

New Zealand Canoeing

Welcome to the Spring issue of New Zealand canoeing. We have some very good news:

Whitewater NZ are very pleased to be able to announce that we have received funding from Water Safety NZ to subsidise River Safety and River Rescue courses for the 2011 Spring paddling season. Current individual and club members of Whitewater NZ can apply for a \$100 subsidy towards an approved River Safety or River Rescue course by emailing our membership officer Jo Dovey on membership@rivers.co.nz. Please confirm your subsidy before making arrangements and check www.rivers.org.nz for further details.

Thank you very much to Water Safety NZ for their support in contributing to keep kayakers safe on the river - we're sure that you will make the most of the opportunity!

In the wider world the tradgedies seem to keep rolling in; amongst them the death of Simon Davidson on Red Creek in Canada's Banff National Park. In the days following this the acolades rolled in for the talented and well-loved young paddler.

The Whitewater NZ Annual General Meeting will be held in Turangi on 17 September. See rivers.org for more details. The Whitewater New Zealand Annual report is available at http://rivers.org.nz/article/annual-report-2011.



Lou Urwin pulls off an air screw on Black Mass in Dolbeau, Canada, Photo: Tyler Fox

About New Zealand Canoeing

New Zealand Canoeing is the official newsletter of Whitewater NZ Inc. NZ Canoeing is published quarterly and distributed free to around 1,200 members of Whitewater NZ throughout New Zealand/Aotearoa. The views expressed in New Zealand Canoeing are those of the individual authors and do not necessarily represent those of the Executive of Whitewater NZ.

NZ Canoeing welcomes advertising from organisations associated with recreational canoeing. Please contact us for our advertising rates, and find out how to show your products and services to kayakers around NZ

Thanks to contributors and advertisers and the myriad of e-mail correspondents for their contributions to this issue of *NZ Canoeing*.

Unless otherwise noted all material in *NZ Canoeing* is © Whitewater NZ.
All rights reserved.

Whitewater NZ Executive & Officers

as elected at the Whitewater NZ AGM July 2010

Patron

Hugh Canard Christchurch patron@rivers.org.nz

President

Polly Miller Christchurch president@rivers.org.nz

Vice-President

Graeme Wilson Christchurch vice-president@rivers.org.nz

NI Conservation

Nick Clendon Wellington conservation@rivers.org.nz

Conservation

Tony Ward-Holmes Wellington conservation@rivers.org.nz

Safety

Dave Annear Wellington safety@rivers.org.nz

Education

Matt Barker Auckland education@rivers.org.nz

Access

Mike Birch Masterton access@rivers.org.nz

Treasurer

Sarah Fawcett Christchurch treasurer@rivers.org.nz

Communications

Mike Birch Masterton communications@rivers.org.nz

Administration

Jo Mair Christchurch admin@rivers.org.nz

Membership

Jo Dovey Wellington membership@rivers.org.nz

NZ Canoeing Editor

Miriam Odlin Rotorua editor@rivers.org.nz

Webmaster

Jonathan Hunt Christchurch webmaster@rivers.org.nz



Simon Davidson

Matt Burton was kayaking with Simon Davidson in June this year when he drowned on Red Creek in Canada.



Simon doing what he did best: lovin' life. Photo: Matt Burton

From Matt:

Simon was not my brother or boy friend, even though most people thought one of the two. He was just the most amazing best friend anyone could possibly hope for. Someone that was standing right behind you no matter what; ready to catch you when you fall, someone that I trusted on the water with my life to do his absolute best to save me. And someone, for me, that made the difference between a good day on the water and a great one.

The day he drowned is one I will never forget for the rest of my life. I could not imagine a better last day with my best friend, Simon. The sun was shining, the river was beautiful, and we got to walk for two hours to the put in together, talking about LIFE.

Simon and I loved doing one thing together, the one thing that brought us together in the first place, KAYAKING, and on that day that's what we did.

Simon Davidson, my best friend, died kayaking on Red Earth Creek in Banff National Park, Alberta, Canada on the 22-6-2011.

From Tyler Fox and Lou Urwin:

There is no comfort in saying "Simon died doing what he loved". There is no love in dying; that's not why we do it. However, we can take comfort in knowing that Simon's time here, cut devastatingly short, was enriched by his passion for kayaking and that he lived his life well. The River held a special place in Simon's heart. It drew him to it, whether it was the challenge, beauty or camaraderie found along its course. The River's attraction

is something that once felt, is hard to put into words, but was easily seen in Simon's smile while on the river.

