AUSTRALIAN CANOEING AWARD SCHEME (ACAS)

FLAT WATER INSTRUCTOR & GUIDE
LEVEL 1
LEARNER MANUAL

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Demonstrate simple kayaking skills

Objectives

On completion of this unit, you should be capable of:

- correctly holding a paddle
- correctly using PFDs and helmets
- an understanding of the basic differences between various kayak designs
- demonstrating the relevant paddling skills

Background

Choice of boat

What sort of boat should you paddle? It depends. What sort of paddling do you want to do? The answer to that question will determine the choice of boat, because modern canoes and kayaks are specialised, and none will do everything.

Kayaks derive from the hunting craft of the Arctic. The paddler is seated, and uses a double blade paddle. Modern canoes are based on the birchbark craft of the North American natives, and are open boats paddled with single blade paddles. The originals were paddled from a kneeling position, as are modern competition canoes, but for touring a sitting position is more comfortable.

The low seating position in a kayak gives stability, and decks fore and aft shed water, so that kayaks can withstand wind and wave better than open canoes. Canoes are usually paddled as doubles, and suitable designs are ideal craft for exploring sheltered lakes, creeks and rivers.

Sit-on-top boats have become popular in recent times. They are paddled as kayaks, are easy to get on and off, but do not provide much protection for the paddler. This resource is written for conventional kayaks.

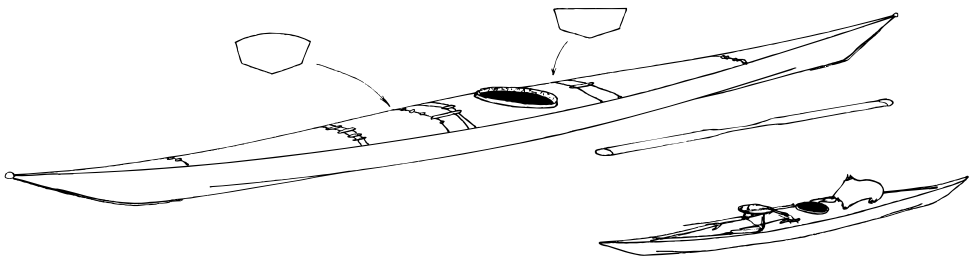
Materials

Two types of materials, composites and rotomoulded polyethylene, are the most common in kayak and canoe construction.

Composite materials are a mix of a synthetic resin—polyester, vinyl ester, or epoxy—and a reinforcing fibre—glass, synthetic (e.g. Kevlar®), or carbon. Glass fibre in polyester is the cheapest and most common, and, looked after, will last for many years. Composites of Kevlar and carbon, with epoxy resins, can be lighter and stiffer, but their durability is often questioned.

Rotomoulded boats are formed of polyethylene. For the same stiffness, polyethylene must be thicker than a composite, and the earlier rotomoulded boats were heavier and slower than composite craft. The advantage of polyethylene is that boats made of it bounce off rocks almost undamaged.

For lightness and performance composite boats have the edge, for the ability to absorb punishment the rotomoulded boats are the better choice.

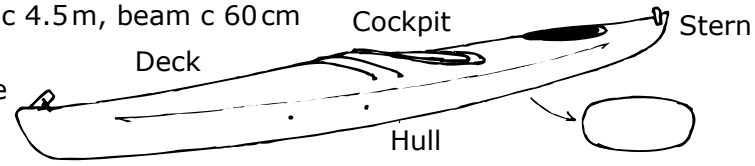


Origins of the kayak

A kayak from Nuuk, Greenland, the 'classic' shape for a kayak. Built of driftwood and covered with sealskin, it was the hunter's craft. The smaller view shows hunting equipment on deck: harpoon, harpoon line stand, and inflated sealskin float

General purpose/touring kayak

Length c 4.5 m, beam c 60 cm



Whitewater play boat

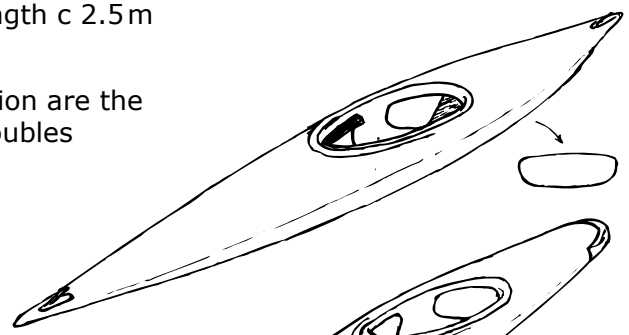
Length c 3.3 m, beam c 60 cm

Freestyle

Length c 2.5 m

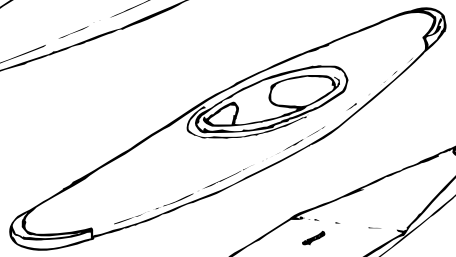
Kayaks

Missing from this collection are the Marathon TK1 and all doubles



Slalom

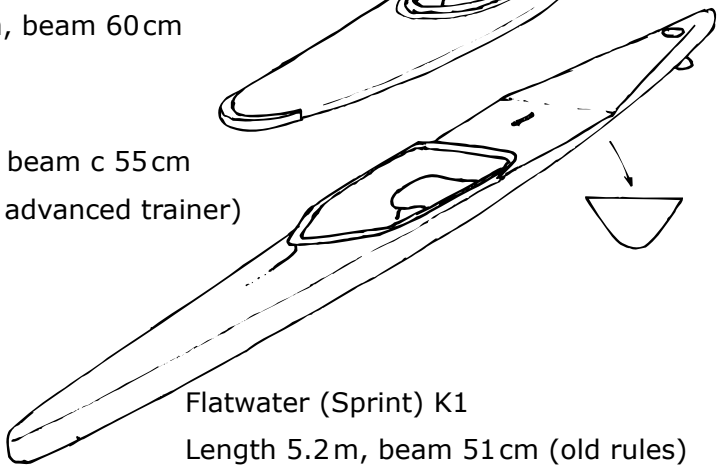
Length 4 m, beam 60 cm



Polo BAT

Length c 3 m, beam c 55 cm

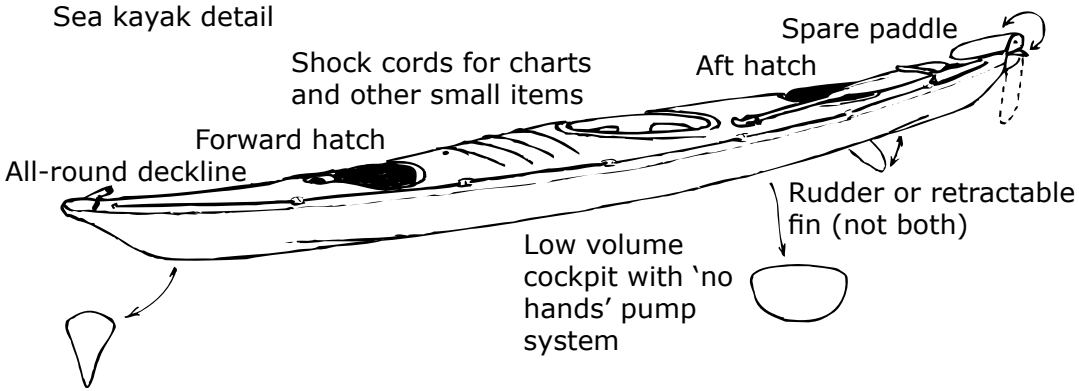
(BAT = baths advanced trainer)



Flatwater (Sprint) K1

Length 5.2 m, beam 51 cm (old rules)

Sea kayak detail



Design

Other things being equal (which they will not be), a longer boat will be a faster one. On the other hand, the longer the boat, the less manouvrable it will be. Rocker, the curve of the keel, affects both manouvrability and speed, with more rocker making the boat easier to turn, but slower. Most single sea kayaks are between 4.5 and 5.5 m long, with little rocker, so that they run straight. Whitewater play boats, such as the Dancer®, are between 3 and 3.5 m in length and have considerable rocker: slow over a distance, but able to spin on the spot. Freestyle kayaks are even shorter and more rockered, and slower.

The beam (width) and cross section affect lateral stability and speed. Wider boats are slower, but more stable. A boat with flat sections admidships will have good initial stability but less secondary stability, i.e. it will feel stable when upright but 'tippy' when on edge. A boat with more V in the midships sections will feel less stable upright, but more stable when edged for turning.

Deep V sections at bow and stern will give good tracking, the ability to go in a straight line, a characteristic wanted in a touring boat.

The lower the decks of a kayak, the less it will be affected by wind, but the internal volume for carrying gear will be less.

Any kayak (or other vessel) will tend to wander when travelling downwind. The solution used on some touring kayaks is a rudder. A rudder is not for steering—kayaks are steered by paddle and boat lean—but to trim the boat to run straight downwind. It's there to reduce the need for

continual sweep and other correcting strokes downwind, and therefore to reduce fatigue. Learn to paddle the kayak without using its rudder, so that you can control the boat if the rudder fails (as they have been known to do).

All boats must have buoyancy built in. In kayaks that is usually in the form of blocks of expanded plastics, supporting the decks. Air bags either side provide even more buoyancy. Some touring kayaks may have bulkheads and hatches, forming compartments for buoyancy and gear stowage. Virtually all sea kayaks are built this way. Compartments should be filled with buoyancy material (e.g. the liners from wine, spring water, or fruit juice casks) as a 'fail safe' measure. All canoes and kayaks will need secure handholds at bow and stern, usually end loops or toggles.

All design is compromise... The diagrams give some idea of the range available.

For learning to paddle, the usual choices are a whitewater play boat or a touring kayak. In the whitewater boat you will probably learn boat control skills faster, but in the touring craft you will be better able to go places.

Other equipment

Paddle

Like boats, paddles come in various shapes and sizes, and are of various materials. Kayak paddles have two blades, usually feathered between 65˚ and 90˚.

The type of boat and paddling determines the kayak paddle length. Slow boats, like the freestyle kayaks, are paddled with short paddles, while sea kayak paddles are quite long, 230cm or so. The reason is to maintain a comfortable cadence (rate of paddling) in the slower or faster boat.

Blade shapes may vary, but the asymmetric shape, which reduces twisting, is now common in kayak paddles. Blades may be of composite construction or injection moulded. Cheaper shafts are of aluminium, with carbon fibre and Kevlar composites favoured materials for quality shafts. There will either be an oval section or a formed hand grip to help give instinctive location in the hands.

In flatwater competition, kayak paddles are the 'wing' or 'propeller' type which slip less in the water in forward paddling. They do not work well in other strokes.

You may have the paddle in your hands for hours on end, so the lighter it is, bearing in mind the need to be strong and durable, the better. It pays to spend a bit more on a quality paddle.

Personal Flotation Device

You will need an approved Type 2 or 3 PFD. (The differences relate to safety colours, etc.) It must fit properly and be comfortable. Make sure all zips and buckles are secure, and stay that way.

The PFD will not save your life. It will support you in the water, and also give some protection if you are washed on to rocks.

Pockets are useful for small items when touring, but beware of filling them with heavy and unnecessary items that will get in the way during rescues. A whistle on a cord is a good idea.

Spray deck

The two main materials are neoprene and proofed nylon or other synthetic fabric. Neoprene decks seal better, but can be less durable. They would be a better choice for paddling in heavy conditions, but a nylon deck may be more comfortable in light conditions in hot weather.

Clothing

As in all outdoor activities, you will need to dress for the conditions, and this normally means some kind of layer system. There is a wide range of clothing available, both in design and fabric, and you will need to choose according to the need for sun protection (e.g. Lycra® rash top) or insulation. Modern synthetics give some insulation when wet, and wick moisture away from the skin. Avoid cotton.

In cool weather you will need a windproof jacket, preferably with good

seals at neck and wrists. In cold weather a wetsuit may be called for, one without sleeves to prevent chafing. The 'long john' style is the usual.

If you are in doubt, take the pessemistic view and add a layer. On the water, it is usually easier to take off a layer than add one. Carry spare clothing in the boat for when you arrive, or to cover contingencies.

Footwear

You may find yourself walking on sharp rocks, broken shells (or glass) and other uncomfortable surfaces. There is a wide range of wetsuit boots, aquatic sports shoes and sandals available. Old sneakers are often worn, although they tend to be bulky.

Choose something that is comfortable both on the ground (and does not pull off in mud) and in the boat, remembering that straps and laces must not tangle in footrests.

Sun protection

As a paddler, you are very much out in the open, exposed not only to direct radiation but also what is reflected from the water surface. Long sleeves and either a hat with full brim, legionnaire- style cap, or keffiyeh-style headwear, tied on, at the very least.

Sunscreen on all exposed skin, including the lips, reapplied regularly as required. To cover the backs of the hands, fingerless and palmless gloves give protection without affecting paddle feel. Sunglasses to protect the eyes from the UV.

Well-dressed paddlers. She is dressed for summer in light fabrics with good sun protection, he for winter in wetsuit and windproof jacket. For whitewater they'd be wearing helmets

If you wear a helmet, as in surfing, a visor gives some protection, and sunscreen will be required as well.

Boat setup

From whitewater paddling we have the notion of 'wearing' the boat, to the extent of being strapped together in the case of C boats. All very well for a run down the rapid, but not necessarily for flatwater paddling. You will need to set up the footrest, back strap (if present) and thigh braces so that you can sit comfortably relaxed, with room to wriggle, yet can brace when necessary in rough water.

The footrest should be set so that the knees are slightly bent, with the thighs against the thigh braces without pressure, and the ankles relaxed. The backstrap, if there is one, should be against the lower back, but again without pressure. To brace, extend the feet to tighten everything all round.

If necessary, pad the sides of the seat so that you do not slide from side to side. You want to be firm, but not tight.

Stowing gear

Clothing, camping gear, food, and other items are carried in waterproof bags or other containers in the fore or aft compartments. Various sizes of waterproof bags are available, and you should choose according to the size of your boat and what you need to carry. Generally, several small containers are better than one large one.

You will need to pack according to where you are going, the duration of the trip, and so on, with reserves to cover contingencies.

Lighter gear should go in the ends of the boat, heavier items such as water, cans, and so on, amidships. This means that handling of the boat in waves will be affected less, and stowing heavy items low will aid stability. Nothing must be able to move about and affect trim. It goes without saying that first aid kits and similar gear will be readily accessible.

The only items on deck should be map or chart and other navigation items, paddle park, spare paddle, towline, and so on, all secure. Communications gear is perhaps best in a PFD pocket.

Inspection and maintenance

Before you launch, check that the rudder (if there is one) and everything else is in working order.

After the paddle, wash and clean everything, and make sure that sand and grit have been removed from any moving parts: rudder and pedals, sliding footrests, and so on. Check that toggle cords and other ropes and cords are not frayed, and moving parts are not excessively worn. Check the paddle, PFD, spraydeck, and all other gear.

If anything didn't work properly on the water or needs attention, fix it. Store everything appropriately, with the boat under cover.

