

CSA SAFETY STRATEGY

Foreword:

For thousands of active paddlers in South Africa, the attraction of the sport includes the exhilaration of running rapids, and mastering the dangers and fears that any river holds in store. The element of danger is inextricably linked to the pleasure derived from the sport. However it also makes safety, and the management of all aspects relating to it, a primary responsibility of each and every individual, as well as the various tiers of the sport's administration.

This booklet sets out the responsibilities of the Federation, Union, Club and individual, as well as elaborating on equipment and techniques that will make the sport as safe as possible. It also embraces the revised proficiency tests and river competency grading. In short, this handbook should be seen as a bible for any active paddler in South Africa. It is also unashamedly aimed at the river marathon enthusiast, aiming to take part in events such as the Berg, Breede, Fish and Dusi marathons. It therefore shies away from trying to teach specific skills needed for extreme kayaking, sea kayaking, slalom, or canoe polo

The CSA constitution provides for:

One safety officer at Federation level (FSO)

One safety officer at Union Exco level (USO)

One safety officer per club (CSO)

The book is dedicated to the men and women who have lost their lives practicing the sport they love.

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1. CHAPTER 1 – THE BASICS OF CANOEING TECHNIQUE

A. BEFORE GOING FOR YOUR FIRST PADDLE -

- i. Check that your craft has buoyancy firmly fitted into the nose and tail so it does not become dislodged in the event of a swim or during a portage
- ii. Check that the footrest position is suitable for your legs (knees should be slightly bent). Adjust seat.
- iii. If you are to wear a splash cover, ensure that the release strap is fitted and the splash cover fits the canoe tightly across the deck.
- iv. Hitch the back of the splash cover above the buttocks, so that you don't sit on it.
- v. Now place your boat on the water.
- vi. Kneel down on land side facing the way that the canoe is pointing. Remember that the seat is toward the back of the cockpit. Place paddle within reach.
- vii. Reach down with the canoe side hand and hold the front of the cockpit.
- viii. Place the land side hand firmly on the landing and do not move it.
- ix. Place the kayak side foot in the boat, central and as far forward as the cockpit hole will permit. Steady the boat by transferring all your weight onto this foot.
- x. Transfer kayak side hand to rear of cockpit. Do not move the other hand.
- xi. Place other foot directly behind the first foot to enter the kayak and maintain a crouch position.
- xii. Sit down, sliding one or both legs forward into front end of canoe taking the weight on the rear hand. This also ensures that the back of the spray deck remains tucked up around the waist.
- xiii. Sit down into the kayak and place hands on both sides of the cockpit, lift body and adjust position by wriggling back into the seat. A capsize results if off-centre push is used.
- xiv. Adjust the splash cover, rear first, front next, sides last. Release strap must be outside ready for instant use.



B. BE COMFORTABLE

Before starting to paddle it is essential to be comfortably set up in the boat. Legs should be bent at the knees at an angle of 120-130°. A rough guideline is for the top of the knees to be roughly 10 centimeters above the cockpit line. The feet touching the footrest usually lie at about 50 to 60° from the bottom of the boat. A comfortable seat is also necessary to allow for good rotation. If a T-bar steering mechanism is being used, it is useful to have a pull strap or bar over both feet to facilitate better leverage from the legs during rotation.

C. POSTURE

Sitting correctly in the boat is important. Normally the body leans slightly forward (5-10°), and the back is kept relatively straight or with a slight outward curvature near the base of the back. It is necessary to lean slightly forward for better reach and to combat the inertia of the boat. Over leaning, however, compresses the diaphragm making breathing difficult, as well as reducing rotation ability.

D. PADDLING

The kayak paddling motion follows a symmetrical pattern of alternation between one arm pulling one blade of the paddle through the water while the opposite arm pushes through the air at shoulder level acting as a support to the stroke. The control hand (right hand if the paddle is right handed) holds the shaft of the paddle in a fixed position, while the opposite hand has to release and allow the paddle to swivel in the hand to adjust for the feather (angle of the blades) as the control hand exits the water. It's a good idea to practice this on land before getting in the boat.

During each paddle stroke, the body must maintain a good posture, while the hips, trunk and shoulders rotate in unison about the axis of the vertebrae. The kayak pattern of motion can be better understood by dividing a paddle stroke into several different phases, namely; the recovery position, the reach phase, the entry position and catch phase, the initial thrust and the power phase, and the exit position.

During the recovery position the paddle shaft is horizontal at shoulder level. The reaching arm is fully extended while the other arm is bent and the elbow hangs down a bit. The body should be relaxed in this phase.

Following the recovery position, the forward arm drops down to the water while the pushing hand rises slightly to accommodate this movement (between ear level and the top of the head). It is important that the shoulder of the forward arm also drops during the reach. The paddle enters the water at an angle of between 35 and 45° relative to the water (side view). The pulling arm remains relatively straight and continues to drop towards the water. The pushing hand slowly travels forward pushing down on the shaft of the paddle. As the blade becomes submerged, the propulsive force on the blade goes from zero to maximum, known as the catch phase. The leg on the same side as the pull arm begins to exert pressure on the footrest.

Following the catch, the stroke moves into the vertical position (side view) or thrust phase, this is a very powerful part of the stroke. Here maximum power is applied to the paddle stroke. The pulling hand pulls the blade close to boat, and the downward rotation motion stops and transfers into pulling in a straight line. Prolonging this phase of the stroke by connecting into the body rotation without changing the respective positions of the hands leads to a more powerful stroke. The push hand must not move too quickly such that power is lost.

The paddle then moves into the power phase of the stroke. The pulling hand draws backwards, the torso counter rotates, and leg on the same side as the paddle in the water pushes on the footrest such that the knee begins to flatten at the same rate as the arm is pulling. The hip moves backwards, facilitating the rotation. A pull strap or bar facilitates the other leg to pull at the same time, thus improving the rotation ability. The opposite knee also begins to bend upwards and the hip on that side comes forward in preparation for the next stroke. The rotation of the hips causes the boat to dip on the pulling side and thus rock from side to side during paddling. This should be minimized as much as possible by applying pressure on the opposite side during rotation. The pulling arm must bend continuously to keep the hand level with the surface of the water (not in the water). The blade of the paddle will naturally start to move away from the boat due to the wing design of the blade. Again care must be taken not to move the push hand faster than pull hand such that power is lost

As the lower hand reaches the hip, any further pull on the blade will not produce any significant power in the boat. The paddle must thus exit the water cleanly and quickly. During the exit, the forearm of the pulling arm lifts the blade of the paddle up to shoulder level, by bending at the elbow, returning the paddle to the recovery position. The shoulder must not lift the blade out the water, only the arm. The push hand is fully extended at eye level during the exit. The paddler has now returned to the recovery position ready to execute the same paddle stroke on the opposite side.

Practice getting in and out of the boat until this feels comfortable. Try getting in and out the boat in different situations; such as shallow water and deep-water entry and exit. Include in this exercise putting on and removing the spray deck. Doing these drills efficiently will save time in race situations.

Balancing the boat may take some time and patience to master. When starting out put about 10cm of water into the boat to lower the centre of gravity. This will assist in stability and as you improve this practice can be discarded. Your paddles are an extension of your arms and hands; never let the paddles go when losing balance. Use the paddles to brace not your hands.

As you feel the boat move off-balance, hold the paddle out at right angles to the boat by resting the back of the blade on the surface of the water. Push down slightly and this will bring the boat back up. Should the blade dive under the water bring it back up to the surface by slicing it through the

water. The more the boat moves off-balance the more substantive the support stroke that will be needed. Practice this drill by purposefully leaning the boat – the brace stroke will be used throughout a paddling career.

E. CAPSIZE PROCEDURE

In spite of following all the rules and theory, you are going to "swim". You should learn how to handle a capsize with the least harm coming to you and your boat.

i. ON FLATWATER

1. If your splashcover has not come loose during the capsize, pull it loose from the side of the cockpit rim, and kick yourself out of the boat, all the while holding on to your paddle with one hand.
2. Grab the boat and flip it up as quickly as possible, (in hazardous situations it may be better to leave the boat upside down and concentrate on yourself). In K1 / K2 racing kayaks you can slip the paddle into the cockpit, to enable you to use both hands to swim the canoe to the bank.
3. In a plastic kayak you must use your hands to push yourself out of the boat.

If a second paddler is nearby he can hold the boat and allow the swimmer to get in the boat (on flat-water). The person in his boat paddles alongside the capsized boat. He places his paddle across his cockpit and behind the cockpit of the other boat. Grab the paddle and the back of the cockpit of the other boat with both hands, leaning onto the other boat. The person swimming can easily climb into his boat and paddle to the side.

ii. IN A RAPID

Your first priority is to ensure that you are in no immediate danger and then ensure your partner is safe. In a capsize situation the boat will automatically fill up with water making it heavy and cumbersome to handle. A capsized boat in a flowing river runs the risk of wrapping around an obstacle and it needs quick action to alleviate a potential wrap. On capsizing exit the boat as quickly as possible. This means that the spray deck must be released from the cockpit. To do this the side of the spray deck and not the tag in the front must be released first. To release the front of the spray deck means having to pull forward and up – this is not always possible when capsized – so pull the spray deck off the side and then the front.

Get to the upstream side of the canoe and swim it through the rapid steering from the back. Position yourself so that you can see downstream. Staying downstream of the canoe puts you at risk of being pinned between the boat and an obstacle in the river. If possible the canoe can be turned the right way up but don't waste energy trying this if it is too difficult. Keep the canoe straight, if it is at right angles to the flow straighten it. In a doubles combination do not have one paddler on the front and the other on the back – control the boat from the back only. When some element of control has been reached look for the nearest eddy or beach where the boat can be landed, assess any possible risks – some of the best wraps occur when the paddler has reached 'safety'. **At no time try to stand up when swimming in fast flowing water.**

F. SWIMMING

Swimming is a fact of canoeing; sooner or later you will swim and it is critical to know and follow the correct procedures. **Take Note:** Do not lie back and wait to be rescued – help yourself.

