



# QUARTERLY

NEWSLETTER OF THE NEW ZEALAND OUTDOOR INSTRUCTORS ASSOCIATION

ISSUE 72: MARCH 2016



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Cover photo: Sam Cottrell-Davies and friends on summit of Taranaki after completing Peak to Peak journey early 2014.

NZOIA gratefully acknowledges the financial support of the following organisations:



Member Organisation

**Chairperson's Report**

Kia ora all

I hope you have all had an enjoyable and safe summer – whether getting out on your own adventures, or instructing/guiding others so they can make the most of the outdoors. It's been a mountain biking summer for me – checking some new local trails around Nelson and Lake Rotoiti – there are a couple of great new trails at Teetotal Flats (St Arnaud) and the Maitland Ridge from Beebys Knob to the Red Hills hut is worth the slog up the Beebys 4wd road. That's not to mention the Old Ghost Road in Buller – awesome country to put a trail through, and right there if you are planning a kayaking trip to Murchison. Then we went exploring Central Otago and Northern Southland tussock country, including great rides in the headwaters of the Manuherikia, and the Windon Burn at the top of North Mavora Lake.

Having spent two months last August - September in British Columbia, Colorado and Utah with my mountain bike, I have been reminded this summer that NZ mountain biking is certainly up there on an international scale. The International Mountain Biking Association (IMBA) have identified two gold star riding destinations in New Zealand – Nelson/Tasman and Rotorua. This compares with 4 gold star centres in the whole of North America. Taupo is silver rated.

While I've been off playing, the office team of Sonya, Shona, Steff and new addition Nicola have been very busy responding to membership requests and making sure assessments, refreshers etc are being organised to meet demand. A big thanks are due to them all, and in particular to Shona who has worked extra hours during school holidays to fill in while Penny recovers from the consequences of their ski trip to Japan.

In between mountain biking and other work commitments, I have had a few NZOIA engagements, including a workshop with David Bond,

the film maker behind the "Project Wild Thing" film and "The Wild Network" in the UK. David is travelling around New Zealand showing the film and talking about the Wild Network. The Wild Network is "a movement of people on a mission to re-wild childhood...to help kids roam, play free, play wild and lead nature rich lives". He describes his mission as "marketing nature". It's inspiring stuff – check out the website: [www.thewildnetwork.com](http://www.thewildnetwork.com) and if you haven't seen it already and have opportunity to – see the film (there is a short promo clip on the website).

The workshop was organised by the CEO of Sport Tasman, Nigel Muir, who is keen to extend the reach of his organisation more into outdoor recreation, with the vision of the outdoors as the way "to grow well being amongst our nation's youth, starting at the Top of the South Island". He had gathered together Mark Bruce-Millar from Whenuiti Outdoors, Martin Rodd from DoC and me, to explore with David what we could learn from the UK Wild Network.

Stories of New Zealand schools cutting back on outdoor education because of costs, risks, school principal and Board liabilities, and the like are all too common. Having kids put up tents and lighting primuses in the gym may be a good start point for an outdoor programme. Going beyond this needs committed teachers, parents, school board members and leadership from skilled practitioners like NZOIA instructors.

David Bond's image of New Zealand is a country that sends adventurous entrepreneurs out into the rest of the world? Each one of you is a key player in "saving New Zealand's wild child brand". It might not be the best paid job, but what a mission!

Gillian Wratt, Chairperson

**The Capital Connection: More eyes are looking out for the outdoors**

While investment levels in outdoor recreation may not be on the rise, people on the ground to promote the benefits of outdoor recreation and champion advocacy issues that may adversely impact on NZOIA members is. Annie Dignan, former Sir Edmund Hillary Outdoor Recreation Council member advising Sport NZ, has been appointed to the Board of the New Zealand Recreation Association (NZRA). Annie has been working closely with the NZRA Board for the past year as the Outdoor Recreation Advisor. She has lead the Applied Learning and Practice programme for the School of Physical Education at Otago University, worked as Programme Manager for Research and Evaluation at the Mountain Safety Council, and is currently an educator at AUT University in the School of Sport and Recreation.

In addition to Annie's appointment to the Board, NZRA has appointed Sam Newton as a fulltime advocacy advisor for the outdoor sector. This position will continue the core services established by previous Outdoor Recreation Project Manager Kim Willemse, while re-focussing the outdoor sector work plan on advocacy, in line with NZRA's Strategic Plan 2015-2020. Sam has most recently held the position of General Manager at New Zealand Alpine Club. He also has a background in government policy and advocacy through his work at Parliament, so will be well placed to understand and deal with any advocacy issues impacting on outdoor recreation and NZOIA members, particularly around such things as access, concessions and the Adventure Activities Regulations.

In the last issue of Quarterly I talked about the launch of Water Safety

New Zealand's (WSNZ) new strategic plan and the stretch targets that they had set themselves of a 50% reduction in male drownings and no preschool drownings, all by 2020. The results for 2015 show just how much of a mission that goal is going to be, with the overall drownings higher than ever. WSNZ continues to rely on NZOIA instructors who work in and around water to lead by example and convey all the right safety messages and warnings. Particularly when working with young people, so they can look after themselves safely and have enjoyable experiences, not only when they are with an instructor, but when they are out on their own or with their mates.

The quality of experiences participants have is something that Sport NZ is interested in as well and will be focussing on in their next investment round. It's not just about whether people participate, but what they get out of it. As you can appreciate giving someone a safe enjoyable experience in the outdoors can mean the difference between them taking up a lifetime of outdoor recreation experiences or being put off for life. It almost goes without saying that as NZOIA qualified instructors you are offering safe, quality experiences, but do you check this with your participants along the way to see if their perspective aligns with yours? It can be tricky when you are working with young people as there is often peer pressure to conform and people not enjoying themselves can be easily overlooked for the more outspoken and overly confident, so it is always something to keep an eye out for.