From Josh Neilson:

Friendship is a BIG thing, and its also a million little things too! Simon Davidson was a big guy with a big smile and a big heart and his friendship to me was a BIG thing! This friendship was made up of a million little things, some we both physically knew about like our shared passion for kayaking, our general love of water, the odd dress-up party etc. And then there were the things underneath that are not talked about much like the huge amount of respect I had for him, how genuine he was when he asked how things were with my injury or life in general, how much I loved his smile, energy, passion, humor and these things needed not to be spoken to Simon as this is just what made him who he was but it was a Big thing for me to know! Then there are the things I am still learning about Simon that I cherish in our friendship! How he played the guitar and while I'm just starting he will motivate me to keep trying, and how much of a hole he has left within our community of friends that will never be filled! Simon you were taken from us too early and those millions of little things you brought to make my life and our friendship better should really have gone into the billions. I will miss the kayaking with you, hanging out with you, chatting on Facebook about how epic both our missions were going and how great the reunion would be back in the falls. So now we must make that reunion some other day. I'll keep remembering you down here and you keep looking over me out there and someday when we have that reunion we can share stories and add to those million things that made our friendship so amazing! Bro you will be missed so much! Thanks so much for everything that you gave me and the inspiration you have left me! You have made the world a better place and for that I know you have succeeded! See ya on the other side someday bro! ~Aroha Nui~



Simon in Quebec, Photo: Josh Neilson

Mokau victory!

by Terry Lasenby

Bev checked the Mokau gauge and got back to me with a reading of 2.95m so I put some emails out to find keen paddlers for Sunday. We ended up with a big crew with Darrin, Stu, Michelle, Steve, Greg and myself from our Waikato club and Bruce Clark, Joe Anderson, Phil Boorman, Mark Thomas and Mike Gerrand from over the Kaimais, plus about seven or eight from the Auckland Uni club. On arrival at the put-in we found the level had dropped to 2.65m but the sun was shining and Wairere Falls pumping full force was a spectacular sight.

Everyone managed to avoid the first few holes and a few had rolls on the first drop leading down to the eddies directly above Little Huka. Here, most eddied out to check the line. When I say most, that excludes Darrin who didn't realise where he was until it was too late. No problems though, he has bombed it before. With a big crew it took a while for everyone to go through with Michelle doing the most spectacular yellow submarine imitation. With no carnage thus far we headed on down through Cork Screw and the other smaller rapids to Cow Rapid. At the bottom of this one at high flows there is an eddy that sometimes likes to play games with you so I kept going till I was in the next eddy down and stopped to watch. Most who

caught the big eddy had to work hard to escape it but Jenifer from Auckland did multiple circuits before she finally managed to break through the line and continue on her way. Next stop was Dragons Tooth where the level was high enough for us to have a right and a left line option. Most took the hard man's line on the right including Greg who had started the trip paddling his Mystic which had miraculously turned into a Smoothy somewhere along the way. Everyone avoided that big hole just on the other side of the final dragons molar. Except Greg. He eventually got surfed out the lower end of the hole. With that little bit of entertainment over we stopped for lunch.

For those that didn't know about the proposed dam I pointed out the cone up on the hillside that marks the spot where the dam would be and shows how much of the run we would lose. At this level the river moves on nicely even in the flat sections and the Tauranga crew who had never been to the Mokau before were impressed by the size of some of the waves. Little Aratiatia was at its intimidating best with huge waves and very disturbed water for a long way down the run out. It is, however, generally safer at this level. Greg got smoothly through in the Smoothy and then took my boat through as well while I took pics and kept the throw bag close just in case. He says the Habitat paddles itself anyway and he may be right because he hardly



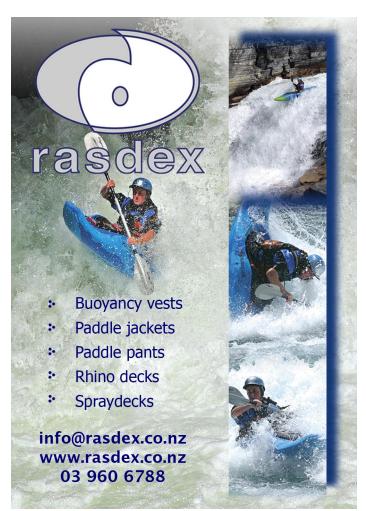
Flying Flippy on Little Huka . Photo: Terry Lasenby

put the paddle in the water the whole way through. Matt from Auckland started his run with a back loop, a quick roll and then finished with a more dignified line to finish. Everyone else made it though easily enough although Steve G also picked a manky place to test his roll.