In rocky shallow rivers:

Stay upstream of the canoe, if necessary push away from it or guide from behind. Lie on your back looking downstream keeping your hips and feet near the water surface. Do not



it

allow the canoe to obstruct your view. Swim for the bank using both arms and legs. ***Never try and stand up in fast flowing water.**

In deep water with large waves:

Stay with the boat for as long as possible remaining on the upstream side of the boat ensuring you can see clearly downstream. Select a bank / eddy and swim for it steadily and purposefully. If separated from the boat use a front crawl and be determined to make it. ***Never try and stand up in fast flowing water.**

Defensive swimming vs. aggressive swimming

A defensive swim is used when the swimmer lies on his back keeping hips and feet near the water surface. The arms can be used to "steer" through the rapid. Aggressive swimming is employed by the swimmer when trying to reach the bank or an eddy using the crawl technique.

Look for eddy currents to break into. These offer sanctuary from the fast flowing mainstream and allow the swimmer a chance to get to the bank. Once the swim is under control actively look for eddies that will offer a respite. These techniques need to be practised. The probability of a swim is very high and the only way to avoid possible injury or death is to adhere to the correct swimming technique. *Attempting to stand in swift flowing water deeper than the knee can lead to a foot becoming trapped on the riverbed. This entrapment coupled with the fast flowing water can push the trapped paddler over and with nothing to support himself on drowning is likely. The risk of a foot entrapment is enhanced when wearing running shoes. These are flexible and act as a wedge when forced into small gaps – it cannot be stated enough - **never try and stand up in fast flowing water.**

G. EMPTYING THE CANOE

There are a variety of methods to empty the canoe. Ensure that the seams of the boat are still intact before placing too much strain on them when lifting a boat full of water. The simplest method of emptying is to turn the boat upside down and let all the excess water drain out, then lift the boat by the tail or nose and drain out the balance of the water. If the boat is in the water push down on the tail or nose so the water drains into the submerged end. Then lift and tilt the boat at an angle to allow the water to drain out the cockpit. Repeat until the boat is empty. In the case of a K2 each end of the boat is held and alternately lifted until the water has drained out. If you have to empty the boat often because of capsizing, you will get very tired. Recognise the symptoms and react accordingly i.e. take a break!



H. RE-ENTRY FROM KNEE DEEP WATER (CLOSE TO RIVER BANK)

- i. Choose a spot out of the current - stand between the bank and the boat.
- ii. Place the paddle in the canoe-side hand, offset towards the bank and behind you.
- iii. Place this hand at the rear middle of the cockpit.
- iv. Place the thumb under the cockpit rim and fingers over the shaft of the paddle to lock it in position. Rest the paddle (extended side) on the bank.
- v. Put the canoe-side leg into the cockpit.

- vi. Slide the behind over the cockpit rim. This will require a transfer of balance from the foot on the bottom of the river, to the hand on the kayak and paddle. Drop down on to the seat.
- vii. Release your grip on the rear of the cockpit and bring round to the front.
- viii. Adjust your position in the canoe by wriggling into a level position, leg trailing, holding paddle in both hands.
- ix. Lift the other leg into the canoe and adjust your position again. Fit splash cover on with paddle on your lap, or held by a 'vasbyt' in the mouth, or by making contact with the bottom of the river with the paddle in one hand.

I. RE-ENTRY IN DEEP WATER

At some stage, every paddler falls out in deep water and needs to get going again quickly. Without a foothold it is almost impossible without assistance. Solo re-entry requires practice and a fairly strong deck. The boat is floating level with the water right way up – swim to the rear end of the boat with paddle near, pull yourself onto the deck with legs dangling on either side until you reach over the cockpit. Keeping a low profile, get your bottom over the seat by bringing the legs forward and dropping down into the seat all in one movement. Place legs inside and retrieve your paddle.

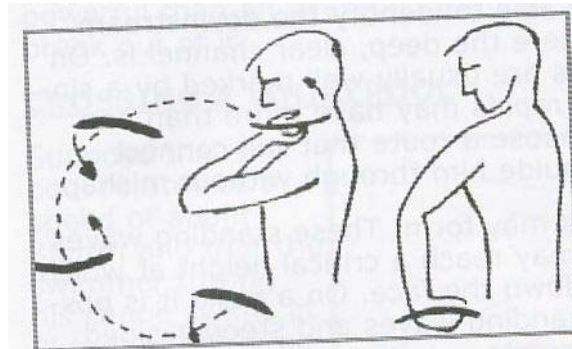


J. SOME USEFUL EXERCISES WITH PADDLE

ARM AND WRIST EXERCISE

Take the paddle in a normal grasp, arms bent, both arms at shoulder height. Rotate the wrist backwards until the drive face of the right blade is turned upwards and the elbow is bent upwards.

This is an extreme effort. Rotate the shaft away from the body, and then the blade should turn over through 180 degrees and then 360 degrees until the wrists are bent in and towards the armpits, shoulders braced forwards and the wrists feel strained. The purpose of this is to find out if anyone has extreme difficulty in doing it. If one does have difficulty in doing this exercise, it is an indication of some arm injury that prevents this range of movement, and allowances must be made right from the start. Ordinary feathering requires a 90-degree twist of the shaft and the exercise effectively squashes anyone who says they cannot do it because they just have.



SHOULDER EXERCISE

Take the paddle in a normal grasp. Then widen the grasp until the hands are just about touching the part where the blades join the shaft. This is not possible with long blades, but one should take a very wide grasp. With paddle held horizontally across the chest, swing it into the vertical position at one shoulder and press the paddle around behind the shoulder. The upper arm must now be thrust straight down until both arms are straight down at full extension behind the back. Pick up your paddle and do it again until you can hold it all the way round. The arm which was initially lower now swings upward and the

paddle is brought around to the vertical position at the other shoulder, swinging it round from behind the back. Try not to duck the head. Return the paddle to the rest position across the chest. Repeat a dozen times, then do it with opposite rotations about the shoulders. This is designed to show that the novice has no shoulder injury that may preclude a full movement of the shoulder muscles. It also emphasises the need for supple shoulders in the paddling effort and removes creakiness and stiffness at the beginning of a paddling session. It may be used to limber up before getting into the kayak.

2. CHAPTER 2 – SAFETY EQUIPMENT

Always ensure that your kayaking jacket and helmet are in your kit bag at every event. Race organisers have the right to make helmets or kayaking jackets compulsory at the last minute.

A. KAYAKING JACKET S

Technically, a life jacket is the name given to the horseshoe-shaped flotation device issued on board ships. These are tied around the torso, and designed to keep you floating face upwards, (even when unconscious) and are not suitable for canoeing.

The following has been adopted by CSA:

- The term “kayaking jacket” is adopted in place of flotation device, life jacket or buoyancy aid.
- A waist tie using a quick release buckle or drawcord must feature on the jacket.
- The amount of flotation must support a minimum of 6kg lead weight in water.
- Shape and design of the jacket must allow freedom to twist and lean the torso.
- Head movement and visibility must not be impaired or obstructed by the jacket even when swimming.
- Closed cell foam, or beaded flotation must be evenly distributed front and back, (flotation may also occur on the sides).
- Loose fitting unsecured jackets are not acceptable.
- Nothing that may fill with water or snag on trees / branches should hang from the jacket.
- The stitching, buckles and flotation must be in good working condition, jackets appearing worn out or aged may be rejected **by a Safety Officer** on suspicion of not being in good working order.

When purchasing a kayaking jacket ensure that the criteria listed above are met.

B. HELMETS

Recommended features:

- To protect forehead, temples and back of head.
- Must fit the head perfectly, i.e. not wobble on ones head, and must have a chin strap.
- Must protect the forehead, temples and back of head.
- Foam must line the inside of the helmet.
- The harness must be strong.
- The helmet must be made of polypropylene or polyethylene, or suitable material.
- Holes may be moulded into the helmet for ventilation, not drainage, as water should not get into a perfectly fitting helmet.

Note: Cycling helmets are not permitted because they do not meet the above criteria.

C. BOAT BUOYANCY

A minimum of 10 litres of buoyancy **firmly fixed** in each end of the kayak is mandatory. Wine Bags, balls, polystyrene blocks and 2 litre bottles are not acceptable unless they are tied in - e.g. in an orange pocket which is tied into the craft. Airbags shaped to fit into the kayak are strongly recommended. **The 10 litre limit is the absolute minimum** – paddlers are recommended to use substantially more buoyancy to limit the risk of boat damage in a

capsize; (buoyancy assists a boat to ride higher on the water surface in the event of a capsize reducing the risk of a wrap, it also makes it easier to free a boat that has been pinned on an obstacle).

D. SPRAY DECKS

Must be stretched flat across the cockpit lips, and fit tightly, but with grab handles for quick release. Shoulder straps prevent the spray cover from slipping down around the legs when inadvertently taking a swim. Shoulder straps for neoprene spray decks are not mandatory.

E. THERMAL CLOTHING

In cold climates, such as the Cape, the wind chill factor can be extremely dangerous. Thermal vests and gloves and paddling jackets are recommended. Lightweight chill chasers are most effective at overcoming the wind-chill factor. It is recommended that shoes are always worn on marathon-type races. This is because shoes prevent heat loss, and are essential in the unplanned case of having to walk out of a river valley. Head gear in the form of a buff or beanie to reduce heat loss is recommended.

F. DRINKING SYSTEMS

Must be designed to stay with you at all times. Water bottles installed in the boat may go down with the boat. Quantities should be planned to last for the specific event. Do not run out of liquid - it is potentially dangerous. A generally accepted rule is one must drink 250ml every half hour in a race situation and every 15 minutes on a very hot day.

Drinking systems must be worn on the **outside** of the kayaking jacket, not the inside. Systems worn inside the kayaking jacket render the jacket bulky and reduce the effectiveness of the jacket. The drinking system must fit comfortably – avoid loose fitting systems that could snag. Some systems are designed to tear apart under pressure should they become snagged.