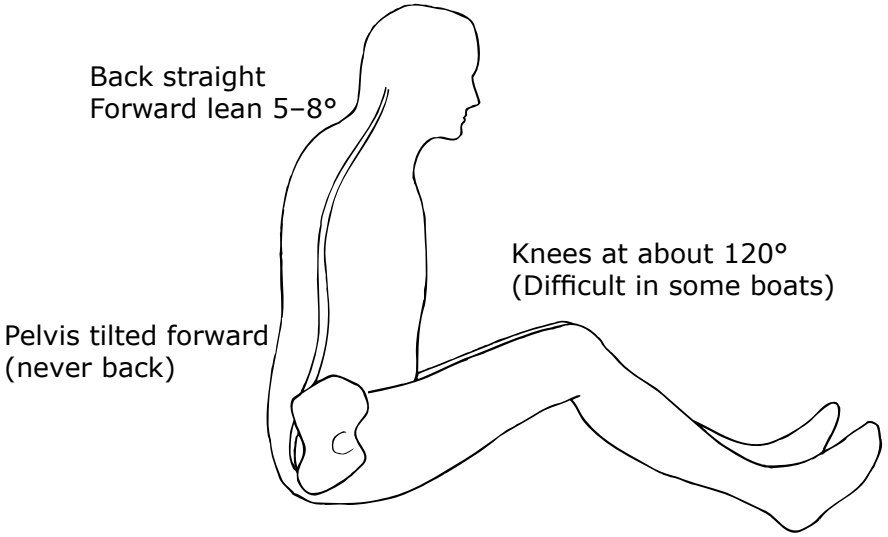
Paddling

You can be on the water for hours on end: for comfort and safety it pays to have an efficient, relaxed style that maximises power and minimises fatigue, strain and injury. Our understanding of the mechanics and biomechanics of paddling has greatly increased in recent years, thanks to the work of coaches in the competitive disciplines, particularly in flatwater racing. What follows for forward paddling, therefore, is a condensation of the instruction given to sprint and marathon paddlers. If you can arrange it, time spent in a K1 or TK1 under the watchful eye of a Flatwater Coach will be well repaid. (It will also sharpen your reflexes!)

Correct setup of the boat has already been discussed. Correct ergonomics and posture are essential for paddling, and the diagram shows how you should look in a kayak or on a sit-on-top: slight forward lean (5–8°) from the pelvis, back straight without being forced, shoulders ahead of hips, head, neck and shoulders relaxed. The legs are slightly bent, enough that you can't quite push them straight without moving on the seat.

Lean too far forward and you restrict movement and lung capacity, lean back and again you will restrict movement (and perhaps cause injury).

Where are your most powerful muscles? No, not the arms. In paddling,



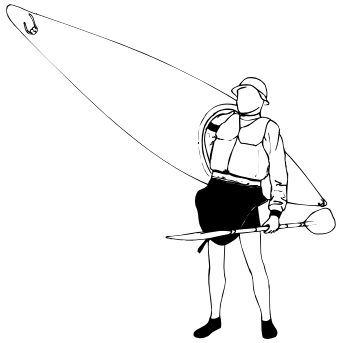
your arms are little more than the linkage between the power source, the muscles of the body, and the paddle. Your arms are there to put the paddle into the water and take it out again: power comes from body rotation, right from the toes. It's body rotation that shares the load between the muscles, and smoothly produces more power and length of stroke. That's true of all strokes. (In a flatwater kayak it's possible to rotate the backside on the seat, indeed, some K1s have pivoting seats. That's not always easy in other kayaks, but if you can set up the seat to allow that movement it will help.)

The 'paddler's box'

The shoulder is the joint in the body with the greatest range of movement. It is also the most susceptible to dislocation and other injury. To reduce the likelihood of injury, and also to develop the most power, the elbows should always be in front of the line of the shoulders, and for some strokes (e.g. high support) held low. The roughly rectangular volume in which the hands work is called the paddler's box, and that space rotates with the shoulders. If you want the paddle blade behind you, as in reverse strokes, it means that you rotate the body so that your elbows remain in front of the line of the shoulders.

Several things before you go too far...

Carrying the boat



The safest way is to have a person at each end. (Remember that end loops and toggles are really there to give you a safe handhold when you and the boat are in the water together.)

Over a short distance a kayak can be carried like a suitcase, and a **light** boat can be carried on one shoulder. Use two hands for the lift. To pick up the paddle, hook a toe under the middle of the shaft and lift.

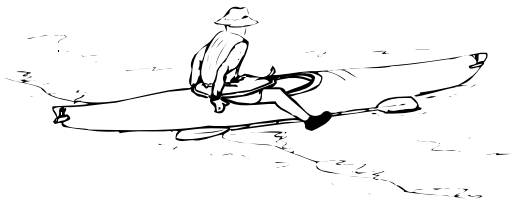
Launching

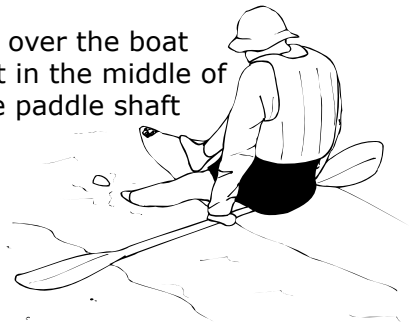
The easiest way to launch a kayak (the only way at sea) is to place it, facing the water, at the top of the swash zone on the beach. Park the paddle either on deck or alongside, being careful it isn't washed away. Sit astride the boat, wash the sand off your feet, and put them into the cockpit. Then with knees straight and weight supported on your hands, slide in. Fit the spraycover, aft end first.

When you're ready, and with the waves, 'walk' the boat on your hands until you're afloat. Paddle away. (Yes, the boat will be scratched. Get over it.)

On a beach with surf you will have to time things carefully.

The other way is to have the boat afloat, parallel to the shore. Put the paddle across the deck behind the cockpit, with the blade on the ground facing upwards, to act as an outrigger. Sit over the aft end of the cockpit, wash off any sand or mud, and put your feet in, then with weight on hands, slide in. Fit the spray deck, pick up the paddle and paddle away. Reverse the procedure to disembark.





Drive face **up**

Capsize

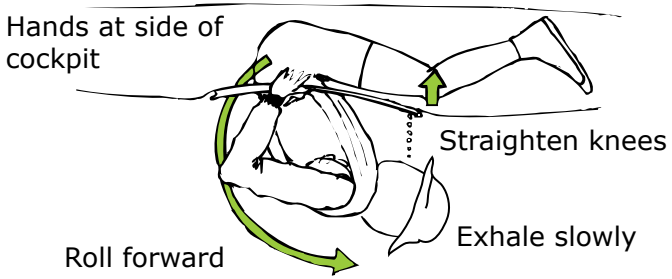
Capsizing is part of kayaking, and the sooner you experience a controlled capsize the better. On a course, your instructor will supervise, and will probably have some exercises. If the water is cold, you may want to prepare yourself with a few splashes, and swimming goggles or masks may make things more comfortable. Your first capsizes will be without a spraycover.

Keep hold of your paddle and lean to one side or the other until the boat capsizes. When it has stabilised inverted, tuck the paddle under one arm. Lean forward, grab the spraycover strap and release the spraycover. Put your two hands on the deck behind you, straighten your knees, and, rolling forward, push the boat away from you. While this is going on, hum a tune to help keep most water out of your nose. Come up alongside the boat, paddle still under one arm, and take hold of the boat. Work your way along the deckline if there is one to the bow. Let go of anything and it will drift faster than you can swim. Either swim the boat ashore, keeping to seaward of it, or await rescue. **Leave the boat upside-down until you reach shore.**

Some instructors will want you to put your hands in the air and bang on the hull while you are upside down: a good confidence exercise.

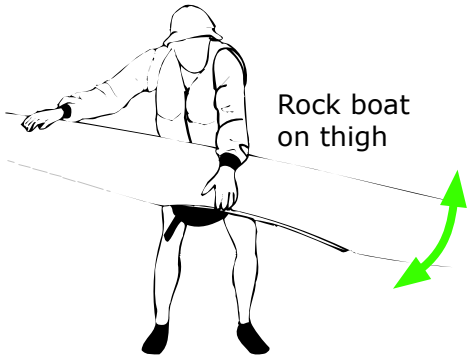
When you capsize unexpectedly remember to tuck forward and not lean back. Tucking forward is a much safer position when you are being churned around, especially in shallow water.

Don't be afraid of being trapped in the boat. Capsized in rough water the challenge may be to stay in: get it wrong and you can be thrown out.



Emptying out

The easiest and safest method is to have a person at each end, raising and lowering alternately. Hold the boat about half a metre in from the end so that it does not roll upright.



On a steep bank you may be able to empty the boat by raising and lowering the end nearer the water. A **light** kayak can be rocked on one thigh.

Forward paddling

You want to go places, so forward paddling is the important stroke, and is usually described in three phases.

Catch

The catch is the start of the stroke, the entry of the blade into the water. The key points are:

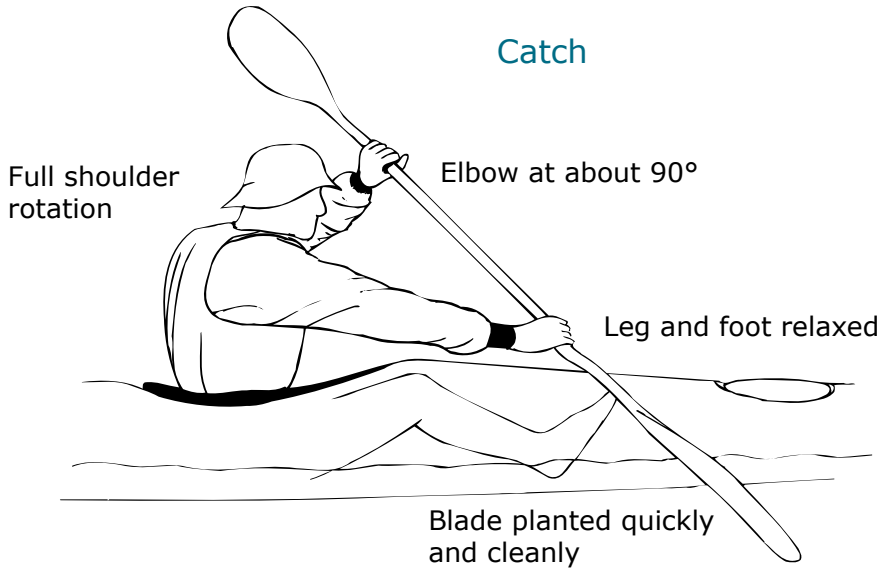
- clean entry, as far ahead of the feet as possible, with the blade as vertical as possible
- full rotation of the torso, bottom hand shoulder forward
- quick development of power

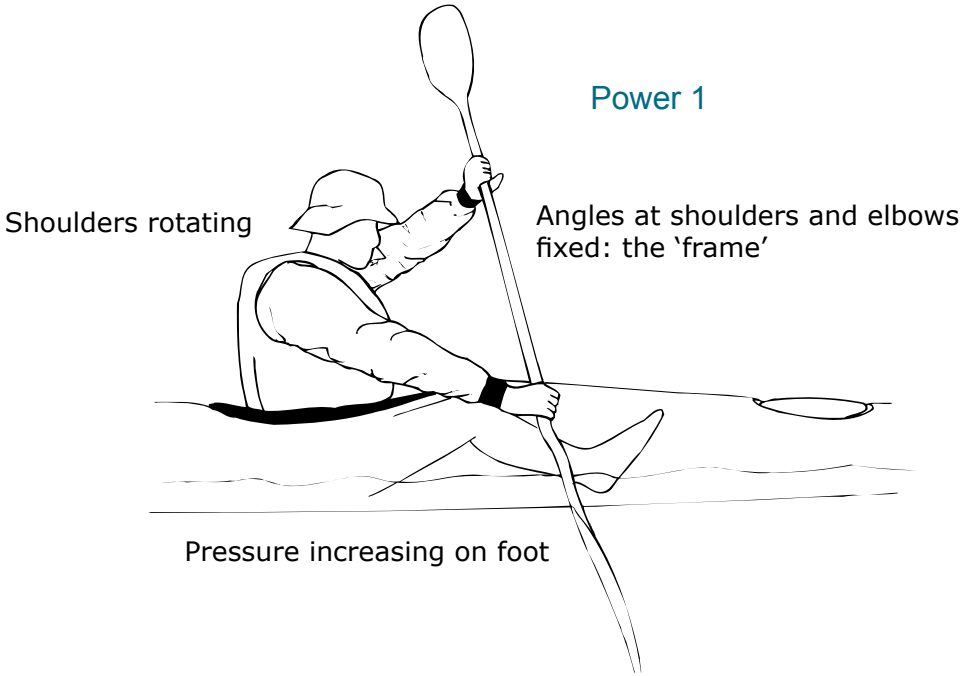
Think about:

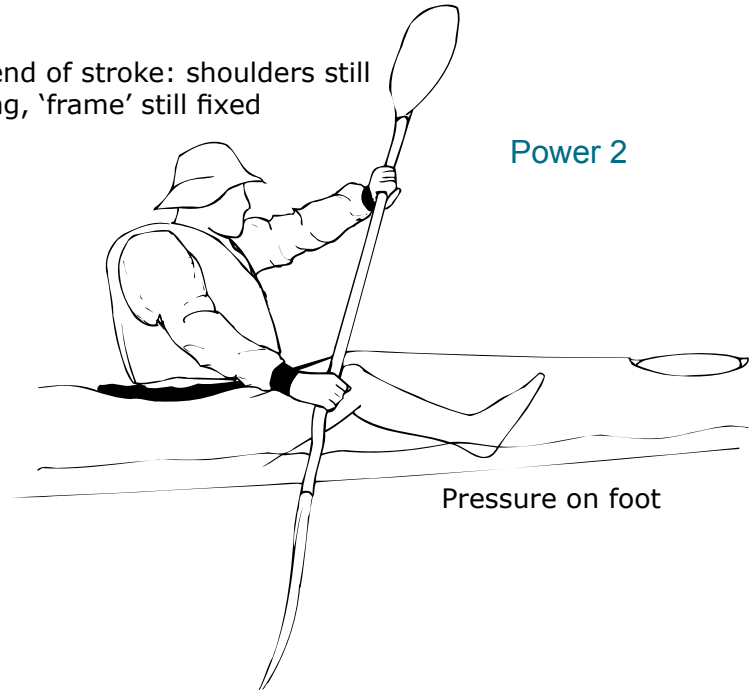
- taking the blade to the water: the bottom hand takes the blade to the water in a spearing motion, with the top hand following the shaft movement, but not pushing the blade in
- squaring the blade: the blade must be at right angles to the direction of travel—if the angle is wrong the blade will slide sideways
- burying the blade: completely immerse the blade as quickly as possible, keeping the bottom hand several centimetres clear of the water throughout the stroke