One more rapid to go and the trip would be done and dusted but this is where things went a bit pear-shaped for me. When I arrived above the drop, people were already running the left line. From above, it looked as if they were getting through ok although some seemed to be paddling franticly to clear the bottom of the drop. On the many previous trips here I've always gotten out to check which line is best but this time I went ahead and ran it without looking and took the right of centre line that had worked on other occasions. Bad call. At this flow that's where the tow back was strongest and although I timed my boof nicely and landed cleanly it pulled me back in and smashed me. I pulled the deck for the inevitable swim. I've never seen anyone flush from this side and I didn't want to waste any of my breath fighting it because there's usually a bit of down time. Well, I can tell you I needed all of that breath. I got pushed real deep and seemed to take ages to resurface and although I was well away from the drop when I did come up, no sooner had I taken a breath than I was pulled down in a sucky seam for another short sub daylight mystery move. There were plenty of people around to get me to the bank and retrieve my boat so no real harm done in the end. My pride was a bit battered but I really did deserve it. With that last bit of entertainment supplied by me, everyone was in relax mode for the flat paddle out. As we paddled the flat section to the take out, Matt showed us his planking skills across two kayaks. I've always thought that planking and some of the words that rhyme with it are quite inappropriate but actually it was a clever touch of humour to end the trip and showed he must have awesome stomach muscles. We all stopped at the Thirsty Weta in Otorohanga for a beer and hot wedges on the way home and it was suggested that I should be drinking from one of my paddling booties (and I will). But having survived a swim in the river, there was no way I wanted to risk almost certain death



Greg runs the Wairere Falls, Photo: Terry Lasenby



by drinking from a booty that had just walked back to the van through cow pats, goose poos and Mokau mud.

A few weeks after this trip we received the great news that King Country Energy have withdrawn their appeal to the Environment Court action that could possibly have given them approval to build a dam. This really is the best news we've had for a while and shows the value of being members of organisations like Whitewater NZ and your local clubs. Together we are strong and have a voice that is being heard.

A big thanks to everyone who sent in submissions, went to the hearings and showed up in force with their kayaks the day the news media visited the river. There were many people who gave their time freely to the cause. Two of the kayaking community's real gentlemen that come to my mind instantly are Craig Peters from the Ruahine club and Alan Bell from the Hutt Valley club. These guys had to travel more than most to be at the hearings and without these two our case would not have been as strong. Anyone who knows me will tell you that I'm not the most eloquent person about so thanks to all those who spoke so beautifully and passionately at the first hearing in Te Kuiti. The Mokau is the Waikato Club's closest long run during the winter and we use it frequently. So to everyone involved in saving it, THANK YOU once more from the bottom of our hearts.

Whitewater Grand Prix

Louise Urwin

So, we just finished up two weeks of epic unprecedented competitions and it feels good to be a World Champion! The White Water Grand Prix was made up of 6 events (3 Freestyle & 3 Extreme Racing) each of which was the burliest event of its kind.

We started out with a big trick freestyle contest on the biggest wave I'd ever surfed - "Gladiator" (Ottawa River). Everyone was nervous as the dreaded 'ledge' lay just downstream waiting to swallow a victim. I dropped into the pit for the first time and was instantly owned. I came up in the middle of the river (the worst spot) and the crowd was tense as I just managed to skirt the hungry hole. I figured this was worst case scenario so off I went for some

more attempts and finally managed to surf the beast, got a trick and won the first women's event.

The next day, we made like gypsies and our entire party, athletes, media crew, safety crew, groupies, et al. hit the road for the Rouge. The second event was a big water boater cross and it was BIG! I thought it was quite a long course so decided I would pace myself on the first run and save some power for the end when we had to plough through some enormous waves. It turned out there was no need as the water was cooking and we were at the finish line before I knew it. So, the next run I went hard from the start and got a good lead and the overall win.

