safety education within NSW will have the greatest impact in addressing fishing related deaths in NSW.

**Recommendation:** Ensure fishing safety programs for locals are operating within NSW.

It is interesting to note that there have been several recommendations made by the media or within newspaper reports. These recommendations include:

- Warnings on fishing licences that are language appropriate.
- Providing advisory materials to inform the level of safety at a particular fishing location. I.e. like the bush fire danger symbols and traffic lights (red is dangerous conditions, green is safe conditions).
- Regulating safety equipment.
- Further life buoys/ angel ring installation.
- Providing education and safety information for Asian rock fishers/ novice rock fishers.
- Reducing restrictions on fishing at safe locations as this forces angler’s to fish in more dangerous locations.
- Increasing restriction for fishing in dangerous locations.

While the authors of the report agree that these suggestion have merit, caution is urged and encouraged that resources be allocated to investigate the appropriateness of these
recommendations, including examining the practicalities of implementation and enforcement, as well as ensuring they are effective (i.e. work) in preventing people from drowning while rock fishing.

**Recommendation:** Further investigation into the effectiveness of possible prevention strategies, including communication, their implementation and enforcement.

**Recreational Fishing Survey**
This survey was undertaken using an online survey and as such may have missed key recreational fishing groups. While the information collected in the survey provides for the first time valuable insights into recreational fishing in NSW, the authors believe that this is the start of having a complete understanding and future studies should be adequately funded to help facilitate the inclusion of people where English is not their primary language. The authors also believe that observational studies should be conducted to see if what is reported by recreational fishers holds true.

**Recommendation:** Future surveys to be appropriately resourced to include people where English is not their first language.

**Recommendation:** Future observational studies of recreational fishing behaviour should be undertaken.

**Exposure**
While waves are predictable, conditions can and do change rapidly. If recreational fishers are not paying close attention to what is happening around them tragedy can strike, appearing to occur without warning. Fishers need to be aware of the dangers of fishing at particular locations and authorities may wish to prevent access to some fishing locations where access in and out quickly is slow or difficult, such as where climbing up/down rocks to get to the fishing location is required. Signage is one possible way to discourage people from fishing at these locations.

**Recommendation:** An exploration of exclusion zones should be undertaken to see how it may be implemented at NSW fishing “black spots”.

Fishing alone is dangerous, yet many fishers still prefer to do so. Most fishers prefer to fish at dawn or during the day and from the examination of fishing fatalities, the majority occurred during the day. Having co-ordinated fishing groups which encourage fishers to fish together may help to reduce/eliminate fishing fatalities and should occur at dawn or during the day.

**Recommendation:** Fishing safety programs should encourage people to fish in groups.
Attitudes

In his survey, Moran (2008) [7] found Asian fishers did not think that rock fishing was any more risky than any other aquatic activity. In this study, rock fishers of Asian backgrounds accounted for 59% of all drowning related rock fishing fatalities. It is unclear if people from Asian backgrounds are aware of the dangers but choose to rock fish anyway or if they are unaware of the dangers and thus place themselves unnecessarily at risk. In the survey 29% of respondents were form Asian backgrounds and it appears that it is a combination, where some are aware of the dangers and choose to fish anyway and others are not aware or do not perceive there to be any danger. Unfortunately it was not possible to explore how dangerous a location where people fish is.

**Recommendation:** Ensure there are appropriate fishing safety programs delivered to people from Asian backgrounds.

Life jacket use was viewed by many of the survey respondents as not necessary and therefore not utilised by many recreational fishers, particularly rock fishers. The authors believe it is important that rock fishers are equipped with appropriate safety equipment, particularly life jackets, in the event they end up in the water, which often occurred from being swept in by a wave for most rock fishing fatalities.

**Recommendation:** Explore the possibility of life jackets being made mandatory when rock fishing including how this may be enforced.

Participants to the survey also highlighted that safety of the fishing location was not as important as the type and size of fish at the fishing location and the distance of fishing location from residence.

**Recommendation:** Information should be provided on safe locations to catch different types of fish.

Safety

Safety precautions need to be taken in and around the ocean. Life jacket use is needed to ensure the safety of fishers is met. As life jackets prevent the head of the wearer from going under the water, there is less chance of drowning if a life jacket is worn. Data from the SLSA report [31] also indicated that the least successful safety areas of their campaign were widespread failure to wear a life jacket and poor First Aid skills. Anecdotally, one of the excuses as to why fishers do not wear appropriate safety equipment is because they inhibit their ability to fish.