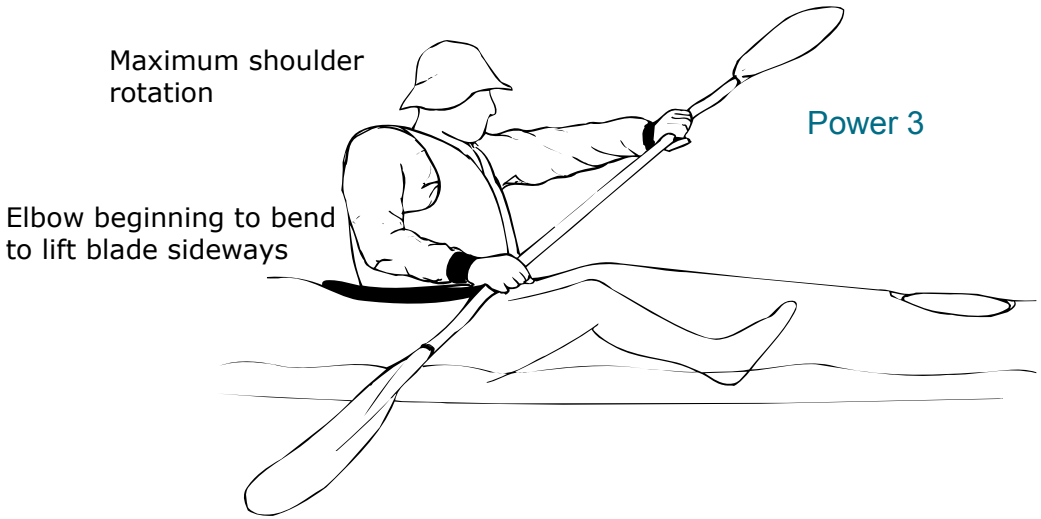
Power

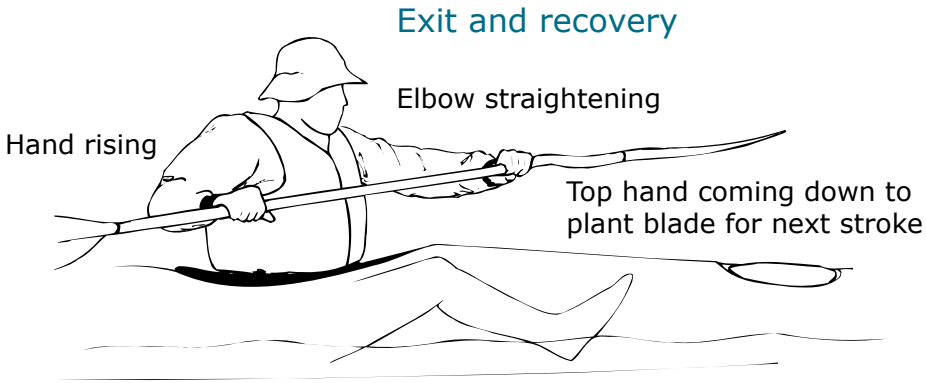
Think of the blade as being fixed in the water: you pull the boat past it. From the catch, the stroke is 'taken' by the whole 'pulling' side of











the body—toes, leg, hip, torso, and shoulder—all working smoothly together.

The bottom arm remains in a fairly extended extended position throughout this phase, with the top arm, elbow bent, and hand at around eye height and 30–40 cm in front of the head, following the rotation of the shoulders.

Flatwater paddlers talk of the 'frame', the arms and shoulders, remaining fixed through this phase: in other words the elbows are not bending or straightening but remaining at the same angles. The top hand does not push, it follows the shoulders.

The blade will tend to follow the bow wave of the kayak, moving about 5cm away from the boat, during the stroke. A blade that moves straight back, relative to the boat, may be a sign of insufficient body rotation.

Exit and recovery

The stroke is finished when body rotation is complete. Taking the stroke too far is simply wasted effort. At exit, the blade moves out of the water to the side, with the top hand still high and the bottom elbow bending to lift the blade. That elbow should stay low and relaxed. At this stage the paddle is parallel to the centreline of the boat, but over the side.

You are now in position to set up for the catch on the other side, where the stroke is a mirror image.

Touring strokes

When you're paddling for hours on end you will prefer a more relaxed stroke. All the principles described above still apply, but the stroke will be a little lower and wider, with the top hand lower.

In windy conditions a lower stroke is safer and more stable, with the top blade less exposed to crosswinds, and with the blade in the water able to provide a little support.

Key points

To revise:

- plant the blade by or ahead of the feet, bottom arm extended but not straight
- rotate the torso to pull back the shoulder and drive the stroke
- the top arm holds its position relative to the shoulders, crossing the boat with the shoulder rotation
- the power phase ends with the blade in line with the hips
- lift the blade out sideways
- keep the top hand high
- rotation continues, to set the shoulders and paddle for the next stroke

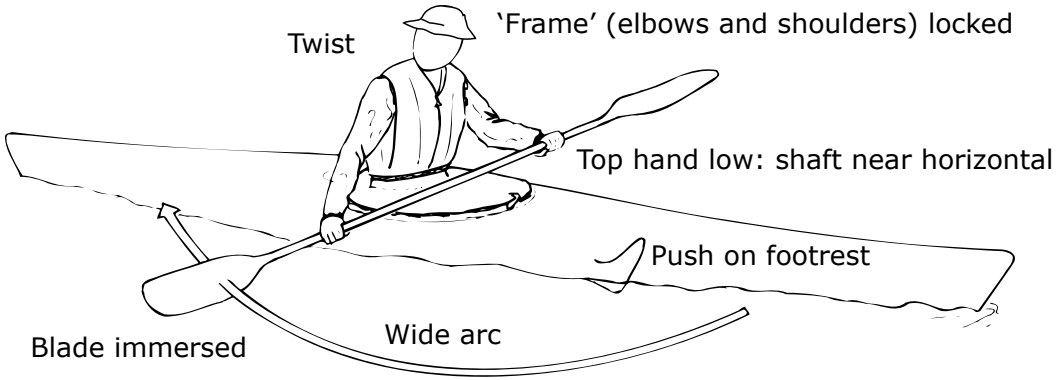
Things to avoid:

- excessively long strokes
- punching or dropping the top hand

Sweep strokes

Sweep strokes are the main strokes for turning the boat at low speed, either to manouvre into position or to keep the boat running straight. Many instructors prefer to start with the forward sweep so that students can have some confidence that they can control the direction of the boat before they concentrate on forward paddling.

As with other strokes, power comes from the torso muscles, but here the stroke will be a long wide arc, the longer and wider the better. For



a forward sweep, twist to reach forward and put the blade in as close to the bow as possible. The lower arm is slightly flexed, the top hand low, just high enough to clear the deck. The blade should be completely immersed, just beneath the surface.

Apply power by twisting the body in the opposite direction, keeping shoulder and elbow angles fixed, so that the blade moves (relative to the boat) in a wide arc all the way to the stern. While you are learning, watch the blade all the way around so that you develop the full twist necessary.

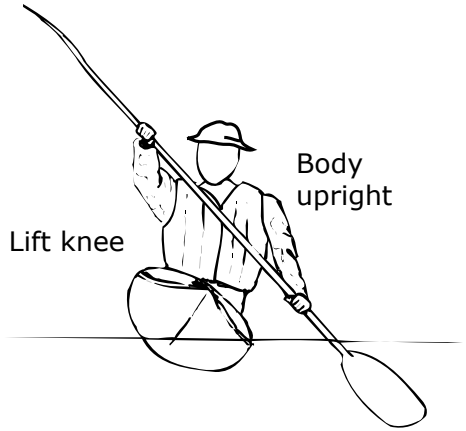
The reverse sweep works the same way, but in the opposite direction. Begin by twisting so that the whole paddle is over the side and put the blade in close to the stern. (No, don't change your grip on the padddle: all reverse strokes are with the back of the blade.) Now twist the other way to move the blade in a wide arc all the way to the bow.

In many cases a series of forward or reverse sweep strokes can be used to control the boat. When you want to turn on the spot, alternate forward sweep on one side with reverse on the other.

As you develop confidence, look where you are going rather than watching the blade through its arc. Later you will also want to put a sea or touring kayak on edge as you sweep to increase its rate of turn, and in waves you will sweep on wave crests when bow and stern are out of the water.

Edging

Putting a kayak on edge changes its underwater shape, helping it turn more easily. In the case of sea kayaks, the deep V sections at bow and stern are lifted and rocker increases.



To edge a kayak, use the muscles of hip, torso and legs to roll the kayak slightly while you keep your upper body upright. This is often called 'J lean' because of the shape of the spine.

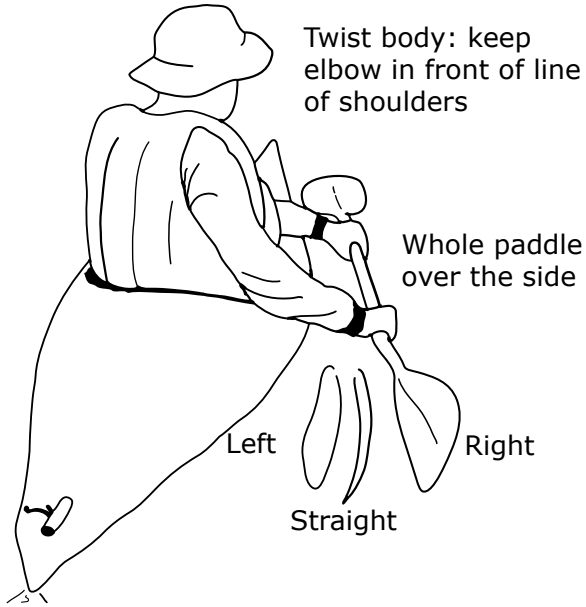
Lift your left knee to lower the the right side of the boat for sweep strokes on the right. This means that the boat is leaned outwards from the turn: the opposite to the way a bicycle is leaned.

Paddling straight

Kayaks, particularly the whitewater types, appear to have minds of their own, wandering all over the place. Paddle behind an experienced paddler and you'll see that the boat does not travel in a straight line but yaws from side to side with each stroke, and that each stroke is a little different, perhaps a little wider, perhaps a little closer to the boat, so that the end result is a smooth movement across the water. You may see some edging used.

That comes with practice. At first you will tend to overcorrect too late. Be patient, make sure you are paddling evenly on each side, and be prepared to make a forward stroke into something of a sweep stroke when the bow wanders a bit too far. Don't watch the bow, but focus on a spot well ahead. Don't rush, but pause between strokes to see what the boat is doing, and perhaps give it time to come back into line. Anticipate.

Into wind, you shouldn't have too much trouble keeping straight. Downwind, and it can be a different story. This is why sea boats have rudders or retractable fins. Use sweep strokes wherever possible. The alternative is the stern rudder stroke.



Stern rudder

In this stroke the blade is used as a control surface rather than to apply power. It therefore slows the boat.

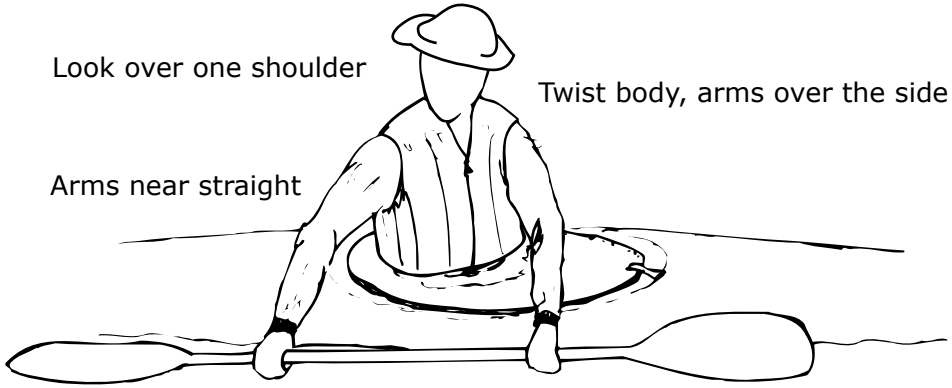
The position is similar to the starting position for a reverse sweep, with the body twisted towards the paddle side. Often the blade will be trailed into that position at the end of a forward stroke. The blade is trailed in the water, with slight outwards pressure so that the boat turns towards the paddle side. (By changing the angles, the boat can also be made to turn the other way.)

When the boat is facing the desired direction, return to forward paddling.

Reverse paddling

There will be times when you will want to back into or out of some situation. The reverse stroke begins in much the same position as a reverse sweep, but instead of sweeping wide is kept closer to the boat for more power. As you twist to put the blade in on one side look over that shoulder so that you know what's behind you. Don't look over both shoulders: you'll drive yourself giddy.

Remember: power from torso twist—your arms are just the linkage.



Emergency stop

Short, sharp reverse strokes will stop a forwards moving kayak. Put the blade in close to the hips rather than well behind. The number of strokes doesn't matter: the important thing is to stop the boat quickly without it turning one way or the other.

In reverse, a couple of short, sharp forward strokes will stop the boat.

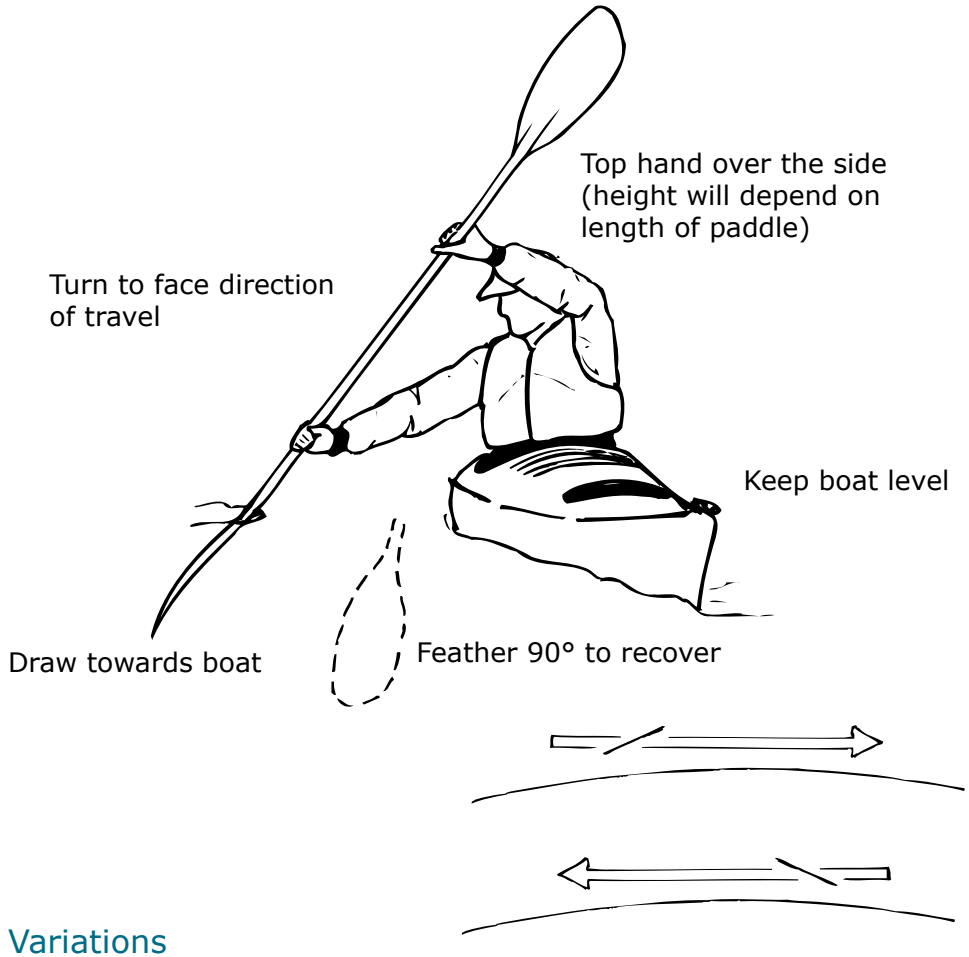
Draw stroke

You may want to go sideways towards or away from a jetty or raft of kayaks. The draw stroke is the method.

