

Learning from the Legends – A Guide to achieving your Kayak Potential

What makes paddlers like Andrew Martin, Ben Fouhy or Marnie Furnusek – guys and girls of relatively average build – so much better than the rest of us? One of the answers of course is talent, but the real key is knowing how to make the most of whatever talent you have. No we can't all be Ian Fergusons' or Paul MacDonaldds', but by following their example we can all come a lot closer to becoming the best paddler we can be.

As with anything in life, the key to realising your potential with a paddle lies with understanding the fundamental principles of what it is your trying to do.

Kayak racing is essentially an endurance sport. Olympic kayak legends Ian Ferguson and Paul McDonald found that out when they adopted the endurance principles that Arthur Lydiard pioneered on running legends like Snell and Halberg. Lydiard taught the kayakers that their potential was controlled not by how fast they could go, but by how far they could go at the necessary speed – which is pretty much the definition of endurance.

Kayaking, however, differs to endurance sports like running and cycling. These sports involve basic human movements that become ingrained in the sub-conscious. Kayaking does not and as such optimising your potential has almost as much to do with technique as endurance.

Understanding Endurance

It was Lydiard who pioneered that all endurance sports revolve around the same principles: 1) Development of cardiac endurance by exercising the heart at moderate levels to promote blood flow for oxygen transportation to the working muscles. 2) Development of muscular endurance by exercising the muscles specific to your sport so that they can withstand the time and intensity of racing. This is achieved by training at what we term 'aerobic' efforts.

Aerobic exercise is any effort up to 85-90% of the maximum heart rate that can be attained in the sport in question. Any harder and you're into 'anaerobic' exercise where you can't take in enough oxygen to satisfy the demands of the effort and within 10min you'll start to slow down. In racing that's disastrous, but even in training we want to mostly avoid that because what we're trying to do is condition the body to go hard for long periods – not stop every 5-10 minutes for a rest!

Lydiard initially identified the development of aerobic endurance by training for long periods at solid but comfortable aerobic efforts that physiologists found correspond to 65-75% of maximum heart rate. This developed cardiovascular endurance but mostly muscular endurance and energy efficiency, the benefits of which relate mainly to surviving the distance. What physiologists have since found is that training at efforts close to aerobic maximum (85-90% of max HR) develops a superior cardiovascular capacity that enables us to hold hard but not maximum efforts for longer periods of time.

This aerobic maximum is termed 'anaerobic threshold' (AT). It is best developed in two ways: 1) Controlled speed-based training where you condition the body to the speeds you expect to race at. 2) Controlled strength-based training where by applying resistance to the working muscles (runners would use hills) you'll also condition your body to handle bigger, harder training loads and develop a resistance against muscular fatigue. When combined with Lydiard's approach all this enables us to race faster for longer... which is pretty much the definition of endurance!

Understanding Technique

About 12 months ago 48 year old Ian Ferguson came down to a 10km kayak race in Wellington and on less than a dozen paddles in the previous 12 months kicked this author's supposedly fit arse all over the river. Apart from his undoubted genetic gifts, the reason was that Ferg's awesome technique outweighed my fitness.

Good technique accounts for up to 40% of your paddling potential. It enables you to not only generate more power and thus speed but also conserve energy, which in the long run enables you to paddle faster for longer. Developing good technique is a neuro-muscular matter, where by teaching the muscular system a particular movement the brain eventually retains a memory not only of that movement but also a 'mind's eye' view of what you think that movement looks and feels like.

Your 'mind's eye', however, can be at the same time a hugely amazing and frustrating thing. It retains memory of every motion you show it. However, if what we show it isn't right it can a pain in the proverbial trying to relearn even the most basic tasks. It's a 'teaching old dogs new tricks' scenario whereby if you're not shown correct technique from day one your mind's eye can chase the old dog around in circles.

Now comes the frustrating bit – because of this mind's eye situation your mental approach to technical endurance sports like kayaking, rowing and swimming must at times be in complete contrast to everything you've just read about developing endurance. While sports like running are usually a 'more is more' situation, kayaking – especially for beginners – can be a case of 'more being less.' Why? Because if you blindly put in the miles without attention to technique, all you're doing is teaching yourself progressively worse technique.

Think about it mathematically. If technique accounts for 40% of your potential but you're training hard without any thought for technique you might only be operating at 60%. However if you do 20% less training but work as much as you can on technique you could be operating at 80% of your potential on less training!

Endurance Training for Kayaking

While the principles of endurance are universal, the specifics of kayaking differ hugely from sports like running. 1) Because your upper body is weaker than your lower body your maximum heart rate before muscular exhaustion is about 10% lower than while running. 2) Because kayaking doesn't carry body weight the injury risk is lower. 3) Because kayaking doesn't fight gravity the low heart rate and low injury factors play even bigger parts. 4) Because of all of the above you recover faster from kayak training than running.

