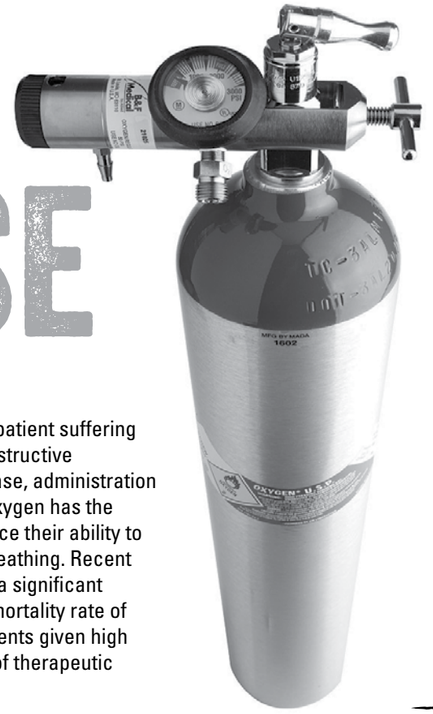
# PRE-HOSPITAL OXYGEN USE

HENRY WORSP, PEAK SAFETY



Organisations such as outdoor education centres, ski patrols, fire brigades, rescue teams and some expedition companies carry oxygen to help stabilise unwell patients prior to evacuation by emergency services. Traditionally supplementary oxygen has been used for a range of different ailments, often without much thought as to why it is being administered. Commonly, when asked why a patient was being given oxygen the responder would reply "because it can't do any harm" rather than identifying how it was beneficial for that particular patient.

This article seeks to clarify some of the times when oxygen should or should not be used in the pre-hospital care setting. We understand that not everyone has access to oxygen but for those that do this will hopefully shed some light on its application.

Our cells require oxygen to metabolise, however there are times in an emergency setting when the patient is carrying decreased amounts of oxygen due to injury or illness. This could be due to the lungs not working effectively, such as during a pneumothorax, asthma attack, or airway constriction during anaphylaxis. It could also be due to a depressed respiratory effort following a head injury, drug overdose or during a resuscitation. All of these patients should be given supplementary oxygen as the amount of oxygen in their blood is likely to be greatly reduced.

But what about the case of a heart attack, a stroke or someone who is having a major bleed? In the past these patients have all been administered oxygen as a matter of course but recent research has proved that, in many cases, we could be doing more harm than good.

Studies have consistently found that patients suspected of having an acute myocardial infarction (heart attack) actually show a decrease in cardiac output when put on oxygen instead of breathing atmospheric air (medscape.com), even resulting in slightly higher mortality rates.

Increased oxygen levels in a patient having a stroke have been shown to cause vasoconstriction in the cerebral blood vessels (Cornet et al. 2013). In the case of an infarctic (blockage) stroke this certainly has the potential to make things worse.

In the case of a patient suffering from Chronic Obstructive Pulmonary Disease, administration of therapeutic oxygen has the potential to reduce their ability to regulate their breathing. Recent studies showed a significant increase in the mortality rate of those COPD patients given high concentrations of therapeutic oxygen.

Even in major bleeds, as long as the patient is respirating effectively there appears to be no benefit to administering supplementary oxygen although studies on this front are limited.

The ability to measure the amount of oxygen in a patient's blood therefore is a vital piece of information to assist with decision making around oxygen administration. Historically pulse oximeters have been mainly limited to the clinical setting but more recently the development of quality battery powered versions have given the pre-hospital responder the ability to measure oxygen saturations in the field. The accuracy of these devices depends on the amount of patient movement, perfusion, sensor quality and the way in which it is positioned on the patient.

With good quality equipment we can generally say that anyone who has a oxygen saturation greater than 94%, and who is ventilating well does not require supplementary oxygen.

## References

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Cornet et al. ( 2013). Critical Care. *The potential harm of oxygen therapy in medical emergencies*. Retrieved from **http://www.ccforum.com/content/pdf/cc12554.pdf**