Deb Hurdle, Executive Services Provider, NZRA

# Congratulations on these recently gained NZOIA Qualifications!

<b>Alpine 1</b>	Brian Cresswell, Ashley Whitehead, Jean Cane, Maike Walther, Bridget Janse, Nigel Seebeck
<b>Alpine 2</b>	Paul Stevens, Beatriz Boucinhas, Cameron Walker
<b>Abseil Leader</b>	Tom Baanders, Caroline Slater, Shay Cunniffe, Nathan Lawton, Scott Martin, Joni Tomsett, Colin Elsasser, Josh Danen, Zoe Findlay, Connor De Ardenne, Jordan Lineham, Kayla Stuart, Lucy McRae, Sean Jolliffe, Takuto Matsuda, Sam Aldrich, Madison Oram, Philip Cadzow, Alana Dodunski, Jack Ferguson, Jeremy Shanks, Nicholas Hardie, Mitchell Fenton, Cameron Hill, Morgan Larkins, Cameron Taylor, Ian Barber, Oscar Brownlie, Ben Hickey, Jamie Lock, Matthew McGarvey, Emma Swain, Anthony Fokkens, Michelle Williams, Rowan Toomer, Matthew Huang, Joshua Purcell, Kyle Smart
<b>Bush Walking Leader</b>	Luca Goy, Leilani van Dieren, Tania Seward, Sam Brown, Steffan Rolfe, Nathan Lawton, Isaac London, Scott Martin, Joni Tomsett, Madison Oram, Abby Palmer, Anita Gorter-Smith, Conner De Ardenne, Marko Belcher, Takuto Matsuda, Nicholas Edwards, Ben Withell, Jordan Lineham, Josh Danen, Lucy McRae, Sean Jolliffe, Philip Cadzow, Alan Dodunski, Hannah Duggan, Sara Eden, Jack Ferguson, Aaron Fleming, Beau Kerseboom, Charlie McKee, Joseph Rawlings Bryers, Arye Samon, Fraser Seymour, Jeremy Shanks, Conner Stapley, Jack Waddell, Nicholas Hardie, Ruby Mitchell, Mitchell Redmond, Danielle Lusk, Sara Reidie, Eric van den Broeke, Jessica Bailey, William Lang, Andrew Mora, Justin Calcott, Jess Garrett, Josh Cocker, Troy Greenem, Melanie Gliddon, Angie Stoddart, Moana-Lyn Te Whata, Arthur Machado de Oliveira, Morgan Larkins, Cameron Hill, Rick Kloosterman, Ian Barber, Oscar Brownlie, Ben Hickey, Jamie Lock, Matthew McGarvey, Emma Swain, Anthony Fokkens, Michelle Williams, Rowan Toomer, Josiah Russell, Kyla Dench, Sean Lee
<b>Bush 1</b>	Stewart Barclay, Mark Chapman, Hanna McLeay, Helen King, Mark Brinsden, William McIndoe, Sophie Dec Barnes, Rata Lovell-Smith, Logan Laws
<b>Bush 2</b>	Margaret Horne, Kevin Webb, Noel Bigwood, Alan Haslip, Asher March, Amy Horn, Karl Ridgen, Zak Shaw, Sarah Sellar, Tom Speers
<b>Cave 2</b>	Chris Stephenson, Russell Hodgson, Wayne Darlington, Ryan Malcolm
<b>Canyon 1</b>	Leandro Jacob den Haan
<b>Climbing Wall Supervisor</b>	James Muir, Keziah Van der Wel, Nick Dodds
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<b>Kayak 1</b>	Blair Trotman, Rhys Elliott
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<b>Sea Kayak 1</b>	Daniel Berger, Campbell Potter

**NZOIA**  
Excellence in Outdoor Leadership



From L to R: Purcell prusik (6mm nylon with 3 wraps), nylon sling with overhand knots, nylon daisy chain, dyneema daisy chain, and a dyneema anchor chain (Metolius PAS).

# COWSTAILS, DAISY CHAINS AND PERSONAL SAFETIES...

WHAT SHALL WE CALL THEM?  
LET ALONE WHAT SHOULD WE USE?

SASH NUKADA

So it all started with an innocent question from one of our second year students earlier this year. We were off to Arapiles soon and she wanted to know what to buy for her cowstail/daisy chain/personal safety/lanyard. "What shall I call it? Why are all the instructors using different 'things'?"

I know our usual pros/cons/justifications for using all the different 'things' that we do, from the traditional daisy chains and plain knotted slings, through to purcell prusiks and the 'anchor chains' (the Metolius PAS is the most common one). They come in nylon and dyneema, different lengths and widths. The question though prompted me to do a little bit of research.

Let's get a few things straight here. I do agree with two commonly held beliefs with these 'things' (a.k.a. personal safeties);

1. As long as you understand the limitations of what you are using as a personal safety and using it appropriately, it is safe.
2. The most important thing is not to expose yourself to situations where you may shock load your personal safety.

After reading around, #2 above was always the first take home message. BUT (and it's a big but) what would happen if you did, if you really stuffed up, and took a factor 1 fall onto it?

I will be the first to raise my hand and say that I have been in several situations where I have exposed myself to a shock load on my personal safety; e.g. clipping into an anchor at foot level and climbing down onto the anchor (e.g. top of Engine Block in Wanaka), or pulling up on the anchor to make some adjustments or to check it.

So keeping #2 above at the forefront of our minds, what are some other criteria with which we can measure the pros and cons of various personal safeties? Given a fall factor 1 (FF1) we would want to see the personal safety at a minimum (Gibbs, M.; 2005 & 2006);

1. maintain its integrity, i.e. not break and send you plummeting to the ground and

2. minimize the shock load on your body, i.e. keep the maximum impact force (MIF) under around 10kN so that your back doesn't break or internal organs get mushed.

So I found a few tests where they threw an 80kg mass (as per UIAA rope tests) or a 100kg mass (as per rescue standard tests) onto various personal safeties at FF1.

**Please note:**

- Most lead falls generate around 4-7 kN
- Above around 10 kN your back will start to break and internal organs will be mushed
- All the tests below are worst case scenario FF1. In reality there will be friction of our bodies falling down rock, and it is unlikely that we would free fall straight onto the anchor.



The author finds the 'one finger pocket alternative crux' on pitch 4 of Skink, Arapiles.

## Test 1 – DMM

<http://dmmclimbing.com/knowledge/how-to-break-nylon-dyneema-slings/>

DMM used an 80kg mass at various FFs, and each personal safety was tested three times. I have only included the results for 120cm slings here as it's the most common sling length used for personal safeties. ▶

### 80kg test mass

Personal Safety type	Fall Factor	MIF (kN)	Integrity
11mm dyneema x 120cm open sling	1.0	22.4 kN	1 failure out of 3
11mm dyneema x 120cm with overhand knot	1.0	11.1 kN	Failure
16mm nylon x 120cm open sling	1.0	12.8 kN	Catch
16mm nylon x 120cm with overhand knot	1.0	11.0 kN	Catch

So general conclusions from this:

- Dyneema with its very little stretch and low melting point resulted in very high MIFs and often failed completely. Dyneema with knots failed at a very low impact force; this reinforces the common understanding of never putting knots in dyneema sling!
- Nylon has some stretch in it and has a higher melting point. This is reflected in the much lower MIFs and no failures. There was a decrease in MIF with knots as they absorbed some of the impact force.
- So knots in dyneema = bad (causes failure). Knots in nylon = good (absorbs some impact force).
- Again generalising, dyneema = bad (low stretch so high impact forces). Nylon = good (some stretch).
- Keep in mind dyneema is often used as it's light and doesn't absorb water.

### Test 2 – Daisy Chains and Other Lanyards: Some Shocking Results when Shock Loaded. Mike Gibbs (2005)

<http://www.riggingforrescue.com/research/projects/daisy-chains-and-other-lanyards/>

They used an 80kg or 100kg mass at various FFs.

Please note the difference between a 'daisy chain' (with body weight tacks and designed originally for aid climbing) and an 'anchor chain' (e.g. Metolius PAS).

### 100kg test mass

Personal Safety type	Fall Factor	MIF (kN)	Integrity
Metolius PAS (made from 11mm dyneema)	1.0	19.2 kN	Catch
Metolius PAS (made from 11mm dyneema)	1.25	20.9 kN	Failure
Yates Spectra Daisy Chain	0.5	11.3 kN	Failure
Climb High 25mm Nylon Daisy Chain	1.0	12.8 kN	Catch
Purcell prusik, 7mm nylon with 3 wraps	1.0	9.1 kN	Catch
Purcell prusik, 6mm nylon with 3 wraps	1.0	8.9 kN	Catch

### 80kg test mass

Personal Safety type	Fall Factor	MIF (kN)	Integrity
Metolius PAS (made from Dyneema)	1.25	20.1 kN	Catch
Purcell prusik, 7mm nylon with 3 wraps	1.0	8.1 kN	Catch
Purcell prusik, 6mm nylon with 3 wraps	1.0	7.2 kN	Catch

General conclusions from this:

- The Metolius PAS had similar results to the open dyneema sling not surprisingly – a very high MIF. Definitely back breaking forces.
- The Metolius PAS started failing at FF1.25 (MIF 20.9 kN).
- Note the latest Metolius PAS currently available is 73% nylon and only 27% dyneema, so results would differ. The Metolius PAS tested here was the 2005 version which had a much higher dyneema content. More testing is required on the current 73% nylon/27% dyneema PAS.
- Spectra daisy chains failed at just FF 0.5
- Nylon daisy chains performed similar to open nylon slings in the DMM test. Didn't break and lower MIF, but still a bit high for your body to handle.
- Purcell prusiks had a significantly lower MIF due to the prussic knot sliding and absorbing some force. Well under 10 kN.
- 6mm Purcell prusik had a slightly lower MIF than 7mm.