Begin by twisting the way you want to move. Reach out at right angles with the blade, with the top hand high, and over the side of the boat: the more vertical the paddle the more effective the stroke. Draw the blade towards the boat, but before it reaches the hull lift the wrists to rotate the blade 90˚. Slice the blade outwards again for the next stroke. The work is done with the lower arm, with the upper remaining steady.

Control the direction with blade position: towards the bow will turn the boat one way, towards the stern the other. Just right and the boat will go straight.

For the present, keep the boat flat. Some sea boats go sideways more easily if edged slightly towards the direction of travel. (Low volume whitewater boats are edged the other way, to avoid being pulled under.)



Variations

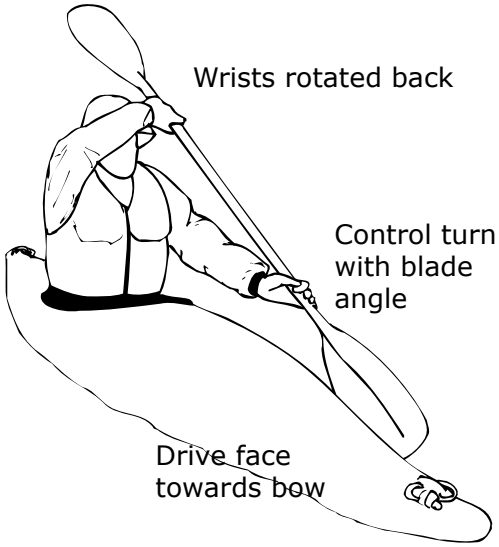
Sculling draw

The sculling draw is perhaps the most useful variation for moving sideways, and is a good exercise in understanding and control. The position is similar to that for a normal draw stroke, but the blade is moved fore and aft parallel to the boat, about 25cm from the hull. As the blade changes direction the angle is changed, so that the blade is always 'climbing', drawing the boat sideways continuously.

Begin with a small angle, and remember that the blade moves more or less in a straight line, not an arc.

Bow draw

Draw strokes made well forward can be used to move the bow one way or the other, either to line the boat up with a raft, or to avoid an obstacle. Apart from the blade position, the stroke is the same as a normal draw stroke.



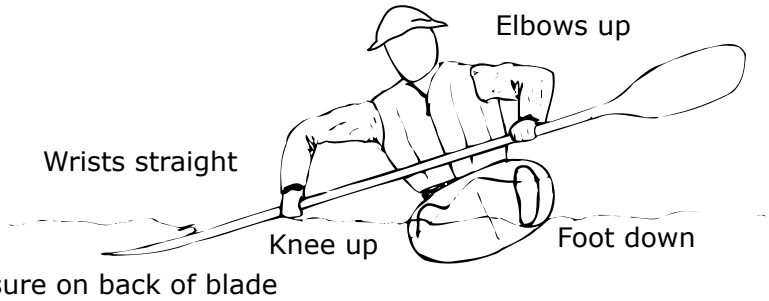
Bow rudder

The bow rudder stroke uses a position similar to that of the bow draw, but the blade is held at an angle to the water flowing past the boat, turning the boat to the paddle side. The drive face of the blade faces the bow, which means the wrists have to be rotated back. A turn with bow rudder is usually started with a forward sweep on the opposite side: e.g. to turn left, a forward sweep on the right followed by bow rudder on the left. When the boat has turned sufficiently, lift the wrists and paddle forwards.

Low support

This is for those situations when you are about to go in. As with the other strokes, the key is body movement, and certainly not brute force.

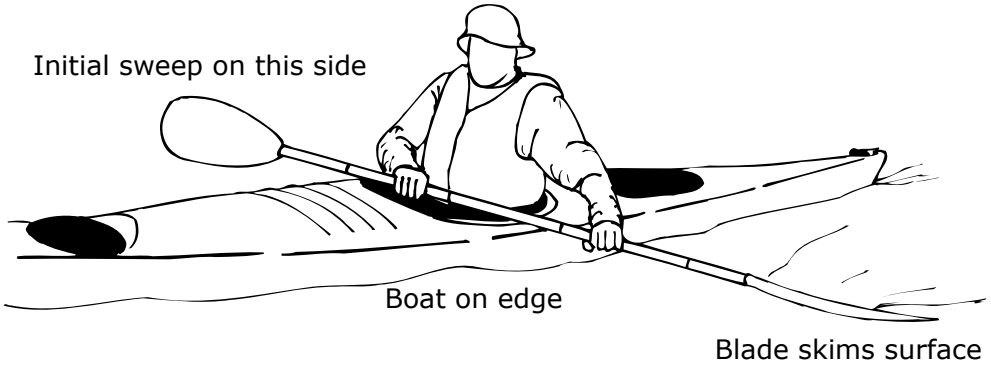
The back of the blade is placed on the water, with the shaft low and near horizontal, wrist straight and elbows above the shaft. The boat is righted with hip movement (the 'hip flick'), with the blade on the water simply being something to react against.



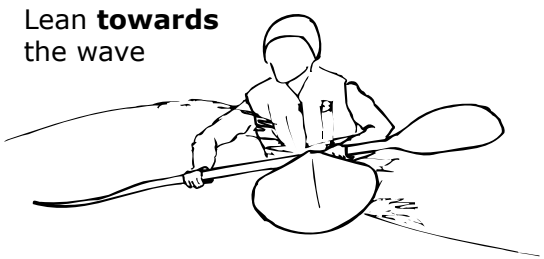
Don't try to lift your head—the natural reaction—but bring it up last: boat first, head last. Drop your wrists to slice the blade up again.

To practise this, sit comfortably, then lean until the boat becomes unstable, Recover. Try it on the opposite side. Another way to practise is in pairs, with your partner standing in hip-deep water and holding the aft end of your boat. Your task is to remain upright while your partner tries to tip you in.

Another good exercise is the low brace turn. Begin by paddling forward, then make a forward sweep to begin the turn. Now put the boat on edge, on the side away from the initial sweep, and support yourself with a low brace. As the boat slows, right it with hip movement and resume forward paddling.



The low support is also the stroke you will use as you are pushed sideways in small surf. Lean the boat **into** the waves, and support yourself on the blade. (Lean away from the wave and the capsize will be instant.)



Acknowledgement

This resource was written and illustrated by Peter Carter

Knots

Introduction

Paddlers need knots for a variety of purposes: tying boats to roof racks and trailers, mooring boats during lunch stops, and the critical needs of rescue in white water.

Most synthetic ropes can be used for tying boats to vehicles, and polyester yachting sheet rope makes good decklines for sea kayaks (at least 6 mm diameter, preferably 8 or 10 mm). For rescue work, floating rope is preferred, polypropylene for throwbags, Spectra with a polypropylene sheath for hauling.

All ropes should be stored in the proverbial cool, dark, dry place, loosely coiled so that air can circulate. Climbers never tread on their ropes and neither should paddlers.

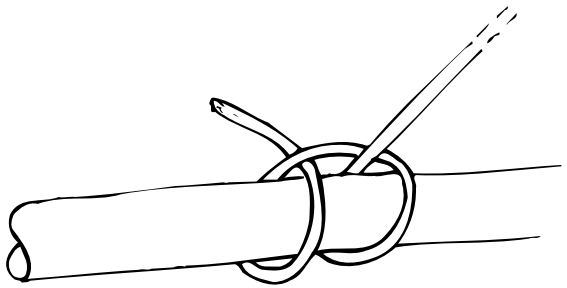
All knots weaken the rope, and the tighter the bends in the rope the more it is weakened.

Knots for tying on

Clove hitch

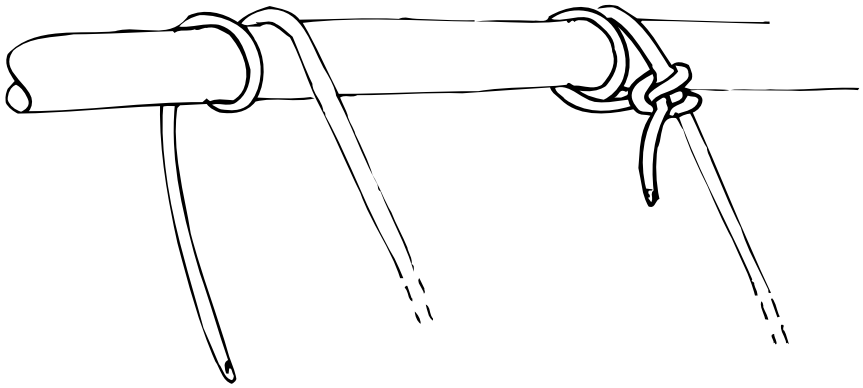
The clove hitch is suited to ties around poles where slip along the pole is not wanted. It is designed so that the rope tightens on itself and around the pole. Tension is required for an effective clove hitch. Half hitches formed by the loose end around the end with tension will make the knot more secure. If the tension is intermittent and/or the pole is slippery, the knot can work loose.

The main advantage of the clove hitch is that it can be tied when there is tension on the rope without losing the tension.



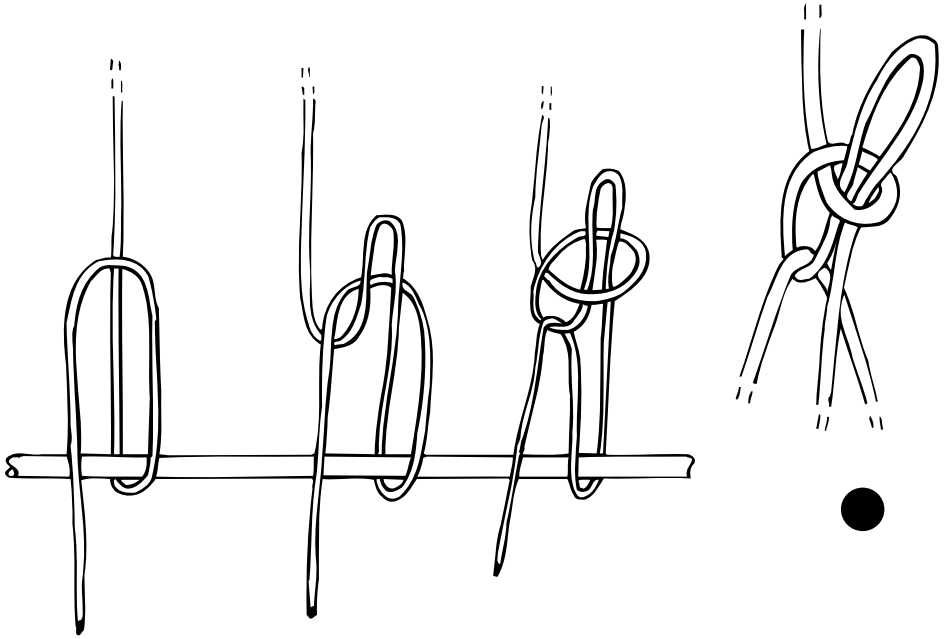
Round turn and two half hitches

This knot is useful for tying rope already under tension around a pole, branch or roof rack. It is very simple to tie, reliable and easily undone. It is possible to retain tension during tying. The first half hitch should be tightened before the second is tied.

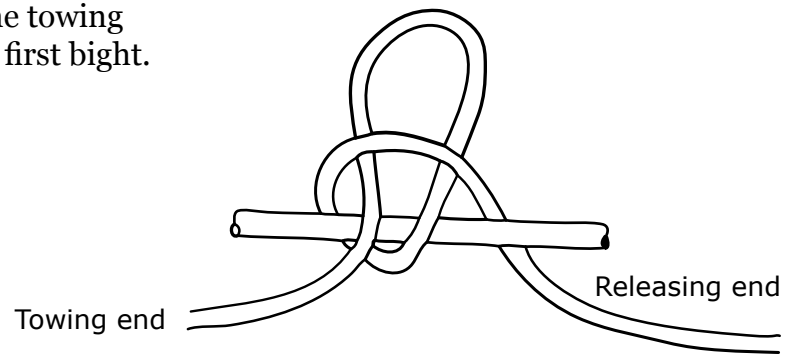


Truckies' hitch

This knot uses half a sheepshank to make a loop to gain mechanical advantage, and is useful for securing boats to vehicles. The free end is tied off with a clove hitch or round turn and half hitches.



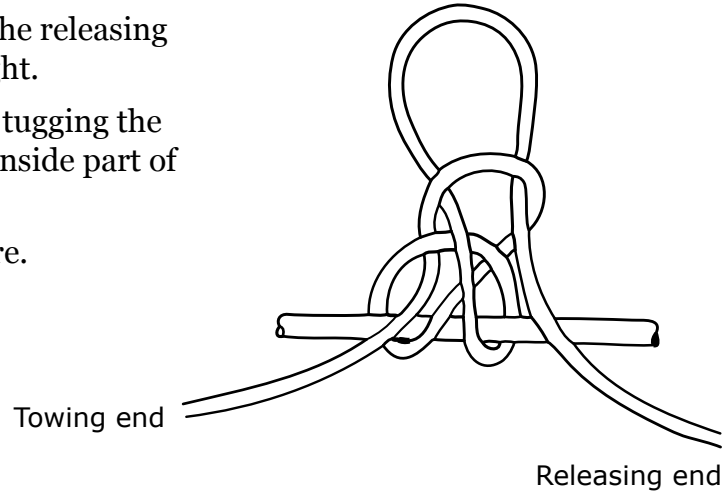
Pull a bight of the towing end through the first bight.



Now pull a bight of the releasing end through that bight.

Tighten the hitch by tugging the towing end and the inside part of the third bight.

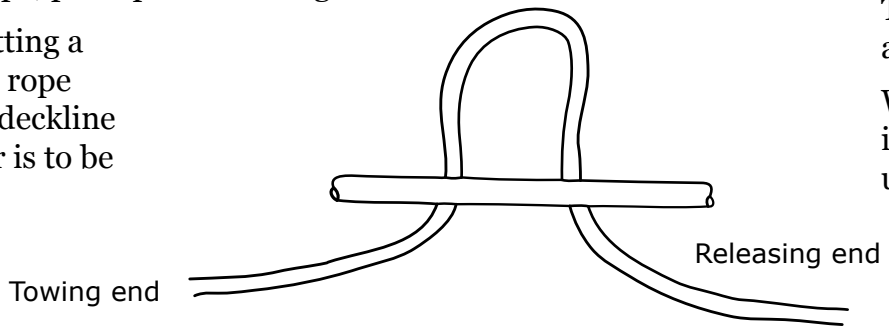
Check that it is secure.



Highwayman's hitch

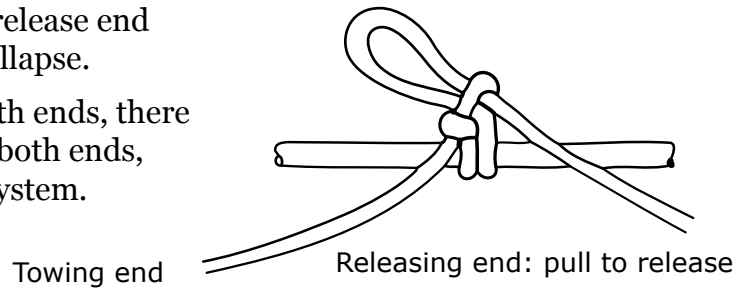
Once used to secure horses, but have them quickly released for a quick getaway, this hitch can be used to make a towline from any suitable length of rope, perhaps a throwbag.

Start by putting a bight of the rope behind the deckline or whatever is to be tied to.