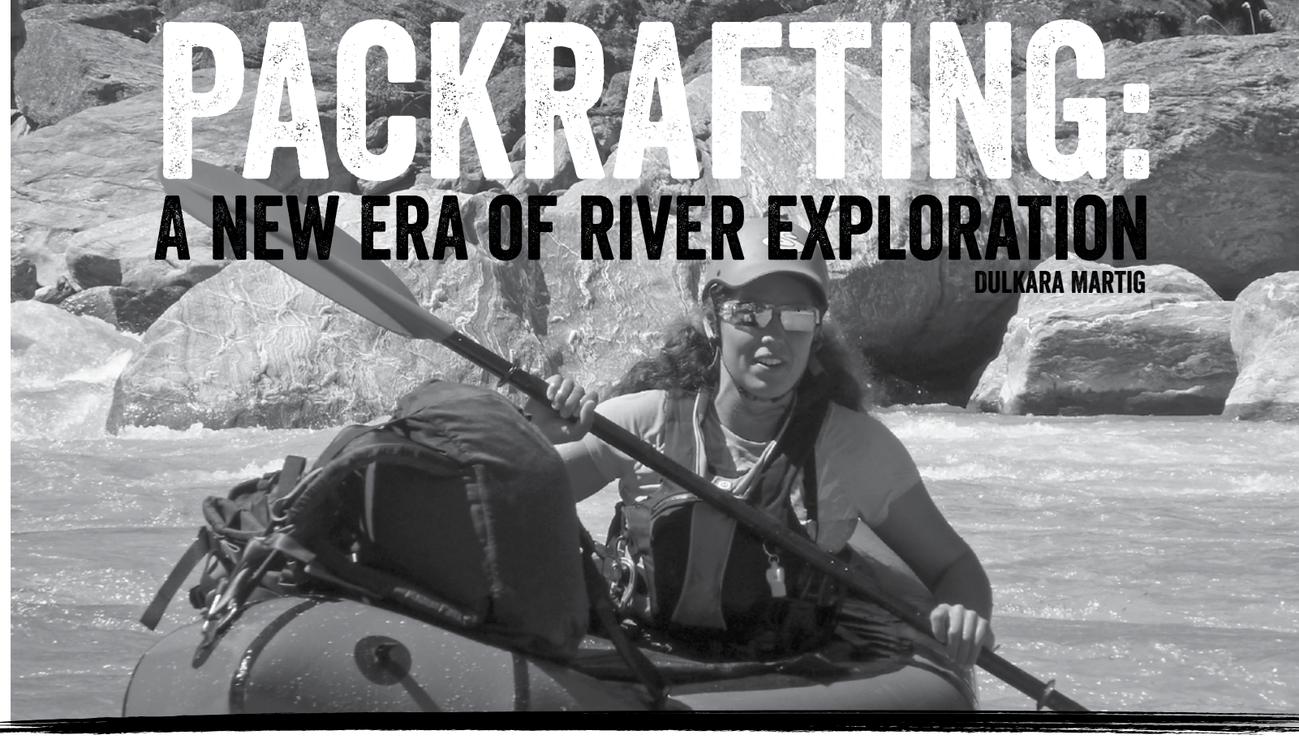




# PACKRAFTING:

## A NEW ERA OF RIVER EXPLORATION

DULKARA MARTIG



If you'd asked me about packrafting 18 months ago, I would have visualised people floating down rivers in cheap Warehouse duckies with bike helmets. Times have changed; a modern-day packraft is the ultimate tool for amphibious exploration and I reckon New Zealand is one of the best places on the planet for it. Here's an insight into what packrafting is all about.

## A brief history of inflatable craft

Inflatable rafts have been around for thousands of years. Some of the first rafts used cow or goat skins as an air-tight bladder. These were the traditional form of water transportation for many people living in remote villages in Central Asia and were mostly used for transporting cargo and to cross big rivers safely. In the 1800s inflatable rafts started being used on exploratory trips, mostly in the American Rockies and in the Arctic. This was around the time that rubberised fabric was invented which allowed for more durable and versatile constructions.

Interest in compact, inflatable rafts increased further during World War One with the need for emergency equipment as flights over large bodies of water became common. As life rafts evolved, becoming increasingly lighter and more durable, the interest in rafting for recreation increased. By the 1950s and 60s the use of inflatable craft for recreation had spread significantly and people started going on more adventurous and obscure journeys. This was also around the time that light-weight air mattresses started being used to float down rivers in Australia and to cross the Grand Canyon.

In New Zealand, the earliest recounts I found of rafting were in the early 1900s when three Kiwis headed down the Waimakariri River on a large square raft made of kerosene tins! By the 1960s 'cowboy' rafting was becoming popular and rafts would be made out of tyre tubes roped together and amateur adventurers would propel themselves with manuka branches, or whatever else they could source on the side of the river.