The third event brought us to La Tuque where we stayed in beautiful wooden cabins. We went to scout the course which was ridiculous. The town were helping us out and closing the dam for race day so we would have a third of the flow we observed. We had to run the event super tight as we only had



The final drop on the Bras Louis, Photo: Pringle

a small window before the lake above would become too full and the dam would spill over onto the course. We showed up on race day and waited for the water to drop, which it did - a little bit. It sure didn't look like a third of the water and when the local paddlers/race organisers were asked if they had run it that high, the answer was 'No'. Great! It was stout, probably the burliest course ever raced. Everyone was nervous. It was pretty crazy being at the start line and watching everyone's little nervous rituals as they were about to go, there were a lot a big breaths. The first 3 racers went...and swam! Not a good start and not helping the nerves of everyone else. These were the best boaters in the world! I was up last and by the time it was my turn, there had been 8 swims, I just told myself to go for it and peeled out of the eddy into the current. The first drop was a double drop with two waterfalls, i boofed off the first one and wound up in a boily eddy between the two drops...great!!! It took a few tries and all my strength to get out of the eddy and straight off the next drop. One rapid in and I'm exhausted: awesome! I sucked it up and survived the rest of the run, taking a quick

roll on the slide but I was so stoked to make it to the bottom unscathed and still in my boat. I came out with another win so 3 for 3 was a very good place to be half way through the competition.

Next up we drove all the way up to Dolbeau where we were hoping for the giant wave, "Black Mass" to be running. Unfortunately the water levels were a little high so we went for plan B. The locals were expecting a show so we put on a downriver freestyle on a big wave called "Hawaii". It was a really tricky wave but if you timed it just right you



Play boating, anyone?, Photo: Tyler Fox



Lou and trophy, Photo: Tyler Fox

could get big air. There were some awesome moves, I struggled to do something awesome but came in second after Katya.

The 5th event was to be another freestyle so the search began for the best wave around. We ended up on a wave they named the "Pillars Wave" which was actually two waves right after each other under a rail bridge. They were big and fun! I had a bit of a shocker and

only got a couple of surfs throwing a few tricks but Katya the freestyle specialist threw the biggest trick of her life and probably of the day: a mega massive air screw. So another second place for me, Katya taking the win again.

The sixth and final event was an extreme slalom on the Bras Louis in Chicoutimi. We rolled up to the take out, I'm not sure what we expected but everyone's jaw dropped as they laid eves on the final drop of the race section, a massive drop into a slide with an extra meaty hole at the bottom. And this is what we had to paddle at the end when we were exhausted! Well it was in theme; everything else had been full-on so far. I had an increasingly sore shoulder so I was on the fence a little bit about paddling the long course. I already had enough points to win the competition overall. In the end I decided I didn't want to miss out and went to get ready. At this point I realised my footblocks were still in the hotel room so I raced back to get them - 30 mins each way. After a mare trying to get into my room, getting lost on the way back and a 10 min hunt for my paddle, I missed my first run. They had decided by this time that the girls would finish the race just before the final drop so everyone would enter. I went down the course and missed a lot of gates (they were hard) as the water had risen for race day and was moving really really fast. So I was pretty disappointed with my run and decided to make up for it by firing up the bottom drop which was great fun and made me feel much better. Marie-Pier Cote took down the slalom in the end, and I came in second.

So yeah, sickest event ever!!!!!!!! Huge thanks to Pat, Julie and all the volunteers for putting it together, everyone had an amazing time, the competition has raised the bar for extreme whitewater events and I look forward to seeing all the media coverage that will be coming out and can't wait to see what is in store for next year!

Editors note: See http://www.whitewatergrandprix.com/ for a full appreciation of the bigness of the water at this race. Truly inspiring.



Conservation News

By Tony Ward-Holmes

Some very welcome news arrived in June, when King Country Energy (KCE) withdrew their Environment Court appeal against Waikato Regional Council for declining KCE's application to build a dam on the Mokau. KCE issued a media release claiming that "Waikato Regional Council granted us the supplementary consents required to construct a roller compacted concrete dam on the Mokau River", which is an interesting take on the fact that they'd been granted consent to build a quarry but certainly not to construct a dam. The declined consents were a deserved result of the great work of local kayakers, New Plymouth and Waikato Canoe Club members and Alan Bell for Whitewater NZ. Craig Peters is organising a celebration paddle and riverside BBQ on September 3, followed by a banquet at Hamilton Tomo Group hut.