To release, pull the release end and the hitch will collapse.

With the hitch at both ends, there is a quick release at both ends, useful in a towline system.



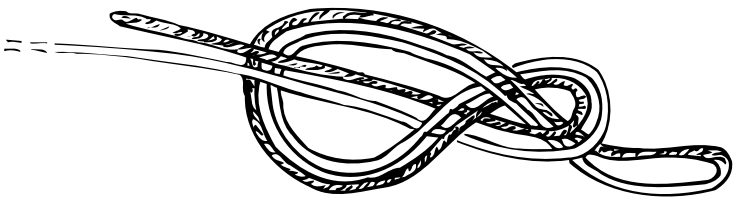
Knots for loops

Figure eight on a bight

This can be done anywhere on the rope as it doesn't require any threading through of an end. The knot will not slip even under high tension but can be undone with relative ease when tension is absent, even after large loading.

A half hitch with the loose end (if there is one) to the incoming rope helps the knot's security. Climbers depend on this knot to attach harnesses to ropes.

It is often used in place of the bowline, being stronger as well as easier.



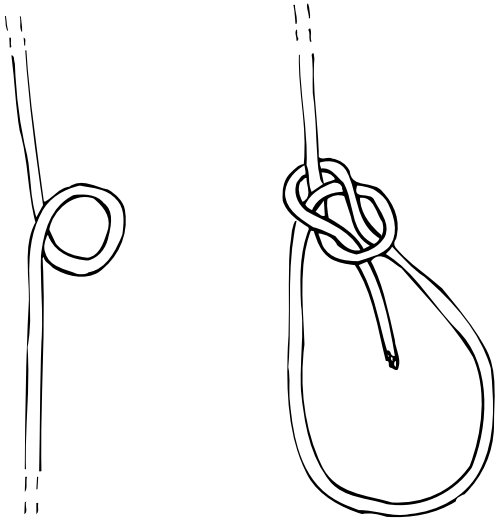
Bowline

The bowline is useful for tying around a pole or solid object. The knot will not go tight around the object so ensure that the pole or object shape will not allow escape.

Form a loop and feed the rope up through the loop, and around then back down again.

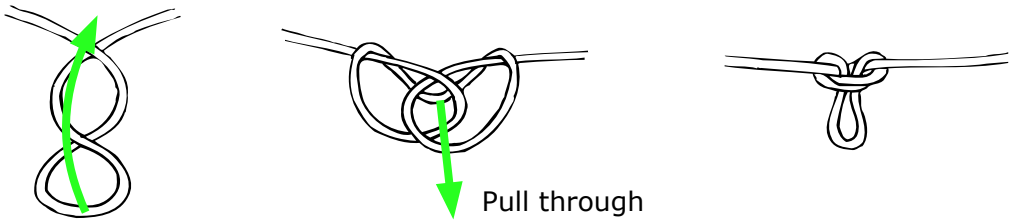
An extra half hitch with the free end will ensure that the knot won't slip. Rope which won't bend or grab easily may tend to work loose if tension is intermittent.

This knot is difficult to tie while holding tension.



Butterfly knot

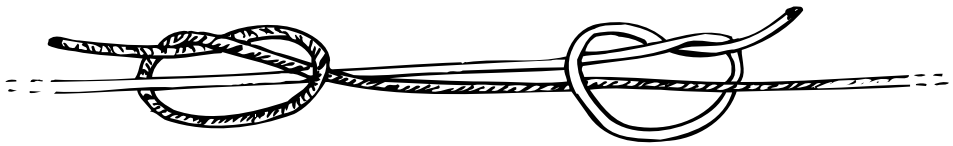
This is a mid-line loop knot that can be loaded in any direction and is good for attaching one system to the middle of another such as pig rigs or adding vector loads onto ropes.



Knots for joining

Fisherman's knot

Used for joining ropes together, but not very good when the ropes are very different in diameter, and not the most secure method. Tighten the two individual knots first and pull together until the knots sit nicely together.

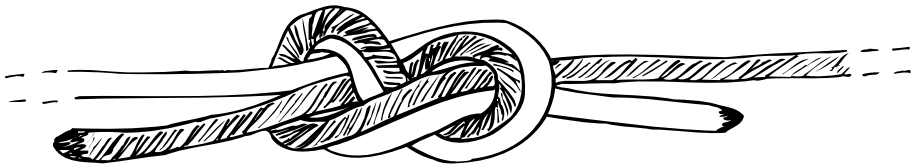


Double fisherman's

The double fisherman's knot is much more secure than the fisherman's knot for large loads. Rock climbers depend on this knot extensively, often using it to join the ends of Prusik loops. As with the fisherman's knot, both sides are tightened before being pulled together and tightened further.

Rethreaded figure eight

By forming a loose knot in one rope and then threading the end of the other through two ropes can be joined. It is easier to tie than the double fisherman's, and much easier to untie after loading.

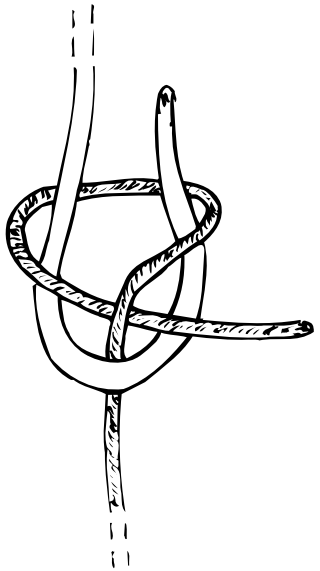


Sheet bend

A knot for joining ropes of dissimilar diameter. Form a loop with the larger rope as shown, then thread the smaller rope through.

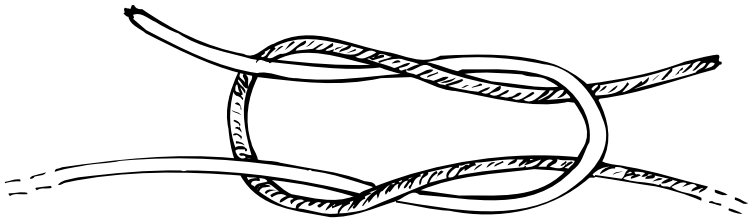
The sheet bend is not ideal for situations involving high tension, and the knot is less likely to hold great strains when the difference between the diameters of the two ropes is large.

Ensure the short ends are on the same side.



Reef knot

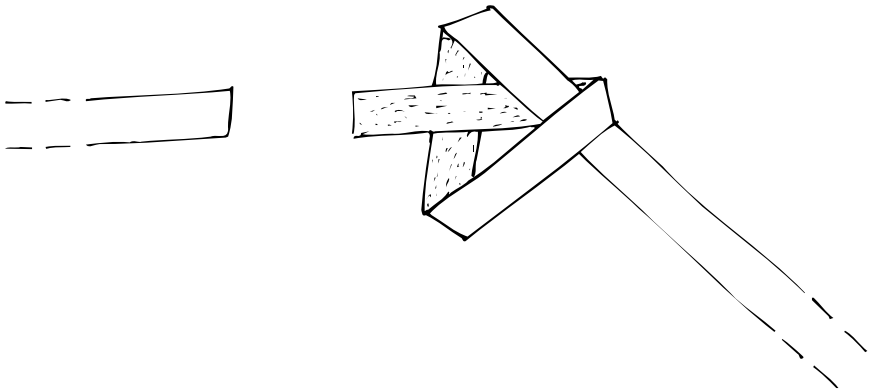
Not a good knot when the ropes are different diameters, and not ideal for large loading. It should be used only when the knot is against some surface, like the reefs in a sail. Half hitches on the loose ends can make it more secure. The ends should naturally lie along the incoming rope. If the ends point naturally to the side it is a granny's knot, and if one end is above and the other below it is a thief knot.



Tape knot

Climbing tape (or webbing) is lightweight but very strong. Lengths of tape with the ends joined make very useful slings, and are relied on extensively by rock climbers at belay stations.

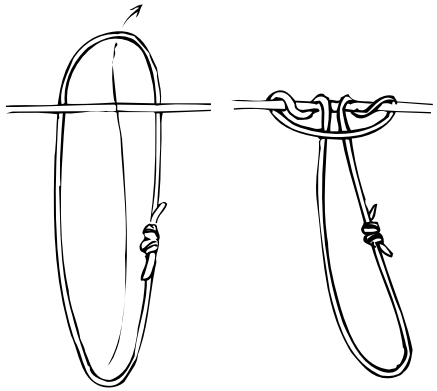
If tied properly the knot will have no twists but nice flat folds at every corner. Form one end first then trace through with the other and tighten.



Knots that move

Prusik knot

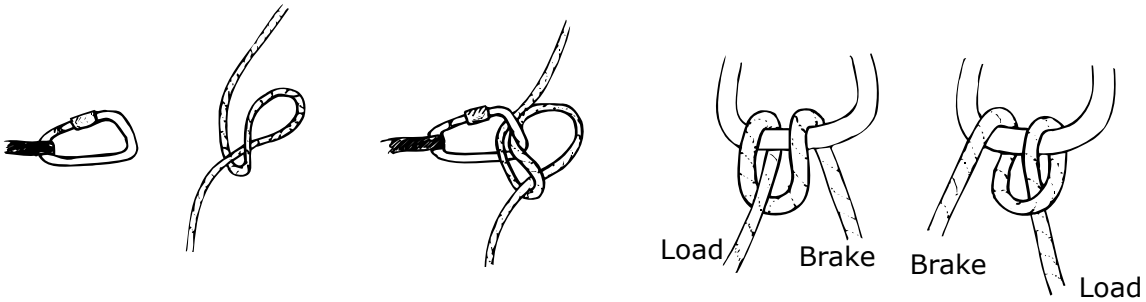
The Prusik knot, named for Dr Karl Prusik, a German climber of the 1930s, is used to attach a separate loop to a rope, so that the loop can be slid along the rope but will hold when a load is applied. The diagram shows the knot before it is tightened.



Munter hitch

Also known as the Italian hitch, this is a hitch that can be used on a karabiner to control descent of abseilers and swimmers. The hitch can belay in both directions.

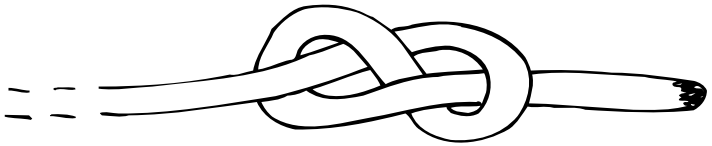
The hitch is named for Werner Munter, a Swiss mountain guide.



Stop knot

Figure eight knot

The standard figure eight knot makes a useful stop knot, and is easy to untie even after loading.



Acknowledgement

This resource was written and illustrated by Peter Carter.

Apply weather information

Description

This unit covers the basic knowledge and skills to access and interpret meteorological data to plan outdoor activities.

Objectives

On completion of this unit, you should:

- have some background understanding of Australian weather
- have an understanding of how weather can affect paddling in your area
- be able to access forecasts and other advice from a variety of sources
- be able to make risk management decisions based on forecasts and other advice.

Background

It has been said that the only constant thing about the Australian climate is its variability. While our modern understanding of the Southern Oscillation and El Niño may help to explain the poetic 'droughts and flooding rains', there is still a lot we do not know, and cannot predict.

Why do we have weather? The simple answer is that the surface of the Earth is not uniformly heated by the Sun. At a local level that leads to convection, and sea and land breezes. On a global scale, the hot tropics and cold poles lead to warm air moving aloft towards the poles, and cold air moving at the surface towards the Equator. Much of the heat is carried by water vapour, thanks to the high latent heat of vaporisation of water. But the Earth is round, and rotating, with oceans and continents, and seasonal influences, so the actual circulation is very complex. Meteorology is not an exact science...

The Australian region stretches from cool temperate in the south to tropics in the north, with much of the inland being arid, and with an alpine region in the southeast. Tasmania, being farthest south and in line with prevailing westerlies, can be very cold, wet, and windy.

In the south, the succession of Highs and Lows, with their cold fronts, is responsible for much of the weather. In the north, nominally north of 30°S, the main influences are the SE trade winds, and the monsoons.

In general, places on the coast have lesser temperature ranges than places inland. They also tend to have higher rainfall, particluarly if they are open to the prevailing winds: westerly in the south, easterly along the east coast.

Air masses

A large body of air, such as that over the Australian continent, is termed an air mass.

Air masses develop characteristics according to the surface beneath them: air over the continent becomes warm and dry for example. Inland Australian air, particularly in summer, becomes very hot and dry, and is often labelled as a continental tropical air mass.

Air over the oceans to the north of Australia becomes both warm and humid. A maritime tropical air mass moving over the continent, as happens in the wet season in the north, leads to storms and heavy rain.

From over the oceans to the south come maritime polar air masses, moist but cool. It is from these air masses that the southern part of Australia receives most of its rainfall.

Farther south, there are polar continental air masses over Antarctica: cold and dry.

Changes of air mass bring changes in weather.

Weather and canoeing

For paddlers on inland waters, the weather has direct and indirect influences. Depending on other factors, paddling in the rain may be enjoyable, but if that rain is raising river levels to dangerous heights then the fun ceases. Other forms of precipitation, like hail and snow, are best avoided. (And of course snow melt in spring will raise the river levels.)

Extremes of temperature will influence paddling. Events like the Murray Marathon in summer mean light clothing (with adequate Sun protection), the drinking of plenty of fluids, and so on. At the other extreme, hypothermia may be a real danger, and is always better prevented than treated.

The third factor is wind. Wind is measured, and forecast, at 10 m above the surface, averaged over 10 minutes. The highest wind speeds may be as much as 40% greater than the average: something to remember in windy conditions. Wind speeds are given in knots for marine and aeronautical users, kilometres per hour for others.

River paddlers may be sheltered from some of the wind, but if the general wind direction is the same as the river valley, then wind will be funnelled along it, making paddling difficult, and also leading to wind chill.

For the paddler on open water wind is perhaps the key factor. Unless you are paddling downwind (perhaps with sail assistance) wind will slow progress, and lead to fatigue. It will certainly make the water rougher, perhaps leading to capsizes. Add wind chill, and you find paddling in wind is not the most comfortable.

Information

To describe the weather, both present and expected, various aspects can be measured: temperature, humidity, precipitation, wind, barometric pressure, and so on. That data can be represented in a number of ways, with synoptic charts perhaps being the most familiar.

Synoptic chart features

High

In the southern hemisphere the circulation is anticlockwise. Barometric pressure is high. Air in the centre is descending, but is relatively calm. There may be stratus or cumulus cloud. With no cloud, or traces of cirrus, expect fine, warm weather.

Low

Air is circulating clockwise, and air in the centre is rising. Barometric pressure is low. Cloud and showers are likely. The tropical cyclones of northern Australia are smaller, but violent versions, without fronts.

Isobars

Isobars join places of equal barometric pressure. As with contour lines on a topographic map, the closer the lines, the steeper the gradient. In this case the steep gradient indicates strong winds.

Winds are shown on charts with arrows, with the number of tails indicating wind strength. Precipitation is shown by shading.

