

Courting Speed

by Sandy Winterton

There are many excellent reasons to go faster in a kayak. Going further, getting there sooner, claiming the best tent site, beating your so-called buddy - they are all valid. The underlying motives are a bit harder to pin down. Desire to not get left behind, the ghost of a childhood need for approval, vengeance, body chemicals only manufactured while paddling downhill...the list goes on.

Anyone who has watched any racing on television and who has leaned with the motorbike as it takes a bend, squeezed the flanks of an imaginary thoroughbred in the final furlong or flexed their pyjama clad knees during the Winter Olympics giant slalom knows why it is necessary to go fast.

The why is not what we need to explore, but the how.

Speed is a fugitive that must be pursued, but the chase must not compromise life, health or sanity. Safety equipment must be worn and carried. Minimising the weight carried and maximising the range of body movement while in paddling clothing, a PFD and spray skirt are challenges in themselves.

There are several factors affecting kayak speed, but there is little discussion in sea kayaking circles on many of them. This article contains some crafty schemes to hasten the attainment of speed.

Some factors are the same for everyone be they novice or champion. The natural laws of water and air have a big influence on speed, and yet they are often disregarded. Hydrodynamics is the science of how liquids behave. We don't need to understand much about it, just how boat speed is affected. There are a few important factors to be aware of when selecting a kayak. When it comes to boat characteristics, the following word groups go together:

Group A	Wide	Short	Stable	Slow
Group B	Narrow	Long	Tippy	Fast

It is not possible to have a kayak that is both very stable and very fast, so we have a choice to make. There are many shades between the extremes and each paddler should consider the best point on the scale to suit their ability, balance, fear of falling in and the type of paddling they will be doing.

Many of the characteristics seem obvious, but it may come as a surprise that a long boat tends to be fast while shorter boats are likely to be slower. For two craft the same width and design, up to a certain point, the one with the longer waterline length will be faster. The reasons are out there somewhere.

Clearly the trade-off is how stable the boat is. There's no point having a fast kayak if we can not stay the right way up or if we paddle with trepidation. It is better to err on the more stable side to maintain an upright character and a calm demeanour.

Crafty Scheme 1 (CS1) –

The wise paddler of faster and tippier boats secretly brushes up on their bracing and rolling.

There are a few things that can be done to maintain or improve hull efficiency. Keep the hull smooth and shiny and never dangle or tow anything such as deck stowed gear or weed. Depending on conditions and the water to be paddled, it may also be an option to go without a rudder or to lower it only partially. A rudder pulled all the way down gives best steering and most resistance. If the water is flat or waves are small and you're going fairly straight, you probably don't need the rudder all the way down.

CS2 –

Use the degrees between rudder raised and fully down by locking it part way. On flat water and with no wind, a trailed rudder with just a lower corner dipped is usually adequate to maintain a straight course.

Aerodynamics is little talked of by kayakers, and yet deck bags or anything else strapped on top offer increased wind resistance. In general, keep decks as clear as possible except for essential safety gear, and in a headwind avoid clothing likely to billow like a parachute.

There are other natural laws of which we need to be aware. For the same craft and motive power, the heavier the boat is, the slower it will be. What difference does a few kilos make? The Department of Physics at Oxford University has published a paper that explores factors affecting rowing boats from single sculls to eights and the logic seems applicable to kayaks. The conclusion is that increasing the overall weight of a craft including its crew and cargo by one percent decreases speed by one sixth of a percent. A PhD in rocket science is necessary to follow the argument fully. See <http://www.atm.ox.ac.uk/rowing/physics/weight.html#section7>

An example in terms of a kayak, paddler and gear:

The paddler weighs 75kg, their kayak 20 kg and normal gear for a half day trip weighs 5 kg.

The total laden weight is 100kg and we will assume they paddle at 6 km/hr in no wind.

For a camping trip, they instead take 35kg of gear and food with them for a total of 130 kg.

Their total weight has increased by 30%.

Their speed decreases 1/6th of that i.e. by 5% and is therefore reduced to 5.7 km/hr.

On a 30 km day trip they would take about 15 minutes longer than if they were unladen.

If there were two boats and paddlers identical in everything other than weight, the one with the extra 30kg would still have 1.5 km to go when the lighter boat arrived at their destination.