### Test 3 – Lanyards Part II: An Examination of Purcell Prusiks as Personal Restraint Lanyards. Mike Gibbs (2006)

<http://www.riggingforrescue.com/research/projects/lanyards-part-ii/>

In this test they dropped 100kg test mass repeatedly onto a 6mm nylon Purcell prusik with 3 wraps.

### 100kg test mass

Personal Safety type	Fall Factor	MIF (kN)	Integrity
Purcell prusik, 6mm nylon with 3 wraps (39 drop tests)	1.0	7.5 kN	Catch (39 times)
Purcell prusik, 6mm nylon with 3 wraps (20 drop tests)	1.5	9.5 kN 10.3 kN	Catch (18 times) Failure (2 times)

In conclusion Gibbs makes the following recommendations which are in line with what we have already discussed;

- When using personal safeties, keep unnecessary slack out of it (thus reducing potential for a shock load)
- When selecting a personal safety:
  1. Avoid ones made from low-elongation high performance fibres (i.e. dyneema and spectra)
  2. Chose ones that have an acceptable MIF at FF1
  3. Chose ones that maintain their integrity at FF1.

## My conclusions

In order of what I think is best to worst for personal safeties according to the above criteria;

Personal Safety	Pros	Cons
Climbing rope	Always have one, low MIF, strong	Not very applicable in some situations, e.g. multi-pitch abseiling, block leading
6mm purcell prusik, 3 wraps	Low MIF (~7.5kN), strong enough, cheap (can get sewn one from Aspiring)	Bit bulky & heavy, not as versatile (e.g. for abseil ledge rescues)
16mm nylon sling with overhand knots	Borderline MIF (~11kN), strong enough, cheap, simple	Borderline MIF (~11kN)
Nylon anchor chain	Strong, simple to use	Med MIF (~13kN), not common/hard to get, expensive
Nylon daisy chain	Strong	Med MIF (~13kN), can fail (and be fatal) if clipped into two bar-tacked loops (if you don't know what I'm talking about here, you should not be using a daisy chain! Scope for a whole article here)
Dyneema anchor chain	Strong, simple to use	High MIF (~20 kN), expensive
Dyneema daisy chain	Strong? (needs more testing)	High MIF (~20 kN), expensive, can fail (and be fatal) if clipped into two bar-tacked loops (if you don't know what I'm talking about here, you should not be using a daisy chain!)
Dyneema sling with overhand knots		Fails at FF1, expensive DO NOT USE THIS!

Personally I use the rope for anything in the hills (don't have to carry anything extra), and am experimenting with a 6mm purcell prusik for general use. My go-to personal safety is the knotted 16mm nylon sling; simple, cheap, versatile, strong, borderline MIF. I replaced all the personal safeties in our rock shed at work with 120cm x 16mm knotted nylon slings from Aspiring. Though it's borderline MIF, keep in mind that in a real situation, there would be friction involved and unlikely to be a pure free fall onto the anchor. So at least your back and internal organs are in with a chance with a knotted nylon sling.

## Future directions

- If you are using a personal safety made of dyneema, what about the strength of the knot that attaches it to the harness (the girth hitch)? More research required here.
- More research is also required on the current Metolius PAS which is 73% nylon and 27% dyneema (this is widely used in NZ).
- Anchor chains made from plain nylon sling are not very common (Sterling make one). It would good to see more manufacturers making them out of nylon rather than dyneema.
- I'm going to design and patent a daisy/anchor chain type rig made out of 7mm dynamic rope (I'm not actually, but I'd love to. Any other takers?) I'm serious, why hasn't anyone done this yet?
- I still haven't addressed what we are going to call these 'things'. Maybe that's a good PhD topic for someone. Any takers?

Sash Nukada, Outdoor Education team leader - Aoraki Polytechnic. NZOIA Rock assessor

## We want your story!

We are looking for contributions from you, the NZOIA members, for the NZOIA Quarterly. Do you have a story to tell? Do you know someone who has thoughts to share?

Articles could be:

A personal adventure and how your experiences have impacted your instruction of others. / An incident, near miss or accident that others could learn from. / A personal profile – an interesting tale about how you got to be where you are now in the world of outdoor instructing. / An organisation that is doing innovative and interesting things – with its programme, philosophy, direction and instruction. / A reflection on any aspect of outdoor instruction that you think would be educational and beneficial for others to hear.

Contact Jen Riley the editor with your ideas and for guidelines: [editor@nzoi.org.nz](mailto:editor@nzoi.org.nz)



Photo: Johnny Johnson

# SMARTPHONE MAPPING APPLICATIONS: ANOTHER USEFUL ITEM FOR THE TOOLKIT

GUY SUTHERLAND



Smartphones over recent years have become the phone of choice for most people, with NZ having some of the highest statistics of smartphone ownership in the developed world. The GPS capability within the devices is of high accuracy and the availability of reasonably priced apps with detailed NZ Topo 50 maps makes them a great tool for assisting with navigating in the outdoors.

Using a smartphone for digital mapping can be daunting for some people. There are constant updates to deal with, trying to understand how specific apps work can be confusing, and how to set up your phone to use the navigational apps can also lead to users finding the nearest tech savvy youngster to assist them. But the benefit of having bright, full-colour, Topo 50 maps with integrated GPS functionality in your pocket can be very useful. The following outlines some of the pros and cons around using smartphones for navigation in the outdoors:

## PROs

### 1. Cost

Most people already have a GPS enabled smartphone. Navigational apps are relatively cheap compared to buying paper maps. For less than a cup of coffee you can have the entire Topo 50 South Island cache on your device.

### 2. Functionality

A smartphone with GPS capability works just as well (if not better due to some devices having an accelerometer) than a dedicated GPS device. The screen is large and provides bright full colour definition to easily zoom in and out and pan to read Topo maps. The apps now have the ability to cache maps offline so no data connection is needed.

### 3. Trip planning

They are very useful for scanning for possible routes when planning trips. You can plot a route and see elevation profiles and distances. Some digital mapping solutions are web based thus needing data connection but are great for finding new tracks to explore. An example is the Marlborough District Council webmap showing all the possible walking and biking tracks to explore in the region.

### 4. Photo/Video

The main use of a smartphone for most. For the last three years photographs taken with a smartphone have been of good enough quality to be used for the cover of our College magazine. The photos can be GPS tagged to show location taken.

### 5. GPS Features

Most apps will show you current altitude (and accuracy of that), moving speed, average speed, and other standard GPS features useful for tracking progress. You can plot a route in advance and save Points of Interest in the field. The two apps I use both have the NZTM projection thus giving very accurate grid referencing.

### 6. Field Notes

The smartphone can also be used for taking notes in the field. I record most of my assessments in the field on my smartphone which saves considerable time. When back in Wi-Fi any incident reports completed in the field are automatically synced into online folders ready to share.

## CONs

### 1. Temperature

Devices shut down in the cold but turn on again when warmed up. This necessitates keeping the device warm and limiting exposure to the cold and wind. iPhones seem to be affected by cold temperatures more so than Samsung devices. I always keep mine in a closed cell foam cover next to body and pull out for short periods when needed.

