NEW ZEALAND

PHYSICAL EDUCATOR

Te Ao Kori Aotearoa

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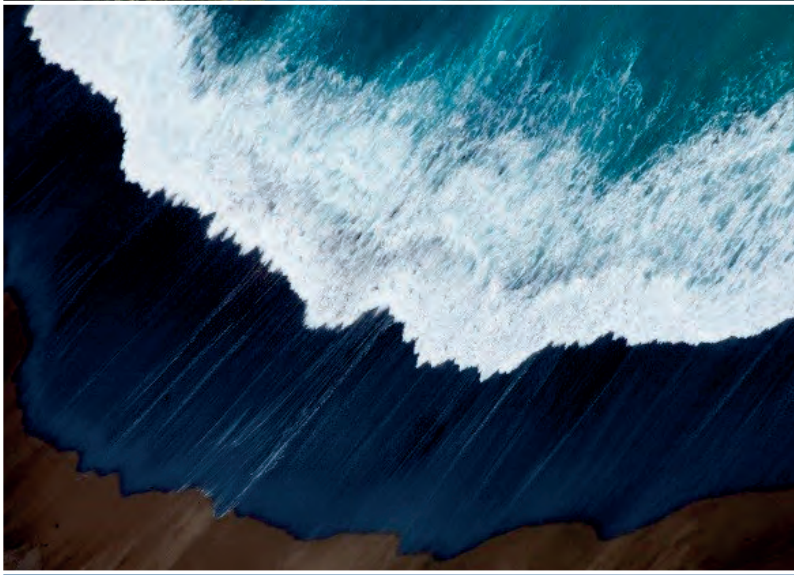

PHYSICAL EDUCATION NEW ZEALAND
TE AO KORI AOTEAROA

2016 WORKSHOPS

GROWING STUDENT ACHIEVEMENT - Level 3/4

Are you planning to meet student needs and expectations within the NZC at Level 3/4?

This workshop will:

- revisit your Health and PE vision so students can be challenged to engage in the NZC
- provide learning experiences that build student resiliency
- critique outside providers working in your school in order to meet student needs
- incorporate practical HPE activities and investigate resources that support your programmes
- enjoy and experience practical activities in Health and PE

SCHOLARSHIP PE/HEALTH/HOME ECONOMICS

How do we, as teachers, ensure students are best equipped to deal with the rigours of Scholarship PE/Health/Home Economics?

This workshop will:

- unpack the Examiner's Assessment Report
- explore the elements of academic writing within a report
- develop a resource bank of the latest research in order to keep up with local trends and implications
- examine what is required to step up from Excellence at Level 3 to Scholarship

ECO SPORTS - CONSERVATION THROUGH MAORI GAMES AND SPORTS ARTEFACTS.

Continuing the development and enhancement of your kete with Ngā Taonga Tākaro.

This workshop will:

- Explore the socio-ecological relationship between Maori games artefacts (aro-takaro), the environment and ourselves and the relationship with the Health and Physical Education Learning Area.

DEVELOPING CREATIVE, AUTHENTIC TEACHING AND LEARNING UNITS OF WORK/ PROGRAMMES

Student needs should drive all teaching and learning programmes, not the assessment task.

This workshop will:

- explore ways to develop authentic creative units of work that meet student needs
- explore integrated and collaborative cross curricula planning
- consider the place of ICT and eLearning

SKILL ACQUISITION

What is the difference between a motor skill learning approach and a skill acquisition approach to learning?

This workshop will:

- explore the contemporary approaches to skill acquisition which have changed substantially from Fits and Posner in the 60's and TGFU in the 80's
- develop your knowledge about current research and practice
- include theoretical and practical components

For further details on these workshops visit www.penz.org.nz

From PENZ's Chief Executive

Greetings and welcome to another academic year. I hope you have had a relaxing break over the Christmas and New Year period. Over the summer, many New Zealanders as well as visitors to our shores make the most of the abundant opportunities we have to recreate in and enjoy aquatic environments. Spending time at beaches, rivers, lakes and in swimming pools seems to be a quintessential part of a Kiwi summer. This special issue of Physical Educator picks up on this theme with its focus on water safety. There have been 10 drownings over the official 2015-16 holiday period, double the number in the same holiday period in 2014-15. Despite the best efforts of educators, professionals, researchers, and organisations such as Water Safety New Zealand and Surf Life Saving New Zealand, the increasing number of people drowning suggests continued analysis and investigation into movement in water is warranted. Articles in this issue pick up on this point from a range of perspectives, raising pertinent questions for physical educators about their role in educating about health and safety in water. While Douglas Booth the guest editor reminds us that drowning is "…a complex and broad-based problem" (p. 4), he also asserts that physical education is "well suited" to making an important contribution to the holistic approaches required. I hope all physical educators enjoy the special issue and take time to ponder the ideas and challenges presented and the possible implications for professional practice in their own learning communities.

As well, I encourage readers to check out our new website for information on the call for abstracts for this year's PENZ/EONZ/HZHEA Conference in Palmerston North 11-13 July.

Ross Merrett

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Water Safety in New Zealand and Australia

Special Edition of the *Physical Educator*

Edited by Douglas Booth and Richard Pringle

Contents

Cover: *Surf Lifesaving New Zealand (centre left), Nick Mulcahy (centre right), and Rob Brander (bottom left).*

Water Safety in New Zealand and Australia: An introduction to multidisciplinary and interdisciplinary research and policy

Douglas Booth

Early in 2015 the School of Physical Education, Sport and Exercise Sciences at the University of Otago hosted a symposium on water safety. The symposium drew researchers from Australia and New Zealand together with professionals from Surf Life Saving New Zealand and Water Safety New Zealand (WSNZ). This edition of the Physical Educator showcases the research presented at the symposium and highlights the diversity of disciplinary and thematic perspectives on water safety. The disciplines include geography, history, outdoor education, Māori studies, motor control, physiology, and policy analysis and development; themes include cold- and hot-water immersion, evidence-based policy formulation at hazardous recreational sites, fundamental motor skills and aquatic locomotion, techniques and methods for crossing rivers, reading rip currents, the culture of the surf lifesaving movement, and waka ama as cultural vehicles to safely engage the ocean.

The high number of deaths caused by drowning, and strategies to reduce this form of accident, provided the obvious context for the symposium and this edition of the Physical Educator. Many of the articles in this edition cite statistics to highlight the scores of people who drown every year in rivers, lakes and seas across and around Australasia. Drowning is a social problem that all decent societies and polities wish to eradicate through effective policies and strategies. However, national drowning statistics do not, in themselves, constitute a fully-defined or fully-formed subject for analysis. Each drowning involves a plethora of factors and variables that have combined in unique and different ways. Hence statistics merely point researchers to an issue that requires careful analysis and interpretation of varied conditions and circumstances. Symposia are good vehicles to begin that task and the School of Physical Education, Sport and Exercise Sciences is ideally placed to host such forums. The School is home to a number of researchers who analyse movement in water in ways that illuminate health and safety, and its faculty are well connected to researchers and professionals who work in the area from around Australasia.

The Physical Educator is another useful conduit to advance discussions about drowning, and to raise questions concerning the role of physical educators in tackling the problem. Movement in water is a motor skill and, at the most basic level, physical educators should have the capability, and the resources, to teach that skill. Indeed, much contemporary discussion of drowning in New Zealand refers to the closure of pools in schools and the loss of essential resources available to physical educators. But as the research presented in this edition of the journal makes clear, drowning is a complex and broad-based problem. Addressing the problem requires more than the provision of swimming pools and an understanding of motor skills*; it involves a holistic approach.

Physical education is well suited to this task. Physical educators understand the holistic nature of their field and they emphasise the multidisciplinary nature of human movement and its diverse and broad contexts. Nonetheless, physical educators have proved less adept at adopting interdisciplinary approaches to human movement. Disciplinary silos–anatomy, biomechanics, epidemiology, history, motor control, physiology, psychology, sociology–continue to bedevil the field with researchers still investigating contemporary issues, such as obesity, childhood inactivity and gender discrimination in physical activity, through narrow, disciplinary-based, philosophical, theoretical and methodological lenses. Thus, while the articles in this edition highlight critical knowledge pertaining to drowning and water safety, the edition as a whole merely hints at the value of, and possibilities for, interdisciplinary research. The sole exception in this regard is Richard Pringle's aptly titled, 'A concluding dip'.

Trained in physical education and now an award-winning sociologist of sport and physical activity with a keen interest in philosophy, theory and method, Pringle discusses the merits of interdisciplinary approaches to social issues such as drowning. He then identifies ways that different interdisciplinary approaches to this subject could work more profitably to produce better policy recommendations to enable people to safely enjoy water environments. Critically, Pringle raises an essential question for physical education

*It also requires more than technological solutions such as computer-vision detection systems that public pools in the US and Australia are beginning to employ to complement lifeguards. Thanks to Tim Dawbin for alerting me to this technology.

researchers: how do they, and more importantly their peers, evaluate interdisciplinary research?

Of course, interdisciplinary research assumes that researchers have fundamental knowledge and skills in their specific disciplines as the basis for richer and more fruitful discussions. Happily, the ten articles in this edition of the Physical Educator leave no doubt as to the disciplinary credentials of the different authors. The first 'article' is actually a reprint of WSNZ's newly released strategy that aims to significantly reduce the number of drownings in this country. Although WSNZ wants to work collaboratively with partner organisations, physical educators will be surprised to learn that the Ministry of Education is not a partner. This is somewhat strange given that physical education teachers are at the frontline of teaching foundational aquatic skills. On the other hand, researchers interested in water safety will be well pleased with the commitment by WSNZ and its partners to undertake more research into what they acknowledge is a highly complex, multifaceted problem.

According to Chris Button, teachers of, and researchers in, human movement pay insufficient attention to competent movement in aquatic environments. In the second article, Button argues that movement in aquatic environments is a fundamental form of physical literacy, essential for anyone who lives near, or works or plays with water, and he thus advocates that physical educators adopt what he calls an aquatic pedagogy.

'Reading' water hazards and responding to incidents is a common theme in the three articles by Nick Mulcahy, Mike Boyes and Allen Hill, and Rob Brander. Based on an analysis of aquatic risks at Hunua Falls near Auckland, Mulcahy charges the water-safety sector to develop an aquatic risk management framework that ensures hazards are clearly identified and that can deliver quick responses to emergencies. Similarly, Boyes and Hill observe that fast-flowing rivers are a particular hazard faced by trampers in New Zealand and that good decision making around this hazard demands precise cognition. Like Mulcahy, Boyes and Hill believe that official organisations within the sector, notably the New Zealand Mountain Safety Council and WSNZ, have a particular responsibility to communicate the key messages and methods regarding crossing fast-rising rivers, notwithstanding ongoing debates among bushcraft instructors as to the best methods. Brander adopts the same argument with regard to rip currents at the beach. Although water-safety practitioners face real challenges to increase knowledge of rip currents among beachgoers and to encourage them to bathe and swim in areas patrolled by lifesavers, Brander remains optimistic that educators can employ relatively simple messages and utilise social media technology to improve overall awareness of the rip-current hazard.

The sixth and seventh articles examine the culture of the surf lifesaving movement and question the historical attitudes of surf lifesavers. Douglas Booth critiques the rescue techniques of the Australian movement, and Renee Wikaire questions historical attitudes within the New Zealand movement toward Māori participation. Wikaire's arguments concur with those made by Hauteruruku ki Puketeraki and Anne-Marie Jackson et al. in the eighth article. In both cases the authors promote tikanga (Māori ways/views) and in so doing graphically illustrate a different way of viewing the sea for safe recreation, enjoyment and as a vehicle for social and cultural identity.

Jim Cotter and his colleagues discuss the physiology of cold water immersion as well as the science of competing in hot water. Each year a number of drownings occur as a result of immersion in cold water and racing in hot water. While physiologists understand most of the basic mechanisms involved in these deaths, Cotter and his colleagues remind us that more research into these areas are required before adequate explanations can be offered. The edition closes with Richard Pringle's discussion to which I have already referred.

I am confident that teachers of physical education and their pupils will profit from this special edition of the Physical Educator. I hope that they will join with the authors in prompting safe and enjoyable engagements with water.

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New Zealand Water Safety sector strategy 2020

Water Safety New Zealand

NEED FOR A SECTOR STRATEGY

Welcome to the New Zealand Water Safety sector strategy 2020, New Zealand's first truly collaborative approach to addressing the issue of drowning in this country. New Zealand has long had a committed and active water safety sector, but with its unenviable position as the nation with the 8th highest drowning toll (per 100,000) in the OECD, and almost double the Australian drowning rate, the time has come for a significant change in the way the sector works. This strategy sets out the water safety sector's plan to work collectively over the next five years to achieve greater impact – working towards its vision of no one drowning.

The strategy is a joint effort, a partnership by water safety organisations including Accident Compensation Corporation, Coastguard New Zealand, Coastguard Boating Education, Maritime New Zealand, New Zealand Recreational Association, Surf Life Saving New Zealand, Swimming New Zealand, Water Safe Auckland and Water Safety New Zealand. Input from other sector members – both large and small – has also contributed significantly to this new approach.

The joint goals the sector has agreed on are ambitious - seeking to halve the male drowning toll and bring the pre-school drowning toll down to zero by 2020. To achieve these goals, and to create a culture where all New Zealanders will enjoy the water safely, the sector will work together to deliver new and innovative programmes and drive attitudinal and behavioural change through communications and other campaigning. It will engage in research, set a policy agenda and resource drowning prevention initiatives according to what will have the greatest impact. The sector will also stand accountable for its results

NEW ZEALAND'S DROWNING PROBLEM: A SNAPSHOT

New Zealanders love the water. Each year, three million people visit beaches, 1.5 million go boating, over 1.1 million participate in swimming and more than 630,000 go fishing. There are also over 20 million visits to public swimming pools. On average,* 103 people die by drowning in New Zealand waters each year, but up to 80 of these deaths are preventable.** A further 172 people are hospitalised as a result of water-based incidents. 1200 deaths are avoided each year through rescues.

Drowning is the fourth highest cause of accidental death in New Zealand – after motor vehicle accidents, falls and poisoning. New Zealand ranks 8th worst of the OECD countries for preventable drownings and has double the Australian drowning rate (per 100,000) and five times that of the UK. Males are four times more likely to drown in New Zealand, making up 84% of total drownings. This is twice the global average. Tragically, pre-schoolers are still drowning. Six infants under five years old drown (on average) each year and a further 34 are hospitalised. 87% of these deaths are attributed to inadequate adult supervision with just over half of pre-schooler drownings occurring in the home (52%). Maori continue to be over represented in New Zealand's drowning figures at just 14% of the population, but making up 23% of those who drown. 90% of Maori who drown are men. New Zealand's changing demographic is having an impact on water safety. Between 2001 and 2013 the population increased 14%, with the Asian population rising by 98% and Pacifica by 28%. Socioeconomic status and ethnicity also have an impact on drownings, with higher drowning rates occurring in lower socioeconomic groups, in ethnic minorities and in rural populations.

Beaches (at 22%) and rivers (20%) closely followed by offshore (19%) are where the greatest number of drowning deaths occur. The largest number of drownings are immersion incidents (33%) where the victims had no intention of being in the water. Boating (at 22% of preventable deaths) claims the second greatest number of lives and almost three quarters (73%) of those that drown in a boating incident are not wearing lifejackets. Swimming makes up 21% of preventable drownings and a further 39 hospitalisations per year. The majority of swimming deaths (39%) occur at beaches.

NEW ZEALAND'S DROWNING PROBLEM: THE CHALLENGE

Drowning is a complex issue, with three key factors influencing New Zealand's high drowning toll:

- People – New Zealanders have varying degrees of knowledge, attitudes and behaviour towards water.
- Activities – A high number of New Zealanders enjoy participation in water based leisure, adventure and commercial activities.
- Environment – New Zealand's environment and weather patterns are unpredictable, increasing the risks for those without adequate water safety skills.

The problem that this strategy seeks to address can be broadly attributed to the tendency for New Zealanders (in particular men) to underestimate the risks and overestimate their abilities in, on and around the water. But at a deeper level, there is only a limited understanding of the root causes

*Statistics are based on the five year average of preventable drowning fatalities 2010-2014

**Preventable drownings are defined as all drowning deaths other than those that result from suicides, homicides and vehicle accidents.

of drowning or the effectiveness of current water safety initiatives. More research and investigation is required.

Adding to the challenge, drowning and water related injuries do not have as high a profile as they should both at a community level and within government. The water safety sector is also funded on a year-to-year basis, limiting the development of longer-term strategies.

The Water Safety Sector Strategy 2020 seeks to address these challenges.

TOWARDS A LOWER DROWNING TOLL - TOGETHER

As this sector strategy shows, there is much work to be done. But water safety organisations are united in the commitment to work together towards these goals and the ultimate, long-term vision that no one drowns. We are focused on ensuring that all New Zealanders have the skills and knowledge needed to enjoy this country's beautiful waters safely.