Cold fronts

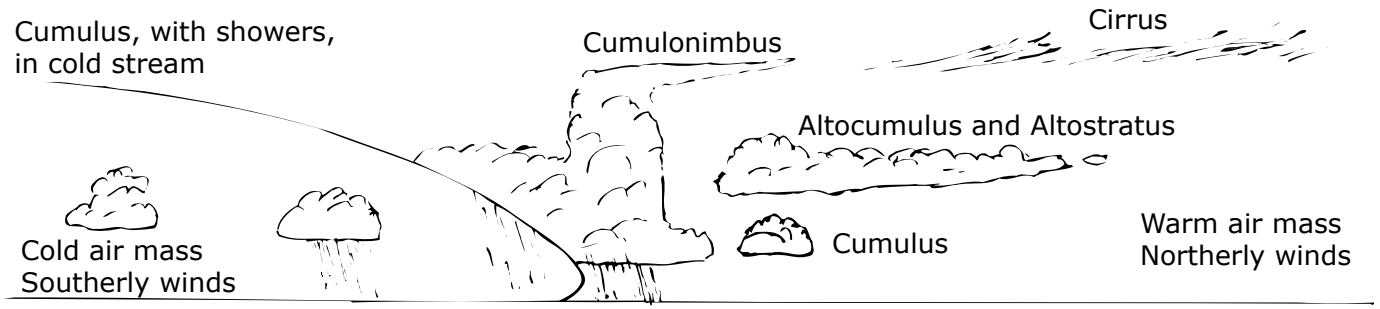
Cold fronts are associated with low pressure systems. Ahead of the front, the wind will be northerly, conditions will be warm (or even hot, because of the overland trajectory of the air (i.e. a continental air mass)), and the barometric pressure will be falling. The cloudbase will be lowering, and there may be rain. If the front is a vigorous one, winds can be strong.

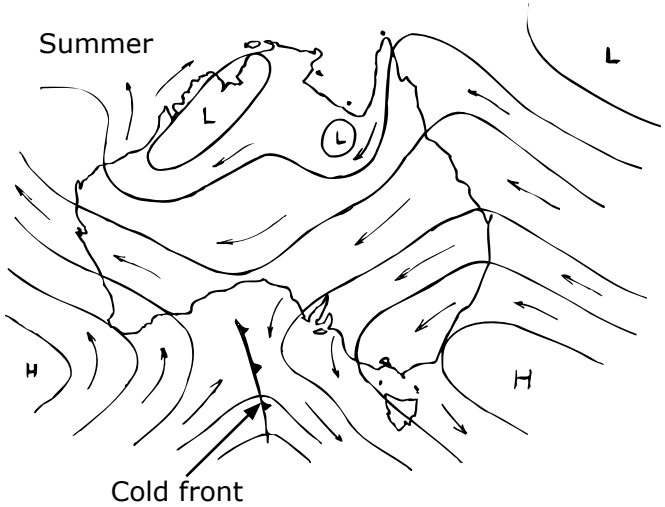
Behind the front, in the maritime air mass, the wind will be southerly (strong with a vigorous front), the air will be colder, there may be showers, and the barometric pressure will be rising. With some fronts there may be thunderstorms.

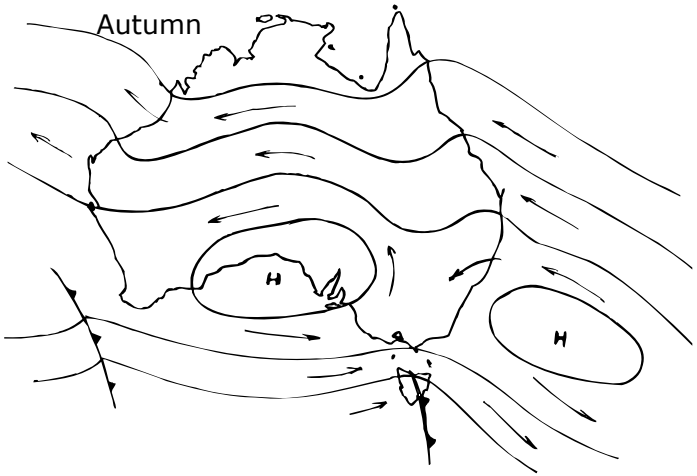
Although fronts are drawn as sharp lines, they are in fact several kilometres across: frontal zones.

The four charts on the next page show typical patterns for the four seasons. Think about how they relate to your local weather.

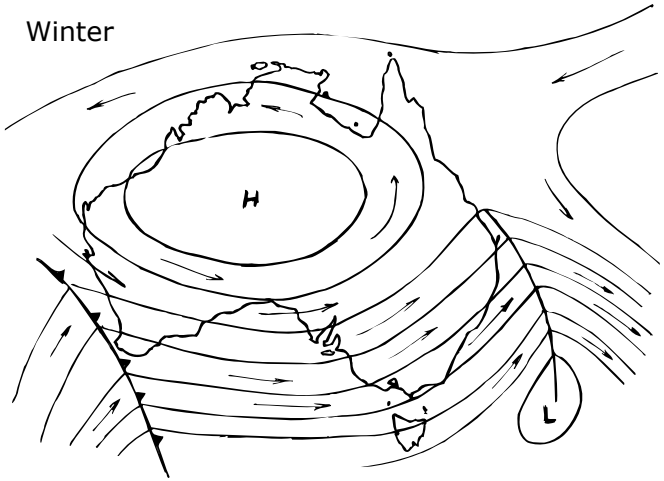
Cross section of a cold front

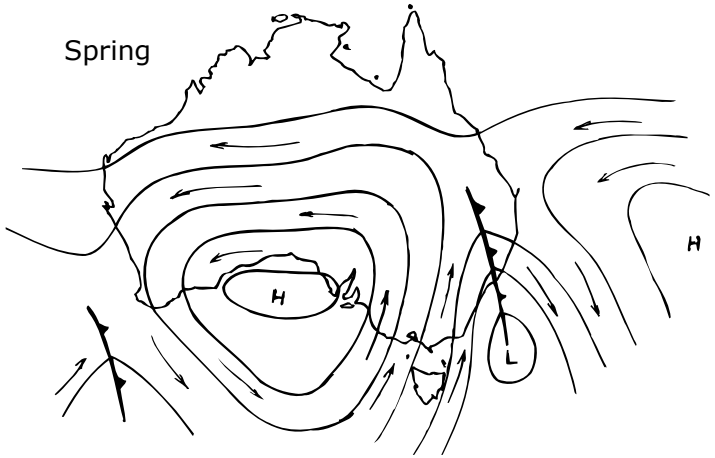






Synoptic charts showing typical seasonal features. Weather systems move from west to east across the region





Summer

Highs tend to be centred south of the continent, and may be stationary in the Tasman for several days, blocking the movement of other systems. Cold, fronts, for instance, will be slowed, and may miss the mainland. Conditions will be hot and dry over Victoria and South Australia due to the overland trajectory of the air, but the east coast may be wet in the on-shore stream. Sea breezes will be common along the coasts. Thunderstorms will be common in the north, with tropical cyclones between November and April.

Autumn

Highs are moving north, and winds generally become lighter.

Winter

Highs now track cross the continent, and fronts reach well inland, bringing wind and rain and showers (and snow on the highlands). Southern parts of the continent receive their greatest rainfall, and snowfall in alpine areas. The generally offshore winds in the north mean that weather is generally dry.

Spring

Highs are moving south, but fronts and lows still bring wind and precipitation.

Remember that synoptic charts will not show local weather like sea breezes.

Other information

Satellite images, visible and infra-red, are often interesting to look at, but they do require interpretation. Other data available from the Bureau includes maximum and minimum temperatures, rain and snowfall, barometric pressure and prevailing winds. Seasonal aspects of these will direct your planning of expeditions.

Forecasts

Based on the information from observers, automatic stations, satellites and so on, forecasters develop computer models of the weather, and with them, make their forecasts. Those forecasts are made available through the Bureau's Web site <www.bom.gov.au> and through the media: radio, television, and newspapers. Forecasts are generally reliable for about three days.

The standards of presentation have improved in recent years, but you still need to interpret forecasts for your own area and activity. How will the forecast weather affect river level, sea state, your own comfort? How will it affect alternate landing sites and escape routes?

Pay particular heed to warnings, in fact take the pessimistic view, and if in doubt, don't. You do not, for instance, want to be paddling under a thunderstorm. Quite apart from the obvious danger of lighting strikes, there can be very heavy showers and very strong downdrafts.

Strong Wind Warnings are issued if the wind is likely to exceed 25 kn (46 km/h), Gale Warnings for winds faster than 34 kn (63 km/h). Other warnings are issued for heavy rain and hail, storm, cyclone, and blizzard.

Other sources of information may be National Park rangers, who will have an understanding of how the weather affects their area, and its river levels and access. Other local people, especially those who work outdoors, can usually offer similar advice. Motoring organisations will be able to help with information about road conditions, and the ways they may be affected by heavy rain. Sea paddlers will find professional fishermen have an intimate knowledge of the weather in their area. Sea paddlers will also need to consider tides.

Conclusion

Nothing beats experience. Look at the forecasts, and relate them to what you see on the water. Play safe, and paddle within your limitations.

Acknowledgement

This module was written and illustrated by Peter Carter, with additional material by Ian Dewey.

Further reading

Australian Geographic, *The Australian Geographic Weather Journal*, Australian Geographic, 1999

Bureau of Meteorology, *Climate of <state name>*, Bureau of Meteorology, 1991 – 1998

Colls, K and Whitaker, R, *The Australian Weather Book*, New Holland Publishers, 2001

Burroughs, W, *et al*, *An Australian Geographic Guide to Weather*, Australian Geographic, 1999

Crowder, R, *The Wonders of the Weather*, Bureau of Meteorology, 2000

Haddock, C, *Managing Risks in Outdoor Activities*, New Zealand Mountain Safety Council, 1993

Questions

1. What are the telephone numbers for Bureau of Meteorology forecasts in your area?
2. At what times, and on which stations, are comprehensive forecasts broadcast in your area?
3. What are the times and channels (VHF, HF, or 27 MHz) for marine forecasts in your area?
4. Where can you find river height information for your area? What about water release for irrigation or hydro-electric power?
5. Collect synoptic charts for at least one week from newspapers or the Bureau's Web site. Note the passage of systems, their associated weather, and how that weather would have influenced your paddling. How accurate were the forecasts?
6. Many other Web sites now have weather information. Explore those relevant to your area.

Appendix: Interpreting forecasts

Coastal waters forecasts

Following is a typical coastal waters forecast with comments on the details of each part.

Date and time of issue

`Issued at 1555 hours on Wednesday the 18th of September 2002`

`For the period till midnight on Thursday`

Ensure the forecast is relevant to your trip. Even future predictions are valid for around three days only.

`PLEASE BE AWARE`

`Wind gusts may be a further 40 per cent stronger than the averages given here, and maximum waves may be up to twice the height.`

This warning is pertinent to all paddlers, especially sea kayakers: the forecast may be 1.5 m swells with winds to 20 knots, but if you are going to go out in it, you must be able to handle 3 m swells and 28 knot winds.

`SITUATION`

This is a general section giving you an overview of what you will see on the synoptic chart

`A cold front through Bass Strait, expected to reach the south NSW coast this evening, reaching the Hunter later Thursday.`

The weather is about to change, it will get cooler and probably windier, starting at the border this evening and reaching to north of Sydney by late Thursday. If your activities are in exposed areas in the next 24 hours, you have wind and possibly rain coming.

`WARNINGS`

This is a section that needs careful attention: is something about to happen in your area?

`A Storm Warning is current for waters south of Green Cape.`

`A Gale warning is current for waters Seal Rocks to Green Cape.`

`A Strong Wind Warning is current for waters Seal Rocks to Port Macquarie`

`Weather`

The weather section tells you whether it will be wet or dry. 'Rain' is steady and normally falls from stratiform (layer) cloud, 'showers' are short-lived and fall from convective cloud.

`A few showers in the south.`

If we are in southern NSW, we should plan for periods with showers.

`Far North Coastal Waters:`

There is one of these for each area of the coast: find the relevant map of the areas for your state.

`Qld – NSW border to Wooli and 60nm seawards`

The defined area

`W'ly wind 20/25 knots. S/SW wind 20/25 knots Thursday, tending S'ly 15/20 knots later.`

The expected wind strength and direction. Remember it can be 40% stronger

`Sea 1.5 to 2 metres. Swell 1.5 to 2 metres.`

'Sea' is the waves caused by the local winds, 'swell' are the waves caused by distant conditions, the two act with each other, so that you can get areas of flat and areas of large combined waves.

`Outlook for Friday`

The future. Remember that accuracy decreases as you forecast farther into the future

`S/SE wind 10/15 knots, afternoon E/NE seabreezes 10/15 knots`

Standard district (inland) forecast

NORTH EAST DISTRICTS FORECAST

BUREAU OF METEOROLOGY

NEW SOUTH WALES REGIONAL OFFICE

Issued at 1603 hours on Wednesday the 18th of September 2002

For the period through to Sunday

Make sure the forecast is relevant to you.

NORTHERN RIVERS

Tonight

Very High fire danger.

Dry. Moderate to fresh westerly winds.

A warning not to light any type of fire and to be aware of smoke to your west. Note also, the words 'moderate' and 'fresh' have specific definitions, which can be read from the Beaufort scale below.

Appendix: Wind and wave

Sea and Swell

Sea [in open sea]

Description	Height (metres)	Effect
Calm (glassy)	0	No waves breaking on beach
Calm (rippled)	0 - 0.1	No waves breaking on beach
Smooth	0.1 – 0.5	Slight waves breaking on beach
Slight	0.5 – 1.25	Waves rock buoys and small craft
Moderate	1.25 – 2.5	Sea becoming furrowed
Rough	2.5 – 4	Sea deeply furrowed
Very rough	4 – 6	Sea much disturbed with rollers having steep fronts
High	6 – 9	Sea much disturbed with rollers having steep fronts (damage to foreshore)
Very high	9 – 14	Towering seas
Phenomenal	over 14	Precipitous seas (experienced only in cyclones)

Swell

Description	Wave Length	Period	Wave Height
Low swell of short or average length	0 – 200 m	<11 sec	0-2 m
Long, low swell	> 200 m	> 11 sec	0 – 2 m
Short swell of moderate height	0 – 100 m	< 8 sec	2 – 4 m
Average swell of moderate height	100 – 200 m	> 8 sec, <11 sec	2 – 4 m
Long swell of moderate height	> 200 m	>11 sec	2 – 4 m
Short heavy swell	0 – 100 m	< 8 sec	>4 m
Average length heavy swell	100 – 200 m	> 8 sec, < 11 sec	>4 m
Long heavy swell	> 200 m	> 11 sec	>4 m