What all this means is that your maximum effort in a kayak is nowhere near your true maximum, which combined with the low injury risk and faster recovery rate means that a kayaker can pretty much train for as long and as hard as their sanity will allow.

Having said that, however, you have to train for the event you want to race. Logic tells us that a K1 1000m requires a lot more anaerobic threshold training than the Coast to Coast, and Coast to Coast requires a lot more endurance than a K1 1000m. However, effective training actually involves a blend of both – the trick is finding the right blend for the race in question.

There are three bases to cover in effective endurance training: 1) basic endurance; 2) strength endurance; 3) speed endurance.

Basic Endurance

Basic endurance is your ability to last the distance in question. It is developed ala-Lydiard by simply spending large amounts of time training at 65-75% of your maximum heart rate (an effort at which you can talk). This develops both muscular endurance and energy efficiency, the main effect of which is an ability to last the distance in the question.

For shorter races up to 60min long these basic endurance sessions can be replaced by speed/endurance sessions of up to 90min. But generally you'll get the best endurance returns by getting out close to two hours. For longer races such as the Tongariro Challenge and Coast to Coast, logic decrees that you build up to either the time or distance you're going to be racing.

Two basic endurance sessions every 7-14 days week is ample – one longer session of 100%+ of race duration at 65-70% of maxHR and one semi-long session of 60-80% of race duration at 70-75% of maxHR.

Strength Endurance

Strength endurance involves placing added resistance on the muscles, which in time will enable you to handle bigger training loads and withstand muscular fatigue. According to Ian Fergusson, the best ways of creating the resistance necessary is by paddling into moderate headwinds and upstream currents, and tying bungies around your boat. Another good way is paddling a kayak erg with high resistance loads.

Although we are training endurance still, because of the added stress of resistance strength/endurance sessions should be semi-long, with 1.5-2hrs (including warm up & warm down) being enough for even the fittest paddler. Adding resistance also increases the heart rate, which has the potential for you to slip into anaerobic zone. You don't want this because within 10min you'll have to either slow down or stop, which tends to kill the endurance training effect. Having said that, for all round cardiovascular and muscular development it is desirable to do some strength/endurance training toward the upper end of your aerobic zone.

These sessions can be done in two ways: 1) non-stop paddles with lesser resistance. 2) Repetition sessions with more resistance where you work hard for short periods (2-5min) with easy periods in between (e.g: 10x3min hard into head wind with 3min easy between each rep). The first option is more on the endurance side, while the second is more on the speed/endurance side. One each of these sessions every 10-14 days is ample – the first for 1-2hrs at 75-80% of maxHR and the second for 1-1.5hrs at 80-85% of maxHR.

Speed Endurance

Speed/endurance involves developing the afore-mentioned anaerobic threshold, which decrees how fast and for how long you can go without moving from the aerobic to anaerobic zone. Depending on fitness, AT kicks in between 80-90% of your maxHR. At the upper limit you generally can't last more than 45-60min, so essentially it's the pace/effort you would paddle a race of approximately 10km.

Because the efforts involved have you sitting on the edge of your comfort zone for relatively long periods of time it must be juggled carefully to allow adequate recovery between sessions. As such you should never do AT days in a row. In fact, one each of the following sessions every 10-14 days is ample:

Sessions can be done in two ways: 1) Non-stop time trial-type efforts for 45-60min at 85% of max/HR. A 10-15km race is perfect AT training. 2) Repetition sessions where you work for 2-10min at 85-90% of maxHR with 50-75% of that time (e.g: 10x5min at 90% maxHR with 3min easy between each rep).

Technique Training for Kayaking

According to Ian Fergusson, good kayaking technique starts with your position in the boat. Your torso should be upright with body slightly in front of the hips by tilting pelvis forward as much as possible. This creates a firm base for generating power. Legs also play a part in providing stability and power for your body position, with the ideal angle being 130-140 degrees.

Once your position in the boat is settled American Olympic gold medallist, Greg Barton, says good kayaking technique can be broken down into three basic elements: 1) Setup/Entry 2) Push/Pull. 3) Exit. The key he says is understanding and witnessing their mechanics, then paying attention to one per training session and over time they will find their way into your minds eye.

Setup/Entry

The key to your entire stroke is the setup and water entry of your paddle. The key to the setup is the quality of your exit where if done correctly your paddle should be parallel to the water at about ear height. Your rear arm is bent at 90 degrees with your hand slightly in front of your elbow. Your front arm is reaching forward by straightening your arm and rotating your shoulder forward.

From here you drop your paddle into the water aggressively; Barton suggests imagining you are spearing a fish. At impact the paddle blade should be as close to the side of the boat as possible and at about 45 degrees to the water. Interestingly, from both a front and side perspective your paddle shaft should be at about 60 degrees.