The KCE media release went on to note that "high consenting costs on smaller developments are a significant hurdle", and "it can take smaller generators a lot longer to find the right project and get it online." To which we can only reply: Yes, exactly! All generators, not just small generators, should be prioritising projects like wind and geothermal that don't trash non-renewable rivers. This is one of the reasons Hugh Canard has been so active on the Land and Water Forum, ensuring that collaboration is early and developers don't get committed to projects that are damaging, unpopular amongst local communities and stakeholders, and likely to result in expensive battles.

The Mokihinui however is still steaming ahead, albeit in slow motion as Meridian has repeatedly sought to delay Environment Court proceedings. Dates for evidence to be submitted are now Q2 2012, with the hearing itself starting in June 2012.

Meridian released an opinion-piece in the Dominion Post on February 11 which unfortunately the Dom would not let Whitewater NZ reply to. One of its most outrageous statements was that the 46 MW Arnold scheme combined with the 25 MW Stockton scheme would not meet the West Coast's demand for electricity. In fact Electricity Authority statistics show a highest peak daily demand of 57.6 MW so far this year. The average daily peak demand is 47.1 MW - not much more than the Arnold by itself - and Meridian ignored the fact that the Coast already generates 18 MW which with the Arnold would usually supply West Coast demand even without Stockton. One wonders if this kind of deception will be employed in Meridian's evidence to Environment Court.

Whitewater NZ often submits on legislation and policy that affects kayaking, including two policies released recently. Suffice to say it is difficult for Whitewater NZ to be heard amongst much better-resourced commercial and political interests. In May the government released the National Policy Statement for Freshwater Management. The draft policy was developed by a board of inquiry with substantial consultation up and down the country, followed by endorsement by the Land and Water Forum. The final version has been emasculated by the government. Dr Mike Joy, Director of the Centre for Freshwater Ecosystem Management and Modeling at Massey University commented: "It's hard to see how this long overdue freshwater NPS will make any difference to the state of NZs waterways when it contains no national standards and farming intensification, arguably the biggest issue for freshwater quality and quantity, is not addressed."

More recently the government released the NPS for Renewable Electricity Generation. Again this policy is substantially different from the draft and it has turned into a disaster for kayakers. Two of the main worries are requiring councils to make special provision for developing electricity generation in their regional plans, and changes to the RMA so that offsets or compensation can be used instead of mitigating, remedying or avoiding environmental effects. It barely paid lip service to any notion of conserving the energy we already have. The writing was on the wall at the government official's responses part of the hearing: a stunning spring day in Wellington, sun pouring in through 5m high windows, and bouncing off the drawn curtains behind which the hearing proceeded under electric lights and heating. Nobody commented on the irony.



Tony Ward-Holmes on a research assignment, Photo: Miriam Odlin

Releases and Events

Whitewater New Zealand AGM	
17 September	10:00 - 16:00
Wairoa River Release from McLaren Falls	
11 and 25 September	10:00 - 16:00
9 and 23 October	10:00 - 16:00
13 and 27 November	10:00 - 16:00
4 and 18 December	10:00 - 16:00
Tongoriro River Release Access 10	
17 September	09:00 - 15:00
Tongoriro River Release Access 14 and 13	
18 September	08:00 - 16:00

Women on Whitewater 2011 8 and 9 October, Bliss-Stick Factory, Taihape http://www.facebook.com/groups/244235435599202/

Piripaua Release	
8 and 9 October	09:00 - 15:00
5 and 6 October	10:00 - 16:00
11 December	09:00 - 15:00
Whakamarino Release	

5 and 6 November 09:00 - 15:00

Refer to our website (<u>rivers.org.nz/events/</u>) for the latest release schedules, including flow information.

river, boof, waterfall, sieve, huck, drop, paddle, rock, loop, cartwheel, air, nature, float, explore, canoe, white water, buffer, travel, experience, rescue, slide, spin, ferry, attain, eddy, whirlpool, cataract, gorge, swim, blunt, kayak, fun, scout, hydraulic, play, portage, creek, slalom, grade, carve, inspire, power, pourover, stroke, slice, pfd, donkey flip, helmet, race, wave, expedition, friends, lines, camping, throw-bag, movies, trips, adventures, knife, ecology, fitness, life, lateral, gate, undercut, lifejacket, carry, challenge, pour-over, competition, breath, crank, shuttle, mission, sunshine, passion, road-trip, events, prizes, tips, techniques, pin-drop, seal launch,



AVAILABLE AT KAYAK & BOOKSTORES ALL OVER NEW ZEALAND, OR VISIT WWW.CUMECMAGAZINE.COM TO SUBSCRIBE

How good is your rescue kit and techniques? Part 1.