### 2. Battery life

The battery does not last forever and you can't put in fresh batteries. I have found on a four day trip my iPhone battery will last the duration with quite a lot of use if I use the following key points: decrease screen brightness, turn off Wi-Fi and data, use in airplane mode unless this turns off the GPS which is when I turn off airplane mode briefly when using the navigation app, and keep it warm by keeping it close to the body and sleeping with it. I do carry 2 very small thumb sized power banks that will each recharge the device 1-2 full charges. There are also solar chargers that are available to recharge devices but are usually only needed for longer trips or if you are also charging a head torch, water filter and other devices.

### 3. Water

Water and electronic devices don't mix. Easily available are robust waterproof cases which eliminate this risk.

### 4. Technology dependence:

Dependence on a smartphone for navigation alone does have its pitfalls. For example, what will you do if your battery dies and you have forgotten your charging cord to charge up from your back-up power banks?

Similar risks exist when using a map and compass with getting a map soaking wet and ripped, it blowing away in a strong wind, or dropping a compass and breaking it.

I always carry a paper map and compass and teach students how to use them as they are essential skills to have. One needs to rationalise the risks involved in using smartphone navigational techniques versus traditional methods as there are other technologies we trust our lives with every day such as the electronically controlled brakes in cars.

I have found that with certain students who are smartphone savvy, they find using digital mapping in the outdoors quite rewarding and it adds to their experience. Others prefer to learn the traditional map and compass way of navigating only (which I teach to all students). Thus, the teaching of digital mapping is a way of extending the skills and knowledge of those who have grasped the key concepts already.

In the field, when students are learning to navigate using a digital mapping device it gives them instant visual feedback in a medium they are very familiar with. It is essentially thumbing the map for them and helps them identify collecting features along the way. Seeing the current walking speeds aides with their travel time estimations and they use the device to show how accurate their pacing is.

Their use of a smartphone often decreases as they become more confident in their own ability to judge current location using just the map on the screen and not the GPS functionality with it. Then they can more easily use a map alone to navigate with. They are assessed when using only a map and compass. Once they have passed their assessment, more often than

not the students' feedback is they prefer to navigate with a smartphone as the detail and brightness of the maps on a screen is superior.

## Some useful Apps to check out

ViewRanger and NZ Topo 50

- Both of these use the NZTM datum for grid references (although the NZ Topo 50 app currently has the user reading the grid reference with Northings prior to Eastings).
- ViewRanger is slightly more expensive and complex to use but offers much more functionality and the maps are much clearer to view.
- Both allow offline caching of the maps.

Gaia GPS, Map Toaster, and Memory Map are also good options to use.

Once you know the limitations of the devices and how to use them effectively I believe they become another tool to utilise, alongside a map and compass, when navigating in the outdoors. If we don't know how to use smartphone digital mapping apps ourselves as teachers and instructors we are missing extending our students skills and knowledge.

For those that have been in the digital wilderness I recommend you give it a go, you will find it a useful tool to aide in navigation in the outdoors.

Guy Sutherland, HOD Outdoor Ed, Roncalli College. Bush and Rock 1

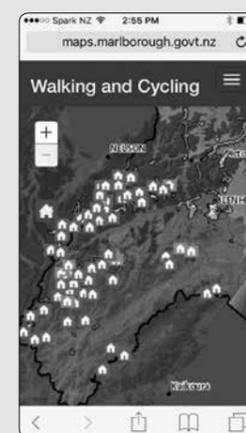
## EXAMPLES OF APPS IN USE:



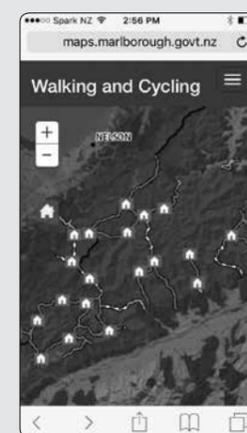
App: View Ranger. Showing recorded paddleboard route.



App: Topo 50, with GPS on my house.



App: Marlborough smartmaps, found at maps.marlborough.govt.nz, (huge collection of maps with variety of information from boat moorings to playgrounds to distribution of pest plants.



App: Marlborough smartmaps, zoomed in on Richmond Range



Recorded mountain bike trail (Duck Down Trail) using View Ranger, since uploaded to Trailforks app (awesome mountain bike trails app).

And a planned route on paddleboards on Lake Rotoiti to Coldwater Hut to check distance in advance. From speed previously recorded on the app I know I travel 6-7km/hr on the SUP with my daughter Mia on board.

# Profile: Aoraki Polytechnic Outdoor Education Programme

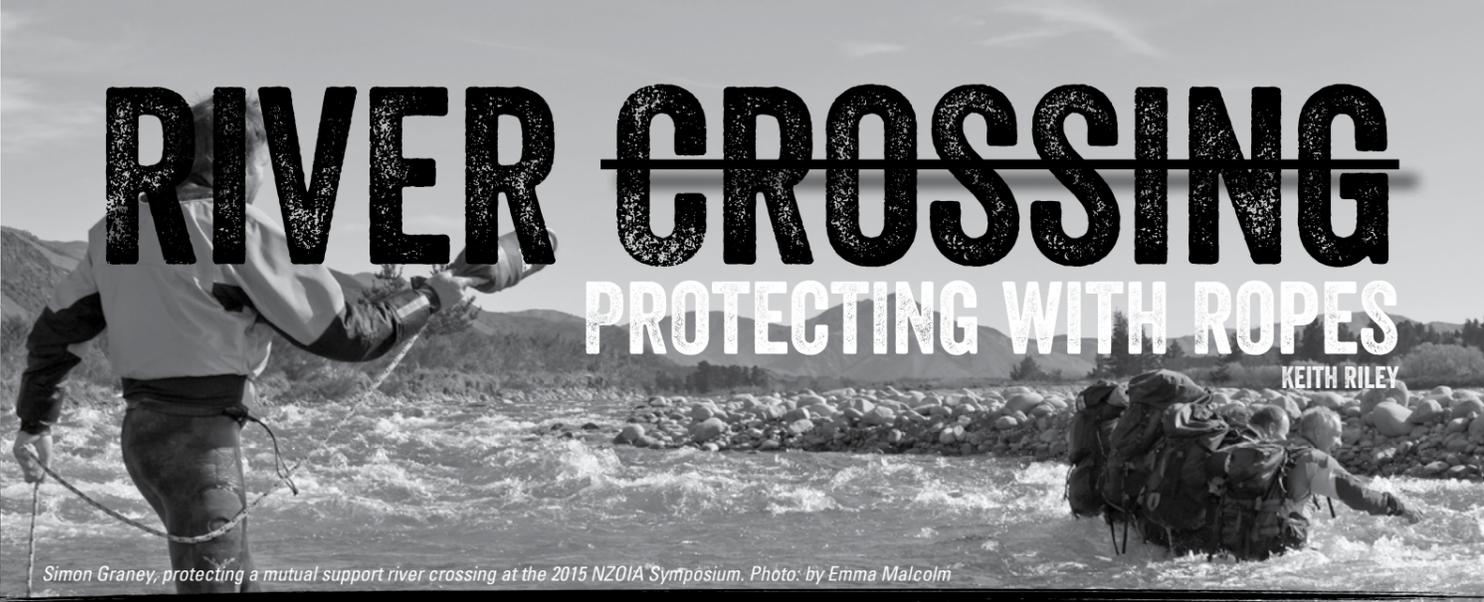


Aoraki Polytechnic's Outdoor Education Programme (APOEP) has been synonymous with outdoor education in NZ for over 20 years. The programme has a strong reputation for producing graduates with solid hard skills, a good dose of resilience, and who are ready to 'hit the ground running' when they enter the industry. The foundation of the APOEP has always been a strong focus on high skill levels in bushcraft, rock climbing, white water kayaking, mountaineering, risk and safety management, group dynamics and environmental education.