Mental anguish is inversely proportional to the square of the deficit, so:

If one boat is 5% slower, the paddler is demoralised by 5², or 25% compared to their rival.

CS3 –

Keep weight to a minimum.

Other forces that influence speed include current, tidal streams, and waves that affect steering or which can be surfed. Above the waterline, wind has a major effect on both safety and speed. For both wet and dry agencies, their influences can sometimes be mitigated by skill, such as picking friendly water flows and avoiding unfavourable ones, saving energy or gaining speed from surfing waves, choosing a course that avoids or takes advantage of winds and wash hanging other boats.

The *homo sapiens* male has a tendency to lethargy which was essential in the days when we had to conserve all our energy for chasing mammoths. It is clearly not our fault and it has proved impossible to shake off. Typically the factors to which we first turn to increase our efficiency are the ones that require least effort. In the mammoth days, we invented the bow and arrow to replace the club and enjoyed better safety and more cave time as a result. Since then, new or improved technology has always been a favourite strategy and, failing that, using existing equipment more effectively.

The humble footrest is a critical part of a kayak. It must be solid, set at the correct distance from the seat and it should have rudder pedals that allow steering while the knees are positioned fairly centrally. On non-threatening water, efficient paddling requires leg drive and to achieve this, the

knees should not be locked in place. On more serious water, some surfing, rolling and bracing require the paddler to grip the boat with the knees, so footrest placement and knee bracing locations must permit a quick transition from central placement with legs pumping to knees in braced position. Some kayaks have movable seats, and different positions should be experimented with. Moving the seat back may allow the knees to clear the front of the cockpit, which helps leg action. It may also allow fine tuning of the distance between seat and footrest. A full range of paddling motion is important; so cockpit clutter, baggage on deck and clothing worn should not restrict any movement required for strokes, braces or rolls.

CS4 –

Set up the boat for paddling efficiency.

If the person is the motor, then the paddle is the drive train. Greenland paddles have their adherents and virtues, but are not considered here. Of the standard or ‘euro’ type paddle, there are a number of shapes, but a common choice is between curved blades of traditional type and a wing type paddle. Both have advantages, but the wing turns more of the effort supplied into forward motion and is favoured for speed. Like the fast-but-tippy vs wide-and-stable dilemma, there is a trade-off with paddles. The wing is faster but less user friendly. Plain blades are slower but easier to master. Having opted for the desired style, getting the blade size, length and feather angle right is a matter of personal taste. In general, an offset of 50-75 degrees is favoured and there is a trend towards shorter paddles which allow a higher cadence rate.

CS5 –

Use a wing paddle but carry a traditional one as a spare. If conditions get too tricky for the wing, you can swap.

Blade size is generally determined by physical strength. Most people should err on the small side and go with an adjustable length paddle. If you generally paddle with, say a 212 cm paddle and are looking for a replacement, go for one that extends from about 208 – 216 cm. Changing the shaft length can be helpful to tune the cadence rate and for use in different boats e.g. if both singles and doubles are to be paddled. Always try out prospective paddles before purchase.

CS6 –

Lengthen the paddle coming down wind and shorten up into the wind to maintain a similar cadence.

Having addressed the easy aspects, if further speed increases are required, sadly but inevitably, more effort is required. There are many skills that can influence speed. Some of these can be learned quite easily and others require longer on the water.

Good technique justifiably gets a lot of attention these days. Two world renowned paddlers from different backgrounds have produced an excellent DVD called and entirely devoted to ‘The Kayak Forward Stroke’ – and this is well worth watching.

The feet are well placed on a solid footrest and able to control pedals without loss of contact. Assuming conditions are kind and self preservation is not a consideration, knees should be central and able to move freely as legs are pumped. As one arm pulls, the leg on the same side pushes against the footrest. Hips are pivotal.

As far as the upper body goes, there are two styles – again each has advantages. The first is racing technique and the one taught almost exclusively by coaches. It can be used for any euro paddle type and is the only way to get the best from a wing blade. The second method works best with curved paddles, and has fallen out of favour with the advent of wings. It is a bit less efficient but many people find it more natural and comfortable for the traditional style of paddle.