**Recommendation:** Develop PPE in consultation with industry including life jackets and appropriate clothing specific to recreational fishing to facilitate increase use by fishers.
Fishers need to be equipped for an emergency situation; this includes preparation beforehand, skills to undertake a rescue and resuscitation skills afterwards. The online survey highlighted that current First Aid skills were limited in many fishers. This is an issue because if any fisher needs emergency aid, other fishers should be able to provide this aid to increase their chance of survival. Also, continual knowledge of sea and weather conditions before and whilst fishing is important as conditions can change.

**Recommendation:** Promote the need for all fishers to have a current First Aid or CPR certificate and this should be supported and facilitated in the fishing community. RLSSA- NSW also recognises the RLS Bronze Medallion and proposes a pilot RLS Rock Fishing Rescue program as appropriate water safety and education programs to improve the water skills and abilities of fishers.

**Recommendation:** Explore the possibility of fishers providing their mobile phone numbers to receive updates or creating a mobile phone application/direct telephone number where fishers can access sea and weather conditions at any location in NSW by organisations such as BoM.

Most survey respondents drove their cars to fishing locations and indicated that the internet and radio would be the most likely places they would get safety information from. A possible strategy to increase safety proposed by SLSA [31] was that future materials could also appeal to the wives and children of fishers, who will then influence their male rock fishing family member to behave safely and it might also be effective to equate safe fishing with being a responsible parent.

**Recommendation:** Increase the number and type of fishing safety materials/campaigns.

**Recommendation:** Delivery mechanisms for fishing safety materials/campaigns should reflect current trends such as through the internet and radio.

It should be noted that one limitation to the online survey is that most people who responded tended to be doing the right thing. As the survey was self-reported, many fishers may note what they think the right thing is as opposed to what they actually do.

**Risk**

From the information provided in this study, a range of risks have been identified. There is a higher chance of drowning whilst recreationally fishing if a life jacket is not worn, if the fisher is alone, there is a change in conditions particularly wave heights if rock fishing, it is difficult to access and leave the fishing site and not being prepared for an emergency.

**Recommendation:** Awareness and prevention materials should incorporate recreational fishing risk factors and how they can reduce their risk of drowning.
**Prevention**

Less than half of respondents to the survey had heard of any fishing safety campaigns and a range of locations were identified as places where people seek fishing safety information. However it has been said that an over-reliance on using promotion pamphlets and flyers due to relatively low costs associated with these safety campaigns and the relative ease with which they can be mounted has little effect [14].

The authors believe that safety campaigns should be multifaceted and not rely on education alone. There are ways of approaching the prevention of recreational fishing fatalities that when used in combination are more likely to have an impact than when used individually. These include legislation, education, engineering, enforcement, removal of hazard, systems, behaviour change and use of personal protective equipment to name a few.

Behaviour change theory is important to explore in understanding where recreational fishers are in the process of becoming safer. The Trans-theoretical model [39] which focuses on the decision making aspect of health behaviour change involves five steps which include:

1. Pre Contemplation- Have not thought about changing behaviour.
2. Contemplation- Have given some thought about changing behaviour.
3. Preparation- Have gained knowledge and resources to change behaviour.
5. Maintenance- Have continued with the behaviour change.

**Recommendation:** A multi dimensional approach to the prevention of recreational fishing deaths should undertaken including ensuring people are receptive to the message.
CONCLUSION

Recreational fishing is part of Australian culture and should be a safe and fun activity to participate in. Too many lives have been lost and many lives continue to be lost each and every year as a result of drowning related recreational fishing. Therefore, safety and prevention of these fatalities is paramount. There were 119 drowning related recreational fishing fatalities in NSW from 2000-2007 and a further 27 recreational fishing fatalities in 2009-2010 which highlights the need for action. These fishing fatalities in NSW are preventable if fishers take appropriate action including using safety equipment.

This study has aimed to provide a report on drowning related recreational fishing fatalities and a survey (undertaken online) of current perceptions, exposure and attitudes of recreational fishers. From the results of this study the authors have made several recommendations which we believe would help to reduce/eliminate recreational fishing fatalities. The recommendations are aimed at all involved in recreational fishing safety, but should be noted by recreational fishing organisations, NSW Government and those not-for-profit organisations with an interest in preventing the deaths of recreational fishers. Royal Life Saving Society will continue to report on NSW recreational fishing deaths in its NSW Drowning Report, as well as undertaking research and prevention programs to reduce drowning related recreational fishing fatalities.
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Royal Life Saving NSW

Royal Life Saving is dedicated to the prevention of aquatic related injury and death through our health promotion and training programs, public education, research and aquatic risk management services within the community.

For more information contact:

Sydney 9634 3700
Hunter 4929 5600
Riverina 6921 7422
Western 6369 0679
Northern 6651 6266
Illawarra 4225 0108

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