Appendix: Beaufort scale

Beaufort number	Descriptive term	Wind speed in km/h	Wind speed in knots	Description on land	Description at sea
0	Calm	0	0	Smoke rises vertically	Sea like a mirror
1 – 3	Light winds	19 km/h or less	10 kn or less	Wind felt on face; leaves rustle; ordinary vanes moved by wind	Small wavelets, ripples formed but do not break: a glassy appearance maintained
4	Moderate winds	20 – 29 km/h	11 – 16 kn	Raises dust and loose paper; small branches are moved	Small waves, becoming longer; fairly frequent white horses
5	Fresh winds	30 – 39 km/h	17 – 21 kn	Small trees in leaf begin to sway; crested wavelets form on inland water	Moderate waves, taking a more pronounced long form; many white horses are formed, a chance of some spray
6	Strong breeze	40 – 50 km/h	22 – 27 kn	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty	Large waves begin to form; the white foam crests are more extensive with probably some spray
7	Near gale	51 – 62 km/h	28 – 33 kn	Whole trees in motion; inconvenience felt when walking against wind	Sea heaps up and white foam from breaking waves begins to be blown in streaks along direction of wind
8	Gale	63 – 75 km/h	34 – 40 kn	Twigs break off trees; progress generally impeded	Moderately high waves of greater length; edges of crests begin to break into spin drift; foam is blown in well marked streaks along the direction of the wind
9	Stong gale	76 – 87 km/h	41 – 47 kn	Slight structural damage occurs: roofing dislodged; larger branches break off	High waves; dense streaks of foam; crests of waves begin to topple, tumble and roll over; spray may affect visibility
10	Storm	88 – 102 km/h	48 – 55 kn	Seldom experienced inland; trees uprooted; considerable structural damage	Very high waves with long overhanging crests; the resulting foam in great patches is blown in dense white streaks; the surface of the sea takes on a white appearance; the tumbling of the sea becomes heavy with visibility affected
11	Violent storm	103 km/h or more	56 kn plus	Very rarely experienced: widespread damage	Exceptionally high waves; small and medium sized ships occasionally lost from view behind waves; the sea is completely covered with long white patches of foam; the edges of wave crests are blown into froth

Another view

Beaufort Number	General description	Sea	Canoeists' Criterion
0	Calm	Sea like mirror	Everybody goes out and gets sick! Open canoes cross English Channel. Surf kayakers commit suicide
1, 1 – 3 knots	Light air	Ripples appear	Same as for 0, except too rough for open canoes
2, 4 – 6 knots	Light breeze	Tiny waves. No breaking crests	Same as for 0, except too rough for open canoes
3, 7 – 10 knots	Gentle breeze	Small waves. Crests begin to form	Life gets interesting for all. Good for practice capsize drill. Getting tough for beginners
4, 11 – 16 knots	Moderate breeze	Medium waves building up. Some white horses	About the limit for the Sea Kayak Skills standard paddler if on journey
5, 17 – 21 knots	Fresh breeze	Decidedly lumpy sea Many white horses	Anybody over Sea Kayak Skills standard would enjoy this. Usually creates very good surf. Long distance travels are out
6, 22 – 27 knots	Strong breeze	Large waves everywhere. Continual white horses	Short journeys by advanced paddlers all right, but you are reaching the border line
7, 28 – 33 knots	Near Gale	Sea piles up and spindrift off tops of waves	Surf tends to be big. Experts are beginning to swear
8, 34 – 40 knots	Gale	The difference from a landsman's view of these is difficult to say except that the sea looks very lumpy, high breaking waves and spindrift following wind path	Surf gets to be very big, and you spend your time hanging on to your tent
9, 41 – 47 knots	Strong Gale		
10, 48 – 55 knots	Storm		Surf enormous, and you get blown away with your tent

Adapted from *BCU Coaching Handbook*, first edition, 1976

Interpret weather conditions in the field

Description

This unit covers the knowledge and skills for interpreting weather signs to predict future weather conditions and their impact on outdoor recreation activities.

Objectives

On completion of this unit, you should:

- have an understanding of topology and other local factors that will affect the weather
- have an ability to understand current weather and predict likely future conditions
- be able, based on likely future conditions, to decide whether to continue, modify, or abandon paddling activities

Background

All weather is driven by temperature differences across the surface of the Earth: on a local scale sea breezes and the like, on a planetary scale the global circulation.

Sea breezes

Land generally heats (and cools) faster than the ocean. On a summer day air above the land will become warmer than land over the sea. It therefore expands, and being less dense, will be buoyed upwards by cooler air from the sea: that cooler air flowing in is the sea breeze. Aloft, there will be movement in the opposite direction. (Note that warm air does not rise of its own accord: the movement is brought about by pressure changes caused by the differences in density between warm and cool air.)

Sea breezes can reach considerable distances inland, and can be quite strong: 20 to 25 kn is not unusual late in the day. The direction will be directly on-shore as the breeze starts, but will change during the day as the Coriolis effect deflects the airflow. Strength and direction will also be influenced by the winds of the general circulation: if the two are in the same general direction the result can be quite strong.

At night, the situation is reversed, and breezes blow from land to sea, although not as strongly as during the day.

Topographic winds

Valleys tend to become warmer than surrounding hills, and breezes tend to flow up the slopes and up the valleys during the day. Strength and direction are influenced by the general circulation.

At night, the flow is reversed, down the valley.

Hills and valleys also tend to channel the general circulation, wind tending to blow along valleys rather than across. Sea paddlers should be careful of winds channelled down valleys opening on to cliff coastlines, which might otherwise give some shelter.

Downslope winds

Downslope winds are caused by the general circulation and occur on the lee side of mountains and hills, especially where the upwind slope is gradual and the downwind steeper. The Adelaide gully wind and Perth scarp wind are the best known in Australia. They can be quite gusty.

Eddies

As with water flow in a stream, eddies can form in flowing air behind obstructions large and small. Expect gusts and turbulence downwind of hills and islands in strong winds. Wind flowing down hills and over cliffs can generate strong downdrafts, sufficiently strong to blow paddlers over.

Southerly Buster

The Southerly Buster (or Burster) occurs along the south-east coast of the continent, and is marked by the sudden onset of strong southerly winds, often gale force, along the coast. The temperature can fall 10 – 15˚C in less than half an hour. The Buster occurs when a cold front is slowed across the south-eastern ranges but surges along the coast. Southerly Busters are most frequent in November and December, and forecasts of the phenomenon are becoming increasingly accurate.

East Coast Lows

East Coast Lows occur in autumn or winter over New South Wales and southern Queensland. They usually begin at night near the coast where there is a large temperature difference between ocean and land, and rapidly develop strong winds and produce heavy rainfall.

Local influences

Places along the coast tend to have more moderate temperatures and temperature range than those farther inland. They will also have sea breezes in summer. If the prevailing wind is onshore, they will have a higher rainfall than inland.

Inland, temperature ranges can be extreme: it may be 40˚C in the day, but freezing at night.

Mountains and hills have their effects, with higher places being cooler. Slopes facing the prevailing maritime winds will receive higher rainfall than leeward slopes: the 'rain shadow' effect. In winter in alpine areas and Tasmania cold fronts will often bring snow as well as other precipitation.

Wind over open water

Wind over water will generate waves, the 'sea'. The height of that sea will depend on the strength of the wind, the distance across water it blows, the 'fetch', and the time. The water can look deceptively smooth from the upwind shore of a lake or the sea, but the whitecaps will not be far out.

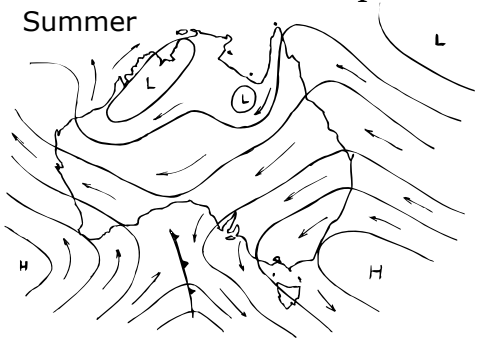
Tide and sailing direction books may have tables for the likely sea states in your area.

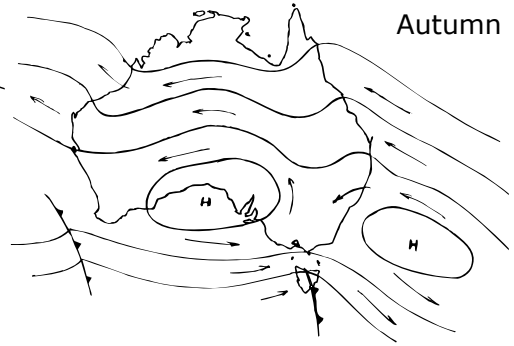
The general circulation

Seasonal norms

Summer

Highs tend to be centred south of the continent, and may be stationary in the Tasman for several days, blocking the movement of other systems. Cold, fronts, for instance, will be slowed, and may miss the mainland. Conditions will be hot and dry over Victoria and South Australia due to the overland trajectory of the air, but the east coast may be wet in the on-shore stream. Sea breezes will be common along the coasts. Thunderstorms will be common in the north, with tropical cyclones between November and April.



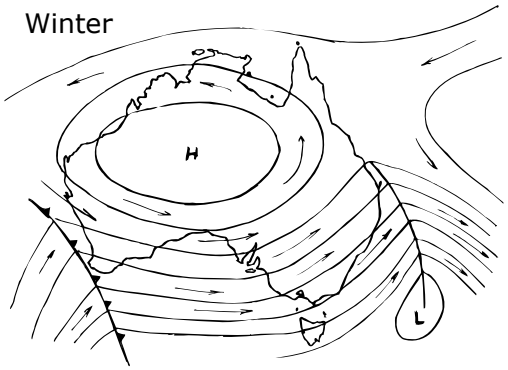


Autumn

Highs are moving north, and winds generally become lighter.

Winter

Highs now track cross the continent, and fronts reach well inland, bringing wind and rain and showers (and snow on the highlands). Southern parts of the continent receive their greatest rainfall. The generally offshore winds in the north mean that weather is generally dry.



Spring

Highs are moving south, but fronts and lows still bring wind and precipitation.

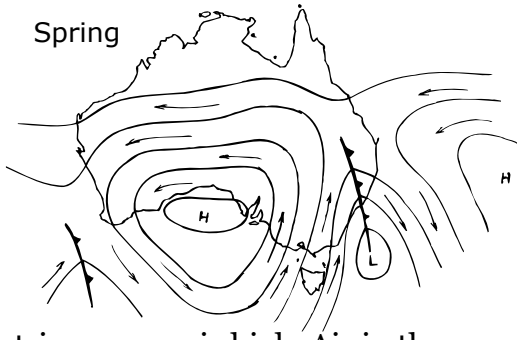


Chart features

High

In the southern hemisphere the circulation is anticlockwise. Barometric pressure is high. Air in the centre is descending, but is relatively calm. There may be stratus or cumulus cloud. With no cloud or traces of cirrus, expect fine, warm weather.

Low

Air is circulating clockwise, and air in the centre is rising. Barometric pressure is low. Cloud and showers are likely. The tropical cyclones of northern Australia are smaller, but violent versions, without fronts.

Isobars

Isobars join places of equal barometric pressure. As with contour lines on a topographic map, the closer the lines, the steeper the gradient. In this case the steep gradient indicates strong winds.

Winds are shown on the charts with arrows, with the number of tails indicating wind strength. Precipitation is shown by shading.

Cold fronts

Cold fronts are associated with low pressure systems. Ahead of the front, the wind will be northerly, conditions will be warm (or even hot, because of the overland trajectory of the air), and the barometric pressure will be falling. The cloudbase will be lowering, and there may be rain. If the front is a vigorous one, winds can be strong.

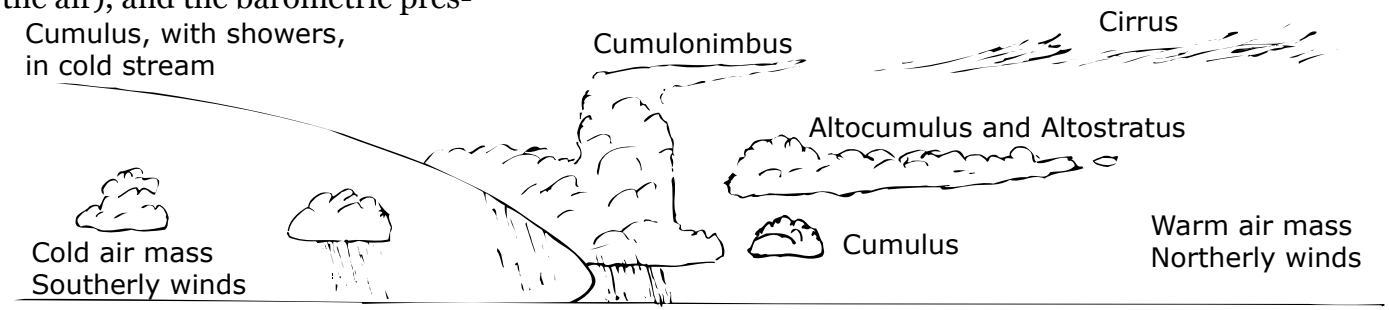
Behind the front, the wind will be southerly (strong with a vigorous front), the air will be colder, there may be showers, and the barometric pressure will be rising. With some fronts there may be thunderstorms.

Typical sequence of cloud and weather with cold fronts

(Afer Colls and Whitaker)

48 hours prior	Small cumulus or clear sky	Fine, north-east wind
24 hours prior	Possibly medium cumulus, cirrus invading from west	Fine, gusty northerly winds
12 hours prior	Overcast cirrus or cirrostratus, large cumulus	Some showers, possibly lightning to west and south-west, strong north-westerly winds
6 hours prior	Overcast cirrus or cirrostratus, some altocumulus, large cumulus and some cumulonimbus	Some showers, possibly lighting to west and south-west, strong north-westerly winds
Passage of front	Cirrus, altocumulus, altostratus, large cumulus and cumulonimbus	Showers, squalls and storms, wind backing to south-west
After front	Cumulus, stratocumulus and altostratus clearing	Showers and rain clearing, cooler southerly or south-easterly winds

Cross section of a cold front



Air masses

A body of air with similar characteristics of temperature and humidity is referred to as an air mass. An air mass that has been over the continent for some time will tend to be warm and dry: a continental air mass. An air mass from over the ocean, a maritime air mass, will be moist, especially if it is from the tropics.

Knowing the source of an air mass, you can predict its characteristics, and the likely weather from it.

Wind

Wind is measured, and forecast, at 10m above the surface, averaged over 10 minutes. The highest wind speeds may be as much as 40% greater than the average: something to remember in windy conditions. Wind speeds are given in knots for marine and aeronautical users, kilometres per hour for others.

Clouds

Clouds are not just shapes in the sky: they are indicators of what is happening in the atmosphere, and a guide to future weather. Clouds form when air is cooled, usually by being lifted. That lifting may be by flowing over coastlines or hills (orographic), by convection, or by the passage of a front. Air can also be cooled by radiation (clear nights, leading to dew or fog) or by flowing over a cold surface, as when warm air flows from the sea over land. When the air is cooled to saturation moisture condenses: the Dew Point is the temperature at which condensation begins. The shape of the cloud is determined by the way in which it is formed, e.g. convection produces cumulus, orographic stratus, and so on.

Ten types of cloud are recognised, and 27 subtypes. That is beyond the scope of this module, which will concentrate on a few main types.

Low clouds

Cumulus

Scattered cumulus is usually a sign of fine weather. However if large clouds develop in the afternoon there is the possibility of showers. Cumulus that grows to a great height in warm humid air, becoming cumulonimbus, means showers, perhaps a thunderstorm. In winter, hail and snow may be the result. In the tropics, thunderstorms are a daily occurrence in the wet season.

Middle level couds

Altocumulus and altostratus

With northerly winds, and the cloud thickening, expect a change within 10 to 20 hours. On the other hand, with southerly winds, expect any rain to decrease.

Altocumulus

Altocumulus on summer mornings may mean thunderstorms later in the day. Keep an eye out for developing cumulus and cumulonimbus.

High clouds

Cirrus

These high feathery clouds are an indication of fine weather if winds are southerly over the southern half of the country. If winds are from the north, increasing cirrus means that a front is on the way, within perhaps 20 to 30 hours.

Cirrostratus clouds will often produce a halo around the Sun or Moon as the ice crystals refract the light.