THE NEW ZEALAND WATER SAFETY SECTOR STRATEGY 2020

Vision: No one drowns.

Mission: To work collectively to reduce drowning and injuries so that all New Zealanders enjoy the water safely.

2020 GOALS:

a. Every New Zealander has the opportunity to develop water safety knowledge and survival skills.
b. New Zealand communities take the lead to promote the safe enjoyment of local water.
c. Males improve their knowledge, attitudes and behaviour to take personal responsibility for water safety.
d. Parents improve their knowledge, attitudes and behaviour to take personal responsibility for supervising preschool children around water.

Outcome: A changed culture in which every New Zealander:

• understands the risks associated with water, and

• has the ability to survive in, on or around water.

2020 GOALS:

a. Drowning deaths are reduced from 77* to 50 or less (- 35%).
b. Drowning hospitalisations are reduced from 172 to 100 or less (- 42%).
c. Male drowning deaths are halved from 66 to 33 or less.
d. Preschool drowning deaths are reduced from six to zero.

Outcome: Minimised social and economic costs from preventable drowning and injury.

2020 GOALS:

a. The sector works together to maximise its collective impact.
b. The sector's influence secures public and political support for water safety outcomes.
c. The sector has the capability and capacity to achieve its mission.
d. Research and evidence drives investment decisions and continuous improvement.

Outcome: A world leading water safety sector.

CHALLENGES

1. One hundred drowning deaths a year is not yet seen as a crisis by New Zealand society in the way that demands the scale of response received by road and workplace deaths.
2. Business as usual is important to maintain and improve but it will not achieve the water safety sector outcomes. These require a significant step change.
3. Achieving the outcomes will require new initiatives, with the sector working together for collective impact.
4. A better understanding is needed of the underlying causes of the drowning problem, the impact of current interventions and how to use resources more effectively.

STRATEGIC ACTIONS

1. Implement a sector policy agenda:
   a. a sector capability plan identifies key assets, strengths and development needs to improve sector effectiveness.
   b. a data and research plan helps understand the drowning problem, informs decisions and is used to improve sector performance.
   c. agreed positions for key issues underpin consistent policies and communications.

2. Implement a national engagement and communications strategy:
   a. the sector is connected by sharing information, leveraging collaborative action and encouraging thought leadership.
   b. new partnerships are established within the sector and new stakeholders are enrolled.
   c. sector media, advocacy and communications plans build public and political support for water safety.
   d. advocacy targets priority national water safety policies and supports consistent regulations and compliance enforcement.

3. Implement a plan to ensure the development of water safety knowledge and survival skills for every New Zealander and the development of national standards.
4. Implement prevention, education and awareness programmes that target males and parents focussed on achieving attitudinal and behavioural change.
5. Resource and allocate existing preventative and rescue assets and training according to their greatest impact.
6. Obtain additional resources and allocate them to initiatives of greatest impact.

*Preventable drownings are defined as all drowning deaths other than those that result from suicides, homicides and vehicle accidents. Statistics are expressed as a five year average.

Water Safety New Zealand participated in the symposium but was unable to present an article for the Physical Educator. In lieu of an article we present Water Safety New Zealand's new water safety strategy which was released in September 2015. The strategy can also be found at: http://www.watersafety.org.nz/assets/PDFs/About/Sector-Strategy-Published-Version-Aug-2015.pdf

Aquatic locomotion: Forgotten fundamental movement skills?

Chris Button

In this article I will explain what fundamental movement skills (FMS) are and why they are considered an important platform for a healthy and active life. Then I make the case that notable absentees from most FMS taxonomies and assessment tools are the skills needed to move effectively in aquatic environments. Hence, I argue that certain aquatic skills should first be acknowledged as fundamental to human motor development, and that appropriate emphasis on teaching aquatic movement skills must follow.

WHAT ARE FUNDAMENTAL MOVEMENTS?

A person's physical literacy is the range of physical capacities they develop in life that allows them to act upon opportunities and fully realise their potential through physical activity (Whitehead, 2001). In the last couple of decades, governments across the world have committed significant resources into physical literacy intervention and monitoring programmes (Giblin, Collins, & Button, 2014; Tremblay & Lloyd, 2010). Politicians justify such investment in terms of a wide range of anticipated benefits including improved physical and psychological well-being of the population, improved safety, expectations of significant future savings to health care and raised levels of expertise in sport and exercise participation (Kolt, 2005).

Arguably, in no other environment is the diversity and value of physical literacy more apparent than in and around water, where humans exhibit a huge range of relative competencies, sometimes with tragic consequences.

In essence, a physically literate person can produce and transfer movement patterns to function effectively and confidently in different performance environments such as at school, in the workplace or competitive sport (Whitehead, 2010). The movement component of physical literacy is composed of a group of so-called fundamental movement skills (FMS) which are presumed to be the 'building blocks' for more sophisticated, context-specific motor skills (Clark & Metcalfe, 2002). The FMS concept is based upon a commonly held assumption that there is a critical developmental window early in life within which certain movement skills should be acquired. According to Clark and Metcalfe (2002): 'The overall goal of this period is to build a sufficiently diverse motor repertoire that will allow for later learning of adaptive, skilled actions that can be flexibly tailored to different and specific movement contexts' (p. 15). Indeed, Stodden et al. (2008) suggested that if humans do not acquire FMS in childhood then they will struggle to adapt and transfer these skills and may consequently have limited opportunities for physical activity later in life.

FMS development should include a broad range of movement skills to deal with the range of different environments that humans typically encounter. In his pioneering work, Johnson (1962) suggested several FMS in his assessments of the motor abilities of primary school children, namely: throwing, catching, kicking, batting, jumping and running. While the assessment of motor skill competency has evolved considerably over the last century, the 'sport-centric' focus of FMS assessment tools has doggedly persisted. Indeed several of the motor skills listed by Johnson (1962) remain in the dozen or so movement assessment batteries commonly employed today (e.g., Test of Gross Motor Development: Ulrich & Sanford, 2000). However, it is immediately noticeable from the different published FMS taxonomies that aquatic movement skills such as floating, diving and swimming are common absentees despite their relevance in many aquatic sports and recreations. Presumably for logistical and practical reasons (e.g., many schools lack both pool access and assessment expertise) aquatic skills have been conveniently 'forgotten' in the FMS literature.

WHY SHOULD AQUATIC MOVEMENT SKILLS BE RECOGNISED AS FUNDAMENTAL?

Given that FMS are supposed to represent the generic building blocks for more complex motor skills required throughout the lifespan, the omission of aquatic movement skills is at the very least questionable. While much attention has been directed at land-based FMS (e.g., Henderson, Sugden, & Barnette, 1992), much less attention has been directed towards what movements may be fundamental to aquatic environments. Before I address that issue, let us first consider why aquatic movement skills should be recognised as fundamental.

Global trends in drowning and water-related hospitalisation statistics indicate that many children grow up lacking basic survival skills in aquatic environments. In Asia (containing two-thirds of the world's children), drowning is a leading cause of death for children in all age groups after infancy (Linnan, Scarr, & Giersing, 2013). In many countries, young people seem to be particularly vulnerable to drowning, as children are over-represented in statistics relative to other age groups (Croft & Button, 2015).
A high proportion of New Zealand's children (up to 54%) cannot swim 100 m and have a low level of water safety knowledge (Moran, 2008). Yet despite the potential dangers associated with exposure to aquatic environments many humans choose to live, work, and play, close to water for all kinds of positive outcomes.

There is considerable evidence to suggest that aquatic movement skills are important (fundamental) skills and that many children are not learning such skills adequately (Linnan, Scarr, & Giersing, 2013; Moran, 2008). But an important question is what aquatic skills should children be learning? Learn to swim teaching programmes typically place great emphasis upon learning to perform classical swimming stokes (i.e., freestyle, breaststroke, backstroke). However, Brenner et al. (2006) argue that traditional measures of swimming ability are inadequate when evaluating the skills needed to prevent drowning. Also emerging evidence suggests that learning to swim within the sheltered confines of a swimming pool creates a misplaced confidence in aquatic ability that does not transfer well to other aquatic environments (Kjendlie et al., 2013). For example, a child may believe that swimming 25 metres in a pool equates to an ability to swim the same distance in the ocean. However, such comparisons are made invalid and potentially dangerous by numerous environmental factors that can be unpredictable (e.g., tide, waves, water temperature).

Interestingly, a radical shift has recently been proposed in the teaching of aquatic skills, to be based upon acquiring a range of survival skills rather than certain 'classical' swimming strokes (Stallman, Junge, & Blixt, 2008). Indeed, this shift in emphasis seems appropriate, as survival skills are typically absent, or at least downplayed, in learn-to-swim programmes. Stallman et al. (2008) suggest a list of eight aquatic FMS (see Figure 1), each of which are closely linked to common causes of drowning (i.e., didn't recognise danger, unintentional immersion, difficulty in returning to the surface, unable to orient in the water, panic, fatigue, etc.). Core skills such as how the child enters the water (skill 1) and then subsequently reorients their body into a streamline position (skill 2) form the building blocks from which more sophisticated ways to move through the water can later be developed.

In my view, the teaching of these eight core skills also needs to be supported by improved awareness of the aquatic environment and the learner's ability to move in that environment (see also: Kjendlie, et al., 2013). Hence the model in Figure 1 includes four additional cognitive elements to the Stallman et al. (2008) list that could form the basis of a pedagogical model of fundamental aquatic skills. Robust motor learning requires skills to be transferable across performance environments which demands sensitivity to one's own action boundaries and an appreciation of how they can change from one situation or environment to the next (Seifert, Button, & Davids, 2013). While this model may not yet be complete (e.g., there may be value in adding an object manipulation skill in the water such as putting on a lifejacket), I believe this version can still provide an important direction for aquatic pedagogy to pursue. Clearly this model may require physical educators to rethink existing priorities and be more creative in terms of how and where aquatics FMS are learnt.

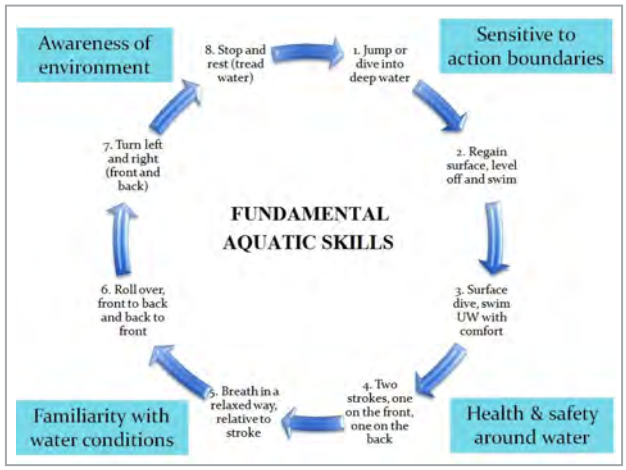

Figure 1. Proposed model of fundamental aquatic skills based upon the 8 skills linked to common causes of drowning by Stallman et al. (2008). Four key cognitive elements (blue panels) have been added in this model to reflect the necessity to develop awareness of the context within which aquatic skills are acquired.

SUMMARY

- Physical literacy is a person's physical capacity to act upon opportunities and realise their potential.
- There has been insufficient attention to aquatic movement competency within existing physical literacy research.
- A pedagogical model for teaching aquatic movement skills is available to address the common causes of drowning.

Moving forward

- Teaching survival skills and improving aquatic movement competency should be fundamental in all learn-to-swim programmes.

DISCUSSION AND CONCLUSIONS

It is important that children develop physical literacy as a platform for the learning and transfer of motor skills. To date there has been insufficient recognition of aquatic movement competency within physical literacy research (and more specifically FMS). It is my belief that logistical challenges in teaching and monitoring aquatic skills have partly driven their omission from this important debate, rather than a robust, research-informed justification.

Whilst the research literature has been slow to recognise the importance of aquatic skills in children's education, there are encouraging signs that aquatic FMS intervention programmes are already being trialled in some countries. As an example New Zealand's Swim for Life programme (launched in 2010) seems a step in the right direction. In this programme, children are taught to acquire a range of simple survival skills alongside more traditional learn-to-swim techniques. Another example is Swimming NZ's Active Movement in Water programme which is aimed at 0-5 year

old children. An unfortunate but likely reason that NZ leads the world in trialling such aquatic FMS programmes is the significant problem that drowning represents in this country (Croft & Button, 2015).

According to the World Health Organisation, we are in the midst of a global drowning pandemic with an estimated 372,000 fatalities per year, and that figure is almost certainly an underestimate (WHO, 2014). Such worrying statistics suggest that aquatic locomotion skills must be quickly recognised as fundamental to human motor development. In this article, I have developed a recent model based upon the common causes of drowning that could form the basis of an aquatic pedagogy for physical educators.

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Aquatic risk management and evidence-based decision making: Hunua Falls, Auckland, New Zealand

Nick Mulcahy

Drowning is the third highest cause of unintentional death in New Zealand (Accident Compensation Corporation, 2005). On average, 108 people drown in New Zealand every year. Historically, a wide range of strategies have been implemented to reduce drowning and injury, and since the 1980s and 1990s these have led to a steady decline in the drowning rate. However, any tailored distribution of programmes and resources to particular aquatic sites has often been based on a 'best guess' of what was required, or a reactive response following a drowning incident. To further reduce the risk of drowning and injury in New Zealand, evidence-based decision making and effective use of finite resources is required. To achieve this, I have developed an aquatic risk management framework to enable the water safety sector to make informed decisions, and to ensure that high-risk locations are identified and resourced accordingly (Mulcahy, 2014).

I recently applied this evidence-based approach to an aquatic risk assessment at Hunua Falls near Auckland, where there have been seven drowning fatalities since 1987. In this article I outline the results of the risk assessment which subsequently informed the development of best-practice risk management strategies which were recommended to water safety stakeholders.

DROWNING AND INJURY PREVENTION STRATEGY

I have developed a conceptual drowning and injury prevention strategy to guide evidence-based aquatic risk management across New Zealand's water safety sector, and I have aligned this to best-practice risk management principles (Mulcahy, 2014). Application of the strategy ensures that all elements of risk in the aquatic landscape are duly considered and addressed in the risk assessment reporting and implementation process.

In the strategy I identify six overarching risk factors that lead to drowning and injury in aquatic environments, and six corresponding strategies that can be applied to manage the risk of drowning and injury (Figure 1). The six risk factors are:

(i) Exposure to the hazard
(ii) Ignorance or misunderstanding of the hazard
(iii) Disregard for the hazard
(iv) Inability to cope when exposed to the hazard
(v) Lack of surveillance or advice when exposed to the hazard, and
(vi) Inability to affect a rescue prior to succumbing to the hazard.

The first corresponding strategy is:

(i) Eliminate or isolate the hazard.

Where the hazard cannot be fully eliminated or isolated, the following additional strategies should be considered:

(ii) Increase awareness and understanding
(iii) Legislate, monitor, and enforce
(iv) Enable and equip
(v) Increase supervision and surveillance, and
(vi) Increase efficiency and effectiveness of response.

METHODOLOGY

The risk management methodology that I followed at Hunua Falls aligns with the current standard, AS/NZS ISO 31000:2009 (Standards Australia/Standards New Zealand, 2009). The process is represented in Figure 2, and further explained below.

The physical area investigated as part of the aquatic risk assessment encompassed Hunua Falls, a section of the Wairoa River, and the surrounding regional park used to access the site. In addition, I gathered information on area and visitor demographics, and sourced incident statistics from Water Safety New Zealand's Drownbase™ database.

I conducted several site visits and undertook a methodical assessment to identify site hazards, access to the site, public facilities, and existing safety interventions. In addition, I held discussions with relevant stakeholders to understand the different ways in which visitors use the site and other factors relevant to the interaction between users and the environment. I also interviewed 136 members of the public about their use of the site.

I analysed the identified hazards against a risk assessment matrix, and assessed the effectiveness of existing safety interventions. I examined all relevant information in detail under each causal factor from the Drowning and Injury Prevention Strategy (Figure 1). I then systematically evaluated all the information gathered using decision-assisting models and strategies to formulate best-practice risk management recommendations, which are detailed under each overarching risk management strategy.

I presented the completed risk assessment report to water safety stakeholders. It is anticipated that the stakeholders will incorporate the proposed safety interventions into their management plans, and implement all recommendations within ten years. The implementation of the recommendations should be monitored and reviewed to ensure their timely delivery, and to assess their effectiveness in reducing the risk of drowning and injury.

Figure 1: Drowning and Injury Prevention Strategy (Mulcahy, 2014)

REGIONAL SETTING

Hunua Falls is situated in the southeast of the Auckland region, 19 km east of Papakura (Figure 3). The Hunua area is home to 4,242 people, but is easily accessible to residents from the Auckland region, which has a population of 1,415,550 (Statistics New Zealand, 2013). Auckland Council manages the Hunua Range Regional Park, which attracts over 220,000 people annually. The majority of these visit Hunua Falls, and site use peaks in summer and early autumn. Auckland Council provides and maintains facilities at the site.