New Zealander John Mackay published 'Wild Rivers' in 1978, telling the story of exploratory expeditions on six of New Zealand's wild rivers. I came across the book at a friend's place and managed to track Mackay down. He was surprised when I phoned him up out of the blue asking about his book which was over 40 years old! When we met up in Auckland he had a twinkle in his eye and a big smile as he recounted trips down various rivers in decades past.

When I asked what inspired him, John simply stated; laziness. "We'd see rivers on the train and daydream about floating down admiring the amazing country without too much physical effort." The first time he went rafting they caught the train to Mount White bridge and put in from there. They used long sticks, which worked reasonably well as paddles. Their initial vision was of standing up on their raft, paddling along with manuka poles. They would often carry paddle blades which they'd then attach to the poles but sometimes they wouldn't use blades at all. "We thought it'd be a cruisy way to see some beautiful country. Often we'd find ourselves meandering along looking at trout but most of the time it was also bloody hard work."

They had minimal information, trips were mostly exploratory. In contrast, today we have plenty of information: water gauges, Google Earth, blogs and previous trip reports. People are even starting to use drones to scout rivers.

Advancements in technology and some innovative designers have seen inflatable crafts evolve into the modern-day packraft, designed to carry a person along with around 20kg of food and equipment down remote rivers. An Alpacka 'Yukon Yak' weighs less than 2.5kg, has a spraydeck (optional add-on) and packs down to the size of a small two-person tent. It sits nicely at the bottom of your backpack and is ideal for exploring new country on and off the water. Contrary to what many assume, these boats are made of tough material and can endure hard use; rocky shallows, bush bashing and class 3 whitewater. Some paddlers are even using these rafts to run remote class 5 whitewater.

## Personal experiences of packrafting in New Zealand

I come from a background of both tramping and whitewater kayaking and now am addicted to the fun, the challenge and the exploration factor of packrafting. I find myself visiting places I'd never thought to go to before.

I distinctly remember my first real packrafting trip. It was a gloriously sunny South Westland day, one of those days where you find yourself grinning ear to ear, not wanting to be anywhere else on earth. I hitch-hiked from the front door and walked up the Wanganui River valley. My daypack weighed less than 6kg as I sprang along the trail and boulder-hopped my way to a put-in spot. I inflated my raft (which took less than 5 minutes) and hopped in, beaming as I cruised down the rapids towards the main road. Not only was it much more fun than walking alongside the river, but it took around one third of the time! A river run which would otherwise be a helicopter-run became a regular afternoon trip.

It wasn't long before I began heading off on overnight and multi-day trips. One of these started in Nelson Lakes; we tramped to the very source of the Clarence River at over 2000m elevation. From here we walked down the dry riverbed to Lake Tennyson where the Clarence was big enough to start paddling, and we paddled all the way to the sea. Another trip started with a meandering float from Lake Heron down Lake Stream into the mountains (a real novelty - there can't be many rivers that head into the mountains!) before crossing two alpine passes and paddling out the south branch of the Ashburton River.

My local favourite (being based in the Nelson area) is the Pelorus River, recently flung to fame in the barrel scene in "The Hobbit". It's the ultimate weekend-warrior trip and can be done from the Hackett road-end to the Pelorus bridge in less than 48 hours door-to-door from Nelson (hitch-hiking included).

*Hooker River, Mt Cook.*

Packrafting has inspired me to do more off-trail, multi-day wilderness journeys. I'm drawn to areas where I can link together interesting routes; trips which seemed downright crazy suddenly appear both exciting and logical. Google Earth is a useful tool for scoping out potential expeditions and is particularly useful when trying to determine whether a river will have enough water to paddle. Many of these rivers are small, obscure and very isolated and there is often no information documented on them.

I'm seeing the wilderness from a fresh perspective and instead of long stretches of river bank travel (on foot), I've enjoyed floating out, saving both time and energy…and having more fun! So far I've found that I can save at least half the time when compared to walking. For keen world-adventurers, a packraft is an easy way to explore some of the Earth's most beautiful wild places and you carry everything you need within the typical 23kg baggage limit for an international flight.

*Nick Riordan pack rafting the Pelorus River.*

## Safety implications

Typically there are two main ways people begin packrafting: via a background in whitewater and via a background in tramping. The increased stability of a packraft compared to a whitewater kayak means that people can end up navigating technical whitewater before they've developed the skills needed to do so safely. They're unlikely to be aware of this until something goes very wrong. With experience we develop good judgement, and most importantly the ability to accurately assess what is within and beyond our level of competence. Without a background in whitewater, a novice packrafter is all too likely to be unconsciously out of his or her depth.