By Matt Barker

White-water rescue equipment can be made to fail using conventional and widely used rescue practices. If failures of this type were to occur in actual rescue environments, catastrophic results would ensue for both rescuer and rescuee. The current investigation set out to try to answer these questions,

- 1. Which of the ropes on the market were suitable to the demands of white-water rescue?
- 2. Which of the current mechanical advantage rescue techniques are best suited to the equipment available?
- 3. What force can a 3 man team generate?
- 4. Are there any experimental techniques that could improve the force generation and safety of the rescue system?

We tested floating synthetic ropes of between 6 and 8 mm for

in-use strength, abrasion and throwability, buoyancy aid rescue harnesses and various haul systems and knots to find the limits that we were working within and the forces that the equipment could withstand.



The author in action

Table 1: Bouyancy aid testing

Test	Force at Failure	Type of Failure
Hydraulics 2004 chest strap plastic buckle	4.1kN	Webbing broke
Hydraulics 2008 chest strap plastic buckle	4.5kN	Webbing slipped
Macpac chest strap plastic buckle	1.6kN	Webbing pulled through buckle
Hydraulics 2004 chest strap plastic & metal buckle	6.7kN	Pulled central pin out of alloy buckle
Hydraulics 2007 chest strap plastic & metal buckle	7KN	Steel buckle bent & webbing slipped
Macpac chest strap plastic & metal buckle	9.8kN	Stitching on buckle broke
Hydraulics 2004 cowstail ring	2kN	Weld broke
Hydraulics 2007 cowstail ring	15kN	Weld broke
Macpac 2005 cowstail ring	2kN	Ring broke
Hydraulics 2004 cowstail	2.7kN	Webbing broke
Macpac 2004 cowstail	6.3kN	Stitching broke
Hydraulics 2005 shoulder strap	4.3kN	Stitching broke
Hydraulics 2005 waist strap	1.5kN	Fastex buckle broke

Table 1. shows the forces at failure for the components of the rescue harness incorporated into white water buoyancy aids as well as auxiliary attachment points that could be used to clip a person to a rope in a rescue. This testing highlighted some surprising mismatches in components and materials. Components of the same system varied in strength from 2 kN to 9.8 kN. The ring that attaches the cows tail to the chest strap was found to be a weak link in both manufacturers' systems, failing at 2 kN and the cows tail webbing and buckles used on the chest strap failed at as low as 2.7 kN and 1.6 kN respectively.

Table 2. shows the strength of the ropes using 'overhand' and 'figure of eight' knots. The 'figure of eight' knot with Donaghys' Spectralite rope and Southern Ocean's Southern light provided the strongest terminal knots failing at 15.4 kN and 11.3 kN respectively. The ropes specifically manufactured as water rescue ropes, PMI's Rescue Rope and Esprit's Swiftwater Line, were poor performers, failing at 7.1 kN and 5.6 kN respectively.



3 to 1 rig



Marlinspike hitch

These ropes displayed separate sheath and core failure, probably due to the sheath and core materials not having similar stretch characteristics and therefore not loading across all fibres, leading to progressive failure at relatively low loads.

Table 3. shows the force at failure for the various 3:1 pulley systems. The best performing knot used to create the 3 to 1 mechanical advantage system was a Marlinspike hitch, although the in-line 'figure of eight' knot and clove hitch sometimes were stronger than the Marlinspike hitch, they tightened up to such an extent during loading that they became impossible to untie thus leaving a knot, or knot and karabiner, in the rope rendering it useless as a clean throw or rescue rope later. Prusik knots although widely used and recommended by various authors, are in fact quite inadequate to handle the maximum forces able to be applied without slippage.

In part 2 of this article we will look at different hauling systems and aids and test throw bags and their handling properties.