Visitors swim in the lake at the base of Hunua Falls (Figure 4), and some climb the steep cliff face to jump into the water. Those staying at adjacent camps and lodges also use the lake and Wairoa River for kayaking, rafting, and other activities led by commercial operators.

Since 1980, seven drowning fatalities have been recorded at Hunua Falls (Water Safety New Zealand, 2013). Three drownings occurred after the victims jumped off Hunua Falls, two victims drowned while swimming, and two deaths followed accidental immersion. However, anecdotal evidence suggests at least another 12 unrecorded deaths have occurred as a result of people jumping off the falls.

AQUATIC RISK ASSESSMENT FINDINGS

Members of the public are exposed to a range of hazards at Hunua Falls, including sudden changes in water depth, slippery rocks, submerged rocks and debris, steep cliffs, and turbulent water. Due to the limited competence of a considerable

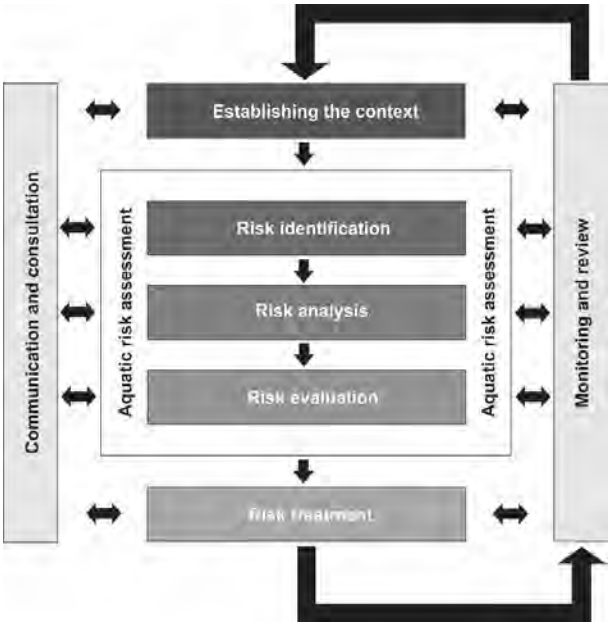

Figure 2: Aquatic risk management process, adapted from AS/NZS ISO 31000:2009 (Standards Australia/Standards New Zealand, 2009).

number of water users, the risks posed by these hazards should be considered high to very high.

Many users appear to lack sufficient awareness and understanding of the hazards at Hunua Falls. Over 10% of those interviewed during the risk assessment could not identify a single hazard at the site, and responded that there were 'no hazards'. Only a small proportion of those interviewed (15%) identified 'sudden depth changes' as a hazard, despite these posing the greatest risk to unsuspecting water users. The lakebed drops abruptly from 0.5 to 9.0 m deep; this was a primary causal factor in the most recent drowning.

A number of users disregard hazards at the site, or have poor personal risk management practices. Some climb over barriers, ignore warnings, and jump from the top of the waterfall. The most recent recorded death from such activity occurred in 2009, although others have recently been injured.

A considerable proportion of visitors have limited resilience to water-based hazards. Of those who entered the water during the on-site assessment (n = 135), 38% had either limited or no self-reported water competence (Figure 5); others may have overstated their ability.

Despite the high levels of use, there is no formal supervision provided at Hunua Falls. During the summer peak, weekdays commonly experience median visitation of 40 to 60 people at a time (10:00 am to 6:00 pm), while weekends experience a median of 60 to 100 visitors. On-site analysis found water users generally account for 15% to 25% of total visitors. Family members generally provide informal supervision, although in some instances those providing supervision have limited to no water competence, and are unable to identify hazards. Finally, the ability of emergency services to respond to time-critical incidents is limited by their considerable distance from the site.

Figure 3: Location of Hunua Falls, in the southeast of the Auckland region, New Zealand.

Figure 4: (a) Grass reserve in the centre of the valley, and (b) reserve and waterfall access area.

EXISTING RISK MANAGEMENT

The risk of drowning and injury at Hunua Falls has been reduced as a result of strategies implemented by water safety stakeholders. Access tracks leading to the top of Hunua Falls have been closed and barriers installed to discourage access. Water safety signage has been installed along some access tracks, and this is mostly effective at conveying relevant information, though some could be improved. In addition, a dual-purpose phone for park information and emergency use is situated on a noticeboard in the main car park; however, the phone is difficult to identify. Finally, public rescue equipment has been installed near the lake at Hunua Falls.

AQUATIC RISK ASSESSMENT RECOMMENDATIONS

In response to the findings, I recommended a range of additional safety interventions. These interventions target the causal factors of drowning and injury at the site, and align with the six risk management strategies identified in Figure 1.

Access to hazardous areas at Hunua Falls should be restricted, and man-made hazards removed where practicable. A bathymetric survey of the lake should be conducted to identify the location of sudden depth changes

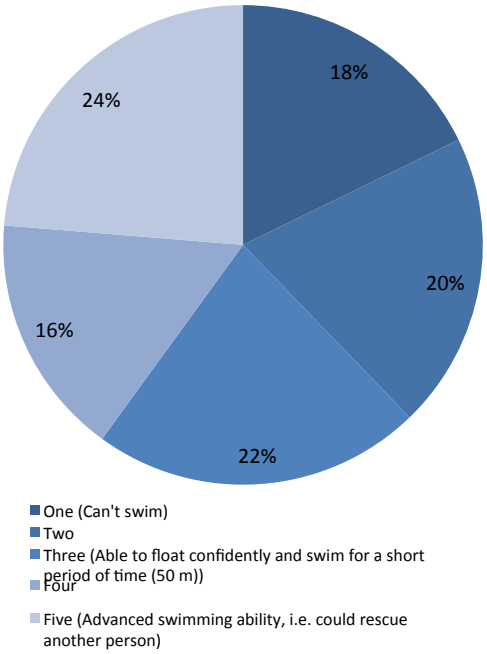

Figure 5: Self-reported water competence of those interviewed at Hunua Falls.

SUMMARY

- Water safety stakeholders should identify and adequately resource high risk sites.
- Managing risk in aquatic environments should follow a hierarchical process of implementing controls and measures.
- Risk management plans for aquatic sites might include physical barriers, education and awareness, legislation, upskilling water users, supervision and surveillance, and improvements to emergency responses.

Moving forward

- A site-specific evidence-based approach is the most effective way of reducing drowning and injury in New Zealand's highest risk aquatic environments.

and any other underwater hazards. Once these have been identified, a removable safety boom should be installed in the lake during the peak summer period. The safety boom should be designed to withstand regular flow, limit any adverse impacts on public safety, and consider cultural and aesthetic concerns.

A range of resources and programmes should be instigated to increase the awareness and understanding of water-related hazards among those visiting Hunua Falls. Relevant information should be integrated in resources and brochures, while groups staying in camps and lodges should be briefed on site hazards. An awareness and education programme should also be delivered directly to the public over summer, targeting identified high-risk groups. Finally, some improvements to water safety signage are proposed.

The introduction of a new bylaw, as well as monitoring by the police, should be investigated to restrict the consumption of alcohol at the site; a number of visitors are reported to have jumped off the falls after consuming alcohol. In addition, access to water competence courses, particularly amongst identified high-risk groups, should be improved. Some water competence courses could be delivered at Hunua Falls.

A lifeguarding service could be implemented during identified high risk periods. This service would help educate and inform users of the hazards, provide effective supervision, and respond to incidents. However, a lifeguarding service should only be instigated if other environmental hazards, i.e. water temperature, do not pose undue risks to water users. Provision of lifeguarding services is also highly funding dependent.

Finally, a range of measures should be taken to improve the efficiency and effectiveness of emergency response to Hunua Falls. This includes improving emergency communications, installing additional public rescue equipment, and developing an emergency response plan for the site.

CONCLUSION

The aquatic risk assessment of Hunua Falls identified the causal factors of drowning and injury at the site, and I subsequently proposed a range of recommendations to further reduce the risk. The risk assessment is currently in the final stage of consultation, with the aim of incorporating the recommendations into the long-term plans of relevant stakeholders.

This project demonstrates the effectiveness of the evidence-based approach to decision making in the water safety sector, as it provides holistic and site-specific risk management plans for high-risk aquatic sites. This methodology is currently being applied to other aquatic locations throughout New Zealand.

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River crossing revisited:
Bushcraft instructors' beliefs and values

Mike Boyes and **Allen Hill**

A plethora of rivers and streams flow from New Zealand's mountains and high country to the sea, and many recreational, educational and adventure tourism activities take place in and around these waters. Heavy rain and glacier melt can cause rivers and tributaries to rise quickly. Coupled with easy and unrestricted access in national parks, rivers present high risk natural environments (Dingwall, Fitzharris & Owens, 1989).

New Zealand's rivers have posed a hazard to Māori and Pakeha since settlement. More than 1,115 river crossing fatalities were recorded by 1870 (Te Ara). In more recent times, 41 river crossing fatalities occurred between 1980 and 1994 (Langley, Warner, Smith & Wright, 2001) and current statistics record around three river-crossing deaths a year in outdoor recreational activities; some 80% of these occur in fast-flowing flooded rivers or side streams (New Zealand Mountain Safety Council, 2015b). Deaths of tourists are particularly newsworthy. For instance, in 2014 Australian Yessica Asmin was swept away while crossing a flooded side creek on the Milford track and in 2015 American Allison Willen drowned in the Young River in Mt Aspiring National Park. These incidents have traumatic consequences for family and friends. In addition, global media coverage of such events has the potential to damage the image and the economy of New Zealand's lucrative adventure tourism industry (Bentley & Page, 2008).

Rivers are complex ecosystems that vary greatly between regions in New Zealand. The Hurunui, which begins on the eastern side of the Southern Alps as cataracts littered with projecting rocks and trees, is a fast-moving braided river on the plains of north Canterbury. Many of the streams flowing down the North Island volcanoes are steep and fast near their source, but become deeper and slower moving as they progress. Others, like the Whanganui (Ruapehu-Wanganui, North Island) and the Clutha (Otago, South Island), begin as small-mountain streams, but become wide and unhurried as they near the Tasman Sea and the Pacific Ocean respectively. Every river is dynamically multifarious, as water flows fluctuate and streambeds change with each flood. While there is a body of common knowledge that applies to all rivers, different sections of running water demand localised understandings and techniques for their crossing.

One problem in National Parks involves side-creeks where typically low flows of easily-crossed water can, within an hour or two of rain, become dangerous major torrents. For New Zealanders and tourists alike, images and discourses around the Great Walks (e.g. Lake Waikaremoana, Tongariro, Abel Tasman, Routeburn and Milford tracks) convey impressions of safe, low-risk environments. While most of the potentially dangerous crossings on these tracks have been bridged, it is not possible to eliminate every hazard. Different rivers, conditions and water flows demand judgement calls as to where and how to cross. Few tourists or self-guided participants possess this knowledge.

In a joint initiative, the New Zealand Mountain Safety Council (NZMSC) and Water Safety New Zealand (WSNZ) have produced excellent river safety resources in the form of booklets, pamphlets, DVDs, and electronic media. The material covers hydraulics (water flow, turbulence, eddies, hazards, strainers), basic river crossing principles (mutual support, using the current, what might go wrong), decision making (when, where and how to cross) and recovery. However, the challenge facing these organisations is not only to produce and practice the information, but to effectively communicate the key messages and skills to the public. Moreover, river crossing techniques continue to evolve and, in some cases, have generated controversy among professionals working in the area. NZMSC identified two technical concerns: the most effective technique to recover from lost footing in fast-flowing water, and the use of ropes in river crossings. Thus, we investigated the perceptions of NZMSC bushcraft instructors in order to gain further insights into these two issues, as well as the most appropriate ways to educate tourists and recreationists, and develop resources and professional expertise.

METHODOLOGY

In this research we employed mixed methods with a concurrent triangulation model to integrate qualitative and quantitative data. Our target population was qualified NZMSC bushcraft instructors for whom we prepared a survey containing 15 Likert scale questions and five qualitative sections. We actively worked with the NZMSC Bush Craft Advisory Committee in 2010 and sought their input and feedback on the survey. The 15 questions appear in Table 1. We requested additional qualitative information regarding the education of tourists, the ideal contents of a river safety course, desirable resources, and professional development needs. We used SPSS statistical software to analyse and graph the quantitative data, and identified emerging themes from an inductive analysis of the qualitative information. We gathered and analysed both datasets concurrently.

Question	Mean	Std Dev.	N
Q11 Rivers present a significant danger to trampers	1.27	.71	162
Q12 The most important aspect of a river crossing is deciding whether or not to cross	1.31	.67	164
Q14 Basic river safety guidelines apply to all rivers	1.57	.94	163
Q21 There is a need for tourists to have river safety information	1.67	.90	157
Q10 It is important for the MSC to educate the public about recovery techniques	1.74	.81	165
Q9 It is important for the MSC to ensure compliance to river safety guidelines	1.98	1.12	163
Q13 A knowledge of river hydraulics is important	2.01	.91	160
Q15 Specific river safety techniques should be applied appropriately to different rivers	2.09	1.23	160
Q7 The river safety chapter in the 2006 MSC Bushcraft manual is an accurate and effective source of information	2.15	.93	165
Q8 I prefer guidelines to practice, rather than strict rules that must be adhered to.	2.16	1.27	165
Q20 I find the present MSC river safety resource component in the DVD "Let's Go Tramping" to be adequate	3.28	1.10	165
Q19 I have taught groups that have misgivings about the head first recovery technique	3.42	1.51	165
Q17 In the right situation I would employ a rope assisted crossing	4.39	1.96	164
Q16 The most universally appropriate recovery (pack float) technique is head first	4.40	1.85	164
Q18 When wearing a suitable pack, the head first recovery technique works best in shallow rivers with many obstacles	4.51	1.86	163

Table 1: Rank order of level of agreement with each question

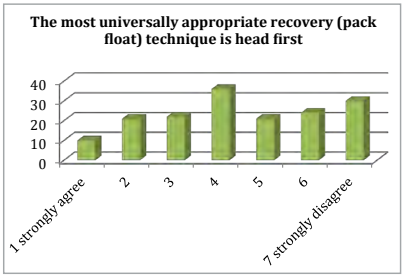

Figure 1: Levels of agreement with head-first recovery techniques.

RESULTS AND DISCUSSION

Two hundred and twenty instructors completed the surveys from a pool of 585; this represented a response rate of 37%. The respondents had an average of 10 years' instruction, ranging from one to 43 years; 72% were male and 28% female; and the average age was 45 years. Pakeha New Zealanders were the predominant ethnic group (94%), 2% were Māori and 4% Others. The respondents came from all regions of the country. A summary of the results from the survey appears in Table 1. The items were measured on a Likert scale from 1 = strongly agree; 7 = strongly disagree.

As expected, the bushcraft instructors recognised that rivers pose a significant danger to trampers. They agreed that the most important aspect of river crossing safety is deciding whether or not to cross. They also recognised that while basic river safety guidelines apply to all rivers, different rivers and sections of rivers demand specific techniques. The instructors generally felt happy with the quality of information provided in the bushcraft manual and through different river safety resources. They noted that this information is also available online. While there was uncertainty prior to the survey about the inclusion of river hydraulics as a topic, the instructors confirmed the importance of river hydraulics in safety courses and the literature.

We were particularly interested in the most effective technique to recover from lost footing in fast-flowing water, and the use of ropes in river crossings. Bushcraft practitioners traditionally favoured a recovery technique which involved swimmers floating on their backs with their feet facing downstream, and using the pack to remain afloat and their legs to fend off obstacles. However, an analysis of this technique by NZMSC identified a risk of foot entrapment and noted that the position made it hard to steer toward the side of a river. NZMSC subsequently advocated a head-first recovery position in which swimmers float on their backs with their heads facing downstream. While the method makes it difficult for the swimmer to see ahead and thus exposes them to potential head injury, and in this sense seems counter-intuitive, NZMSC believes that the advantages outweigh the problems. NZMSC has advocated this recovery position for a number of years. However, our survey reveals that only 31 (19%) of instructors 'strongly agree' with the technique, that many do not agree 54 (33%), and lots are unsure (n=79, 48%). Furthermore, a significant number of leaders (n=84, 51%) indicated that their group members have misgivings about the technique.

On receipt of the research outcomes, NZMSC amended its river safety courses and resources. The latest advice in the official information states: 'Be prepared to use your pack as a flotation device … . Use your arms and feet to propel and control your direction towards a position of safety' (New Zealand Mountain Safety Council, 2015a Recovery section). In addition, NZMSC outlines the advantages and disadvantages of head-first and feet-first recovery methods (see New Zealand Mountain Safety Council, 2011: 172). This is consistent with the view of many instructors who believe that the Council should present guidelines for practice rather than strict rules that do not always apply in a complex and dynamic outdoor world.