It is crucial now to sink the blade to its hilt before pulling. This provides an anchor which with your pulling hand as a fulcrum you will as much pull the boat past the paddle as pull the paddle past the boat.

Push/Pull

When done properly the push/pull element is actually as much a rotation from the torso as pushing and pulling with the arms. Using only the arms is a common mistake and because they are the weakest major muscle groups in your body it's a mistake that leads to premature muscular fatigue and muscular fuel depletion.

The push/pull/rotation element is a simultaneous action that uses the pulling hand as a fulcrum to lever the boat past the pulling paddle blade. The key is to pull with a straight-locked arm and push with your other arm semi-locked. By locking your arms and also pushing with your leg on the same side as your pulling arm you provide a base to from which to bring in shoulders and torso in a rotation motion. This rotation also sets up your pushing arm to reach further forward for the next entry.

When pulling it's important to keep as close to the side of the boat as practical because you can better utilise your muscle power than with arms stretching out the side of the boat. When pushing it's important to keep the hand at about head level and not allow the arm to travel past the kayak edge of the pulling side.

Lastly, when pulling there is a tendency to grip the paddle too hard. This can cause huge problems such as tendinitis in the knuckles or wrist and carpal tunnel syndrome where the forearm muscle has not been allowed to relax and has swollen to the point where the muscle sheath is strangling it. As much as possible hands should remain square on the paddle shaft. When you pull try to avoid overloading your index fingers and when you push relax the grip even to the point of flexing your hands out.

Exit

The key to the exit is to not allow the hand to travel past your hip. It's pointless letting the paddle goes past the hip as it's almost impossible to pull water and it also ruins your reach for the start of the next stroke; yet pulling past the hip is the most common fault amongst multisport paddlers.

The trick is as soon as the earlier mentioned side profile sees the paddle reach 90 degrees to the water, tuck your pulling elbow into the body with a bicep pull. This instantly allows your paddle to pop out the side of your hip without lifting any water. Ian Fergusson says another trick to avoid pulling past your hip is keeping your pushing hand at head height and not letting it cross much past the centre line of the boat.

When exiting the pulling hand should lift slightly in front of the elbow to about ear height so the upper and lower arm are at 90 degrees. During this time the front of your stroke has finished the push element level with your eyes and for a split second your entire stroke is paused parallel to the water before once again 'spearing' into your entry.

This natural pause is called the setup and is natural if technique is correct and even desirable because it allows the boat to run before touching the water again with your paddle.

Sample Weekly Schedules

RECREATIONAL MULTISPORTER		
	Races up to 2hrs in length	Races from 20km up to Coast to Coast (67km)
TUES	Speed/Endurance: 1.5-2hrs. Start 75% build to 85% maxHR. One week do non-stop, next week do rep session working on technique.	Speed/Endurance: 1.5hrs. Start 75% build to 85% maxHR. No-stop session. <i>Could be low key race / Tues could swap with Sun if race on.</i>
THUR	Strength/Endurance: 1-1.5hrs. Start 75% build to 85% maxHR. Rep session working on technique.	Strength/Endurance: 1.5-2hrs. Start 75% build to 85% maxHR. Rep session working on technique.
SUN	Race: 5km to 15km – or Day Off.	Endurance: 2.5-5hrs. 65 to 75% maxHR. One week do 100%+ of race distance, next week do 60-80%. Constant attention to technique.

SERIOUS MULTISPORTER

	Races up to 2hrs in Length	Races from 20km up to Coast to Coast (67km)
MON	Endurance: 2-2.5hrs 75-80% maxHR.	Technique: 1.5hrs... or Day Off! 70-75% of maxHR. Short reps with long recovery working on each stroke element
TUES	Strength/Endurance: 1-1.5hrs. 80-85% of maxHR. One week non-stop, next week rep session working on technique.	Speed/Endurance: 1.5-2hrs. 80- 85% maxHR. One week non-stop, next week reps working on technique. <i>Could be low key race / Tues could swap with Sun if race on.</i>
THUR	Speed/Endurance: 1-1.5hrs. Start 80% build to 90% maxHR. One week do rep session working on technique, next do non-stop.	Endurance: 2hrs 75-80% maxHR. In water conditions expected to race.
FRI	Technique: 1hr. 65-70% of maxHR. Short reps with long recovery working on each element of stroke.	Strength/Endurance: 1.5hrs. 80-85% max HR. Rep session at upper aerobic efforts. Concentrate on technique.
SUN	Race: 5km to 15km – or Day Off.	Endurance: 2.5-5hrs. 65-75% maxHR in water conditions expected in race.

NB: A serious paddler could add two or more sessions to the serious multisporters schedule. These would relate either to what the paddler needed most to work on or at what stage the paddler was at in their build up. Early in a build up emphasis is on endurance & technique. Midway emphasis is on equal amounts of endurance, technique, strength & speed. Late in the build up emphasis is on technique & speed.