G. THROW ROPES

Must be readily accessible and a minimum of 20 metres long, with non-sinking rope and a brightly coloured buoyancy bag which is weighted to maximum of 200 gms. Kayak to swimmer rescues require considerable skill. The correct use of ropes requires training. Under no circumstances should ropes be **tied off** unless a quick release mechanism is used. **Never tie a knot** in the end of a rope used for throw bagging. It is highly recommended for each craft to carry a throw rope.

H. SWEEP BOATS

Suggested requirements are:

Simple, rugged and stable design of kayak, equipped with:

- Throw ropes (20m + bags), slings, duct tape, whistle, spare paddle, karabiners.
- Extra water supply
- Mini first aid kit
- Knife and small saw
- Space blanket
- Red cross on white background sheet
- Cell phone in a dry bag if reception is available on route

[additional items for specific terrain may be added.]

3. CHAPTER 3 – RIVER CLASSIFICATION AND PADDLER PROFICIENCY RATING

Proficiency ratings have been introduced by the CSA to cover the safety aspect of who may or may not paddle in the more dangerous events on South African waterways. All rivers and marinas have been classified as F, C, B, A, or X for paddling in Kayaks. Where a stretch of water has been classified with a “+” symbol, this refers to isolated obstacles that exceed the overall grading of the river. These obstacles are identified in the river gradings, and will be highlighted in race brochures, pre-race briefings, race maps, and should ideally be clearly signposted, indicating the portage route, well in advance of the obstacle (example “Fish B+ - Keith’s Flyover, Cradock Weir”) It is imperative to note that the difficulty grading of any stretch of water can be significantly affected by unusually high or low water levels, as well as factors such as cold, rain, sleet, wind, mist and fog. The presiding safety officer is entitled to revise the river grading appropriately, and apply restrictions to entry, in these circumstances.

CSA RIVER CLASSIFICATIONS (note that changes in water level will affect the classification of A, B and C class rivers e.g upper Umgeni at 20 cumecs = B class)

Class F – Flatwater, no discernible flow eg Marina da Gama Midmar Dam or Victoria Lake.

Class C – Flowing gently, some small rapids (class 1 and 2), and possibly reed channels and/or tree blocks eg Albert Falls weir to Bluegums (Umgeni) or Klip from Henley to Confluence.

Class B – Steady flowing water, with some technical spots that require significant manoeuvring, but seldom exceed class 3 rapids. eg Campbells farm to Dusi Brige (Umsindusi), Breede, Barrage to Parys (Vaal).

Class A – Technical, consistent wild water, with class 3 or 4 rapids, difficult access, may contain technically difficult obstacles such as weirs eg Tugela, Umko, Lowveld Croc.

Class X – Extreme, class 4 and 5 rapids, for very competent plastic kayak paddlers only eg Thrombosis Gorge, Deepdale to Hella Hella or Ndedema Gorge.

MODIFIED INTERNATIONAL SCALE OF RIVER DIFFICULTY (open ended)

CLASS 0: Flat stationary water - no waves.

CLASS 1: Moving water with a few riffles and small waves - few or no obstructions.

CLASS 2: Easy rapids with waves up to a metre high and wide clear channels that can be seen without scouting. Some manoeuvring is required to avoid obstacles.

CLASS 3: Rapids with high, irregular waves (above 1m) would likely swamp an open canoe. Has narrow channels and has some drops causing turbulence that may require complex manoeuvring and even scouting from the bank.

CLASS 4: Long difficult rapids with constricted passages that require precise manoeuvring in very turbulent water. Scouting from the bank is often necessary and the conditions make rescue difficult. Paddlers in kayaks should be able to successfully execute an eskimo roll.

CLASS 5: Extremely difficult, long and very violent rapids with large drops and highly congested routes that nearly always require scouting. Rescue conditions are difficult and there is a significant risk to life in the event of a mishap. Gradient is steep (1 in 20 up to 1 in 10) with large stoppers. Bomb-proof roll is essential!

CLASS 6: The difficulties of class 5 carried to the extreme of navigability, nearly impossible and very dangerous. For teams of experts only, after close study and all precautions taken. Generally a very steep gradient of more than 1 in 5 with a large number of stoppers

4. CHAPTER 4 - READING THE RIVER

River paddling is an exhilarating experience however to be successful you need to understand the water and exercise caution. The water in a river is relatively predictable in its behaviour making it possible to read and assess how and where to run a rapid.

FEATURES

RIVER TYPES

- *Pool-drop vs continuous rivers*
A pool drop river typically comprises a pool of water followed by a rapid and these are mostly raced by canoeists. In contrast a continuous river offers no pools, just a constant gradient.
Boulder gardens
Sections of river strewn with boulders of various sizes that make navigation technically difficult.
- *Gorges vs floodplains*
Gorges are steep sided valleys that contain the river. Should the water level rise the velocity increases and escape is extremely difficult. A floodplain does not contain the river allowing rising water to flood outwards.

WAVES, HOLES

- *Laterals*

Also known as diagonals these are waves that lie at an angle across the main flow of the water. Often powerful enough to deflect a boat off its line.

- *Stopper waves(aka "holes")*

Stoppers fall into two categories:

- a) Those in which circulation is mostly on the surface, (hole on the left, adjacent photo).
The surface stopper is fairly powerful but just below the turbulent surface is a strong uninterrupted flow of water downstream. This lower current will carry a boat or swimmer clear of the wave.
- b) Those in which circulation extends deeply below the surface, (hole on the right, adjacent photo).

The deep, circulating stopper is usually found at the base of waterfalls, weirs, and pourovers, - anywhere where water falls **vertically** into a deep plunge pool. Characteristic of these is a long boil line, (water flowing back towards the drop), with bubbles and boils rising to the surface. Avoid these at all costs.

Smaller stoppers on Grade 2 rapids are not bad but the Grade 4 stopper really stops the boat. The boat is held firmly and the nose rises and the tail sinks, sometimes resulting in a "tailwalk" or loop. It is essential to keep on paddling through the waves.

There is a distinct feeling of horror on meeting one's first real stopper because it appears to hover overhead, and then the temptation to stop paddling and hold the paddle high is very strong.

Resist, and paddle hard. As the stopper buries you place the blade over the face of the stopper wave and pull the boat forward and out the stopper.

Really big stoppers are best avoided by just clipping the edge, but taking care not to move over into the curling eddies which then pulls one out to the side.

- *Standing waves and wave trains*

A series of waves usually where a fast flowing of current of water is slowed by a pool. Standing waves can vary in height.



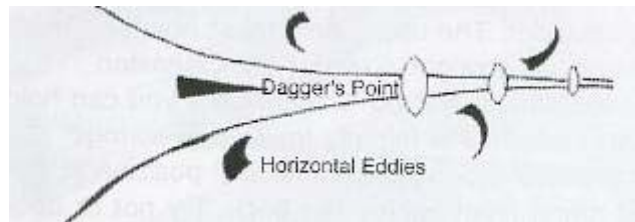
- *Troughs and crests*

A wave train consists of troughs, the base of the wave, and crests, the top of the wave. A swimmer flushing through a wave train can become disorientated and usually tries to breath on the crest. Breathing should be timed in the trough as the swimmer will wash through the crest and swallow water.

DOWNSTREAM "V'S"

The most basic form of a rapid is found where the current is accelerated and the tongue of fast water forms a long "V" pointing downstream. The still water on each side of the "V" is known as an *eddy*. It is important to be able to identify the downstream "V" shape as this indicates where the deep clear channel is. On simple low-grade rivers rapids are usually well marked by a single "V" but the more difficult rapids may have more than one "V". The paddler must then choose a route that will connect them in a sequence that will guide him through without mishap. *Note the downstream "V" between the 2 holes in the previous photo.*

Within the "V" a line of waves may form. These standing waves in fuller faster flowing water may reach a critical height at which point they break and tumble down the face. On a rapid it is possible to find solid, unbroken standing waves and steeper sided waves with foaming breaking crests.



EDDIES

As the energy levels of a river increase so the calm water of an eddy responds by moving in the opposite direction to the stream. Eddy currents may run in a horizontal or vertical plane.

Horizontal eddy currents may be found:

- Behind exposed obstacles.
- Behind hidden obstacles.
- Where a fast moving flow of water enters a still area of water.
- On the inside of a bend where the fast water runs on the outside.
- Eddies are used to break out of currents, to scout rapids, to set up rescues or to provide signals to approaching paddlers.
- Eddies are one of the most important features of a river.
- Vertical eddy currents may be found behind covered obstacles like weirs.

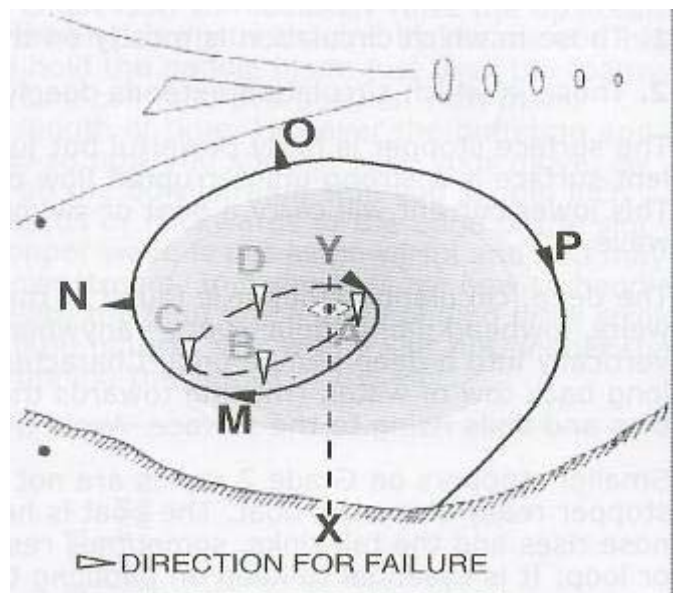


Eddy is being used to retrieve a K2

RIVER LEFT VS RIVER RIGHT

When scouting or describing a rapid the international term "river left" or "river right" is used to clarify the left or right side of the river. "River left" refers to the left hand side of the river as the water flows downstream and "river right" the refers to the right hand side.