The APOEP has been based in Timaru since its beginnings in 1992. Timaru is almost designed as a venue for teaching outdoor education, being close to several outdoor venues, and is a major factor in the Aoraki graduate profile and outcomes. Crags (2 trad and 1 sport crag within 15-30min drive), rivers (Rangitata River is a 50min drive), bush (Peel Forest, Kakahu Bush, Orari River Gorge, etc. are all 30-50 min drive), and mountains (Mt Dobson and Fox Peak in the Two Thumbs range are 1-1.5 hrs drive) are all readily accessible. Everything between Queenstown, Wanaka, Mt Cook and Arthurs Pass is also within an easy weekend's drive away. Timaru is big enough that it has all the essential services, but small enough so the students can get out easily. Being a small town and with over 80% of the outdoor ed students being from outside the region, we have a very strong 'outdoor recce' student culture; one based on getting out missioning in one's spare time, safety, professionalism and resilience.

Gaike Knottenbelt established the programme in 1992, being one of the first tertiary outdoor education courses in NZ. During the 1990's the programme was further developed by several people, many of whom are past and present industry gurus; folks such as Gaike, Sean Waters, Jo Straker, Mike Atkinson, Kirsten Price and Marty Beare. At the turn of the new millennium, the programme was handed over to more industry gurus; Ian Logie, Dave Moore, Penny Holland and Andy Fullerton who ran a steady ship for the good part of the 00's. The baton was handed over again in 2012 where Rob Dunn, Niki Jacomb, Jo Martindale, Curtis Vermuelen and Sash Nukada have been continuing the tradition of producing graduates who are in high demand by industry for anything from sea kayak and glacier guiding, to being outdoor educators at Outward Bound and Hillary Outdoors.

This year sees an exciting evolution of the Aoraki Polytechnic Outdoor Education Programme, as CPIT and Aoraki Polytechnic join forces to form a new Canterbury wide tertiary institute. With CPIT's level 7 degree and graduate programmes and strength in environmental sustainability, and Aoraki's level 4-6 qualifications and strength in solid field skills, it will be a huge boost for both Aoraki and CPIT's outdoor education students and programmes. Exciting times lie ahead – watch this space!!



# RIVER CROSSING

## PROTECTING WITH ROPES

KEITH RILEY

Simon Graney, protecting a mutual support river crossing at the 2015 NZOIA Symposium. Photo: by Emma Malcolm

"River Crossings with Ropes". The title, suggests some mystical techniques exist to enable the wet and weary trapper to pull out the trusty bush rope and safely get to the other side of the swollen river. I've tried to find or invent those techniques and wow the reader with my outdoor brilliance; alas I've come up with nothing. It seems there is no getting around the fact that a rope will not make it any easier to cross that river. That would be a clean, easy conclusion and a horrid anti-climax to this article.

However, "Protecting River Crossings with Ropes", this title has a little more potential and might go some way to removing the stigma attached to the trusty bush rope / throw bag on the river's edge.

The industry-endorsed methods of river crossings all have one shared dirty little secret: if the participant/s lose their footing, they are swimming. Pack, boots, sodden clothing and temperature will make this outcome challenging. For your team, other than running down the bank offering encouragement, there is no way to render assistance. Unless, dare I say it, you have a rope. And thus, we enter the forbidden arena of mixing rivers and ropes.

In river sports, best practice is to use a rope as a tool to reach a swimmer. Tramping is not a river sport, but river crossing is. With some training and following a few rules, the trapper can better arm their team with skills and a tool that will add an element of protection to a river crossing.

### The rules...

- **Practice.** Don't hope you can throw the rope. Know you can throw it.
- **Positioning.** Where will the swimmer likely be when they need assistance? You should be there, on the bank and ready.
- **Anticipate.** Once holding the rope, where will the swimmer pendulum into shore. This should not expose them to additional risk.
- **Releasability.** Everyone should be able to let go of the rope by extending his or her fingers. No one should wrap the rope around themselves. Don't tie the rope to things. No knots, knots get caught between rocks. No tangles, tangles are unnamed knots. And, just incase, have a knife in your pocket.

In the bush craft context, the bush rope is well understood and endorsed as a tool to mitigate risk. Hand lines are often used to aid clients up and down steep banks. Ropes can be used in a similar light in the river corridor, not necessarily to cross, but to negotiate bluffs and boulders where a slip could have consequences.

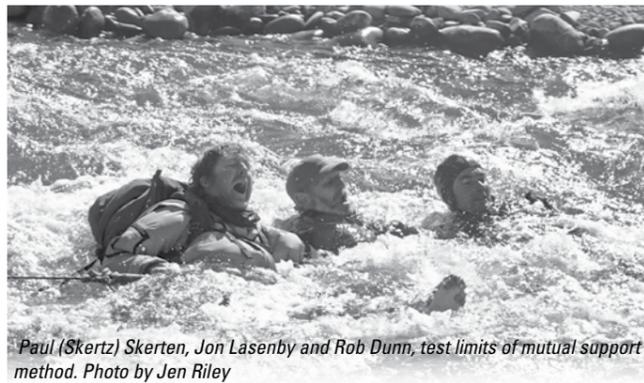
All this talk of rivers overshadows a bigger issue for our weary trapper, it is an unlikely bigger issue as it is the smaller cousin to the river; the sinister creek. Trappers cross creeks far more frequently than rivers. Sometimes benign, sometimes swollen, seldom bridged, often close to the hut or car park. Familiarity, 'get-home-itis' etc will account for the trapper making bolder moves on the swollen creek than they ever would on a river.

So, how do we cross creeks?

The endorsed and practiced methods for crossing rivers will often not apply on steep creeks. Creek crossing can be a blend of river crossing, climbing, canyoning and tramping. Part rock, part water, the creek crosser needs to be clever and creative about selecting the most conservative route. Your route may require you to move upstream and downstream within the creek bed in order to link more conservative moves.

### Some things to consider when deciding if and how to cross a creek:

- Take your time to look downstream so you know what the hazards are. Take your time to look up stream, the further you look, the more options you see.
- Look for divergence in the creek, try to cross the smaller flows.
- Creeks are riddled with eddies, look for them and use them. The rock that creates the eddy might be just under the surface, it might not be visible, but it will offer an area of less forceful current. Don't be afraid of getting wet, the better route might take you through deeper water.
- Look for good rocks to stand on, jump from, and offer physical or directional support from. Be extra careful standing high on rocks in the middle of the creek, a slip from height will have greater impact than one closer to water level. Standing just downstream of a rock, rather than on a rock can offer greater security.
- Be wary of moving rocks. ►



Paul (Skertz) Skerten, Jon Lasenby and Rob Dunn, test limits of mutual support method. Photo by Jen Riley

- Jumping across flows can remove the need to resist the water's force. Landing in eddies allows the jumper to be less precise, landing on rocks requires accurate footing.