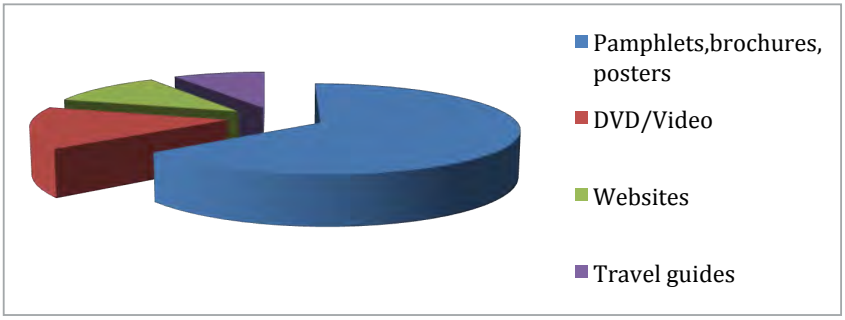

Figure 2: Suggested sources for river safety information for tourists.

The Council recognises that self-rescue techniques are advanced skills that should be practised under supervision (ibid.). This provides another challenge when educating tourists and others; not only is hazard perception and hazard cognition needed to make a decision about whether or not to cross a fast-flowing river, but it also requires judgement calls regarding self-recovery techniques should those crossing a river lose their footing.

On face value, rope-assisted crossings are an artefact from days long gone. Moir's guidebooks and the early Federated Mountain Clubs' (FMC) handbooks advocated ropes in the 1940's (Wilkins, 2011). In experienced hands, ropes can be useful, especially in certain situations. Indeed, a recent FMC Bulletin described and championed a two-rope method (Wilkins, 2011). However, the Bulletin was 'the catalyst [for] a lot of discussion, argument and extra training' (Masson, 2015: 16). While ropes can facilitate crossing a fast-flowing river, NZMSC (2011) identified a number of dangers. It warned of the difficulties associated with people regaining footing after a fall, ropes snagging, heavy rope loads pulling people under water, belayers being pulled into the water, and entangled swimmers (see also Masson, 2015). Some practitioners queried whether people should attempt to cross a river at all if they believed they needed a rope. Moreover, the average tramper and tourist will rarely possess either a rope or the expertise to handle one. The New Zealand Mountain Guides Association warned against rope-supported river crossings on the Matukituki river in egress from Mt Aspiring (New Zealand Mountain Guides Association, 2015). In our study, 34% of instructors indicated that the use of rope is an appropriate judgement call while 49% said they would never use a rope. This provides food for thought as no fatalities have been reported from rope-assisted crossings in the last 20 years (Wilkins, 2011). It appears that the use of ropes in river crossing remains contentious and we recommend further investigation to provide clearer guidelines.

Finally, bushcraft instructors 'strongly supported' the need to give tourists appropriate river safety information. The instructors offered numerous suggestions for disseminating this information (see Figure 2).

Specific suggestions include pamphlets, brochures, DVDs, blogs, posters, handouts, web sites, Lonely Planet/guidebooks and the social media. Such information could be made available through tourist operators, travel agents, information centres, backpacker hostels, universities, outdoor shops, Department of Conservation centres and instruction courses, and / or distributed at the start of tracks, at track huts, river crossing points, airports (in targeted languages), on flights into New Zealand and on tourist buses. Clearly, communicating outdoor safety information generally, and river crossing techniques specifically, remains an important and ongoing concern.

SUMMARY

- Crossing rivers with fast-flowing water is a technical skill that requires advanced knowledge of local conditions and careful judgement.
- Bushcraft practitioners recommend that people crossing fast-flowing rivers use their packs as flotation devices if they lose their footing.
- Many bushcraft practitioners advise against using ropes when crossing fast-flowing rivers.

Moving forward

- Water safety organisations face ongoing challenges in communicating with inexperienced walkers about when and how to cross a fast-flowing river, and about how to recover from lost footing in fast-flowing water.

CONCLUSION

In New Zealand's dynamic environment, river crossings will continue to present risks to people in the outdoors. In this article we identify the issues involved in river-crossing technique from the perspectives of bushcraft instructors. Fast-rising New Zealand rivers demand precise hazard cognition for safe decisions. Ensuring that inexperienced tourists and walkers can make effective decisions regarding when and how to cross a river, or how to recover from lost footing in fast-flowing water, may not be a realistic goal. Effective safety relies on far more than just delivering information - reading about the techniques is different to actually practising them. Nevertheless, organisations such as NZMSC and WSNZ have a responsibility to keep tourists and members of the public as safe as possible while enjoying New Zealand's great outdoors.

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The importance of visual rip current education

Robert W. Brander

Rip currents, or 'rips', are strong, narrow offshore flows common on any beach characterised by breaking waves over a wide surf zone (Short, 2007). Bathers of all swimming abilities caught in rips can quickly find themselves being taken away from the shoreline where they may become distressed (Brander, Bradstreet, Sherker & MacMahan, 2011) and each year, rips are responsible for tens of thousands of surf rescues and hundreds of drownings globally (Brighton, Sherker, Brander, Thompson & Bradstreet, 2013). Rip related rescues and drownings are also common on open ocean New Zealand beaches, particularly in the North Island (Water Safety NZ, 2015).

The vast majority of rip current drownings occur on beaches where, or when, lifeguards are not present (Brighton et al., 2013). Increasing the availability of lifeguard presence and encouraging bathers to always swim near lifeguards, or between the red and yellow flags, are obvious solutions to reducing rip current drownings, but these are often not logistically possible or practical. People will always bathe or swim on unpatrolled beaches. Furthermore, while our scientific understanding of rip currents is fundamentally sound (MacMahan, Thornton & Reniers, 2006; Dalrymple, MacMahan, Reniers & Nelko, 2011; Brander, 2015), communication disconnects between coastal scientists, beach safety practitioners and the general public (Brander & MacMahan, 2011) have sometimes hindered transfer of this knowledge and implementation of effective rip current awareness and education efforts to the public. This is evident from the fact that many studies (e.g. Sherker, Williamson, Hatfield, Brander & Hayen, 2012; Brannstrom, Trimble, Santos, Brown & Houser, 2014) have shown that many beachgoers are either ignorant of rip currents and/or do not appreciate the severity of the hazard.

A significant challenge for water safety practitioners is therefore to increase the knowledge of beachgoers regarding rip currents and to motivate them to seek out lifeguarded areas, or not to enter the water if in doubt. Successful rip current education should focus on both preventing people from entering rip currents in the first place and advising them how to respond if they find themselves caught in one. However, communicating what is often complex information regarding these options can be problematic. The purpose of this paper is to describe how relatively simple messages, based on recent scientific research and utilising modern internet and social media technology, can be utilised by educators to help improve overall awareness of the rip current hazard to both school students and adults.

RIP CURRENT FLOW CHARACTERISTICS

Rip currents exist because water transported by breaking waves across a surf zone 'piles up' towards the shoreline creating a gradient in water level that drives an offshore flow of water. Rip currents are concentrated offshore flows approximately 5 – 50 m across and while their mean flows are typically on the order of 0.5 m/s, short-lived pulses of up to 2 m/s may occur after the passage and breaking of large groups, or sets, of waves (MacMahan et al., 2011). Rip currents also tend to flow faster several hours before and after low tide when wave breaking is enhanced due to shallower depths. As described by Brander (2015), the traditional description of rip currents portrays alongshore feeder currents close to shore that converge into a narrow and offshore flowing rip neck that extends significant distances beyond the breaking waves before decelerating and stopping in an expanding rip head (Fig. 1). However, more recent studies have shown that many rips can be dominated by re-circulating flow fully contained within the surf zone (Fig. 1).

RIP CURRENT TYPES AND VISUAL IDENTIFICATION

Several types of rip currents exist (Brander, 2015) that exhibit both types of circulation patterns (Fig. 1) and share common visual identification clues (Fig. 2). The most common type are 'fixed' rips which occupy deeper channels between adjacent shallow sand bars. 'Fixed rips' appear as darker gaps of seemingly calmer water between areas of whitewater and breaking waves (Fig. 2a) and tend to persist in location for days, weeks, or months, often eroding a scalloped embayment. They also occur in semi-regular intervals along a beach. 'Boundary' rips are also channelised and appear as darker areas of water, but occur adjacent to physical structures such as headlands, rock outcrops, groynes and jetties (Fig. 2b). Boundary rips at exposed wave energy ends of a beach (or structure) can deflect longshore currents, formed by waves breaking on the beach at an angle, significant distances offshore. Boundary rips at an end of a beach, or structure, that is protected or sheltered from wave action tend to re-circulate (Fig 1b). 'Flash rips' are a different type as they are not channelised and form quickly due to the breaking of a group of larger waves. They are very difficult to predict and may only last for a few minutes in one location before disappearing and then forming elsewhere. They also tend to look different, appearing as areas of turbulent water and suspended sand (Fig. 2c).

Finally, although they are not technically rips, the uprush and backwash of broken waves on steep beaches can create strong 'swash rips' during the outgoing flow (Fig. 2d). While they don't extend far offshore, they can knock someone over and take them quickly into deep water, just seaward of the shoreline. This is particularly common on gravel beaches, where an additional hazard is posed by difficulty maintaining footing. Understanding how to identify a rip current is clearly important for avoiding them. Unfortunately, numerous studies have shown that both domestic and international tourists in Australia and the US are very poor at spotting rips (e.g. Williamson, Hatfield, Sherker, Brander & Hayen, 2012; Caldwell, Houser & Meyer-Arendt, 2013).

CAUGHT IN A RIP CURRENT? REACTION AND ESCAPE STRATEGIES

Traditionally, there have been four main global educational messages promoted to people if they find themselves caught in a rip current: i) don't panic; ii) don't swim against the rip back to the beach; iii) swim parallel to the beach to escape the rip; iv) stay afloat and go with the flow. The latter two options were recently tested in a field study by McCarroll et al. (2014) who clearly showed that no single escape strategy is suitable, or successful, under all rip current scenarios. Instead, it seems that a combined approach of swimming/floating should be adopted by bathers caught in rip currents while at all times assessing which strategy best enables escape (Bradstreet et al., 2014). Similarly, recent studies examining the experiences of people caught in rip currents have shown that panic is the dominant emotional response, regardless of ocean swimming experience and/or prior rip knowledge (Drozdzewski et al., 2012; Drozdzewski, Roberts, Dominey-Howes & Brander, 2015). While more work is clearly needed on how to reduce the panic response in the rip current situation, Surf Life Saving Australia is now actively seeking to try and promote preventative strategies (such as rip identification) over physical rip current escape action strategies.

USE OF EDUCATIONAL SOCIAL MEDIA

Traditional attempts at communicating information and safety advice have typically involved various combinations of interventions such as warning signage on beaches, brochures and pamphlets in accommodation and information centres, and posters and billboards (Hatfield, Williamson, Sherker, Brander & Hayen, 2012; Brander, Drozdzewski & Dominey-Howes, 2014). However, the uptake and effectiveness of these approaches is not generally known and evidence suggests that beach warning signage may not be as effective as authorities assume (Matthews, Andronaco & Adams, 2014). However, the relatively recent and proliferating use of social media and improved internet access has provided another valuable tool to communicate the rip current hazard. As described by Brander et al. (2014), rip education can be enhanced through the use of visual imagery, which is easily communicated via websites (e.g. www.scienceofthesurf.com), Facebook, Twitter and YouTube. There are hundreds of YouTube based rip current videos, in particular 'How to Survive Beach Rip Currents' has over 1.3 million views (as of August 2015) and includes footage of a release of harmless purple dye into a rip current. The use of dye imagery provides a very powerful and engaging educational tool showing the speed and trajectory of rips (Fig.3). Use of dye imagery takes the complexity out of rip current flow behaviour and brings a largely unknown and unseen hazard to life, providing a lasting impression that may motivate people to seek out lifeguarded beaches (Brander et al., 2014).

SUMMARY

- Rip currents are strong, narrow seaward flows on many ocean beaches and they are responsible for many drownings and rescues.
- Different types of rip current make it difficult to promote a single strategy to escape them.
- Social media is a valuable educational platform to promote awareness and visual identification of rip currents.

Moving forward

- Social media involving the use of video and still imagery of rip currents may help reduce beach drowning.

CONCLUSIONS

Rip currents will always present a significant hazard to beach users. However, the broad reach of social media provides easily and instantaneously available visual communication tools which can be used to educate both school children and adults alike on the rip current hazard. In particular, school students represent a captive audience who can easily learn about, and be engaged by, the rip current hazard through social media platforms. More importantly educating children about rips will lead to ongoing inter-generational education and cultural awareness of the rip current hazard.

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Figure 1

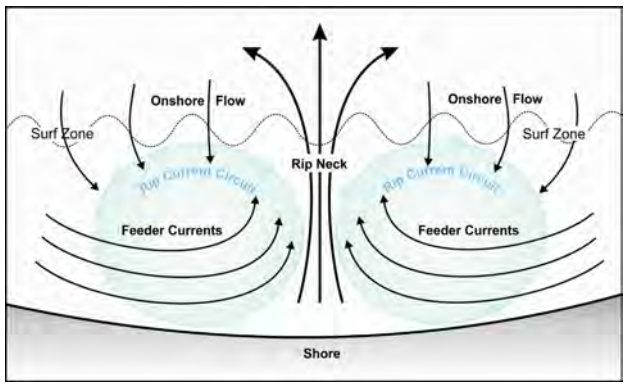

Figure 2

Figure 3

Figure 1: Rip current flow circulation showing both the traditional paradigm of offshore dominated flow (in black) and the new view of flow recirculation within the surf zone (blue shaded rip current circuit).

Figure 2: Types of rip currents: a) fixed rip at St Kilda Beach, Dunedin, New Zealand; b) boundary rip current adjacent to a headland at Bondi Beach, NSW, Australia; c) flash rip (mushroom cloud past breakers) at Rehoboth Beach, Delaware, US; d) swash rips on West Coast, North Island NZ (all photos R. Brander).

Figure 3: A time sequence of a release of harmless purple dye into a rip current at Tamarama Beach, Sydney, Australia. The dye is an effective method for communicating the speed and trajectory of rip current flow (photos R. Brander)

Surf and surf lifesavers as safety hazards: The myth of Bondi's Black Sunday

Douglas Booth

In Australian national culture the surf lifesaver is a paragon of virtue: selfless, steadfast and skilled. Surf lifesavers have provided a volunteer safety service on surf beaches since the early twentieth century and the governing body, Surf Lifesaving Australia (SLA) claims to have saved over 620,000 lives since 1907 (SLA, 2014a: 6). In 2013-14, SLA reported that its members performed 11,711 rescues (SLA, 2014a: 19). In its National Coastal Safety Report for 2014, which provides a detailed analysis of rescues in the surf, SLA boasted that 'no… drowning deaths occurred' in the previous year 'between the red and yellow flags' (SLA, 2014b: 29). Red and yellow flags designate a supervised area of the beach, typically in front of a clubhouse, and announce that lifesavers are on patrol. Indeed, bathers rarely drown while swimming in patrolled areas. But there have been cases, including surf lifesavers competing in recent national titles (Surfprobe Australia, 2015), and these tell us much about the surf lifesaving movement, and patrolled surf as a hazard.

The classic example of drowning in a patrolled area was the five deaths at Sydney's Bondi Beach on Sunday 6 February 1938.[1] The deaths occurred in what the Coroner called a 'boiling' sea, and during a mass rescue in which lifesavers hauled at least 180 bathers from the water, including some three dozen who were unconscious. Two hours after the rescue the captain of the Bondi Surf Bathers' Life Saving Club (BSBLSC), Carl Jeppesen, who reputedly rescued six people, briefed the media. 'It is hard to look back now on what it was like…in that surf', Jeppesen said: bathers 'were sinking all around us. We were doing our best to hold them up to get them to the surf floats and to stop their panic. It was our Black Sunday' (SMH 7/2/38: 13).

Returning a verdict of accidental death, the Coroner, E. T. Oram, sang the lifesavers' praises:

> When it is realised that about 250 to 300 [bathers] were in a sea described as 'boiling', we have a striking instance of the excellent work done by our lifesaving clubs. One wonders how many fatalities might occur throughout the year if it were not for the services of these voluntary lifesavers. They don't ask to be praised…and it is wonderful work they do. (DLMA 26/2/38: 1)

The Sydney press likewise lauded them (e.g., DT 8/2/38), and (SLA) subsequently awarded BSBLSC a special Meritorious Award.

In this article I analyse Black Sunday as a myth. I use the term myth not to signify falsehoods. The deaths of the five bathers were a tragedy and lifesavers showed great determination. As well as dragging scores of bathers ashore, they revived most of the unconscious and a number 'given

up' by medical doctors (Brawley, 2007: 138; Maxwell, 1949: 84). Rather, I use the term myth to signify an overly simplistic story, replete with silences and devoid of critical assessment (Barthes, 1973). More specifically, I challenge orthodox histories of Black Sunday that focus on freak surf conditions and the gallantry, efficacy and adeptness of the lifesavers. And I propose that not only did the deaths on Black Sunday occur within an institutional culture that sanctified the prowess of lifesavers and underestimated the dangers of the surf but that this culture still endures.