I would recommend having proficient river-running skills in a kayak before taking up packrafting, unless you're sticking to flat water. Scaffolding your learning from lakes and slow moving non-technical rivers and slowly building up through the grades means that by the time you get to the harder stuff you'll have a range of experiences to draw from.

Most of the risks are the same as in whitewater kayaking, especially in the event of a swim; for example pinning and foot entrapments. And you're more likely to swim if you capsize when packrafting. Rolling is possible (with modifications - like adding thigh straps) but it requires much more practice to master.

Being able to self-rescue is critical because performing rescues of teammates can be difficult. A packraft is challenging to move around a river at high speed, so therefore is getting to a capsized friend quickly. Also, a capsized packraft will float downstream significantly faster than a whitewater boat which will fill up with water and often get pulled into an eddy. I recently had a friend test out one of my packrafts on the Hooker River. I was on the bank with a throw bag, it was easy to get him to shore after he'd capsized but we then chased the packraft downstream for over a kilometre before being able to retrieve it



*Pelorus River.*

safely. It was interesting watching the way it flew downstream and how it breezed past river features which would catch a plastic kayak. Thus, being stranded without vital outdoor gear during a more remote packrafting trip is a risk that needs to be taken seriously.

These are good reasons to test out your equipment and become confident reading water and manoeuvring a packraft on roadside river runs before heading out on more technical wilderness trips. It's also best to begin with trips where you can paddle next to tramping trails for easy retreat and support.

## The future of packrafting in New Zealand

It is exciting watching packrafting evolve. Many people are modifying their rafts extensively, creating self-bailers and putting in thigh straps for better manoeuvrability (and rolling). New innovative models are becoming commercially available. New Zealand is the perfect playground for a packrafter and is held in high regard amongst the international packrafting community. Although we have limited rivers long enough for multi-day rafting and canoeing, we have a huge range of smaller creeks and rivers in remote wilderness areas. Many of these are inaccessible for ordinary kayaks, or prohibitively expensive to access via helicopter.

## Essential safety tips

- Don't paddle above your skill level.
- Scout! And make good decisions about what to run in relation to your personal competence.
- Rescue skills and equipment are similar to whitewater kayaking – know and practice rescue skills, and carry rescue equipment.
- River communication: use clear hand and signals, make sure your team-mates are on the same page.
- Swimming: learn how to swim effectively and safely in whitewater.
- Self Rescue: be efficient getting back into own raft. Practice, practice, practice!

## Keen to learn more?

- The American Packrafters Association: **www.packrafting.org**
- Facebook search 'Packrafting in New Zealand' to join a growing group of keen (and aspiring!) packrafters.
- Roman Dial's book 'Packrafting! An introduction and how-to guide'.
- Blogs. There are lots of good ones which will come up in a basic google search. Roman Dial and Luc Mehl are good ones to start with.
- Movie edits. A good place to start is with Roman and Luc's blogs – check out the 'show up and blow up' series for technical packrafting.

*Dulkara Martig, NOLS instructor and World Challenge Leader, holds Bush 1*

# QUALIFICATION REVIEW UPDATE

The NZOIA Qualification Review is nearing its end with the Cave Review well under way. Draft Cave Leader, Cave 1 and Cave 2 Syllabus and Assessment Guides have been developed. The Cave Leader and Cave 1 documents have been finalised with the Technical Committee and have now been sent out to the wider reference group for further input. This is the real test to see if we have got it right, as new eyes from industry endeavour to make sense of what we have come up with and see if it will work for them as employers and employees. Draft 1 of the Cave 2 documents are now being pored over by the original Technical Committee.

Once the initial Review of Qualifications is complete NZOIA will embark on a 5 year rotational review of all their qualifications. First off the block are the Rock and Wall qualifications. There are a number of qualifications in this area and they have all been getting a lot of use, so I am looking forward to receiving feedback on these and how they all fit together. If you are interested in being part of this review please contact me at **admin@nzoia.org.nz** The NZOIA Leader Workbooks will also be going through review this financial year.

Any feedback that comes in for each discipline will be collated and used at the time of the review. The plan for the next 5 years (unless there are significant updates that need addressing) is as follows:

| Year | Qualification |
|---|---|
| 2014 - 2015 | Cave |
| 2015 - 2016 | Rock and Wall |
| 2016 - 2017 | Bush / Alpine |
| 2017 - 2018 | Sea Kayak |
| 2018 - 2019 | Kayak / Canoe |
| 2019 - 2020 | Canyon / Cave |

*Penny Holland, NZOIA Operations Manager*