Always use these terms when describing a rapid or obstacle in a river.



WHIRLPOOLS

Eddies will form whirlpools if the conditions are right. Look out for a whirlpool in a river which is wider than average at some point, where the fast moving water is offset to one side and the backwater is wide and deep.

The "eye" of the whirlpool will move around a centre. It is not normally a dangerous phenomenon and whole kayaks are not swallowed up! One may paddle across them with not more than a sudden change of direction as the eye is crossed. Danger does exist when a swimmer is trapped in one of these "jailhouse eddies". It is more powerful than an average swimmer and it needs a simple drill to break out of it.

The proper way in which to tackle whirlpools as a swimmer is to swim away from the eye of the whirl until free from the pull of the current. At Y one swims in the direction of the black arrow. At M the eye of the pool is directly behind and the aim is upstream of X. At N the direction is directly upstream and the eye of the pool is directly behind the swimmer. At O the swimmer is heading directly away from X and by now well out of the centre of the whirl. At P the pull of the whirl is so slight that he may now start to follow a curving path in towards the point of landing, probably slightly downstream of X.

HAZARDS

WEIRS AND POUR-OVERS

Weirs are dangerous. Always scout them first to see how big the slot is and how wide and powerful the boil line is. The weir presents a level obstacle to the water that sweeps over it in a straight line and down into the slot; this is followed by the stopper wave, behind which is the boil line that flows back into the slot. Water in this vertical cycle is returned from a fair distance downstream depending on several factors i.e. the depth of water, the gradient and the general speed of the river flow. In a slow moving pool you could be sucked back upstream from a point 5 metres away. This return flow is known as the boil line.



Water flowing down a river is not consistent and flows occur in surges. Weirs slow the flow of water removing the surging action of the current. This consistent flow over the wall of a weir ensures that the boil line flows back in a consistent action, this factor coupled with the fact that the base of weirs are usually locked off adds to the danger of weirs.

Natural weirs and pour-overs occur at ledges and large rocks and the vertical eddy which lies below them can be equally dangerous, but more to swimmers. Most natural hazards are not locked off as is the case with a weir, and the surging action of the current means that the holding potential is also eased, thus an escape route may exist when the holding action weakens.

In the event that a paddler does not manage to paddle through a hole and is held sideways in the slot, as in a weir, all is not lost. Immediately raise the upstream edge of the boat by leaning downstream and by means of a high brace support stroke hold the paddle blade just over the foamy curling return wave. One can hold this position with minor adjustments for any length of time. However the buffeting and noise is disorientating so now you should make your move. By taking small strokes on the downstream side you should inch your way across forwards or backwards to the edge of the slot to locate a point where the stopper wave is not as powerful and you may fight your way out downstream. In order to learn how to handle a hole or weir slot, learn the high brace and hanging draw stroke and then find a tiny little natural weir with a slot not deeper than 10 cm and practise running the length of the slot.

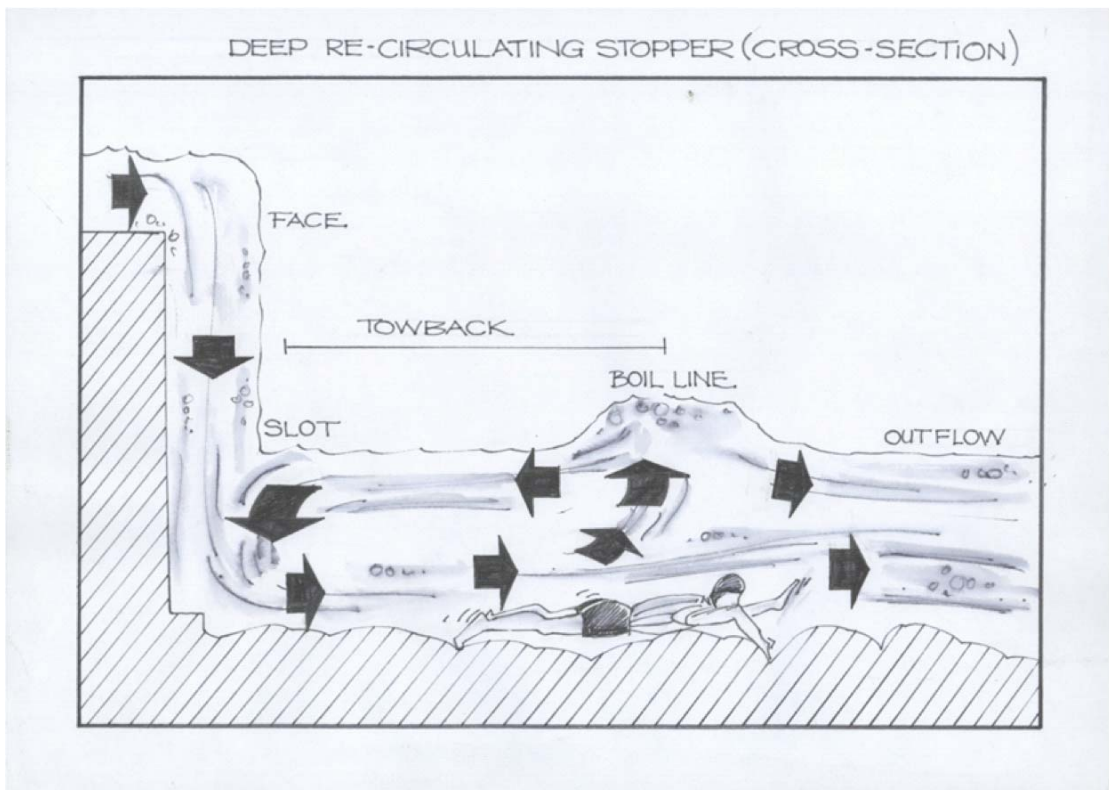
Weir Slot, No Boat

This is an unpleasant situation and it does not usually last very long. The power of the water leaves you almost helpless and the roaring turbulence confuses you. One minute you are on the surface and the next you are being tumbled back into the slot and then dragged under by a tearing shaking force that you cannot match.

Do not panic. Keep your cool. There is a way out. If caught in the boil line when you reach the surface take a breath and another and swim hard into the slot where the down-flow of the water over the weir meets the stopper, attempt to dive right down as if you were trying to touch the riverbed. Stay relaxed and down as long as possible and then let your kayaking jacket bring you back to the surface. Get your bearings and check that you are not being sucked back.

Some authorities advocate removing the kayaking jacket before diving down into the downstream flow. Leave the kayaking jacket on at all times – **never remove it**. Practical experience indicates that speed is everything - you need to break that deadly cycle. Furthermore the downstream flow is not very deep under the surface - about the same depth as the bottom of the slot and it possible to be flushed out beyond the boil line.

SELF RESCUE FROM A BOIL LINE BELOW WEIR



NEVER REMOVE KAYAKING JACKET in this situation.

STRAINERS

Any obstacle that allows water to flow through but will retain larger objects can be referred to as a strainer. The most common are trees but also include fences, cables, ropes. Strainers are deadly and should be avoided. Trees usually collapse into the river on the outside of the bend where the erosive forces are greatest. When negotiating a bend stay on the middle or river right line to avoid possible strainers. Tree block = strainer.

A swimmer heading for a strainer should actively swim hard towards the strainer and before impact lift themselves up and out the water to reach for a branch that is situated above the water. From this position they can either hang on till rescue arrives or pull themselves out the water. A passive swim into the strainer will result in the swimmer being sucked under the water by the current and increase the risk of becoming entangled in branches beneath the water.

SIPHONS

Associated with boulders and rocky rivers where water flows through a gap between or under the rocks. The upstream side of the siphon is an area of high pressure and a person or object will be sucked into the siphon and held there if the space is small. Rescuing a person from a siphon is extremely difficult due to the high pressure zone. Siphons can be detected by the presence of small whirlpools on the upstream side of a rock or sucking sounds, but generally siphons can be difficult to detect.

UNDERCUTS

Normally occur where high banks or rocky cliffs have been eroded by the river. Undercuts can vary in width and in fuller rivers are difficult to detect. Stay away from cliffs or banks that drop directly into the river particularly on the outside of corners. A swimmer or boat with a paddler washed into an undercut may find themselves in a cavern of which the only way out is to swim towards the light. A paddler in a boat may become pinned in an undercut.

MAN MADE HAZARDS

- Weirs – these have been discussed but exercise extreme caution when negotiating weirs.
- Bridges – for some reason attract boats to attach themselves and wrap around their columns.
- Low level bridges – these are usually constructed using pipes or box culverts. Debris has a habit of jamming in the pipes or culverts creating a strainer. Approach these hazards with extreme caution many a paddler has inadvertently been sucked into the pipes or culverts. The current flowing through these is very powerful and has been known to suck paddlers and boats through after paddlers have innocently pulled alongside to climb onto the roadway.

STAY AWAY

5. CHAPTER 5 - RIVER RESCUE TECHNIQUES

"The finest thing a man can do is to save the life of a fellow being". Des Park - Past President - CSA.
In order to make a contribution to the community of river users paddlers need to acquire just a few basics of several skills;

- Pay attention to those around you - if someone is struggling, ask if you can help.
- If you are paddling with a partner you have a responsibility to him or her. Try not to get separated and keep track of where he or she is at all times.

WHEN TROUBLE ARISES, ASSESS THE RISK. There are too many documented cases where the rescuer has become a victim. Consider low risk rescues vs. high risk rescues.

Low risk = rescuer on the bank talking to victim;

High risk = rescuer entering the water to assist victim.