A 'TYPICAL SUMMER SUNDAY'?

Orthodox histories describe Black Sunday as a 'typical summer Sunday'. The official weather report agrees, describing the weekend as 'fine' with 'moderate' temperatures regulated by 'prevailing south-westerly to south-easterly winds' (SMH 7/2/38: 21). However, the phrase 'typical summer Sunday' makes no mention of the surf. In popular accounts (e.g. Slattery, 1963: 109-110), an 'unexpected' set of large waves 'demolished' or 'collapsed' the sandbank on which hundreds of unsuspecting bathers were standing. Thrown off their feet, the bathers were dragged seaward in what were tumultuous waters; five drowned.

Official weather maps for Friday 4 February and Saturday 5 February 1938 show two low pressure systems in the Tasman, one off the east coast of New South Wales and the other east of Tasmania. These systems generated the 'moderate to rough seas' described in the notes accompanying the official weather report (SMH 5/2/38:17; SMH 7/2/38: 21) but which historical accounts typically omit. Moreover, the term 'unexpected' used to describe the waves in the mid-afternoon on 6 February 1938 is inconsistent with the surf prior to that time.

On Friday 4 February, Bondi resident and bather Charles

Walters drowned in rough surf (SMH 5/2/38: 12). On Saturday 5 February Bondi lifesavers performed scores of rescues; in just one hour they rescued 74 bathers, a number exceeding that for some entire summers (Brawley, 2007: 133). Conditions did not improve on Sunday with an unusually large numbers of rescues performed across Sydney's beaches (SMH 7/2/38: 13). The Daily Telegraph reported 'rough' surf throughout the day at Bondi and noted that beach inspectors 'were constantly blowing whistles to warn bathers not to venture out too far'. According to the paper, 'there were several minor rescues earlier, and as the afternoon advanced the sea became rougher' (DT 7/2/38: 2). In an editorial, the Sun (7/2/38) said 'experts all agree that a dangerous surf was running. It was not that it was enormously high, but it ran at unexpected angles, with a heavy backwash and lateral currents. It was no day for a feeble swimmer to take the water'.

With regard to the collapsing sandbank, coastal geomorphologist Robert Brander (2010: 127) is emphatic: sand bars do not suddenly collapse. Similarly, coastal geomorphologist Andrew Short dismisses terms such as 'freak waves' and 'collapsing sand bars' as media embellishments which, he says, had 'little relevance to the…circumstances that contributed to the accident' (Short & Hogan, 1994: 198). According to Short (1993: 44), people who are washed, or walk, from a sand bar into a trough where the sand is softer may believe that 'the bottom has "collapsed"'.

GALLANT SURF LIFESAVERS?

Some historians note that 'the death toll' on Black Sunday 'would likely have been much higher' had lifesavers not been present (e.g. Ford, et. al., 2007: 1). However, this truism ignores critical details. These details pertain to the fortuitous congregation of lifesavers at Bondi just before the mass rescue and the presence of extra rescue equipment on the beach, the effectiveness of the equipment used in the rescues, and the decision to expose bathers to treacherous surf.

More lifesavers were on hand at Bondi at 3.00 pm than would normally be expected on a Sunday. Their presence was the fortuitous result of a scheduled intra-club surf race and the fact that club patrols were changing shifts. Sean Brawley (2007: 134), historian of the BSBLSC and SLA, reports that at 2.30 pm 'around 45 members' were waiting for the race secretary to organise the competitors. Similarly, the presence of extra reels, the main equipment used by lifesavers to rescue patients in the interwar years, stemmed from a chance observation by Carl Jeppesen who saw a current drag a bather rapidly seaward. The power of the current alarmed the club captain who called for extra reels (Brawley, 2007: 133). But irrespective of the additional equipment, this exalted local invention was neither designed for nor suited to mass rescues. Effective operation of a reel requires at least three people while the beltman can only bring in one patient at a time, perhaps two under optimal conditions. In short, the reel-and-line was, in the words of the Daily Telegraph (7/2/38: 2), 'too slow' in the conditions on Black Sunday. Moreover, the paper described the lines as 'a menace', noting that they entangled bathers, especially those 'who clutch…them wildly'. Indeed, the reel team that hauled in one drowned bather found 'his wrist twisted in the…line' (Maxwell, 1949: 84. See also Best, 2006).

Questions arise about the role of the Bondi club's surfboat during the events of Black Sunday. The boat was in the water at the time delivering the turning buoys for the surf race. Notwithstanding a claim by the Sydney Mail (9/2/38: 18) that the boatmen demonstrated 'great heroism' during Black Sunday, Brawley (2007: 136) says that the crew were oblivious to the commotion and offered no assistance.

Other questions about surf lifesaving methods also surfaced in the wake of Black Sunday. In its editorial the Sun (7/2/38) referred to an apparent 'lack of co-ordination in the rescue'. More critically, the paper suggested that Bondi surf lifesavers might have shown 'precaution' by either closing the beach or at least reducing the area available to bathers. The suggestion takes on particular significance in light of the reputation for safety held by Tom Meagher, one of two beach inspectors on duty on Black Sunday. Described as 'without peer' in the history of surf lifesaving at Bondi (Brawley, 2007: 235), and named by the police as one of the heroes of Black Sunday (Sun 7/2/38: 1; SMH 8/238: 11), Meagher aimed to 'stop' bathers from 'getting into difficulty before they required rescue' (Brawley, 2007: 132). But, did Meagher consider closing Bondi that day?

Aub Laidlaw, who was also on duty as a beach inspector at Bondi over the weekend of 5 and 6 February, claims Meagher rejected the idea. In a long interview three years before he died, Laidlaw (1989: 35) said that Black Sunday 'shouldn't have happened'. He disclosed that he wanted to shut Bondi and move bathers to the more sheltered northern end of the beach. Laidlaw (1989: 35) alleges that Meagher ignored his advice and told him to 'look after the north end' while he 'look[ed] after the middle'. Like Meagher, Laidlaw was a champion surf lifesaver and swimmer and in 1929 the North Bondi club appointed him resident member caretaker. The following year he joined Waverley Council as a permanent surf lifesaver and beach inspector, positions he held for four decades. Laidlaw (1989: 35) revealed his cautious approach to lifesaving in the interview during which he warned that the surf 'changes so quickly and so many things can happen'.

It is impossible to determine the truth of Laidlaw's allegation. However, notwithstanding Meagher's reputation, his evidence to the Coroner's Court expressed supreme confidence in the prowess of Bondi surf lifesavers as well as an element of victim blaming. Meagher told the Coroner that 'people were clawing at each other, pulling each other under and trampling on each other. We could have got them all back but for that' (DLMA 26/2/38: 1; see also NMH 26/2/38: 11). Both positions resonate with historical analysis of surf lifesaving culture, an understanding of which contributes further to the myth of Black Sunday.

Descriptions of elite lifesavers began appearing soon after the movement formed. Journalist Egbert Russell (1910: 23),

for example, called them 'a gladiator caste' who 'strut the beaches with superiority that is insolent'. In an analysis of the lifesaving movement in the interwar years, including several iconic pictorial images, historian Kay Saunders (1998: 103) shows lifesavers 'literally and figuratively' superseding the previous generation of soldier heroes. Subordination of the sea was a key ingredient in the surf lifesaver as national hero. This emerges in scores of books about the movement that bear titles such as Heroes of the Surf (Harris, 1960), Gladiators of the Surf (Galton, 1984), Surf: Australians Against the Sea (Maxwell, 1949), and Vigilant and Victorious (Brawley, 1995). Not surprisingly, Maxwell (1949: 87) would declare 'there could exist no conditions at all likely to intimidate these men'.

SUMMARY

- Popular stories of the mass recue and multiple drownings at Bondi Beach on 6 February 1938 are overly simplistic, replete with silences, and devoid of critical assessment.
- A philosophy of conquering the sea underpins the culture of Surf Life Saving Australia.
- Surf Life Saving Australia's philosophy of conquering the sea undermines its safety practices.

Moving forward

- Effective water safety policies and practices must take into account cultural factors that predispose risk taking in the surf.

CONCLUSION

'The media', Brawley (2007: 142) notes, 'did not immediately pick up on the [Black Sunday] label' but the national association appropriated it to signify 'the bravery, dedication and indispensability of the surf lifesaving movement'. Over the last 80 years this became historical orthodoxy. Challenging this orthodoxy as a myth is not merely an attempt to correct historical facts. Rather, it is an attempt to expose the specific interests that the myth of Black Sunday serves. The ongoing controversy over the deaths of three lifesavers who drowned while competing in tumultuous surf at the national titles in 1996, 2010 and 2012 (Surfprobe Australia, 2015), remind us that questions about SLA's assessment of risk are still pertinent.

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Note: 1. Bernard Byrne (34), Ronald McGregor (21), Leslie Potter (19), Carl Saur (53) and Michael Taylor (45).

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Ngati Porou Surf Life Saving Incorporated: Maori, empowerment, water safety, and surf lifesaving

Renee Wikaire

In this article I will illustrate the strategies and techniques used by Surf Life Saving New Zealand's (SLSNZ) newest affiliate club, Ngati Porou Surf Life Saving (NPSLS), to engage Māori and attract them into the surf lifesaving movement. I will begin by outlining the issue of high drowning rates among people of Māori descent. These rates belie the fact that Māori were once great ocean navigators who traversed vast oceans with inordinate skills, knowledge and expertise. I will then discuss the current Eurocentric culture of the surf lifesaving movement in New Zealand, the origins of this culture and the way it historically ostracised Māori. Lastly, I will look to the future and highlight the opportunity for growth, development and change within the surf lifesaving movement through initiatives such as the formation of NPSLS. In this last section I will discuss some of the strategies and techniques used by NPSLS to encourage Māori and draw them into surf lifesaving.

THE ISSUE: CULTURAL DISCONNECTION AND DROWNING AMONG MĀORI

New Zealand has a coastline of approximately 14,000 kilometres comprising sandy beaches, bays, estuaries, and rugged and remote cliffs. Many New Zealanders enjoy these diverse water playgrounds. But they are treacherous playgrounds. At present, the average unintentional drowning toll in New Zealand is around 130 per annum, which is almost double the rate of other socially developed countries such as Australia and the US (Drownbase NZ, 2015). Haimona and Takarua (2007: 85) highlight the issue of drowning in New Zealand when they observe that it is 'the third highest cause of accidental death'. These waterways are particularly treacherous for Māori who made up 20% of the drowning rate between 2009 and 2013. Whilst Māori constitute approximately 15% of the total New Zealand population, on average 27 Māori die from drowning per annum and a high number are hospitalized with water-related injuries (Drownbase NZ, 2015). Furthermore, research by the University of Otago Injury and Prevention Research Unit shows that in the past 20 years, although the overall drowning rates in New Zealand have been decreasing, the rate of Māori drowning has been increasing.

These statistics stand in stark contrast to traditional culture that acknowledges and celebrates Māori as people of the moana (ocean). Spiritually and culturally Māori have strong ties to the moana; Māori view water as the source or sustainer of all life and culture. Much of traditional Māori culture and world views have been based around the moana. One must only look at the plethora of references to the ocean throughout the many different iwi (tribe), hapū (sub-tribe) and whānau (family) that make up the Māori world to understand the central role of water in this culture. Many legends and cultural customs surrounding the water were passed from generation to generation during activities such as fishing, food gathering, waka paddling and sailing, thus weaving together the social fabric of Māori society. However, during the colonial period, Western, Eurocentric perspectives severed and replaced many traditional Māori cultural ties (Hokowhiti, 2004). Indeed, like many other indigenous nations around the world, Māori live with the ramifications of this colonial period: much of the current work regarding water safety in New Zealand, for example, is situated in Pākehā frameworks and conceptualisations of water.

As stated above, the disproportionately high drowning rates of Māori in New Zealand is one social sphere in which Māori have been negatively affected. Other such spheres include, but are not limited to, health statistics, educational achievement, and socio-economic status. So this leads to the question, why? Why are Māori overrepresented in these negative social statistics?

SLSNZ: A EUROCENTRIC CULTURE

The surf lifesaving movement in New Zealand was born out of the Australian Royal Life Saving Society. Contrary to the functionalist assumption that Pākehā were natural beach goers who responded to New Zealand's coastal landscape, the surf lifesaving movement played an integral role in the social construction of the beach as hedonistic space for surfbathing and was at the fore of social debates around morally correct behaviour at the beach (Booth, 1998).

Booth (1998) demonstrates that surfbathing originated in eighteenth-century England when medical practitioners informed wealthy aristocrats about the health benefits of bathing in cold sea-water. From this, aristocrats adopted the practice as a healthy pastime which then 'developed into the sport of swimming' (Booth, 1998: 44). It is no surprise that these pastimes were adopted by many of the colonial outposts of the British Empire such as Australia and New Zealand. However, the act of exposing the body in public in nineteenth century England was unusual and many 'English moralists' condoned the indecently exposed swimmers. In many locations surfbathing was prohibited or restricted to certain hours, places, or laws of segregation of the sexes

(Booth, 1998). The institutionalisation of the surf lifesaving movement in New Zealand, through the formation of clubs such as Lyall Bay (1910) and New Brighton (1911), was critical to the legitimisation and popularisation of surfbathing.

The provision of a safety service for those who lacked confidence in the water was also critical to the legitimisation and popularisation of surfbathing. Today, SLSNZ still provides a public service, helping to keep beaches safe and saving people from drowning in the rapidly changing and unpredictable waters around New Zealand. The clubs are also social and cultural institutions. According to Bob Harvey, president of SLSNZ (2009-2012), surf lifesaving clubs

> broke down social barriers and established a comradeship between strangers. Selection for lifesaving tended to break down prejudices. All clubbies were treated equally - lawyers, plumbers and farm hands worked together to save lives. Their only qualification was an ability to move through the surf. A bronze surf medallion (now the Surf Lifeguard Award) was the entry to a new world that didn't exist in any factory or office block (SLSNZ Website, 2013: 13).

While surf lifesaving clubs may have broken down some social barriers, they have reinforced others. It is important to note that the foundations of this movement are founded in Victorian England, and Eurocentric ideologies and practices still govern SLSNZ.

Eurocentric ideologies and practices present barriers to Māori participation in the surf lifesaving movement. As veteran Māori surf lifesaver and founder of the newly formed kaupapa Māori based NPSLS Peter Boyd states,

> It's about finding a brown door, you know a lot of our Māori youth perceive surf lifesaving as being a Pākehā institution and so they don't want to get involved. Whereas if you have the right people, such as other Māori, their whānau, and leaders in their communities saying to them, come and join surf lifesaving and doing it in a more culturally relevant or 'Māori way', then yea I think they're more likely to feel more comfortable and want to participate (personal communication, 18 January 2014).

Reflecting on more than thirty years involvement in the surf lifesaving movement, Boyd attributes the lack of Māori participation to cultural differences. Thus, in order to honour the Treaty of Waitangi it is important to address the tangata whenua of New Zealand's need for improved water safety education as the first priority. However, I also acknowledge that as New Zealand's population becomes more diverse, there is a need for water safety organisations to understand and develop strategies that encourage all other cultures and peoples to become involved in water safety education given the nature of New Zealand's coast. Nonetheless, the aim of this project is to specifically address the lack of participation amongst Māori in surf lifesaving in New Zealand.

NPSLS: STRATEGIES FOR EMPOWERING MĀORI

In 2014, during my role as the Club Support Manager for Gisborne/Tairāwhiti at Surf Life Saving New Zealand, I worked with Boyd to help him establish NPSLS. A veteran surf lifesaver of 30 years and a longstanding member of the Wainui Surf Life Saving Club, Boyd had planned to start a new club at Hicks Bay. He had experienced the Eurocentric culture in the surf lifesaving movement and seen how that culture had deterred Māori. His vision for NPSLS is to break down the barriers preventing Māori from entering surf lifesaving by creating a kaupapa Māori-based club.

NPSLS aims to encourage Māori participation in surf lifesaving and to reduce the drowning rate of Māori through education and prevention. Above is the club's logo which features Paikea. According to Ngati Porou, Paikea was the first ancestor to come to New Zealand on the back of a whale. The club uses Paikea's story to highlight the fact that many of the members have genealogical links to Paikea, whilst reinforcing that historically Māori have been people of the ocean. The club utilises the story of Paikea to highlight the connection that its members have to the ocean through their genealogy.

In the remainder of this section, I will outline some of the techniques and strategies used by NPSLS to encourage Māori involvement in surf lifesaving.

RECRUITMENT

The club holds numerous 'have a go' community days at local beaches including Hicks Bay and Reporua. 'Have a go' days encourage the community to participate in stand-up paddle boarding, waka paddling, and kaimoana gathering. The club's initial recruitment strategy is to get people into and onto the water to have fun in a safe and friendly environment.

UNIFORM

The traditional lifesaver's uniform of speedos for men and bikinis for women reinforces perceptions about preferred body shapes and is a barrier to participation for many Māori surf lifesavers. NPSLS thus encourages members to wear board shorts, rash shirts and wetsuit shorts which emphasise a different body shape and style.