Table 2: Terminal knot strength

Rope	Construction	Fig. 8	Overhand
Spectralite 8mm	Braided Polypropylene sheath, Spectra core	15.4kN	11.6kN
Southern light	Braided Spectra and Polypropylene blend	11.3kN	11.3kN
Robline extreme	Braided Polypropylene sheath, Spectra core	9.1kN	
Spectralite 6mm	Braided Polypropylene sheath, Spectra core	8.5kN	7.6kN
Espirit Swift waterline	Braided Polyester sheath, Polypropylene core	7.1kN	7.2kN
Econobraid 8mm	Braided Polypropylene sheath and core		6.4kN
PMI water rescue 7mm	Braided Nylon sheath, Polypropylene core		5.6kN
Robline Albatross	Braided Polypropylene	4.3kN	
Econobraid 6mm	Braided Polypropylene sheath and core	2.9kN	

Table 3: 3 to 1 pulley strength

Rope	Inline 8	Marlinspike	Clove hitch	Tibloc	Truckers	5mm	Tape
Spectralite 8mm	15.3kN	13.4kN	13.9kN	10.7kN	10.8kN	9.4kN	
Southern light	9.8kN	10.7kN		8.7kN		2.3kN	
Robline extreme		9.1kN					
Spectralite 6mm	8.8kN	8.5kN					
Esprit Swift waterline	7.1kN	7.2kN				6.3kN	
Econobraid 8mm	5.3kN		7.1kN		6.6kN	6.8kN	3.5kN
PMI water rescue	4.2kN	4.4kN					
Robline Albatross	4.3kN	4.1kN					

Further reading

Bechdel, L. and Ray, S. (1985) River Rescue. Appalachian Mountain Club Boston

Cassillo, F. (2005) Kinesiological and Anatomical approach to the Deadlift. Retrieved 14/10/2005 from http://www.bodybuilding.com/fun/casi4.htm.

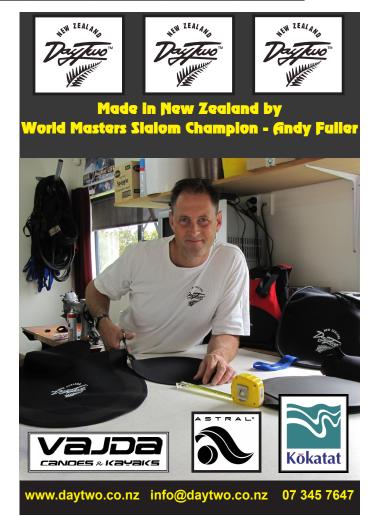
Cavanaugh, J. (2000) The Biomechanics of thoracic trauma. BME 7160, Winter 2000. Retrieved 14/10/2005 from http://ttb.eng.wayne.edu/~cavanau/ucsdout.html

Ferrero, F. (1998) White Water Safety and Rescue. Pesda Press, Wales

Hopkins, R. (2003) Knots. Thunder bay Press, San Diego Moyer, T., Trusting, P. and Harmston, C. (2000) Comparative Testing of High Strength Cord. Paper presented at 2000 International Technical Rescue Symposium

Pawson, D. (2001) Pocket guide to knots and splices. PRC publishing, London

Ray, S. (1997) Swiftwater rescue. CFS Press, Ashville NC. Walbridge, C. and Sundmacher, W.A. (1995) Whitewater rescue manual. Ragged Mountain Press, Camden ME.



Whitewater NZ

Our purpose is to preserve New Zealand's White Water resources and to enhance opportunities to enjoy them safely.

PO Box 284 Wellington • Ph +64 21 027 58661 • whitewaternz@rivers.org.nz • www.rivers.org.nz

Want to make a donation? You can use the form below to join Whitewater NZ and make a donation which will go towards preserving rivers you enjoy for tomorrow

Individual Membership Form Whitewater New Zealand PO Box 284 Wellington E-mail: nzrca@rivers.org.nz

Website: www.rivers.org.nz/membership

Individual Membership

30.00

.00

Please note that Club and Associate members pay different fees. See our website: www.rivers.org.nz/membership for details of other membership classes.

Personal Details

Name Ph (day) Ph (a/h)

Address

E-mail

Occupation

Fax

Club

Your membership details are managed by Whitewater NZ in accordance with the Incorporated Societies Act (1908) and the Privacy Act (1993).

Donation \$.00

Additional support for our work in Conservation, Access,

Safety and Education is gratefully appreciated. Total \$

Tick to receive a receipt

Make cheques out to "Whitewater NZ" and send to PO

Welcome! Box 284 Wellington.

For Whitewater NZ Use Only

Membership ID

Receipt #				
Deposited				

Response Date