**How do we protect creek crossings? Here come the ropes again.**

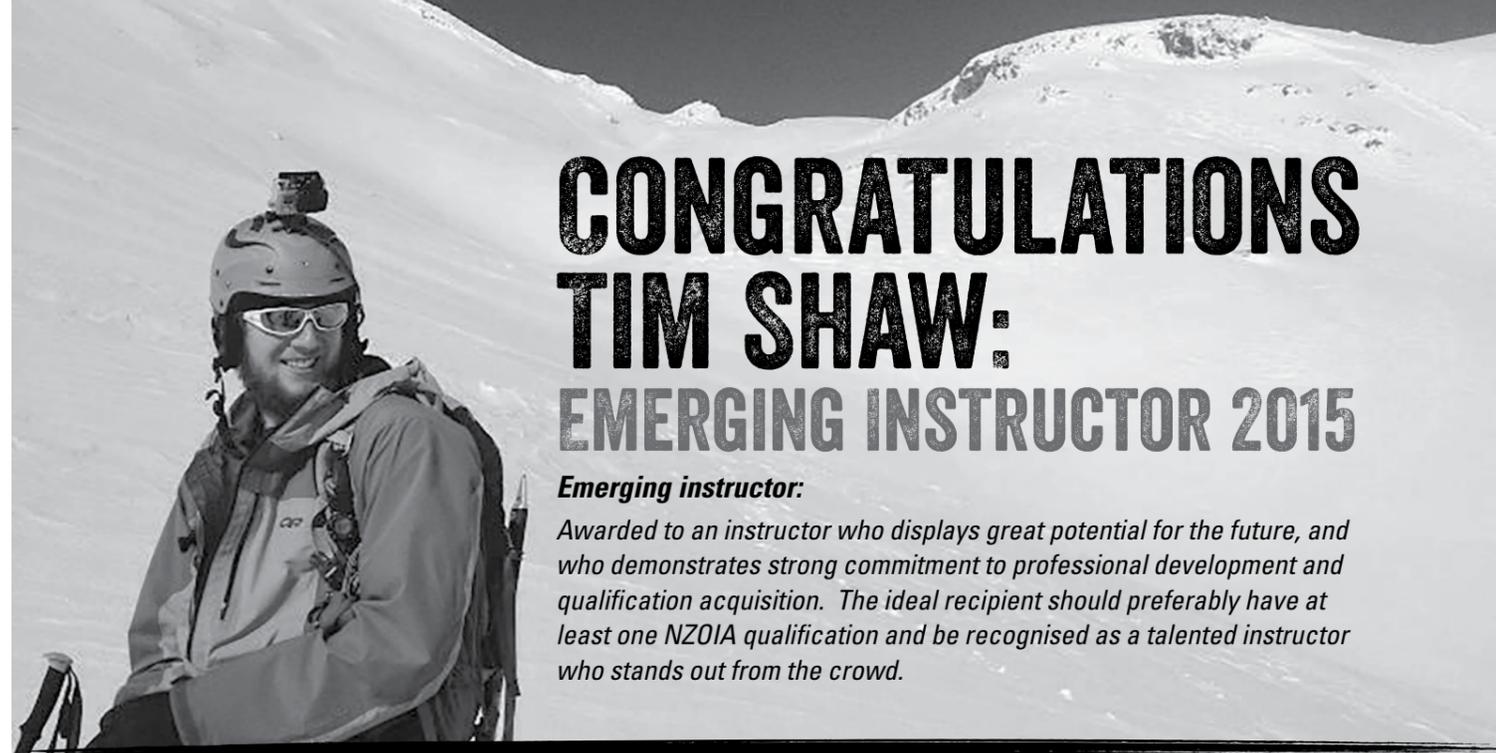
- Throw bags are a good start. You might only need to throw a few metres, the sooner the better as swimmers get beaten up on steep creeks and will quickly lose alertness.
- You might be able pass the rope to the crosser from the opposite side. Let them hold it while you manage the tension, from slightly upstream if possible, on the side they are aiming for.
- You might be able to reach the crosser to hold their hand or pack.

- A tensioned line could be a good option. The more tension (use mechanical advantage), the greater the support. Ideally the line is placed at the perceived crux of the crossing. As you cross, stand downstream of the line and hold it with two widely spaced hands, while you maintain the best footing you can. As well as support, the rope will give you a second chance should you lose your footing. In such an event, you will physically need to move yourself sideways by shuffling your hands. Your teammates should be in a position to assist. If you have to move more than a metre to regain your footing, you should reconsider the appropriateness of the tensioned line and your route choice.
- Be team focused. Physically offer hands, direction and spotting at significant sections.
- Consider removing packs; tyrolean them across or allow a more confident team member to return to carry yours. A pack-less human is far more nimble, stronger and more balanced, great attributes for a creek crosser.

Having a throw bag and the skills to use it must not be a catalyst for riskier river crossings. Experience, site selection, and general conservatism are where the real gains in river crossing safety exist.

Don't let the rivers overshadow the creeks. Plan them into your route and don't assume you will get across them. When the rain stops they will become easier to cross. Be patient, be clever.

Keith Riley – River safety specialist, based in Hokitika



# CONGRATULATIONS TIM SHAW: EMERGING INSTRUCTOR 2015

**Emerging instructor:**

*Awarded to an instructor who displays great potential for the future, and who demonstrates strong commitment to professional development and qualification acquisition. The ideal recipient should preferably have at least one NZOIA qualification and be recognised as a talented instructor who stands out from the crowd.*

**Where are you now and how did you get there?**

I am currently work full time for Adventure Specialties Trust in Christchurch.

I studied at Aoraki; I did all three years. I then worked at Fox Glacier Guides for a summer before going to Hillary Outdoors for almost 2 years.

For a start, I never thought I could make it as an outdoor instructor, but the tutors at Aoraki changed that. Hillary Outdoors gave me the opportunity to work and really grow my skills and now Adventure Specialties has brought me back down to earth and reminded me that there still is and always will be so much more to learn.

**What are your goals?**

*Attempt to live in the now  
Never let an opportunity pass by  
Be comfortable saying I gave it everything  
Go on as many adventures as possible  
Kayak 2  
Cave 1*

**Something inspirational ...**

*"If it is not hard, then it probably isn't worth doing."*  
Sir Peter Blake

**Nominated (2015) by Mark Johnston**

"I first meet Tim at a conference where I was impressed by his enthusiasm, confidence and passion for the outdoors. When a job opening came up here at Adventure Specialties Trust, I contacted Tim. He arrived at the beginning of March, a very busy time for any outdoor organisation. Some instructors would survive in this situation, others would not. Tim thrived, asking good questions and using the time to learn and grow.

In the winter, as things slowed down Tim and I put together a training plan for him identifying advanced facilitation skills as an area in which he would like to grow. Now you don't get four NZOIA level one awards in 2 years from sitting on your hands, and with the same enthusiasm Tim tackled this challenge. As a bird learning to fly; firstly trying and not succeeding, then watching and copying and slowly growing its own style, Tim has followed this path and is beginning to soar. He is becoming a well-rounded instructor with a tool kit of both hard and soft skills.

To be a great instructor you have to do your time on the rivers, rocks and mountains to keep current and build up a depth of experience from which to draw judgement. One of the things I



**Ready Heat Warming Blankets and Vests**

Single use, light weight, warms up to 38 degrees for up to 8 hours. Comes in a range of sizes and weights. 5 year shelf life

**RH II Torso (86 x 61cm 397gr) \$396 12/box ex GST**

The Ready-Heat Lap Blanket warms to a minimum 37.8°C in 10 minutes and will maintain that minimum heat for at least 6 hours. The blanket has a foam core making it water resistant as well as lightweight and comfortable. Open the blanket and drape it over you and in less than 10 minutes you will feel the warm relief. Great for use outdoors when you're staying put for longer periods of time.

**RH Vest (284gr) \$420 12/box ex GST**

The Ready-Heat Warming Vest warms to 37.8C in 8-10 minutes and stays that warm for at least 8 hours. Works off a low amount of oxygen making it perfect for wearing under your jacket for increased protection against the cold. Great for recreational activities such as hunting, fishing, marathons, boating, camping or watching the game. Any outdoor activity can be made safer and more fun with the Ready-Heat Vest!