ACCESS

For many Māori communities access to equipment is a large barrier to participating in a sport or recreation. By providing

equipment, NPSLS can help overcome this barrier and improve the education and skills of members.

FUNDING LITERACY

NPSLS is a charitable trust and a vehicle to gain funding for equipment, programmes, education and courses. In rural communities, such as Hicks Bay and Te Araroa, access to such resources has immense community value. NPSLS also teaches members and the community about accessing funding so that the club and its initiatives can be sustained over the long-term.

EMPOWERMENT

Empowerment refers to the culmination of all the previous points. Through education, NPSLS is building the water safety literacy and capacity of rural and predominantly Māori communities. The goal of NPSLS is to establish a sustainable club to encourage Māori to enjoy water environments in a safe way. Empowering communities also offers other benefits, especially for the youth, including increased self-esteem, confidence, leadership and service.

CONCLUSION

In this article I have highlighted some of the cultural dynamics of the surf lifesaving movement. Specifically, I drew on some of the strategies that NPSLS has utilised to encourage more Māori to become involved in surf lifesaving. These techniques have been successful for NPSLS but should not be taken as an overarching way to get all Māori involved in Surf Life Saving. Rather, these strategies and techniques should be viewed as lessons that can be used to inform local initiatives in other areas in consultation with local iwi, hapū and whanau. The development of Māori initiatives and other cultural initiatives within SLSNZ has great potential, but it is also an area that needs careful, and culturally considered, thought and research.

SUMMARY

- A Eurocentric culture frames the Surf Life Saving movement in New Zealand.
- There are opportunities to grow and diversify the culture of Surf Life Saving New Zealand.
- Ngati Porou Surf Life Saving has adopted a number of strategies and techniques to better engage more Māori in Surf Life Saving.

Moving forward

- More research is needed to understand the diversity, and multitude, of Māori perspectives on water safety.

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One day a waka for every marae:*

A southern approach to Māori water safety

Hauteruruku ki Puketeraki (Brendan Flack, Suzi Flack and Hinerangi Ferrall-Heath), Anne-Marie Jackson, Ngahuia Mita, Hoturoa Kerr, Samantha Jackson & Chanel Phillips

> Kaupapa waka [the purpose of canoe] has a significant role in contributing to the survival and well being of our culture and people. The ocean was once the highway and playground of our tūpuna (ancestors) who traversed the greatest seas and overcame the many challenges that they faced, to seek a life out for us now the living descendants of exceptional explorers, of way finding and sea faring (Personal communication, Kelly Harrison, 2014).

We are the whānau (families) from Hauteruruku ki Puketeraki. Hauteruruku ki Puketeraki is a sub-tribal waka (canoe) club based in Karitāne, a coastal community located 40km north of Dunedin. Our vision is to connect and reconnect all our members and members of our community with the local awa (river) and moana (sea) through ngā waka (canoes) and Te Ao o Takaroa.** We are a group of people who are passionate about Tangaroa (god of the ocean) and waka. In this article, we will outline who we are and our approach to Māori water safety, which is based on the importance of the connection to the water.

As Māori, we are waka people. There are numerous stories that tell of Māori as seafaring people, with a significant amount of mātauranga (Māori knowledge) and tikanga (cultural practice and protocols) associated with the ocean. Māori engagement with waka is entrenched in Māori cosmology. Tāne-mahuta (god of the forest) ascending to the skies in the waka of Tamarereti and the many stories of Māui (Māori ancestor) are evidence of the importance of waka in Māori tradition (Walker, 1990). The remnants of these stories are imbued within our landscapes.

The origins of more recent ancestral waka are within Polynesia and there is whakapapa (genealogy) that connects us to our seafaring ancestors. These ancestors were navigating Te Moana-nui-a-Kiwa (the Pacific Ocean) long before the settlement of New Zealand (Evans, 1997; Walker, 1990). Walker (1990) asserts that from around AD200 these ancestors were completing voyages spanning across the Pacific, moving through the boundaries of the Marquesas, Hawai'i and Rapanui (Easter Island). Walker (1990) explains the knowledge and seafaring prowess held by these ancestors, which allowed for the navigation of the ara-moana (sea routes) that led them to Aotearoa (Walker, 1990).

Waka are also important in the discussion of Māori identity (Taonui, 1999). Stories of migration upon waka explain how iwi (tribes) and hapū (sub-tribes) came into being and occupied tribal lands (Taonui, 1999). Ngāi Tahu traditions are steeped in waka kōrero (canoe stories). The landscape of Te Waipounamu (the South Island) also known as Te Waka o Aoraki, and Te Waka a Māui tells a story of our connection to waka. These stories pertain to the island itself as a physical manifestation of the waka of Aoraki and of Māui, and to the various names of the lakes dug out by Rākaihautū (an ancestor) as he travelled south on the Uruao waka. For us the Araiteuru waka is eminent within the history of Te Waipounamu and has a strong connection with Hauteruruku ki Puketeraki. The coastline around Karitāne, where our rōpū (group) is based, is called 'Te Tai o Araiteuru'; this is a further example of how the landscape of the south, Puketeraki in this case, is imbued with waka kōrero. As the people of Araiteuru explored their new land and made new discoveries, their names were affixed to the landscape. These voyagers are remembered today when we look upon the hills to the west and north of Puketeraki. These names include the ancestors Hikaroroa, Pahatea, Ka Iwi a Weka, Te Wai o te Ao, Nga Tamariki a Hekura, Pakahiwitahi, Rua Tupapaku, Puketapu and others (Hauteruruku ki Puketeraki Inc, 2012;). Araiteuru waka not only connects the people of Hauteruruku ki Puketeraki to waka but also shows the direct link that waka of this area have with the land and sea which provides an immanent context for this project and the significance of the work of Hauteruruku ki Puketeraki in recapturing and re-envisioning these stories.

HE AHA AI? WHY?

For our whānau, being involved in waka has firmly centred us within our cultural traditions. Waka have become the vehicle by which we are able to embody the narratives of our ancestors. In our fast paced lives, many of us have become disconnected both with our ocean traditions and our whānau. As Māori we have high rates of drowning. In the recently released half yearly drowning statistics, Māori comprised 23% of drownings, although Māori are approximately 15% of NZ's population (Water Safety New Zealand, 2015). Furthermore, our kaimoana (seafood) supplies are becoming depleted and there are increasing environmental issues (Hepburn, Flack, Richards, & Wing, 2010; Hepburn, Jackson, Vanderburg, Kainamu, & Flack, 2010; Jackson, 2013; Jackson, Hepburn, & East Otago Taiāpure Management Committee, 2010). In our experience, these issues stem from a disconnection to Tangaroa. Without understanding our atua (gods), there is difficulty in showing them the respect and reverence that our tipuna (ancestors) had.

Within all of us is a connection to Tangaroa. We are all descended from seafarers. Part of our role as kaitiaki (guardians) is to re-awaken that connection. Thus our

* Traditional Māori meeting house.
* Name of Tangaroa in Ngāi Tahu (a primary tribe of the South Island) dialect.

approach to Māori water safety is 'one day a waka for every marae'. For the past three years, through our shared passion for waka, we have been providing one-off waka and water safety experiences for other whānau.

TŌ MĀTOU HITORI: OUR HISTORY

Like many other groups, we are all volunteers who share our knowledge for the love of the kaupapa (purpose) of waka. We have functioned primarily through koha (gift giving or reciprocation). Our hope is to be able to expand on what we've been doing to literally 'get people on the waka'. Our idea for waka-based water safety programmes began after Brendan joined Te Moana o te Moana in 2011 as a crew member of the large double hulled sailing waka Haunui, which sailed across the Pacific under the guidance of Hoturoa Kerr. Upon Brendan's return, a number of the whānau built a waka unua (small double hulled sailing canoe) which we named Hauteruruku. We established a relationship with the University of Otago School of Physical Education, Sport and Exercise Sciences which lent us one of their waka ama (outrigger canoes), as did the Dunedin based waka ama club, Fire in Ice, in return for looking after them.

We have run a number of water safety activities to date including: building waka; paddling waka ama and waka unua; tamariki (children's) holiday programmes; navigation wānanga (both traditional and modern learning events) and traditional knowledge wānanga; whānau waka days; Te Reo (Māori language) waka days and; taking groups out on the water who are staying at Puketeraki Marae, when we are available. We have also run a Day Skippers course alongside Water Safety New Zealand, which was led by Rob Hewitt. In mid 2014, we were gifted a kayaking business including approximately $40,000 worth of gear. We have recently gained funding for a youth science project, which examines waka as science vessels.

We have the ability and passion to be able to revive our traditions about waka and ensure that our whānau are safe on and in the water. We also hope to be able to share our knowledge with people from other marae. However, at present we lack the capacity and time to meet the needs of our whānau.

Ō MĀTOU HONONGA: OUR RELATIONSHIPS

We have strong relationships throughout Otago and New Zealand. These relationships include: Kāti Huirapa ki Puketeraki; Te Rūnanga o Ngāi Tahu; Water Safety New Zealand; Te Toki Voyaging Trust; Te Taitimu Trust and; University of Otago School of Physical Education, Sport and Exercise Sciences.

There is no specific initiative in Otago that is trying to solve the problem of the connection Māori have to the ocean. At a national level Water Safety New Zealand contributes to Māori water safety. Te Taitimu Trust within the Hawkes Bay region and Te Toki Voyaging Trust (including Haunui waka) in the Waikato have programmes that connect Māori to Tangaroa. In Dunedin, the Fire in Ice Waka Ama Club promotes waka ama and we support their club through tikanga and in turn Fire in Ice support us with the technical aspects of waka ama. We also support different programmes at the School of Physical Education, Sport and Exercise Sciences. Within the Ngāi Tahu whānui (wider family network), there are similar approaches in terms of the connection to Tangaroa, but there are no specific groups that are focusing on waka building and water safety programmes. At our marae, we are the group that provides the experience for whānau and mahuhiri (guests) to engage with Tangaroa. Thus, we hope to sit beside the marae and to enhance what the marae offers. We already have relationships with all of these groups (and many of our group are members of these other organisations as well).

Ō MĀTOU WHĀINGA: OUR PLANS

Our goals are to:

- build a small waka unua
- create water safety programmes
- build capacity within our whānau.

Our waka unua will connect our whānau to our cultural traditions from Tāne to Tangaroa to Tāwhirimātea (god of the winds). Our water safety programmes will ensure the safety of our whānau within Tangaroa. Our capacity building will ensure those who are delivering our programmes are able to do so with confidence in tikanga and safety protocols.

NGĀ HUA MŌ TE WHĀNAU: WHĀNAU OUTCOMES

> Reconnecting whānau, hapū and iwi. Seeing the light in the eyes of kaumatua and tamariki alike when they suddenly feel the pride of being Māori and a descendant of great ocean going ancestors (Personal communication, Hoturoa Kerr, 2014).

Some of the outcomes we have seen already are: whānau access to waka in a safe environment; whānau waka leaders are becoming trained to deliver water safety programmes; whānau have their own waka, which we have built, and we are involved in building another waka; revival of waka traditions and deeper understanding of our connections to tūpuna and Tangaroa. Through strengthening our club and running programmes we will ensure and secure longevity into the future so that the passion awakened around waka and Tangaroa continues, enabling us to give continuous safe access to this realm.

CONCLUSION

Māori water safety is much more than preventing drowning; it is about re-awakening the connection to our ancestors within the realms of our deities. We will be a people in the south once again connected to our tīpuna, through Tangaroa. We will be effective kaitiaki of ngā tini a Tangaroa (guardians of the offspring of Tangaroa). Tangaroa is our tuakana (older relation). Our people will understand him better, respect him, and this will be reflected in our safety on and around him, and our improved knowledge of protecting his progeny and

the coastal resources. You cannot understand Tangaroa until you can trust him.

We are waka people. Something in our DNA and our hearts and minds responds to the mauri (life essence) that is contained in the wai (water); either waimāori (fresh water) or waitai (coastal water). Maybe it is wairua (spirit) or waiora (positive spirit). We know others experience this when they travel on Tangaroa with us. We love introducing whānau to our waters. We do it in the rain, we do it in the wind, we do it in summer and winter. We do it because we love it.

Mā te whakatau ka mohio, through discussion comes understanding

Mā te mohio ka mārama, through understanding comes enlightenment

Mā te mārama ka mātau, through enlightenment comes wisdom

Mā te mātau ka ora, through wisdom comes life

SUMMARY

- Hauteruruku ki Puketeraki is a sub-tribal waka (canoe) club based in Karitāne, a coastal community near Dunedin.
- Hauteruruku ki Puketeraki has a vision to connect and reconnect its members and members of the community with the local awa (river) and moana (sea) through ngā waka (canoes) and Te Ao o Takaroa (the world of the God of the Ocean).
- Hauteruruku ki Puketeraki advances safety in the water by re-awakening the connection to ancestors through the realms of deities and thus building respect for the ocean.

Moving forward

- Hauteruruku ki Puketeraki will continue to engage with the customs and rituals of the water as a means to strengthen the connection to Tangaroa. As well as empowering people as kaitiaki (guardians) of the water, this connection can improve the skills of those who engage with the water.

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Immersing in thermal extremes: Hazards and opportunities

Jim Cotter, Carl Bradford, Sam Lucas, David Gerrard, Kate Thomas & Chris Button

Nearly all of New Zealand's coastal and inland waters are cold and well below the physiologically and perceptually optimal temperatures for resting (34-36°C) and exercising (26-28°C). While many factors precipitate, or at least facilitate, drowning, some are driven by cold temperature. In this article we provide physical educators with a brief update on the acute and adaptive effects of cold-water immersion, including gaps in the science. We also consider the effects of hot water as a stressor given that many Kiwis compete in open-water races held abroad in warm seas, and because immersion in hot water may have previously-unrecognised potential for health benefits. Table 1 summarises the paper.

THE IMMEDIATE EFFECTS OF COLD WATER

The cold shock response (CSR) is the most immediate and obvious physiological effect of entering cool or cold water. A rapid drop in skin temperature drives large increases in breathing frequency and depth, along with autonomically-mediated rises in heart rate and constriction of blood vessels that together increase arterial blood pressures. These cardiovascular and respiratory effects can be profound, with maximal breath-hold time declining to just a single second in extreme cases, which is problematic for people submersing upon entry into water, not least because the first breath (initial gasp) is the largest. Breathing frequency compares with that of intense exercise—up to one per second at its peak—and reaches near maximal levels in 15°C water in naked or lightly clothed individuals (Tipton et al., 1991). The CSR is therefore significant for New Zealanders in or around most outdoor waterways. Staged entry and mental effort will reduce the CSR, but swimming proficiency per se is not protective (Button et al., 2015).

Laboratory studies in which participants are exposed passively in cold water have shown that hyperventilation reduces carbon dioxide levels in the blood (i.e., respiratory hypocapnia), causing reductions in brain blood flow (Datta and Tipton, 2006) and potentially loss of consciousness (Mantoni et al., 2008). However, the current authors find that when immersion onset is rapid and followed by treading water, the reduction in brain blood flow appears to be mild (<20%) and brief, with flow rising above baseline by ~60 s for skilled and unskilled swimmers alike (Button et al. 2015), and is paralleled by well-maintained oxygenation in the brain region that is responsible for cognition.

Encouragingly, the CSR appears preventable to a large extent by rapid adaptation (e.g., 8-10 brief—~3 min—immersions into cold water) in conjunction with psychological skills training (Barwood et al., 2006; Barwood et al., 2007; Croft et al., 2013). The adaptation also seems robust—lasting at least 13 months—and is fully effective when the exposures take place in only moderately-cold water (15°C) (Tipton et al., 1998). Anxiety before immersion may blunt its effectiveness (Barwood et al., 2013), which is obviously problematic. Anxiety and physiological naivety to cold-water immersion would both seem more likely in people who do not utilise outdoor waterways for fun.

PHYSICAL INCAPACITATION

Cooling of peripheral nerves and muscle can be incapacitating, particularly in colder water (e.g., 10°C) (Tipton et al., 1999). It may develop in conjunction with CSR or more than an hour later. Swim failure occurs readily in poor swimmers but can strike good swimmers, and is characterised by reduced stroke length, increased stroke rate, reduced swimming proficiency and ultimately failure (Lounsbury and DuCharme, 2008). The upper limbs seem most problematic in causing incapacitation. They are important for effective swimming, treading water and survival tasks (e.g., dexterity and strength for working zips, knots, etc), but are also highly susceptible to cooling because of their low volume, thermal mass and skinfold thickness, and their relatively high surface area and movement-induced convective cooling (Tipton and Bradford, 2014). Unsurprisingly, larger arm girth and skinfold thickness both predict swim tolerance, and adding neoprene sleeves provides modest functional and physiological benefits (Lounsbury and DuCharme, 2008). These are most logically provided by a long-sleeved wetsuit.

A HIDDEN KILLER IN SWIM RACING?