Locked arm racing style

Torso rotation is driven with legs and abdomen, and the upper body follows their movement.

While a blade is in the water the upper arm is locked either straight or slightly bent. The hand travels forward at about eye level. The lower arm is also locked at least until the blade is removed from the water. The paddle in the water starts out very close to the side and is tracked outwards as the stroke progresses, exiting the water away from the boat.

Punch and pull method

As the low blade is placed into the water, the high arm is already bent and the hand is next to the shoulder. That hand is then punched straight forward by straightening the arm, while the low hand pulls the blade through the water parallel to the side of the boat. After the blade exits, the arm is bent as the hand is raised towards the shoulder in preparation for the next stroke. The shoulders and upper body are still rotated and the bending and straightening of the arms takes advantage of the leverage offered by the paddle shaft.

You need to find a technique suited to the duration of paddling to be done and which does not result in injury such as tenosynovitis, sore muscles or joints.

CS7 –

If using a traditional paddle, swap between the two styles to give different muscle groups a rest.

There is a wealth of information on the web including video clips on YouTube about good paddling technique. If you want efficient, look at the top flat water or surf ski racers' technique. Sadly, no amount of watching videos or reading books works without doing cockpit time.

Once the laws of nature have been sorted out and technique is down pat, it is no longer possible to avoid the F word – Fitness. First, look for reasons that explain why you are going slowly. Medical conditions provide a happy hunting ground in this respect. Various parts of the anatomy can be correctly and cunningly described as 'bad'. Alternatively, anything difficult for others to check such as allergies, itises, syndromes and even ectomies or otomies may prove fertile ground. If all of these strategies fail, there is no alternative but to get fit.

Paddling time is imperative, but other forms of activity are helpful. Eating and watching TV do not count. There are several aims:

Aerobic fitness

Strength

Stamina

Flexibility

Core muscle condition (helpful for balance)

There are a few other things that need to be addressed for optimum performance. High speed requires good fuel. Sufficient and correct food to give the energy you need is required before and during the trip. Drinking is called hydration these days to allow higher pricing of sports drinks. Find out how much liquid your body needs and whatever fluid you use, take enough and sufficient spare for the unexpected, but don't carry unnecessary weight by finishing a trip with excessive liquid left over. Drinking a lot of fluids may get kidney enthusiasts excited but our aim is to have speed; not to have peed.

CS8 –

Sports gels (available at cycle shops) are sachets of goo that turbo charge the motor for half-an-hour or so.

Finally, comfort is essential. A pinched nerve with resulting leg or posterior agony is a bummer - possibly even the origin of the term. Blow up foam seat cushions can help, but beware of over inflation. A too-full air filled seat can lead to buttock rollage which reduces the transfer of power from leg drive to upper body. Chafing or abrasion spoils the fun, suitable clothing for a comfortable temperature is important, and we should think about the appropriate form and degree of sun protection. There are upwards of 500 paddle strokes per km for most people. Many thousands of repeated movements that cause some small problem can take a heavy toll by the end of a day. Personal comfort is essential if you are to be in good shape in the morning.

CS9 –

For a big or important paddle, never use or try anything new. Make sure you take paddles that have served well for similar trips before and that you have successfully tried everything you will wear or use.

In the style of certain gender targeted magazines, now take this exciting quiz to determine your paddling speed and prospects.

Kayak Speed Calculator

Choice left	✓	Choice right	✓
Kayak wide and stable		Kayak is narrow and tippy	
Paddle type traditional and/or poor technique		Paddle type wing and/or good technique	
Relative beginner		Experienced old sea dog/bitch and kayaker	
Boat heavily laden and/or cluttered		Boat lightly laden and clear of encumbrances	
Unfit, lacking condition and soon worn out		Fit, strong and able to keep going	
Suffering from ailments and afflictions		Body in good working order	
Unskilled and oblivious to speed influencers		Skilled practitioner, reads conditions well	

For each tick in the choice left column, award yourself 2 points.

For each tick in the choice right column, you get 38 points.

Work out your total -

Between 14 and 28 points

Slow but with huge potential

Between 29 and 230 points

Average with fair to good scope to get faster

Between 231 and 266 points Fast and expert but unlikely to have any sea kayaking friends

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