[www.readyheat.nz](http://www.readyheat.nz)





### Instruction

Tim is 100% professional. He has excellent risk management skills and I have total trust in him to work within his own competency levels. He brings zero arrogance to his instructional role.

He has worked extremely hard from day one to increase his repertoire of skills and venues allowing him to offer tailor made courses to his clients. He has an eye for matching the suitability of an activity to the needs of his clients.

Tim is an instructor who we are more than happy to put with our more challenging groups and with groups that want to be pushed hard. However he is also a favourite with our younger client groups.

Tim is one of the few young instructors who have had the opportunity to contribute to our Tertiary teaching programme; again due to his professionalism and skill level.

Tim is professional in every aspect of his work; time management, punctuality, attendance (he has never taken a sick day) and working within Centre policy.

He always makes a positive contribution to discussions at staff meetings and is prepared to share openly any near misses he has had. His honest and open approach is a huge asset in terms of developing a positive culture within our staff team. I really respect the ability Tim has to self reflect and learn from any incidents. He always looks at himself before he blames others or the situation and I think this is one of the reasons he has "blossomed" so quickly.

Tim is an excellent practitioner; he has a good level of all round competence and is very quick to pick up new skills and concepts. He is a keen and adventurous kayaker and performs at a high personal level.

### Contribution to the broader OPC community

Tim has made a significant contribution to the community at OPC, which is hugely important in the isolated situation we are in. On a practical level Tim has been a major contributor in getting internet to our staff village which has made a huge difference to our staff lifestyle and morale. He is extremely practical and knowledgeable and was willing to put in lots of his own time to make this happen. Whenever we need a practical job done, we know Tim will be able to do it.

The staff village community has a really positive vibe at the moment; again Tim has been a driving force in making this happen by organising staff activities and being inclusive to all staff. He has also spent time with our international volunteers who he took under his wing. He has spent many an hour in the pool and on local rivers with a group of them. The fact that by the time they left they were competent paddlers in their own right is testament to his teaching and commitment.

In conclusion, Tim is "pure gold" as an instructor. We feel privileged to have him on our team and know he will be a major contributor to our industry in the future.

Janet Prier – Tongariro Centre Manager, Don Paterson – Training Manager, Hillary Outdoors

have enjoyed about having Tim around the office is his desire for personal adventures. It seems that not a weekend goes past without his tired fully stickered up Toyota Carib heading off in search of Adventure. Tim is a competent white water paddler and ski mountaineer who enjoys days on the rock and off track in the bush.

For me when I put all of this together, add a Christian faith to keep you grounded and connected to the spiritual side of holistic; I come up with an instructor who I believe has a huge future in the industry and one who is worthy of the NZOIA Emerging Instructor award.

Tim holds Kayak 1, Rock 1, Bush 1 and Alpine 1. He was trained at Aoraki Polytech has worked at Hillary Outdoors and is currently a valued member of staff at Adventure Specialties Trust."

Mark Johnston, South Island Regional Manager, Adventure Specialties Trust

### Nominated (2014) by Janet Prier and Don Paterson

"Tim came to us with an excellent reference from Aoraki Poly where he was a student for three years. He has worked at OPC for nearly 2 years and personifies the type of young professional we need in our industry. He excels in all aspects of his work; personal skill level, teaching, attitude and commitment, professionalism and drive for continual improvement. He also makes a huge contribution to the OPC community at both a practical and social level.

Below are some of his attributes:

#### Personal drive to improve personal and teaching skills

Tim has taken every training opportunity that has come his way, will actively seek out opportunities to improve his teaching and is keen to learn from senior staff. He can always be found out playing at weekends and so his personal skills are improving at a rapid rate.

Due to his proactive approach to personal development he has moved from the OPC internal level 1 to level 2 instructor quicker than any other instructor at the Centre.

# IN HINDSIGHT:

SAM COTTRELL-DAVIES

## THE BENEFITS OF ATTENDING THE SYMPOSIUM AS A BUDDING INSTRUCTOR

### Budding Instructor Tertiary Award

The award is aimed at students who have a passion for outdoor instruction and show great potential for further involvement in the industry beyond their studies.

If you are a student of an outdoor programme at one of NZOIA's MOU organisations (NorthTec, AUT, OPC, Whitireia, NMIT, TPP, CPIT, Aoraki, Otago Polytech) then ask your tutor about the Budding Instructor Tertiary Award. We would like to encourage young people to attend the 2016 Symposium and get behind NZOIA as an organisation.



Sam; NOLS instructor course, Goose Island, Hakai Protected Area, British Columbia

While studying Sport and Rec at AUT, Sam Cottrell-Davies was awarded the Budding Instructor Tertiary Award scholarship to attend the 2014 NZOIA Symposium at Tihoi Venture School. More than a year later, with the benefit of hindsight, he shared his thoughts on the value of being at the Symposium as a "budding" instructor.

### What are you doing now?

For the whole of 2015 I have been working as Duke of Education coordinator for Bigfoot Adventures in Auckland. The role involves managing and organizing students, parents and teachers to deliver bronze, silver and gold Duke of Edinburgh journeys. Journeys take place from the Waitakere Ranges to the Kaimais. I work in the field as much as possible which is about 50% of the time.

Bigfoot Adventures provide Auckland schools with outdoor instructors to deliver their Outdoor Ed programme and camps. They also deliver the Auckland council cycle programme - a council funded programme aimed at getting Aucklanders riding smarter.

I'm also doing National Outdoor Leadership (NOLS) work. I did my NOLS instructor course in Canada, sea kayaking and have just worked my first contract with NOLS running a 25 day sea kayaking journey in the Marlborough Sounds.

### How have you got to where you are now in your career?

I was a chef for the first 8 years of my professional life, then travelled and worked for 4 years. I came back to NZ and enrolled in the AUT degree in Sport and Rec. I really fell on my feet in that programme; I thrived on the practical as well as the theoretical aspects, and enjoyed the new level of learning my brain was operating at.

Whilst doing my degree, I did voluntary work for various outdoor organisations around Auckland, making connections for future employment. I also did the "Instructor in Training" position with NOLS which opened up doors there too.

Part of my studies in my final year of uni was to do a big cooperative study with an organisation. I did a project with Bigfoot Adventures developing a short programme for high school leavers to get into the outdoors. Through that project, Bigfoot Adventures got to know me, and vice versa. I started working for them after graduating at the start of 2015.

### What was the process for you to receive the scholarship?

I was already a member of NZOIA at the time, having done my Bush 1, and had read about the Symposium and the scholarship in the Quarterly. I thought that I fitted the criteria so I approached my AUT tutors who applied to NZOIA on my behalf.

### What did you enjoy most about the symposium at the time?

I enjoyed seeing how professional everyone there was. It came at a good time in my career because I'd been questioning whether or not I'd got into the right industry. Being around instructors of such high calibre, being around the 'greats' of the outdoors, gave me more faith in the industry and made me want to be in it for longer.

On a more specific level, the activities were awesome and thought provoking. The food and the social atmosphere was really well done. I really enjoyed the firelighting workshop with teachers from Dilworth. And Jo Martindale's workshop on incorporating environmental sustainability into outdoor education programmes was inspirational; I'd been exposed to those ideas before but listening to her sparked more of an interest in me and I'm continuing that forward in my own work.

### Looking back over the last year, what benefits do you see the symposium having had on your outdoor career?

I made an intentional effort at the symposium to make connections within the industry and some of those have paid off. ►

Being more educated about what is happening; I sat in on some of the discussions and debates which were really insightful. I'm now able to talk with my employers and other instructors with generally more knowledge about my own industry.