A unique combination of factors within open-water swimming races has been suggested recently as a possible cause of drowning. The notion is of autonomic conflict, whereby the two normally-opposing divisions of the autonomic nervous system are activated simultaneously to precipitate an almost intractable arrhythmia (Shattock and Tipton, 2012). While swimming per se can stimulate both divisions because of facial immersion and skin cooling during exercise, racing is more likely to elicit two additional drivers—anger induced by competitive conditions and nasopharyngeal stimulation from aspirating water—which may account for elevated mortality during swimming competition compared with training (Tipton and Bradford, 2014; Tipton, 2013).

HYPOTHERMIA IN VERY COLD WATER

Hypothermia, a core temperature below 35°C, is reached after approximately one hour for adults when stationary even in extremely

cold water (0-10°C) despite its very high conductivity and convectivity. Further core cooling, to approximately 30°C, is estimated to cause drowning, and may take 4 hours if stationary in calm 10°C water, or half of that if survival movements are required (Hayward et al., 1975). Life jackets can aid survival partly by reducing movement requirements. This improves insulation both internally, by minimising blood flow into the limbs, and externally, due to a more closed posture and larger boundary layer of water around the body (Hayward et al., 1975). Core cooling is also faster following exercise or passive warming (Scott et al., 2004), and is accelerated greatly by swimming despite the additional heat production (Tipton and Bradford, 2014). Lean athletes can become hypothermic even swimming short distances in water temperatures for which wetsuits are forbidden by international triathlon and swimming regulations (1.5 km in 20-21°C) (Tipton and Bradford, 2014; unpublished observations from our laboratory). The early post-immersion period is problematic for the heart because of the sudden loss of water's compressive (flow-supportive) effect on the veins (i.e. hydrostatic unloading) upon exiting the water, exercise demands, and exercise-induced worsening of the after drop in core temperature. This aspect of water safety requires more research, particularly because it is also now evident that repeated cold-water immersions typically fail to induce any adaptive protection against core cooling, and if anything, speeds up cooling (Brazaitis et al., 2014; Tipton et al., 2013).

SWIMMING IN WARM WATER

Open-water swimming events are increasingly popular and expose swimmers to environments, such as heat-stressful water, to which humans have not adapted (Tipton and Bradford, 2014). Immersion in heat-stressful water nullifies the effectiveness of sweating; our most powerful means to counteract exercising heat stress. If conduction and convection—which depend on the temperature difference between skin and water—are insufficient, hyperthermia develops. Therefore heat production (i.e., exercise intensity) must be curtailed if heat stroke is to be avoided. Curtailment requires that swimmers are aware of their heat stress (become uncomfortably hot) as core temperature rises. Fortunately, they do (Bradford et al. 2013). And, heat loss appears sufficient to prevent undue hyperthermia while swimming at competitive intensity, even under simulated tropical radiant heat loads in 31°C water. Unlike humans' large adaptations to heat stress in response to exercising in warm air, no meaningful adaptations occur in response to swimming in warm water (Bradford et al. 2015).

REPEATED BATHING

Health and wellness effects of aquatic exercise are well recognised and not addressed here. Athletes also utilise cold or alternating cold-hot immersion following training bouts in the mistaken belief that it aids their adaptation. However, people may benefit from regular immersion for reasons that are largely unrecognised and therefore yet to be adequately researched. For example, it now appears that fat in adults—which is white—may be adapted by chronic cold stress to become more metabolically active (Diaz et al., 2014). This 'browning of fat' stands to improve metabolic health and be achievable with realistic extents of resting in cold water or swimming in cool water, but requires research.

Other potential health benefits relate to tissue heating, such as might be achieved by spa bathing for people who do not generate their own heat via intense exercise. A single bout of heat stress can render the heart and skeletal muscle more resilient to stress, while repeated bouts provide beneficial remodelling within the heart, blood vessels and skeletal muscle and might therefore counteract various non-communicable diseases (e.g., sarcopenia, peripheral arterial disease, type 2 diabetes) (Green et al., 2010; Khaliulin et al., 2007; Yoshihara et al., 2012).

Immersion per se increases brain blood flow to an extent comparable to exercise (10-20%) (Carter et al., 2014), while exercise in water has an additive effect (Pugh et al., 2014). The increase is due mostly to water's hydrostatic effects on the cardiovascular system and partly also on the pulmonary system (by increasing carbon dioxide levels in the blood) (Carter et al., 2014). Regular immersion with or without exercise, and in a wide range of water temperatures, may therefore have considerable promise for brain health, but this is yet to receive research attention (Lucas et al., 2015).

SUMMARY

- Most New Zealand waterways are cold and contain two or more of the key risks that precipitate drowning: cold shock, incapacitation, autonomic conflict, and hypothermia.
- People can adapt rapidly, strongly and robustly against cold shock but they cannot adapt meaningfully to delay hypothermia.
- Cold- and heat-stressful water may be therapeutic against metabolic and cardiovascular diseases but the research is still in its infancy.
- Experience and habituation are known to reduce shock from immersion in cold water, which is a likely cause of drowning.

Moving forward

- Water safety programmes should consider safe and practical ways to regularly expose people to immersion in cold water (e.g., 15°C) as a method to reduce the negative consequences of shock and therefore decrease the risk of drowning.

Table 1. Physiologically-related hazards and opportunities with immersion in cold- and heat-stressful water.

	Water temperature (°C) 0 5 10 15 20 25 30 35 40 45	Time frame	Adaptation?	Comment
Hazards				
Cold Shock Response (CSR)		0 - few minutes	✓	Important
Incapacitation		0 – ~90 minutes	?	Multifactorial
Autonomic Conflict (AC)	?	Seconds - minutes	?	Needs research
Hypothermia		>30 minutes	×	Cool faster if swim
Hyperthermia		~20 - 120 minutes	×	Few data
Opportunities for health effects*				
Metabolic		Days – weeks	✓?	Muscle resilience
		Weeks	✓?	Browning of fat
Cardiovascular		Days – weeks	✓?	Multiple effects
Cerebrovascular		Weeks	?	Needs research

*In clinical populations, and additional to the many beneficial effects of the exercise itself. The vertical bar represents thermally comfortable water temperature for swimming.

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Water safety and the value of interdisciplinary approaches: A concluding dip

Richard Pringle

This collection of articles reveals some of the diverse recreational relationships that New Zealanders and Australians have with fresh and saltwater environments, from surfing to river crossing, competitive swimming to surf lifesaving, and, aquatics education to waka ama. Within each of these different fluid environments, there exists diverse sets of values, attitudes, identities, risks and joys. The associated pedagogical work, which Richard Tinning (2010) defines broadly as the re/production of knowledge, ideals and beliefs, is subsequently complex. The complexity of this pedagogical work requires a broadened understanding of water safety. Although water safety focuses on drowning prevention, it is also concerned with fostering enjoyment and wider issues such as safety issues associated with diverse cultural beliefs (e.g. tikanga Māori), identities (e.g. via challenging sexism in surf cultures), social practices (e.g. religion and women-only swimming times), the environment (e.g. ecology), and learning opportunities (e.g. attempting to retain school pools). This expanded view of water safety concomitantly challenges researchers, health and physical educators, and Water Safety New Zealand (WSNZ).

In recognising the pedagogical challenges of a wider notion of water safety, this collection provides an interdisciplinary approach to examining and understanding the subject. In this concluding article, I comment on the value of interdisciplinary problem-solving approaches and discuss the possibilities for interdisciplinary research into water safety.

INTERDISCIPLINARY APPROACHES

The problem of drowning is connected to a myriad of factors. These factors include, as examples in this edition, the unpredictability of the water environment (Brander), physiological responses to cold- and hot-water emersion (Cotter et al.), sub-cultural attitudes to risk (Booth), ability to swim/float (Button), and risk management strategies (Mulchay). There are also clear sociological dimensions to drowning which are reflected in the mortality rates that are differentiated by age, gender and ethnicity; in New Zealand young males and Māori are both disproportionately represented (Water Safety New Zealand, 2013). The problem of drowning subsequently demands interdisciplinary solutions.

Research approaches have been traditionally divided into different disciplines within the sciences, humanities and arts. This division has produced a wealth of in-depth knowledge within different disciplines and sub-disciplines. Yet, at the same time this division has severed important connections between disciplines that allow for more complex understandings. For example, within physical education, an interdisciplinary field that includes, inter alia, biomechanics, exercise physiology and sport pedagogy, the links between the various sub-disciplines are often tenuous. This situation continues notwithstanding the long recognised advantages of interdisciplinary research for solving complex scientific and social problems. In the 1920s and 30s, as an example, Marcel Mauss (Emile Durkheim's nephew) discussed the importance of integrating physiological, psychological and sociological factors in order to produce a more rounded understanding of social problems.

Only in recent years has the value of interdisciplinary approaches been more openly discussed and promoted. Indeed, there has been an increased recognition that contemporary social, political, economic and scientific problems are multifaceted, non-linear and dynamic and, correspondingly, cannot be solved by the reductionist approaches of a single discipline. In this context, interdisciplinarity has become a hot topic within contemporary academic discussions and many research/funding agencies are now encouraging such approaches (Locker, 1994; Krishnan, 2009). The University of Auckland, for example, offers internal research funding for projects undertaken by researchers from at least three different faculties.

Armin Krishnan (2009: 2) suggested that the increased interest has been fuelled, in part, by the assumption that 'disciplinary research has become too narrowly specialized', parochial, and now yields 'diminishing returns'. An examination of the International Journal of Aquatic Research and Education supports Krishnan's critical observations. The journal's self-stated mission is to advance 'the knowledge and practices of aquatic professionals worldwide' (About IJARE, 2015). The journal further states that it 'publishes significant research findings, articulates unique and innovative ideas, challenges current practices and proposed changes, and disseminates information about the latest and best use of equipment and facilities' (About IJARE, 2015). Despite these iconoclastic aims, the editors' report on the first

six years of the journal's publication reveals a somewhat narrowly specialised focus with the majority of articles falling into three broad categories: drowning prevention, lifesaving/lifeguarding, and aquatic exercise physiology (Langendorfer, Turick & Kaunert, 2013). In addition, the scientific approach prevailed amongst the original research articles with qualitative research approaches and contributions from the arts or humanities virtually absent,* although more recent editions have included articles that draw on narrative accounts and focus group interviews to explore psychosocial dimensions of aquatic recreations (e.g. see, Rathwell, Callary & Young, 2015; Giles, Stadig, Darroch, Lynch, Issaluk & Strachan, 2014).

Krishnan's issue of diminishing returns with respect to the impact of aquatics-based research is difficult to judge. But if we assume that the knowledge produced in the International Journal of Aquatic Research and Education and other sources filter into the public consciousness and shape water-related behaviours and policies, then this could explain the steady decrease in drowning rates in Aotearoa New Zealand. In the mid-1980s about 160 New Zealanders drowned each year; in more recent times that has dropped to approximately 108 (Moran, 2008). The drowning rates in the nineteenth century were likely even higher on a per capita basis, as historians remind us that this form of fatality was so ubiquitous that drowning was dubbed 'the New Zealand death' (Maynard, 2013).

If we desire to see drowning rates continue to fall, while participation in water recreation continues to increase, then we need to employ a greater range of research methods (such as revealed in this special edition) and adopt interdisciplinary approaches. Yet, this leads to the question: if many researchers agree that interdisciplinary research makes good sense, then why has this approach remained marginal?

A key stumbling block with respect to the promotion of interdisciplinarity is related to the difficulty of judging the academic quality of this endeavour. While the academy recognises the importance of interdisciplinary research, the lack of professional mechanisms to evaluate this form (i.e. publication in high-ranking journals and prestigious large grants) has led senior scholars to advise early career researchers against pursuing interdisciplinary research.

Interdisciplinary research has also remained marginal primarily because it is difficult to do. Every discipline has its own language, epistemological beliefs and rules of legitimation. Particular concepts, accordingly 'cannot be simply borrowed across disciplines without mobilizing disciplinary boundary struggles' (Papoulias & Callard, 2010: 50). Indeed, many researchers accept that quantitative and qualitative methods are indirectly linked to incommensurable paradigms and, therefore, the gulf between quantitative and qualitative can, at times, appear too difficult to bridge. Nonetheless, I agree with Fonow and Cook (2005: 2213) who asserted that 'innovative methods are derived from successful efforts to reconcile differences and even from those efforts that conclude that certain epistemological differences are irreconcilable'.

Donmoyer (2006) further argued that even if one subscribes to the notion of paradigm incommensurability, it makes pragmatic sense to at least read the work stemming from other paradigms that concern the same topic. He explained:

> In decision-oriented public policy fields, one must consider issues from a range of paradigmatic perspectives precisely because … what can be seen by examining the world through one perspective or paradigm may not be visible from the vantage point provided by another. (Donmoyer, 2006: 23)

Following Donmoyor (2006), I suggest that water safety research is a 'decision-oriented public policy field' and it is therefore important to at least read the research stemming from other disciplines; hence, this special edition.

REFLECTING ON THIS SPECIAL EDITION

The value of this special edition lies in its attempt to promote different research approaches for understanding water safety. This is a first and important step in promoting interdisciplinary research. 'A waka for every marae', for example, provides insights into a unique way of promoting Māori water safety and waka-based activities: a way that simultaneously promotes tikanga to enhance Māori identity, knowledge and wellbeing. Renee Wikaire's article achieves a similar goal. I consider these articles as exemplary examples of, and approach to, promoting water and cultural safety.

Rather than offering concluding comments about the value of each article, I will illustrate, with four examples, how the differing articles offer opportunities for interdisciplinary research. Firstly, Chris Button's research on fundamental motor skills and Robert Brander's analysis of rips both illustrate the complexities associated with devising, promoting and teaching effective water safety knowledge. Both articles reveal the importance of forging closer links between scientists and sport pedagogues. Secondly, Robert Brander and Jim Cotter and colleagues reveal that staying in control of emotions is a critical aspect of survival if suddenly caught in a rip or immersed in cold water respectively. These articles highlight the potential for psychologists and water safety researchers to work together. The article by Cotter et al. is itself a reflection of an interdisciplinary approach given the team of diverse

* This is not to suggest that research concerning the sociology, history or economics of aquatics recreation, as examples, have not been undertaken but it does not appear in the International Journal of Aquatic Research and Education.

researchers who wrote the paper. The article also reminds us that water should not be reductively conceived as a risk or problem to be managed but also as a potential means to enhance health.

Thirdly, Douglas Booth's article demonstrates the relevance of historical research for understanding contemporary water safety issues. His article reveals how problematic attitudes, such as those associated with hyper-masculinity, can be uncritically promulgated over time to create (somewhat ironically) cultures of risk in places least expected (e.g. surf lifesaving clubs). Booth's questioning of the masculine culture in surf lifesaving links tangentially to WSNZ's strategic plan to reduce drowning rates: this plan hints that masculinity issues offer explanation for why men constitute approximately 80% of all drownings and that it is relatively youthful males who are at greatest risk. Kevin Moran (2011) suggests that young males (aged between 15 and 24 years) are not necessarily at greater risk because they are poorer swimmers but because they tend to overestimate their ability and underestimate the risk. He calls this, in an unflinching manner, the 'male disease'.

These findings that blend sociology and history with water safety knowledge have relevance for health and physical education programmes in schools. These programmes should offer pupils opportunities to discuss and examine the connections between masculinity, risk taking and water safety, so that pupils are made aware of the cultural influence and risks associated with performing hyper-masculinity and strategies of how to resist the attractions of unnecessary risk taking.

Finally, the article by Mike Boyes and Allan Hill indirectly reveals the connection between research findings and policy. Their findings have shaped the Mountain Safety Council's guidelines on river-crossing techniques and will have impact on water safety and enjoyment. Nick Mulcahy's evidence-based approach to aquatics risk management provides a more direct example of how applied research can shape policy. His approach reveals the complexity of site-specific risk management and the subsequent need for multiple strategies that recognise the importance of balancing individual freedoms with appropriate governance tactics.

In relation to this last point, it seems important for discipline-based researchers to think of how their findings can be disseminated more widely (i.e. outside of their disciplines) to have greater impact: an interdisciplinary-based approach is but one way of achieving such a goal. Moreover, if we accept that the broadened mission of water-safety researchers is to develop a culture of safe enjoyment around the water, then such a mission is perhaps best achieved, given the complex realities of water-based recreation, by teams of interdisciplinary researchers working to solve similar problems.

A pertinent example of this form of research stems from the Tucker Center for Research on Girls and Women in Sport (2007). The broad aim of this research was to explore the 'multiplicity of ways in which physical activity and sports have become essential in the lives of girls' (xv). Underpinned by feminist aims, the project consisted of a compilation of research from sport sociology, psychology, exercise physiology and metabolic studies to produce a broad set of recommendations of 'best practice' to enhance the quality of girls' lives.

In presenting this special edition, Douglas Booth and I believe that there is value in reading research stemming from different disciplines, even if you disagree with the research approach or the sentiment of the findings. We also hope that this tentative foray into interdisciplinary research might act as a spur to encourage more diverse approaches for achieving a broader culture of safe enjoyment around the water.