Learn to use the following :-

1. Throw bag and rescue ropes.
2. Useful knots e.g. figure of eight; fisherman's knot
3. Karabiners (screw gate) and cow tails (tow-line).

PRINCIPLES OF RESCUE

- **Establish an incident leader** / commander to take control of the situation.
- **Assess the situation** and the possible risks to rescuers and then set up the rescue ensuring that the rescuers will not be placed in danger.
- **Upstream spotter** - place a person upstream to divert boats or close off the river to protect the rescue operation.
- **Downstream rescue** – place a rescuer downstream particularly if there are other hazards below.

- **Low to high risk rescues:** verbal – talk to the victim and instruct them what to do; bank rescue - from the bank; boat – rescuers use a boat to assist the victim and lastly; swimmer – rescuer enters the water. The latter two techniques increase the risk to the rescuer.
- **Rescue priorities:** Prioritise in order of sequence self; group; victim – the rescue must not place rescuers in jeopardy.
- **Assess the victims behaviour** – are they in / out of control of their emotions; an out of control victim will not comply with instructions and will hamper rescue efforts.
- **The only time a rescuer enters water as a first priority is when faced with an unconscious victim.**

USING A THROW BAG

Choose the location carefully. Assess the downstream area for possible hazards and ensure that as the rescuer you have a suitable point to anchor yourself on.

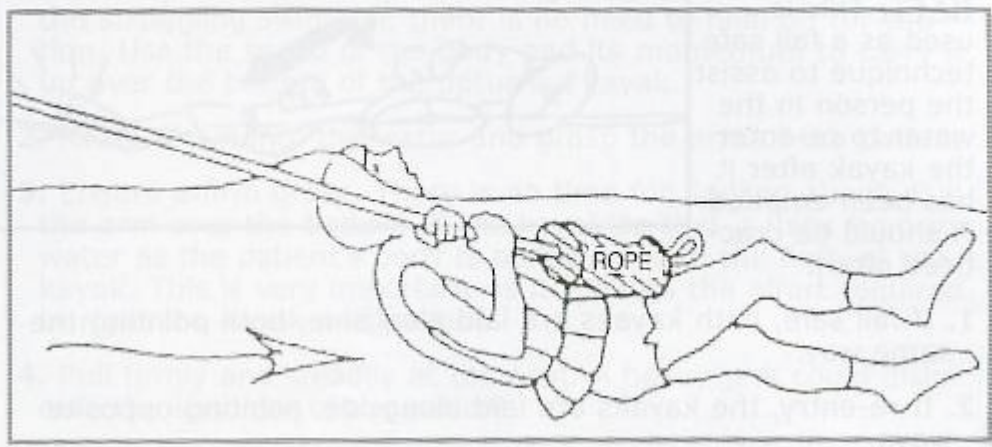
When the swimmer approaches you get their attention – if they are not aware of you they will not see the rope – shout “**ROPE**” and once the victim has your attention throw the rope hard aiming for the head. Use an overhand or underhand throw.

Always leave 2 or 3 metres of rope spare – **DO NOT** anchor the rope to anything. Once the victim has the rope brace yourself and pendulum the victim into the bank. Take care not to be pulled into the river by the tension on the rope. Ensure that the victim is safely to shore.



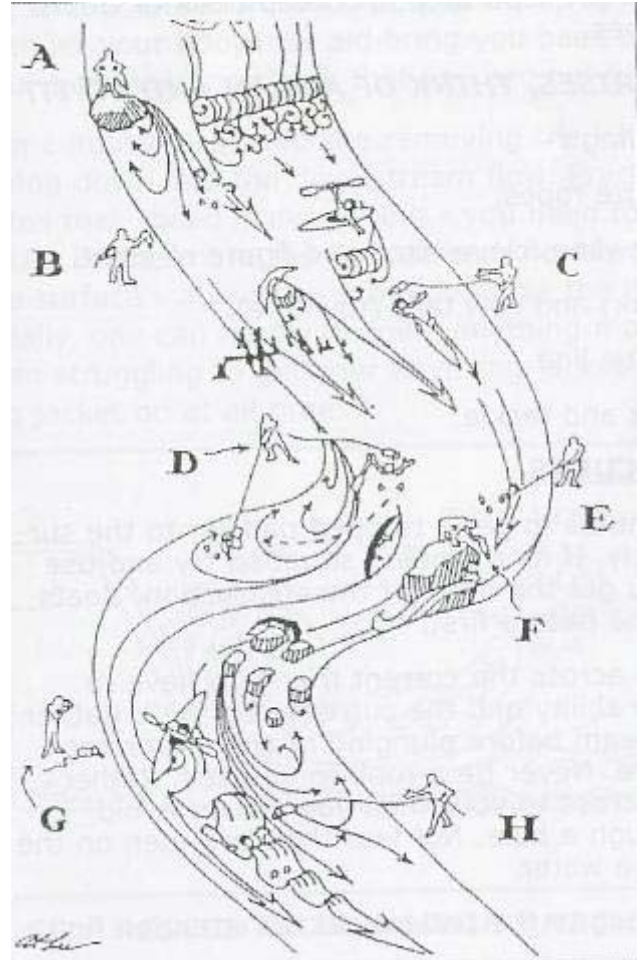
A swimmer that is being rescued by a rope should always place the rope on the opposite shoulder to the bank that the rope has been thrown from; i.e. left shoulder if the rope is thrown from the right bank. Remain on your back face up holding the rope with both hands and let the rescuer do the work. **DO NOT** wrap the rope around an arm or tie a knot.

THE CORRECT WAY TO HANG ON TO A THROW LINE



SUITABLE RESCUE STATIONS

- a). Opposite a keeper hole or washing machine.
- b). Opposite an eddy
- c). Below a stopper wave.
- d). On the inside of a corner.
- e). Before a dangerous obstacle.
- f). Above a siphon or undercut rock.
- g). Photographer at big waves with throw bag at his feet.
- h). At an eddy opposite big waves.



WADING

A very simple technique that can be set up without equipment. One person up to many people can be used to reach a victim trapped in a river. The only limiting factor in this technique is water depth, as soon as the rescuers reach waist depth and deeper it will fail.

- **Single rescuer**
A single rescuer can wade out to a victim using his paddle as an anchor. Facing upstream the blade of the paddle is angled so as to limit resistance from the current, the paddle blade is wedged on the river bed and the rescuer is able to lean into the current on the paddle.
- **Two rescuers**
A pair of rescuers can wade into the river by holding onto the shoulder straps of each others kayaking jackets. Each takes a turn to move while they use each other for support against the current.
- **Three rescuers**
The three rescuers hold onto each other to form a circle and manoeuvre into the river whilst supporting each other. For this to work it is critical for the rescuers to have located a firm footing before moving



- **Multiple rescuers**
With this technique any number of rescuers can form a wedge to wade into the river. Usually the biggest person is placed at the head of the wedge facing upstream. He is supported from behind by two rescuers who in turn are supported by three, in turn by four ... and so on forming a very powerful wedge.



When rescuing a victim using this technique the rescuers will work from the upstream side of the victim, in this way an eddy is formed for the victim and the strength of the current is reduced. With the multiple rescuer wedge this eddy is significant and 3 or 4 rescuers can work without hinderance from the current.

BOAT AND SWIMMER RESCUE

These rescue techniques require equipment and training and a very brief explanation is given. These techniques are used for retrieving victims that are either foot or boat entrapped and the victims cannot be rescued by the wading technique.

The principles are the same in that a boat or swimmer is lowered on a single or V lower (2 ropes) to the victim from upstream. The rescuer on the boat or swimmer uses hand signals for the personnel on the ropes to guide him onto the victim. A knowledge of knots and the ability to put this together quickly is necessary for this technique to be successful. A rescue PFD with a quick release buckle is essential, this allows the swimmer to be able to release the rope in case things go wrong.



FOOT OR BOAT ENTRAPPED VICTIM

The first priority in this situation is to ensure that the victim is able to breathe. In most cases a foot entrapped victim will have created an eddy on their downstream side and an approach to the victim can be made from this position by either ferry gliding or breaking into the eddy, two basic canoeing techniques.

For a foot entrapped victim the most practical is to leave the boat for them to use as a support to hold themselves upright. In these cases the victim seldom has the good fortune to have something to support them; a paddle may also work. Foot entrapped victims have to be removed from the upstream side – i.e. they must go out the way they went in.

Running shoes are the prime reason paddlers become foot entrapped in a river. The shoe is pliable and will compress and expand trapping a victims foot in a gap between rocks. It is for this reason that standing up in a flowing river is not recommended.

A boat entrapped victim will usually be caught on an obstacle in the river, such as a rock. The rescuer needs to get onto the rock from behind the rock on the downstream side of the victim and work on freeing them from this position. If the victim is caught on a bridge column the rescue is complicated as in most cases the only approach will be from above.

Never attempt to swim onto the victim from the upstream side – it will only make the situation worse.

VICTIM IN A WEIR

Self rescue from a weir was discussed earlier but where a victim cannot free themselves rescuers need to assist. The easiest and safest is to throw the victim a rope and pull him to safety. To assist the victim to locate the rope and add to the buoyancy of the rope a kayaking jacket can be attached to the rope.



Due to the aerated water the victim will be struggling to stay afloat. If an inflatable croc is handy this can be thrown in for the victim to hold onto or a large block of buoyancy from a canoe.

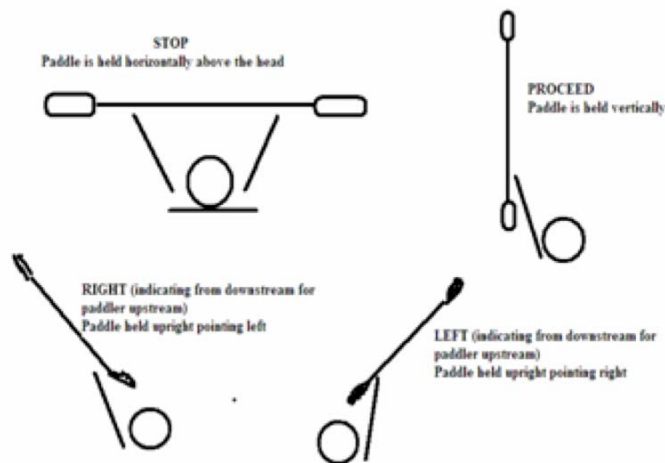
If the river is narrow enough a rope can be thrown across the weir slot to a rescuer on the other side, a kayaking jacket fed onto the rope and when the victim has hold of the rope the two rescuers walk downstream pulling the victim free.