### Would you recommend current students apply for this scholarship?

Yes absolutely. I'd recommend it to students who are at the head of the game, the pro-active ones, the ones who will be strong ambassadors for their training institutions. More than that, they need to be strong ambassadors for the messages coming out of the Symposium, to take those messages back to their peers, tutors and employers.

Tutors should be more aware that these scholarships exist. I think it is a beneficial thing for your students to be part of and it can happen with little cost. It's a great opportunity for your students.

### Parting thoughts?

I was not totally sold on NZOIA beforehand. I felt like I was paying money to some random people to do some random things. At the Symposium, I met the people who were making the decisions, developing the qualifications and giving direction to the industry. It sold me on NZOIA.

# NOTHOFAGUS NO MORE

JO STRAKER



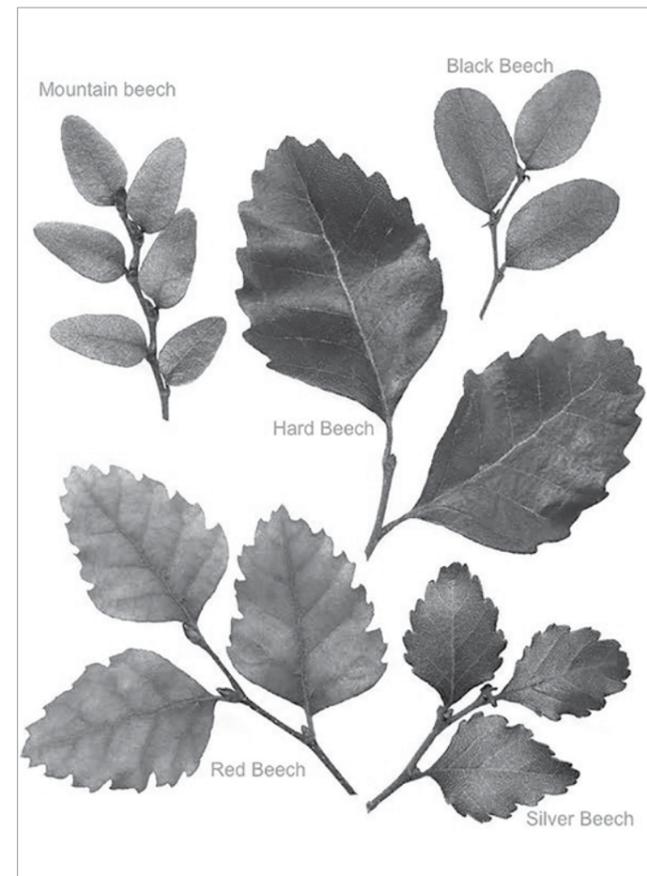
When we talk to people, the conversation is more personal and friendly when we know their name. Often we spend time chatting about where they are from and our mutual friends and relatives. Well learning about our bush is much the same; it's useful to know plant names, where they grow, and the other plants they are related to.

honeydew falling on the ground which changes the nutrient value of the soil. Wasps are so abundant that it can be difficult to imagine that they can be controlled, but intensive baiting programmes in the Craigeburns have reduced wasp numbers and the bird song is definitely increasing.

Current research suggests that southern beech forests evolved around 100 million years ago, when dinosaurs roamed, and New Zealand was still part of the super continent Gondwana. As the pieces of Gondwana drifted apart, these ancient trees moved with them. Hence southern beech forests exist in Chile, Patagonia, Australia, New Guinea, New Caledonia and of course New Zealand.

Much of the hill country of the South Island and some of the North Island, is covered by Tawhai or southern beech trees. There are 5 types of beech tree in Aotearoa commonly called hard, red, mountain, black, and silver. Beech forests usually don't have a wide variety of trees or much undergrowth, so the dappled light and open understory offers quite a distinct feel from the lush mixed podocarp forests. It also means that beech trees have a big impact on all the ecology of the area especially during mast years. Every 2-7 years, beech trees can produce up to 50 million nutritious seeds per hectare, resulting in a consequent explosion of mice and other insects. More mice mean increases in rat and stoat numbers, followed by dangerous levels of native bird predation when mice numbers drop. It's looking likely there will be another mast year this summer, just as mice numbers are dropping from the last one in 2014. Some scientists suggest that mast years will become more frequent as the climate changes.

The beech scale insect (*Ultracoelostoma*) also plays a significant role in the ecology of a beech forest. These aphid related insects, suck the phloem of trees and secrete the excess sugar through their long anal tubes, forming small droplets of sweet sugary honeydew. This is an important all-year food source for birds such as tui, bellbirds, and kaka. The honeydew also promotes the growth of a black sooty mould fungi which a range of insects devour. These insects are in turn eaten by lizards and birds, and so a complex web builds up. Unfortunately introduced wasps also like the honeydew and in some areas eat up to 90% of it. Apart from depleting the food source, high wasp densities also reduce the amount of



I've been particularly interested in southern beech since I was lucky enough to be on an expedition which found petrified beech leaves at the head of the Beardmore Glacier in Antarctica. I've also seen beech trees in Tasmania and whilst cycling through Patagonia. Being on different continents for thousands of years has meant these trees evolved independently, in Patagonia and Tasmania for example many are deciduous. Until recently they were 37 species spread around the southern hemisphere all classed under one genus (*Nothofagus*).

So now we know a little bit about the ecology of beech forests, let's think about what we call them. The European botanists who travelled to Aotearoa New Zealand in the 1800s often named plants after similar-looking northern hemisphere plants and the southern beech trees were thought to resemble birches from the genus *Fagus*. When it was scientifically worked out that they were not really related to birches their genus name was changed to *Nothofagus* or false beech.

For many years, I've been encouraging students to learn about southern beech and have encouraged them to use the Latin genus name *Nothofagus* as it helps to explain a little about continental drift and Gondwana. So I was a bit devastated when beech trees were reclassified in 2013. After extensive research into the DNA, Heenan & Smissen published a paper noting that more accurate names for the NZ Beech would be *Fuscopora fusca* (red beech), *Fuscopora truncate* (hard beech), *Fuscopora cliffortioides* (mountain beech), *Fuscopora solandri* (black beech) and *Lophozonia menziesii* (silver beech). So no more *Nothofagus* in Aotearoa... there are still some in Patagonia.

I've been through the denial stages of – it's just not right to change the name, I'm too old to learn all this new stuff, and a name is not as important as all the history which will be lost. But I'm pretty scathing of climate change deniers, so I can't simply reject science evidence because I don't like it.

It's going to take a bit of practice to get my tongue around the new names, but they are more technically correct and they do clarify relationship conundrums. After all the beech honeydew scale insects already knew that silver beech was different, they have never fed on it and so it doesn't have the characteristic black sooty mould. They only feed on the hard, red, black and mountain beech trees that are now grouped together under *Fuscopora*.

As outdoor educators we should advocate for the environment and how it is treated, without drifting into doom and gloom stories. Things are always changing and we play a part in that change, so as we share some of our knowledge and observations we can easily highlight that change is possible. For if young people don't believe they can have an influence, then they don't even dream about making a difference.

### Reference

Heenan, P.B. & Smissen, R.D. (2013). Revised circumscription of *Nothofagus* and recognition of the segregate genera *Fuscopora*, *Lophozonia*, and *Trisyngyne* (Nothofagaceae)

Jo Straker, teaches Bachelor of Sustainability and Outdoor Education, CPIT



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Profiles of organisations are welcomed for the back page series "Planting the Seeds of Adventure". Contact [editor@nzoia.org.nz](mailto:editor@nzoia.org.nz)