SUMMARY

- Water safety is a complex issue that requires interdisciplinary examinations and solutions.
- Effective and responsible approaches toward water safety should acknowledge drowning prevention and environmental and cultural safety issues.
- Research shows that there is value in promoting different approaches toward water safety.

Moving forward

- Interdisciplinary research is fundamental to achieving a broader culture of safe enjoyment around the water.

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Sport NZ update

KIWISPORT WILL HAVE A GREATER FOCUS ON LOW PARTICIPATION GROUPS

Sport NZ and Regional Sports Trusts will refocus some of the KiwiSport Regional Partnership Fund to provide more sport opportunities for young people in communities where participation rates are low and the risk of poor health is higher. Sport NZ is also working with Regional Sports Trusts to realign some general community investment towards low-participating young people.

Sport NZ, Auckland Council and Aktive - Auckland Sport and Recreation want to understand more about the sport and physical activity needs of local Samoan and Indian communities, particularly young people. Funding from Sport NZ will help research the needs of these communities so that effective interventions can be introduced to raise their involvement in sport and physical activity.

SPORT IN EDUCATION PROGRAMME EXPANSION

Sport in Education is an innovative approach to engaging students by putting learning into a context they understand (sport). Currently running in 8 schools nationwide. 15 more schools will be able to access the programme from 2016.

PLAY.SPORT

Sport New Zealand, recently released its new Strategic Plan and Community Sport strategy for the next five years (2015-20), designed to enrich lives and inspire New Zealanders through sport.

Central to the approach outlined in these strategies is the establishment and support of a world-leading sport system that will create a lifelong love of physical activity among all young people by ensuring:

- They are physically literate
- Their experiences are high quality, stage-appropriate and enjoyable
- They are positively influenced, encouraged and supported
- They can access quality opportunities
- They can participate and compete to the level of their aspiration
- They are empowered to shape their community sport experience

One of the ways we will work towards these outcomes is by supporting teachers, schools, parents and community organisations to improve the quality of young people's experiences of play, physical education, physical activity and sport. A specific project encompassing this will be known as Play.sport.

Many of the specific learnings and proposals of Play.sport have resulted from an enquiry and review process called the School Sport Futures Project (SSFP). The aim of this year long SSFP, was to look at the current state of school sport and physical education, with a view to developing some solutions to the challenges identified.

ABOUT PLAY.SPORT

Through Play.sport, Sport NZ will:

- Provide professional development support to teachers of physical education
- Assist schools with the workforce required to deliver quality play and sport opportunities for students
- Assist schools in working together with their community to support and deliver play, sport and physical activity opportunities for all students
- Develop guidance for schools on the selection of outside providers of sport, and establish an accreditation system to drive consistency and quality in those providers
- Raise the understanding and profile of PE and sport in schools
- Develop more collaborative, longer term, policy environments, particularly between education, health and sport.

SPECIFIC COMPONENTS

1. School Support - Provide a network for schools to access what they need, when they need it.

Schools need hands-on support, training and practical assistance. Our most successful interventions in the past have been when education (curriculum) and sport (extra-curricular) have worked in alignment. Providing access to expertise and support in both areas is the most practical and cost-effective way for schools to empower themselves and make sustainable change.

Within Play.sport, we will address this by providing:

- **PE Mentors:** PE specialists to work in the classroom (part of the week) with all primary teachers, regularly, long-term (3-4 years in their cluster before moving to the next one) to empower and upskill the whole school.
- **Curriculum Advisors:** To work with Principals, Board, teachers to strategize and develop innovative and planned PE strategy and school plans, encompassing all learning areas to improve children's engagement and activity at school.
- **Activators (primary school):** School-based play and sport facilitators to work within schools and across communities to ensure aligned, appropriate and organised opportunities that meet the needs of the children. Activators will facilitate and lead the play, physical activity and sport opportunities, and support teachers in integrating quality physical activity and sport in and out of school time.
- **Sport Coordinators (secondary school).** Extend support for schools to coordinate quality physical activities outside the classroom.
- **Training and development** of this workforce will be shaped and delivered in partnership with PENZ and other organisations to ensure we have a highly capable workforce that will support, advice and mentor teachers, coaches, parents & the community

2. Community Leadership - Communities must lead and develop their own solutions that are flexible and orientated to their needs.

Within Play.sport, we will address this by:

- **Implementing a community level governance/ management group:** While Sport NZ will establish a national approach to the delivery of Play.sport, each area will be locally led in the implementation on Play.sport in order to Identify their specific community's needs and adapt accordingly.
- **Implementing a facilities (spaces and places) audit process and shared operating model:** To understand what children and young people need from spaces and places (built facilities, green, grey and blue spaces, clubs, fields, etc) and to work with them to identifying issues and opportunities.
- **Instigating a quality assurance process for providers:** To provide schools and clubs with guidance on how to select appropriate providers to deliver sport and physical activity in their setting. Currently there is not a quality assurance process (beyond a range of guidelines) for providers who work in the school space i.e. it is an 'open door' to schools who will often allow in providers based on cost only.

3. National Leadership - Government to lead a vision for young people in NZ that we all strive for

Within Play.sport, we will address this through:

- **Implementing a Physical Literacy Approach:** Sport NZ believes that a better understanding of physical literacy, like 'health literacy' or 'nutrition literacy', will support people to have the motivation, tools and confidence to be active. Having a shared physical literacy approach will enable the health, education and sport sectors to be better aligned in their respective contributions to supporting physical activity.
- **Cross-sector agreement** on Young People as a priority, and PE/PA/sport as critical (long term)
- **Instigating a Research, Monitoring and Evaluation** (RME) framework. We will evaluate changes in the quality of PE teaching, appropriate sport provision, and teacher confidence and competence, as well as student confidence and competence within the Play.sport initiative
- **Advocating for Initial Teacher Education review:** This is a difficult policy/regulatory area that involves tertiary institution funding models driving course structure. Intention is to initiate discussion with relevant government agencies and training providers to agree to review process.

SPORT NEW ZEALAND'S PHYSICAL LITERACY APPROACH

WHY IS SPORT NEW ZEALAND TAKING THIS APPROACH?

Sport New Zealand's vision is to enrich lives and inspire a nation through physical activity and sport. We aim to be the world's most successful sporting nation, through the development and support of a world leading community sport system. To be world-leading in Community Sport 1 we will be participant-focused, system-led and performance-driven. To bring this participant-focused philosophy to life we are taking a physical literacy approach.

The Sport NZ Physical Literacy Approach takes a holistic view of the participant that considers their physical; social and emotional; cognitive; and spiritual needs. By understanding that these dimensions influence the needs of every participant, within their specific environments, we can provide physical activity and sport experiences that inspire ongoing participation.

We want to ensure that our partners and providers, government agencies, and all who provide and support physical activity and sport opportunities, have a shared understanding of this holistic needs approach and consider how it can add value to the physical activity and sport opportunities they provide.

WHAT IS PHYSICAL LITERACY?

Physical literacy is "the motivation, confidence, physical competence, knowledge and understanding required by participants that allows them to value and take responsibility for engaging in physical activity and sport for life2".

Sport NZ's Physical Literacy Approach is relevant across all ages, recognising and responding to the needs of a participant as they change throughout life. Babies, children, young people, adults and seniors can all be participating in physical activity and sport in a variety of ways and in a variety of places. Their needs will vary and this document provides a starting point for considering these needs.

SPORT NEW ZEALAND'S VISION FOR PHYSICAL LITERACY

Sport New Zealand's vision is that our partners and providers, government agencies, and all who provide and support physical activity and sport opportunities, see the value of this approach, embed it into their ways of working, resulting in the provision and support of quality experiences, consistent throughout New Zealand, that lead to participation in physical activity and sport for life.

We believe that understanding and embracing a physical literacy approach will lead to more people being active throughout their lives, regardless of age, gender, ability, socio-economic class, culture.

HOW WILL WE BRING THIS VISION TO LIFE?

Sport New Zealand are pleased to be working with PENZ to provide training, resources, tools, practical examples and access to support networks that will explore the application of the approach. Both organisations will work in partnership to lead consistency across the community sector through facilitating, sharing and investing in good practice of physical literacy.

We will also identify and develop partnerships and initiatives with agencies that utilise a similar holistic approach, such as Mason Durie's Whare Tapa Wha model 3, in their ways of working.

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1 Sport NZ Community Sport Strategy 2015-20 http://www.sportnz.org.nz/about-us/our-publications/our-strategies/community-sport-strategy/

2 Margaret Whitehead, 2013

3 http://www.health.govt.nz/our-work/populations/maori-health/maori-health-models/maori-health-models-te-whare-tapa-wha

DEVELOPING THINKING PLAYERS

BASEBALL/SOFTBALL EDITION
BARRIE GORDON PHD.

This book is suitable for both coaches and teachers independent of their knowledge and ability in the sport(s). It is designed to fully support the teacher/coach who has limited knowledge while the variety of approaches available gives the most experienced teacher or coach the flexibility to make changes that will challenge all their students and players, including the elite ones.

The Developing Thinking Players (DTP) coaching program is a unique approach that will help teachers and coaches to generate understanding and a feel for the game(s). The approach is designed to encourage players to think about their game and to learn to make smart decisions in a range of scenarios. DTP is based on a number of well-established teaching and coaching principles supported by a robust research base. The program owes much to the Teaching Games for Understanding (TGfU) model that has become popular within coaching and the teaching of physical education teaching in recent years.

Players participate in game scenarios that mimic real life game situations [see example]. Each scenario is described to the teams and a series of questions [supplied] addressing issues that the teams should be considering are presented. Both teams are given time to consider their tactics and the scenario is set up. The scenario is than played out as in a real game. The fielding and batting teams are awarded points depending on the outcomes of the play. After a chance to discuss what happened the scenario can be repeated or another one selected.

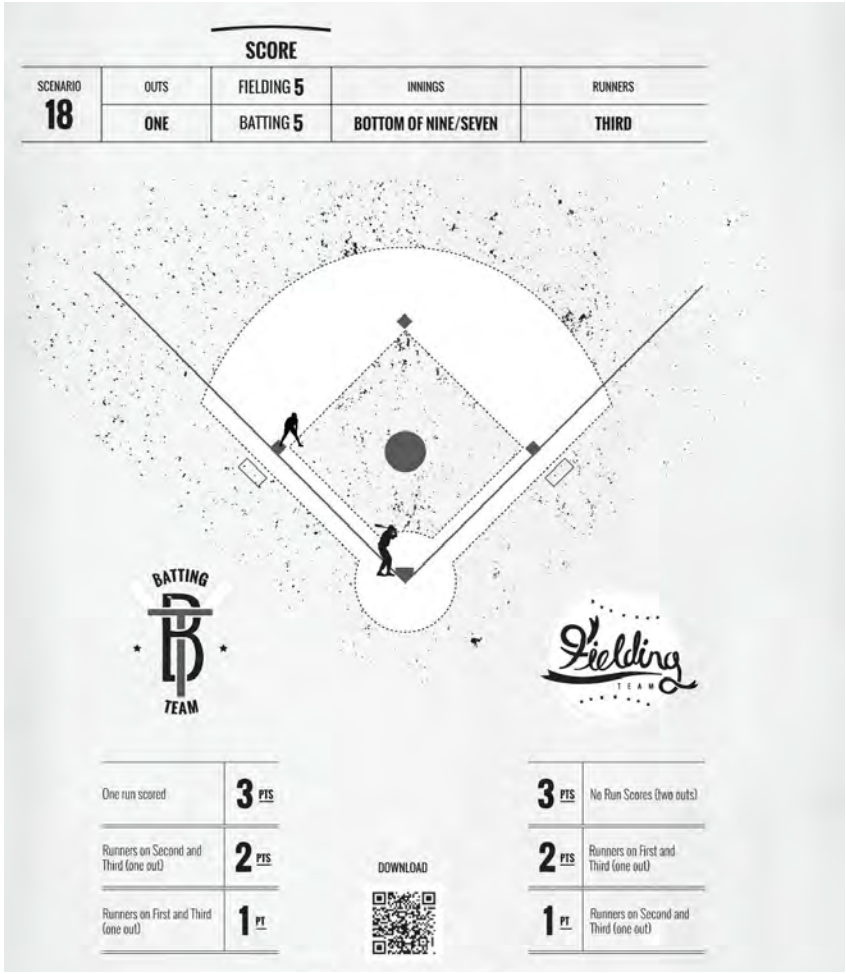
While the scenario outcomes are supplied, players can be asked to develop their own for the different scenarios. This generates a deeper level of engagement as they discuss and argue which is the best, second best outcome etc. Experienced teachers/coaches can also introduce other factors to influence the scenario. In the example given would it make a difference if it was announced that the batter was number eight in the batting lineup? What if the batter was the number two, a left-handed or right-handed batter?

With 25 completed and 10 blank scenarios available to be filled in as required, this book will form the basis of a full teaching unit or support a season coaching. All scenarios have QR codes and can be loaded onto phones or iPad for ease of use in class or practice.

The book is available on Amazon or email Barrie at barrie.gordon@vuw.ac.nz for $29-95 plus postage.

ABOUT SCENARIO EIGHTEEN

Scenario eighteen occurs in the last turn at bat in a tied ball game with one out and a runner on three. This is a pressure position with both teams knowing that a scored run ends the game. Where should the fielding team position themselves? What is their focus and how important is getting the second out? Is it worth risking a scored run by throwing to one for example? How important is it at this point where in the batting order the next batters come from? What are the positives and negatives of walking the next batter?



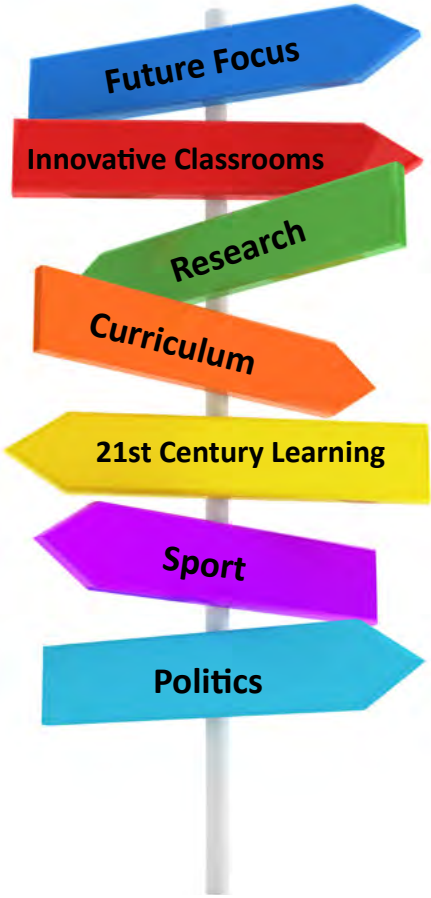
http://www.thinkingplayers.com/scenarios/dtp_scenarios_18.pdf

Eco-Sports - specialised environmental physical education which reinforces kaitiakitanga

Traditional Maori Games (TMG), of which there are well over three hundred, utilise a vast number of aro-takaro (implements of play) - some one hundred have been catalogued so far.These artefacts are skilfully produced from the flora and fauna that inhabit Te Taiao - our environment. Highly functioning aro-takaro can be produced in a very short time with expert facilitation and guidance.The continued revival and application of TMG equipment promotes the concept of eco-sports, specialised environmental physical education which reinforces kaitiakitanga - guardianship and conservation of our native plant life. By safeguarding the indigenous plants and trees that are used to make such artefacts as ki (woven balls), pakaukau (kites and gliders), poi toa, rakau, pikipotae, haumia, hao-nei (a combination catching / throwing implement and musical instrument), puoro, Te Huihui-a-Matariki, Te Ata, moari, piu, torere, tama tai-ki, ku, and many others we can be appreciative of the need to care for such vital resources such as, harakeke, raupo, ti, totara, nikau, manuka, toe toe, kareao and their important habitats with their life-giving springs, lakes and waterways.Integrating TMG into a school curriculum, with aro-takaro technology, role models to students how much you care about Mother Earth and provides your tauira with creative and unique mechanisms for conservation through physical education.

Check out the new PENZ website www.penz.org.nz for the location and dates for these workshops.

PENZ CONFERENCE 2016



PHYSICAL EDUCATION NEW ZEALAND
TE AO KORI AOTEAROA

EONZ
EDUCATION OUTDOORS NEW ZEALAND (Inc)

Ako Hauora Aotearoa
NZ Health Education Association

PALMERSTON NORTH JULY 11 - 13

ABSTRACT SUBMISSIONS ARE NOW BEING RECEIVED - GET IN QUICK TO RESERVE YOUR PLACE AND QUALIFY FOR THE PRESENTERS DISCOUNT

admin@penz.co.nz

ABSTRACTS CLOSE 30th MARCH

EARLY BIRD REGISTRATIONS OPEN 1ST FEBRUARY 2016

SPORT NEW ZEALAND

HART SPORT PLAY ON

hpa health promotion agency