Never send a swimmer on a rope into this situation.

It is a natural human reaction to want to assist another person who is in distress. When encountering a situation on the river always assess the risk to yourself before reacting. It was mentioned earlier but must be mentioned again – a rescuer with every good intention can easily become a victim because they did not assess the risk.

Hand signals

Use a paddle to signal to other paddlers



6. CHAPTER 6 - BASIC FIRST AID

FRACTURES OF THE LIMBS AND TRUNK

Because there is a hydraulic cushion around a submerged rock, it is unlikely that enough force will be applied to break a bone. So the following cover the bare bones of the subject.

1. Stop bleeding by putting a pad of material over the wound or squeezing the edges of the wound together.
2. Splint the broken limb or back or neck to immobilize the break. In general, broken arms, collar-bone, rib and breastbone fractures can all be immobilized by bandaging the arm against the chest. If the arm cannot be bent it will have to be bandaged down at the side of the body.
3. Fractures of the leg, knee or pelvis should be splinted with a board right across the fracture and the legs tied together.
4. A spinal fracture is a serious and very dangerous injury and should not be moved unless properly supported, which means a rigid stretcher with the head supported and the legs tied together. If at all possible do not move until qualified medical attention arrives.

HEART ATTACK

1. If the patient presents with cardiac arrest, treat with C.P.R. (ABC method). Resuscitation must start immediately to prevent brain damage and death.
2. If the patient only has chest pain, carry the patient to a cool environment. (Avoid excessive movement).
3. Then adopt the position most comfortable for the patient (sitting if breathless or lying down if unconscious).
4. Reassure the patient and keep him calm and still.
5. Summon ambulance/doctor/paramedics.
6. These patients are at risk of developing ventricular fibrillation. Remain with them until more advanced medical help is available.

Treatment

The St Johns and Red Cross recommend the ABC method of resuscitation.

A Airway must be opened

Turn the patient on his back, lift up the neck and tilt the head back and lift the chin. Once the airway is open the patient should begin breathing.

B Breathe for the Patient

This is either done mouth to mouth or mouth to nose, while the patient is lying on his back. Close either the mouth or the nose by pinching shut with two fingers and blow into the other orifice. Give the first four inflations rapidly and then settle down to a steady 40 or 50 inflations per minute.

C Circulate the blood by compressing the chest

After the first 4 ventilations, check the pulse at the neck to see that the heart is beating. Only if there is no heartbeat at all should you press heavily with both hands on the lower half of the breastbone to compress the heart. This action must alternate with the ventilation, preferably using two first-aiders. Once the heart beat is established, carry on with ventilation only, even if the patient is doing some breathing, until his breathing is entirely normal.

After recovery, keep monitoring the breathing and pulse.

7. CHAPTER 7 - ESSENTIAL MEDICAL INFORMATION

EXPOSURE

Humans require a surrounding temperature of about 32 degrees C if it is not to feel cooled. A naked body in air at that degree of warmth will feel comfortable, but it must be a naked dry body in still air.

Canoeists should wear clothing suitable for canoeing. "Proper" clothing is partly a matter of personal preference and partly a matter of human need. If certain well-proved principles are borne in mind, then the choice of clothing is narrowed considerably.

It is essential to be properly dressed which means two things:

1. being warm enough to survive in a howling gale if you can no longer paddle to keep warm, and
2. being cool enough so you do not overheat (heat exhaustion), get muggy, aggressive and start making stupid mistakes.

Special thermal vests are available to help keep paddlers warm (second skin). These vests can be worn under the paddler's club vest.

A hat is essential in all weathers - in the hot it helps you keep a cool head, and in the bitter cold it stops you losing heat through your head. A buff or beanie in cold weather reduces heat loss through the head. Shoes or booties are also essential - while canoeing they keep the feet warm (remember your feet might be stationary for 5 or 6 hours). Also if you have a disaster and lose your canoe, your way out might be on foot.

BODY DISTRIBUTION OF HEAT

It is essential to keep the heart, brain, lungs and other vital organs at a proper working temperature. Overheated, one becomes feverish. Overcooled, one becomes comatose and incapable of movement. It is possible to wear so many clothes that one has difficulty in becoming cool but the body heat as a result of exercise rises to uncomfortable levels. What is required is the absolute minimum of clothing which will allow canoeing to go on in relative comfort.

Consider the body as having a core and a surface. The core contains the vital organs and the surface, the skin and limbs. It is possible to cool the surface to very low temperatures so that frostbite may result. This is not necessarily a fatal condition, but if prolonged, one may lose toes, fingers and ear lobes because the cessation of blood flow to the affected parts has allowed necrosis of the tissue to begin. This does not necessarily happen only in extreme cold.

The body loses heat mostly from places usually exposed to cold air. These places are the face, head, neck, chest and the lining of the lungs and throat. Doing heavy physical work, depth and rate of breathing are increased and considerable volumes of cold air are sucked right into one of the vital organs, there to be warmed up to body heat and blown out at once. A lot of body heat is lost almost at the heart of the matter.

The face is usually exposed so that perception of one's surroundings is enhanced. This causes the face to feel cold when the wind blasts the tops of the waves right into it. The silt irritates the eyes and pain in the facial sinuses is often experienced. A nagging headache is often associated with an upset stomach and sickness reduces the ability of the body to produce the necessary effort to go on paddling in what may be difficult conditions. Keep your face warm. Cover your ears. This means that one loses sensitivity to one's surroundings which may or may not matter. The choice may be made on the spot, but be prepared.

Covering the neck, the top of the head and the chest and upper arms is not difficult and should not interfere with the action of paddling.

GENERATION OF BODY HEAT

The body operates at about 37 degrees C. It can go down to about 34 degrees C without fatal results and people who are trained to swim in very cold conditions will manage to continue to exist quite happily in conditions which would stop lesser mortals. Body heat is generated by the breakdown of food in the system into energy which the muscles can use. It is necessary to have food in the body for it to feel warm. If you want advice on how your body will best generate heat, consult your doctor.

The mind has a considerable effect on the workings of the body. A determination to do well may not be the only requirement, but it does help. The mind acts in mysterious ways. One's state of mind at the time is not what wins or loses the day, so much as what one has been for years; the sort of person one is, the way one makes decisions, the tenacity with which one persists in what is being done. The big strong man may not necessarily do better than the little fellow. In other words, survival is not just of the body it is a matter of education and the way in which one usually employs body and mind; it is spirit. The spirit cannot be commanded to do this or that in emergencies. It simply is what is. It may change as the result of the emergency but that is in the future and is a result and not a cause.

The state of mind affects the temperature of the body. The nervous system is linked to blood vessels and these, especially surface blood vessels, can be dilated to increase the blood flow through them or constricted to reduce it. This is not a conscious act. Emotional states of mind affect the autonomic nervous system; one feels embarrassed and the blood flow is increased to the face. Whilst normally, in cold conditions, the autonomic nervous system will restrict blood flow to the skin and with it, of course, the loss of body warmth. In continued extreme cold, the nervous system may lose its grip and allow the blood flow to run unrestricted to the surface, thus permitting a catastrophic and fatal loss of heat at the core.

Fear, apprehension, doubt; all these emotions can affect the state of the blood flow causing temporary variations from normal. Loss of heat from the body is controlled not only by insulating clothing or by the intake of food - the degree of emotional stability is also a relevant factor.

STAGES OF HYPOTHERMIA

As a paddler is already sitting down, the stages of hypothermia may go unnoticed until he tries to get out of his canoe. However, his hands will be cold, his grip shaky and his paddling action slow. He will complain of numbness in the legs, perhaps sickness as a result of an empty stomach and natural apprehension.

At this stage, the mind is suffering a sensation of general discomfort and apprehension. If this is recognised then one should at once set about changing the conditions which give rise to it. Find shelter, eat some chocolate or have a hot drink. Do not take alcohol, however, because its effects are too unpredictable. It may give a feeling of euphoria, but it reduces the control the body has over the skin temperature and this may result in a serious loss of body heat.

After a short time the paddler may act irrationally, exhibit a sudden burst of energy, refuse to talk or gabble incessantly, not answer questions. The result is rather like drunkenness. The brain is being cooled and is losing its power to think and act. Hearing is muffled and sight affected in that one sees double or focuses slowly. Colour balance is affected - the sky looks dark green, the sun bright blue. Different people may be affected in different ways but the general symptoms will be of much the same order.

If swimming in the water, a general feeling of numbness not of cold may occur. One has a reluctance to time the breathing to coincide with the surge of wave tops over the head, a feeling of "Why bother?" Soon after this consciousness fades, returns, fades and then fails to return. There is sudden collapse. The patient lapses into coma and recovery is doubtful. Death may follow in seconds perhaps preceded by convulsions.

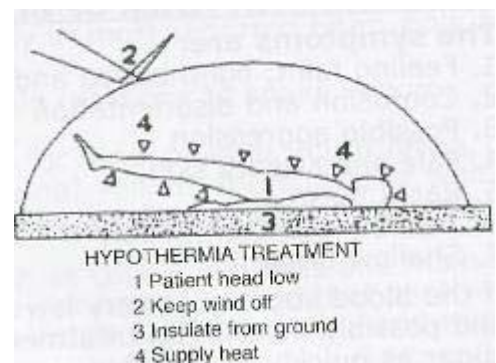
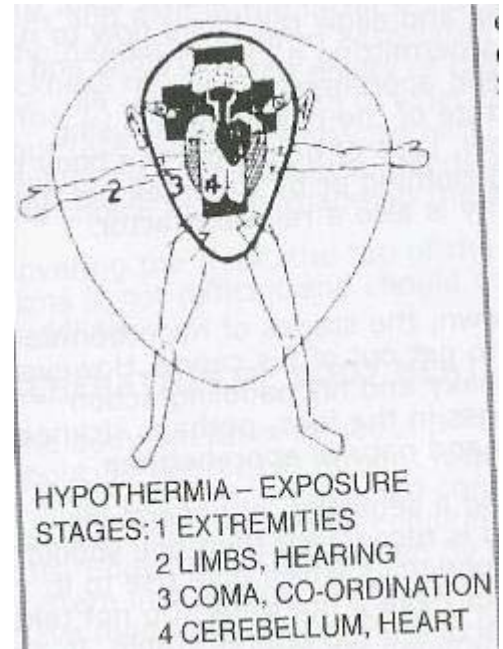
What has happened is that steady cooling has steadily lowered the body core temperature despite the body's defences. Sluggishness of limb movements reflects the cooling of the muscles, numbness is the result of the cessation of blood flow to the surface tissues and to the deeper muscles in the extremities. As the cooling continues, the brain is no longer able to operate properly. When the conscious grip on oneself is lost, the autonomic nervous system is alone maintaining life. This can fail quite suddenly if the surface warms up and the core receives a fatal charge of cold blood from the surface as the blood vessels on the surface dilate.

TREATMENT IN THE ABSENCE OF A DOCTOR

Your first duty is to send for a doctor for your patient, if you can. But canoeing often takes place in remote places and communications are consequently difficult.

In the absence of a doctor, the advice is as follows:

1. Remove the patient from the cooling influence.
2. Prevent further cooling.
3. Start warming the patient externally.
4. Find some way to start internal warming, by feeding a hot drink.
5. Once the patient is sensible again, help will still be needed to get him home.



HEAT EXHAUSTION

The body's temperature is raised to dangerous levels. Heat exhaustion is caused by excessive physical exercise in hot humid conditions. It commonly occurs if the paddler is not fit or has not done any training in hot conditions.

The oxygen available in the blood is needed for the working muscles, cooling the skin and maintaining essential bodily functions such as the brain, the kidneys and the stomach. In conditions of oxygen deprivation, every function starts shutting down, but by sheer effort of will the working muscles are forced to carry on at the expense especially of the stomach, kidneys and brain.

The symptoms are:

1. excessive irritability
2. impaired judgement and dizziness
3. exhaustion
4. nausea and vomiting, if anything is taken by mouth
5. muscle cramps - caused by salt deficiency
6. pulse is rapid and weak
7. face is hot and flushed
8. unconsciousness

As can be seen, the symptoms are very similar to hypoglycaemia and the two conditions usually develop simultaneously in the unfortunate paddler.

However, if the patient is suffering from heat exhaustion, he will immediately vomit up any food or coke. So the heat exhaustion must be treated first with small sips of cold water. Thereafter treat the cramps with half a teaspoon of salt in 500 millilitres of water. Lastly treat the hypoglycemia.

HYPOGLYCEMIA - LACK OF BLOOD SUGAR

The symptoms are:

1. feeling faint, lightheaded and dizzy
2. confusion and disorientation
3. possible aggression
4. pale and sweaty skin
5. rapid pulse
6. trembling uncontrollably
7. shallow breathing

If the blood sugar gets very low it may result in unconsciousness and possible death. The treatment is simple - give as much sugar as quickly as possible.

HEAT STROKE/SUN STROKE

The symptoms of heat stroke are very similar to those of heat exhaustion except that the patient is extremely uncomfortable and the breathing becomes very noisy. Heat stroke/sun stroke is a dangerous condition and could be fatal if not treated.

Suggested treatment:

1. Remove patient quickly to a cool and shaded area. Use tepid sponging.
2. Cool down as rapidly as possible with fine water spray and fan. Place ice packs around the body, particularly the groin, upper chest and neck area.
3. If the patient is fully conscious, encourage to drink cold liquids. If unconscious, put up intravenous drip of Plasmalyte L, Ringers Lactate or 5% Dextrose. Give 1 litre fairly rapidly over 1 hour, whilst seeking urgent medical assistance. Give 100% Oxygen if available.
4. Immediate hospitalisation.

SUNBURN

1. Not a dangerous condition but is painful.
2. Put patient in shade.
3. Cool patient down with ice packs or cold water.
4. Drink plenty of cold fluids.

SNAKE BITE

The majority of the 140 species and subspecies of snakes in South Africa are harmless - only about 20 are truly dangerous. The majority are also more afraid of you than you are of them and will get out of your way if given a chance. So stand still and give them a chance; if they remain inert, quietly retreat. Do not attempt to pick up snakes.

The effect of snakebite varies between species and the treatment will also vary however do not waste time trying to identify or kill the snake. Hospitals will administer treatment according to the symptoms of the bite.

Symptoms

There are three main reactions to snake venom, depending on the type of snake.

1. The adder family, responsible for most bites in South Africa, injects a cytotoxic (cell-destroying) venom, the effects of which are mainly local with intense pain, swelling of the bitten limb and bruising.
2. The front-fanged snakes, such as cobras, rinkhals and mambas, produce a neurotoxic (nerve-poisoning) venom that paralyses the breathing system. The victim cannot breathe - and without prompt attention will die.
3. The third family, the back-fanged group, such as the boomslang produces a haemotoxic (blood-poisoning) venom which interferes with blood clotting. This leads to extensive bleeding into tissues from mucus areas in the body; and the victim of a severe bite literally bleeds to death. Fortunately, bites from snakes in this group are very rare.

Duration

In some cases the amount of venom injected will be quite small - and the victim may recover with a few days' rest and reassurance. More serious bites (requiring anti-venom treatment) could cause problems lasting for weeks.

Treatment

1. Any snake bite arouses panic in the victim and any bystanders which can lead to the wasting of precious time. So the first rule is DO NOT PANIC.
2. The victim must stay quiet and must not be allowed to walk or run, or be given alcohol.
3. Wipe away excess venom from around the bite and cover with sterile gauze.
4. Immobilise the entire bitten limb with an improvised splint and bandage to limit absorption of venom.
5. If skilled help is not immediately available, a bandage can be used - depending on the type of snake. Do NOT use a bandage for back-fanged (boomslang) and adder bites which causes swelling and bruising of the leg.
6. If the venom from a spitting cobra enters the eyes, wash out immediately with water - lots of it and avoid bright light.

8. CHAPTER 8 – PROFICIENCY TESTS AND RIVER COMPETENCY GRADINGS

A paddler's river competency status will be indicated on his/her computer file maintained and updated by the union. This done primarily to protect novice paddlers from hazards, unknown to themselves. This way entry to higher category races will be barred until he/she meets the requirements for that event which is paddled on a particular graded section of river. **Each club is encouraged to take novice paddlers on trips to improve their river proficiency.** New paddlers must enquire about trips and attempt to participate – it is the best way to learn how to negotiate a river.

STEP ONE – THE BASIC PROFICIENCY TEST

A novice paddler, joining a club for the first time, will be required to pass a **Basic Proficiency Test** before receiving a flat water rating enabling him/her to enter races on dams and marinas only. The test may be overseen by the club coach, club captain or the Club Safety Officer.

The paddler's progress along the learning curve is not aided by compressing all the tests into one session and therefore it is desirable and necessary for him/her to complete at least 3 flat-water races or time trials (where results are recorded) before undergoing the River Proficiency Test

STEP TWO – THE RIVER PROFICIENCY TEST

Before entering any river races the paddler must prepare to be tested for the RPA (River Proficiency Award). The examiner is either the CSO or a suitably qualified deputy. On successful completion of the test, the paddler will be awarded a CR river competency rating, which will entitle that athlete to enter any CR rated river race.

The paddler progresses at his/her own pace through various grades of river difficulty as follows;

- completes 3 "C" grade races – upgraded to "BR" competency level, and may enter a "B" grade event
- completes 3 "B" grade races – upgraded to "AR" competency level, and may enter an "A" grade event

9. CHAPTER 9 - BASIC PROFICIENCY TEST

AIM

To provide the CSO or Club captain with an assessment of the new member's position on the learning curve- which aspects of kayaking need attention. Beginner coaching courses or individual assistance must be provided until the novice is deemed fit to enter flat water events. Even if the novice is obviously capable there should be no exceptions.

THEORY

[SAMPLE QUESTIONS] - You have capsized. What is the first action?

- Describe what you do next.
- Your paddle is floating away. What do you do?
- describe the recovery /support stroke
- what is the difference between a life-jacket and a buoyancy aid?
- when should a paddler wear a helmet?
- name four items of clothing that you should consider putting on before paddling.

PRACTICAL TEST

[THIS MAY BE ON FLAT WATER]

Candidates must present themselves with kayak, paddle and buoyancy aid. CSO to check equipment before allowing them on the water.

Candidates must successfully perform each skill- up to three attempts permitted.

- 1 .Launch kayak - must be floating next to bank. Balance and paddle away with strong rhythmic strokes.
- 2.Paddling style - correct entry and exit of blade- correct width of grip.
- 3.Demonstrate emergency stops, support strokes, steering strokes and ability to reverse.
- 4.Demonstrate ability to deal with waves and turbulence.
- 5.Carry out deliberate capsize-release splashcover- grab boat and retrieve paddle- swim boat to shore and demonstrate emptying procedure.
- 6.Demonstrate ability to paddle not less than 2 km without a rest.

10. CHAPTER 10 – RIVER PROFICIENCY TEST

AIM

To provide an "encouragement" or motivation to the beginner and provide him/her with some forewarning of the hazards encountered in events on rivers.

EXAMINER : CSO OR SUITABLY QUALIFIED DEPUTY

TEST - THEORY

[sample questions - candidate to answer 10]

- what is the minimum amount of buoyancy permitted in the kayak?
- what circumstances dictate that helmets and personal buoyancy must be worn?
- when may one not have a drinking system with you?
- describe the dangers of trees , weirs , holes and turbulence.
- where does one find an eddy? Describe two kinds.
- describe the correct way to swim down a rapid sans boat.
- what should you do before negotiating an unknown weir or rapid?
- What is a weir slot? Describe it.
- what is the signal on a river for DANGER- STOP!
- why is it important to travel together as a group when tripping?
- what is the effect of wind on a dam? Where is its effect lessened? What is the effect on a paddler ?
- before you attempt to negotiate a grade 3 rapid what should you be able to do?
- what is the correct rescue sequence when a situation arises? Equipment, Self, Victim, Group

PRACTICAL

[Ideally test should be taken in a slalom type kayak but circumstances may dictate otherwise. Test must be on moving water. Circumstances vary but it is envisaged that the test must be conducted on a suitable stretch of water.

EXAMINER : Club safety officer or qualified deputy.

Candidates must present themselves fully equipped for inspection before going on the water.

CANDIDATES MUST DEMONSTRATE THE FOLLOWING SKILLS;-

1. Drawing stroke sideways in both directions- kayak remains straight paddle upright and fairly deep in water.
2. Low telemark turn- paddle dragging flat on surface but behind and deck slanted towards paddle- reverse sweep to upright position.
3. Breaking into faster current- facing upstream - downstream lean must be evident.
4. Negotiate a bend where the current flows under trees. Deal with turbulence on the eddyline (between slack water and the current)
5. Negotiate a small rapid selected to demonstrate paddlers choice of a good line, and to recover from a bad line.
6. Deliberate capsize - collect boat and paddle and swim to bank - empty kayak and re-enter. Selection of good spot to land on is important. NOTE: The examiner's selection of a suitable deepwater section is also very important.

At the end of this test the examiner is asking himself the question- is this paddler advanced enough to manage races on his own on "C" class rivers? If so then the award of a RPA certificate is appropriate.

11. CHAPTER 11 – THE ROLE OF THE CLUB SAFETY OFFICER

Safety officer - club level - Duties and responsibilities

The CSO needs to have completed a CSA approved course in swift water rescue

A. Induction of novice paddlers

The CSO should hold a series of graduated self-improvement exercises. These may take the form of planned coaching sessions if the numbers warrant it, or may be informal. The CSO should enlist whatever expert assistance he may need, e.g. St. John's ambulance for first aid and CPR courses.

The CSO is the obvious authority to consult on the suitability of the various kayaks, which the beginner paddlers may use.

The CSO must arrange for the testing of beginners for their proficiency tests (examples follow) and act as examiner as far as possible although a qualified deputy may serve as well. The CSO must sign the certificates at the back of this book verifying the successful completion of each proficiency test and river competency upgrading. Where a race entry form requires verification of an athlete's river competency, the CSO must sign the designated section.

B. Monitor observation of safety rules

All club activities (time trials, trips and races) are governed by the CSA safety rules. In particular the CSO must ensure that the following rules are applied:

- i. all craft must contain a minimum of 10 litres of buoyancy fixed into each end,
- ii. all paddlers/competitors must wear an approved kayaking jacket at all times while on the water.
- iii. all CSA sanctioned kayaking jackets must pass certain design criteria, (refer to chapter 2), the most important of which is that the garment must support a minimum 6kg lead weight. (Union Safety Officers may sanction random tests at races in conjunction with the organising club)
- iv. helmets are mandatory for all A+ class rivers. Unions may motivate a case for this rule to be waived for specific events.
- v. performance enhancing substances are banned. Information on banned drugs is always available through the Canoeing South Africa office, or the Institute for Drug Free Sport's website. (www.canoesa.org.za).
- vi. No registered paddler may use a particular section of river or waterway while an event is in progress if he/she is not part of such event.
- vii. competitors in an event who withdraw for whatever reason must notify the timekeeper or an official.
- viii. abuse of race officials is not permitted. Procedures for protests are always available at all races.
- ix. paddlers in small or keyhole cockpit kayaks must wear helmets and kayaking jackets at all times on the water.
- x. paddlers who act as sweeps at the back of the field must operate as a group of never less than three.
- xi. if race conditions are such that certain grades of paddlers are precluded from racing by the club safety officer, no appeal or objection is permitted.
- xii. any section of river which is graded "A" may not be paddled without helmets and kayaking jackets.

NOTE: The CSO should remember the safety of many is his concern. His actions may not be popular but he must always show that he has the courage of his convictions.

- C. In conjunction with club captain and coach organise skills improvement clinics E.G. basic first aid, rescue techniques, self-rescue, paddling strokes, slalom and rivercraft.

D. Take a pro-active part in the organisation of all club events organised under the auspices of CSA. The CSO should always be an ex-officio member of the race organising committee which is tasked with the following;-

- i. Arrange for medical personnel and equipment
- ii. Arrange for an effective communication system
- iii. arrange for a recce of the course and if possible remove hazards or at least mark them.
- iv. Arrange for rescue personnel and equipment at known hazardous points.
- v. Arrange for patrol craft on dams with special attention given to back markers.
- vi. Arrange for suitably qualified sweeps to follow the field, (each must have minimum 5 years paddling experience). A minimum of three is the rule.
- vii. Check that all authorities that are affected are notified- eg SAPS, PROV TRAFFIC, FARMERS, WATER AFFAIRS, CHIEFS and CONSERVATION OFFICIALS.
[Warning signs to motorists to beware of spectator traffic must not be overlooked.]
- viii. Check that there will be boat pounds and a proper check of safety equipment at the start of the race.
- ix. Check that there are checkpoints [on long races] where if necessary, paddlers are taken off the water for their own well-being.
- x. Obtain an up to date weather report.
- xi. Have a contingency plan should water levels be higher than normal.

E. ON THE DAY OF THE RACE

If conditions are hazardous the CSO must exclude those classes of paddlers who are at risk.

F. AT THE FINISH/ OVERNIGHT STOP

Obtain the sweeps report for assessment. Check that allowing for notified withdrawals all paddlers who started the race have been accounted for. In the event of a missing paddler a deadline must be set after which time a search must be initiated.

As can be seen from the above guidelines the Club Safety Officer has become an important official upon which the development of our sport largely depends. He/She has more than mere policing duties and should promote the concept of safety in as many ways as possible.

The aim of this test is to satisfy the testing official and CSA that the candidate has attained the level of proficiency required to participate in Flat Water.

nd until this test has been completed, the candidate will not be allowed to enter such events.

Carry out a deliberate
capsize

Canoeing South Africa

Candidate: _____

K1	K2	River Proficiency Test	Boat No.: _____
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The aim of this test is to satisfy the testing official and CSA that the candidate has attained the level of proficiency required to participate in c Class River events
 Unless and until this test has been completed, the candidate will not be allowed to enter such events.

Club: _____

1	Theory Test		Comments	OK? Yes/No
	OPEN BOOK TEST - TO BE COMPLETED AND HANDED IN BEFORE RIVER PROFICIENCY. On Reverse of this form			
	<i>Tested by:</i> _____		<i>Date:</i> _____	
2	Practical Test	What should be shown	Comments	OK? Yes/No
	Candidates must be in full kit	Boat, paddle, splash cover, buoyancy aid	Equipment must be checked by examiner	
1	Drawing strokes in fairly deep water	In both directions Kayak must remain straight and paddle upright		
2	Ferry-glide across flowing water, facing upstream and downstream	Must not lose or gain ground Read the current correctly Good rudder control – particularly when facing downstream		
3	Use an eddy to exit fast flowing current	Facing downstream Upstream lean must be evident		
4	Break out into fast flowing current	Facing upstream Downstream lean must be evident		
5	Emergency stop in flowing water	Facing downstream Good rudder control		
6	Negotiate tight corner (preferably S-bend)	Approach – hugging the inside Correct exit –crossover without spin-out		
7	Negotiate a bend where the current flows under trees	Ducking and bracing Leaning into tree Retaining hold on paddle		
8	Negotiate a small rapid	Choice of good line		
9	Carry out a deliberate capsize	Release splash cover and retain paddle Retrieve boat and turn it upright Swim to shore and empty boat efficiently Launch again, facing upstream		
10	Wading technique	Demonstrate single & tandem wading technique		
11	Defensive & aggressive swimming technique	Demonstrate defensive & aggressive swimming technique		
	<i>Tested by:</i> _____		<i>Date:</i> _____	

ACCEPTED BY:		
Club Safety Officer: _____		Date: _____
CSA Official: _____		Date: _____
<i>Certificate awarded:</i> _____	<i>Union updated:</i> _____	<i>CSA updated:</i> _____

TEAR-OFF RECEIPT

CANOEING SOUTH AFRICA	RIVER PROFICIENCY TEST	Testing fee R
The Club Safety Officer hereby confirms that the Candidate below has successfully completed the River Proficiency Test and that the test result sheet has been duly completed, signed and submitted to the CSA and Union Registration Officer.		
Candidate: _____	Club: _____	
Club Safety Officer: _____	Date: _____	

OPEN BOOK TEST - TO BE COMPLETED AND HANDED IN BEFORE RIVER PROFICIENCY

What circumstances dictate that helmet and buoyancy aid must be worn?

When may one not have a drinking system with you?

Describe the dangers of trees, weirs, holes and turbulence.

Where does one find an eddy? Describe two kinds.

Describe the best way to swim down a rapid sans boat.

What should you do before negotiating an unknown weir or rapid?

What do you do if you get caught in a “ washing machine”?

What is the signal on a river for DANGER – STOP?

Why is it important to travel as a group when tripping?

What is the effect of wind? Where is its effect lessened? What is the effect on a paddler?

Put these in the correct rescue sequence when a situation arises. Equipment - Self - Victim - Group