Rain, or showers?

Rain falls from stratiform clouds: it can continue for some time. Showers come from cumuliform clouds: they may be heavy, but for a short time only as the cloud passes overhead.

Instruments

Although you can see clouds and sense wind strength and direction, and temperature we have no way of sensing barometric pressure. A serious expedition may want to have a small barometer or altimeter in its equipment. A rising barometer indicates fine weather is approaching, a rapidly falling barometer is a sign of bad weather on its way. It is the rise or fall, and the rate, that is significant, not the wording on the dial.

If you want to keep records, you could also carry thermometer and some form of anemometer. Several small electronic types are now available.

Certainly carry a radio so that you can receive current forecasts, which you will then need to interpret for your locality.

Conclusion

The Bureau of Meteorology makes its forecasts using computer models based on the information from observers, automatic stations, satellites and so on. They are generally reliable for about three days.

You will have much less information: only what you can see in the sky and measure at one spot with whatever instruments you have. But that limited amount should be sufficient form a mental model to guide your decisions about proceeding with, modifying, or abandoning an activity. It was sufficient for sailing ship captains to start shortening sail when cirrus appeared in the sky.

Further reading

Australian Geographic, *The Australian Geographic Weather Journal*, Australian Geographic, 1999

Bureau of Meteorology, *Climate of <state name>*, Bureau of Meteorology, 1991–1998

Colls, K and Whitaker, R, *The Australian Weather Book,* New Holland Publishers, 2001

Burroughs, W, *et al, An Australian Geographic Guide to Weather*, Australian Geographic, 1999

Crowder, R, *The Wonders of the Weather,* Bureau of Meteorology, 2000

Haddock, C, *Managing Risks in Outdoor Activities,* New Zealand Mountain Safety Council, 1993

Acknowledgement

This resource was written and illustrated by Peter Carter

Questions

1. Ignore broadcast and printed forecasts for a week and make your own, based on the wind and cloud you see, the changes in pressure if you have a barometer, and the local features. Keep a record to compare with Bureau forecasts at the end of the period. How accurate were you?
2. Read reports of weather-related incidents involving groups in the outdoors. Based on what they should have known, what would you have done? (Examples might be the Swiss canyon accident in July 1999, Lyme Bay March 1993, or Lake Alexandrina August 1987. Obviously other factors were involved, but concentrate on the weather aspects.)
3. There are many common weather sayings: “Red sky in morning, shepherd’s warning”, “Red sky at night, shepherd’s delight”, “The calm before the storm”, and so on. Is there any truth in them? Are they any use in forecasting?

Environmental impact

Aim

This learner guide is designed to provide the basic knowledge for planning and executing overnight and campsite based kayaking and canoeing activities with minimal impact.

Introduction

The reference covers the basic knowledge and skills for minimal environmental impact practices for paddlers.

This reference covers the following elements:

- determine the environmental impacts of canoeing or kayaking
- identify the causes of such impacts and their consequences
- adopt practices to reduce impact on the natural environment and on other users of wilderness areas
- find information on related rules and regulations

"A journey by canoe along ancient waterways is a good way to rediscover our lost relationship with the natural world and the Creator who put it all together so long ago." (Bill Mason, 1984)

"The experience [of paddling] is truly like hovering between heaven and earth. No words can describe the feeling of sitting peacefully among the reflections on the Gordon and Noosa rivers, or paddling at sunset..." Alan Jones, Director Kayak & Canoe Inc.

This awareness is most needed today if we are to pass on something precious to our children.

The Australian ecosystem is vulnerable to disturbance especially from foreign flora and fauna. The ecosystem has been isolated for many years and has its own unique system. When there is some kind of impact to the natural environment then there is a high risk exotic plants and animals will enter and compete with native species.

With increasing numbers of people preferring to spend more time with nature, the damage done to the national parks, wilderness areas and rivers is also increasing. Fortunately environmentally conscious visitors are adopting minimal impact recreation practices thereby reducing the damage to the natural environment.

This resource is designed to assist you in understanding and developing practices that limit human impact on the environment and also help others understand these practices. It is both necessary and important that you understand and practice environmentally responsible behaviour. As an Instructor or Guide you should be demonstrating and enforcing the best practice minimal impact actions.

All National Parks management bodies have an environmental code that should be followed. Heavy fines apply, in many cases.

Biodiversity and other key ecological concepts

Biodiversity is the variety of all life forms: different plants (from lichens and mosses to shrubs and trees), animals (invertebrates, frogs, reptiles, birds and mammals), the genes they contain and the ecosystems in which they live.

Biodiversity is vital in supporting human life on Earth. It provides many benefits, including all our food, most of our medicines, and industrial products. It is our life supporting system in that it supplies clean air, water and fertile soils.

An ecosystem is a dynamic complex of plant, animal, fungal and micro organism communities and associated non-living environment, interacting as an ecological unit. Australia is home to more than one million species of plants and animals, many of which are unique. About 82% of mammals and 93% of frogs are found in Australia. However, over the

past 200 years the Australian environment has dramatically changed. Australia has lost 75% of its rainforests and has the world's worst record of mammal extinctions. Some 125 plant and animal species are known to have become extinct including seven per cent of Australia's known mammal species.

Respect special areas and land in national parks and reserves so that key habitats including the wetlands are preserved. Today more than 360 species of animals and around 1240 species of plants in Australia are considered threatened, extinct, critically endangered, endangered or vulnerable.

In New South Wales alone:

- over 40 animal species and 40 plant species presumed extinct
- over 60 animal species and over 290 plant species considered endangered
- over 170 animal species and over 210 plant species considered vulnerable.

To protect critical habitat:

You must identify critical habitat: the areas of land that are crucial to the survival of particular threatened species, populations and communities

You must identify key threatening processes: all sources that harm the endangered species or could cause threat to other species. These range from foxes and feral cats to rock removal.

Be aware of pest animals: exotic animals are the non-native species introduced into Australia from other countries such as cane toads, goats, foxes, deer, rabbits, pigs, cats, dogs and horses. Pest species may be native Australian species that have moved out for their natural habitat and taken over other ecosystems and their numbers, presence or activities cause disturbance to the environment, endemic species or to humans. They include cockatoos, possums, and koalas. They compete with and prey upon the native animals, damage native plants and degrade natural habitats. For this reason some exotic animals listed below have been listed as threatening processes:

deer
Fire ants
Cane toads
cats
foxes
Plague minnows
ship rats on Lord Howe Island

Weeds

A weed is any plant that has been removed or escaped from its natural habitat and has established itself in a new system. Most translocated species do not survive but the species that successfully establish themselves are highly competitive and threaten the native flora. In national parks and reserves, weed control programs are undertaken in areas where weed species are increasing in numbers, spreading into new areas or displacing native plants and animals.

All exotic and native plants that are not local to the area are treated as weeds on land managed by the NPWS. Focus is on controlling weeds on the borders of reserved lands and in water catchments so that weeds do not spread into national parks or neighbouring lands.

Environmental impacts

Impact on the natural environment takes three forms:

- physical: e.g. breaking tree branches for firewood, damaging river banks on launching
- ecological: e.g. polluted waterways
- social and cultural: e.g. noise of vehicles

The degree of impact of canoeing and kayaking activities depends on participant knowledge, care and planning. There's both good and bad news about the impacts involving different activities.
The good news is that people are beginning to understand the no trace camping principles; but we still have incidents of various impacts including:

- pollution with foreign matter (human waste, rubbish, soap, detergent, creams)

- disturbance to the local vegetation by trampling and breakage
- breakage and dislodgement of rock and other formations
- compaction of soil and other deposits
- erosion to banks and soil
- disturbance of fauna
- introduction of new flora and fauna
- chemical alteration of environments
- damage to, or inappropriate behaviour in, cultural sites
- graffiti
- reduction of decomposing timber
- campfire scars
- urbanisation
- noise pollution
- contamination of water supplies
- intrusion into private lives and culture
- development of facilities and signs.

As a paddling Instructor or Guide you need to understand the uniqueness of each water course: be it a river, a lake, or the sea. You should have a good understanding of the flora and fauna present in any area that you intend leading a group, so that you are not responsible for the deterioration of the area. Impacts may include:

- organic wastes increasing the bacterial levels in the water
- soaps and antiseptics that kill the essential micro-organisms and can increase phosphorous causing algal blooms
- improperly disposed of faeces, causing disease and/or polluting the water
- compaction of soil, reducing oxygen cycling for biotic species
- trampling vegetation, destroying food supply and shelter for fauna
- fire scars, bush fires and fires creeping hundreds of metres underground
- rusty cans, broken bottles, forgotten or left tent guys and pegs, scraps of paper—all are permanent scars on nature.

Causes of the impacts on the environment could be various sources:

- individuals or small or large groups of people
- innocence and/or ignorance of people
- natural reasons like a lightning strike causing a fire
- domestic or feral animals.

The consequences of these and other causes are innumerable, causing damage, destruction and degradation of the natural resources. Examples include all of the above outlined impacts.

Management practices and procedures

Various levels of the Australian Government control the paddling environment including:

- National Parks (State bodies) govern National Parks and State recreation areas
- Department of Land and Water Conservation (State bodies) govern water bodies to the high water limit
- Fisheries (State bodies) control all fishing and fishing related practices
- Waterways authorities (State bodies) regulate watercraft, including canoes and kayaks
- Local councils regulate access to water bodies in their districts.

All of these groups implement management strategies to control environmental impact. The overall management strategies include:

- restricting access
- limiting group size
- seasonal closures
- permit only access
- published codes of ethics and conduct.

Minimal impact practices

The overall guideline is to practice the no-trace camping principle, which means when you finish with a campsite, you leave it without any traces of your intrusion with nature. The following are minimal impact practices for paddling Guides and Instructors:

Fires

Light fires only when necessary: fuel stoves should be carried on all overnight trips.

Many National Parks in Australia are designated 'fuel stove only areas'.

Use fuel stoves instead of campfires in all situations. Stoves minimise the risk of fires escaping. Compared with campfires they are faster, and a lot easier in wet weather. Campfires could also lead to local environmental degradation (trampling) around campsites.

Use fuel stoves on hard surfaces like rock or hard earth. Heat from certain stoves can damage underlying vegetation.

When camping in a designated camping area, fires must be lit only in a National Park's provided fireplace. This does not include fire scars found during your trip.

Bush camping (away from designated campsites) is available in many National Parks. Group size and fire lighting provisions apply and you should contact the office to check on these prior to departure.

Many National Parks also specify that any wood used in a fire must be carried in and cannot be sourced either from trees or fallen timber.

Fallen branches and dead trees are the homes of many creatures and provide a source of nutrients back into the soil.

Fires should be kept less than one metre square. Do not put rocks around the perimeter as this simply adds to the visual scar.

Light fires in areas clear of vegetation, not under tree branches and at least four metres from tents.

You need to have permission from landowners to light a fire on private property.

Fire restrictions are present for a number of months each year. On any day there may be either a park specific ban or a State or area ban or both.

Never light an open fire or use a fuel stove outside on a day of total fire ban: there are severe penalties involved.

As an Instructor or Guide it is important that you check the local restrictions and or permissions each day before you light a fire.

Also as an Instructor or Guide it is important that you have spare, dry clothing to avoid the need for a fire.

Be absolutely sure that the fire is out. Feel the ground under the fire and if it is hot, put water on it.

Do not use soil to put out fires, as they may keep smouldering for days.

Remove all signs of the fire and restore the area to its original condition. Do not throw the residual ash, etc. into a water course.

General campsite

Many National Parks require that a trip plan with details of the route and participants be lodged along with fees for over night camping.

Pets, firearms, spear guns and chainsaws are not allowed in National Parks.

Choose a campsite at least 100 metres from the coast, any road, track or parking area.

Camp at least 30 metres from any river bank. Ensure you are not in an area that may flood after rain or at high tide.

Sandy or hard surfaces are better than boggy or vegetated areas.

Limit your stay at a campsite to less than three nights.

Use modern tents and a sleeping mat to limit impact on the ground. Avoid digging trenches.

When you camp, try to avoid camping with other groups and choose a site with a robust bank or beach on which landing and launching of craft will have least impact.

Leave the camping beach scrupulously cleaner than when you arrived, leaving only footprints behind.

Wash everything at least 50 metres from the river. Empty the residual water into scrub at least 50 metres from the water.

Wash yourself, eating utensils and cooking equipment at least 50 metres away from creeks or lakes and spread the dirty water so that it can filter through the soil. No soaps or detergents should be used: even biodegradable types affect water quality. Use sand and a scourer rather than detergents.

Ensure that no chemicals or fuel enters any waterway or is used near any waterway.

Minimise your movements to and from the tent in order to avoid a maze of tracks forming. Carry a large water container to collect water for the night once, rather than making repeat visits.

Toileting

On day activities, participants are encouraged to use public toilets prior to commencing the activity.

Carry a hand trowel for burying toilet wastes (Note: some wilderness areas require the removal of all human faecal waste.)

Toilet pits should be dug at least 100 metres from the lake, river and from your campsite.

Toilet pits should be 15 cm deep so that animals and light rains do not easily expose them, but so that they are shallow enough for fast breakdown of the faecal matter.

Carry out all tampons, sanitary pads, condoms and nappies.

Burn the toilet paper where this can be done safely (Note, as a result of bush fires, some National Parks do not allow the burning of paper.)

In high use areas boil water for 10 minutes prior to drinking. Use disinfectant gel on your hands after going to the toilet.

Use disposable gloves for all food preparation.

Rubbish disposal

Take **all** waste out with you. 'Burn bash and bury' is a thing of the past. When leading a group, it is easiest to enforce the rule 'You bring it in, you take its waste out.' That way you will have no problems with who will carry the rubbish bag.

The use of packing materials is to be kept to an absolute minimum. Remove outer boxes, etc. before you go to minimise weight and waste.

Take all plastic bags out with you. They often end up in water courses where they are mistaken as jellyfish and other marine life and ingested by animals including sea turtles. This may kill the animal.

Animals

Familiarise yourself with the flora and the fauna of the water courses and of the region. For example, salt water crocodiles inhabit over a third of the Australian coast (roughly north of the Tropic of Capricorn from Rockhampton to about Carnarvon in Western Australia, and also many inland river systems). So prepare for any emergencies, avoid crocodile-infested areas. Watch out for fresh water crocodile nesting areas.

Stay clear of other wild animals like dingoes, pigs, lace monitors, wallabies, other big animals that could cause damage to people and equipment.

Feeding wild animals can cause diseases and produce unnaturally high populations. It can also produce animals which aggressively (and sometimes dangerously) approach humans to get food.

Do not leave open food around the campsite.

Be careful of handling packs, etc. with food contaminated hands. There are a number of accounts of animals, including feral pigs, destroying packs, etc. which smelled of food.

Place all food in sealed containers and preferably back in your boat each night to stop nocturnal animals raiding your supplies.

Rats have been known to chew their way into water bottles in times of drought (potentially risking the lives of the campers).

Paddling

Take care when paddling close to the shore and do not disturb vegetation as these areas may be housing bird-nesting sites.

Take considerable care not to disturb fish spawning grounds.

If other groups are present, stagger launchings to avoid congestion and social impacts.

Mangrove areas are highly sensitive and in some States are the nurseries of around 70% of commercial fishing stocks. In some areas you should not paddle through mangroves, and in areas where you may, do not trample the pneumatophores (aerial roots).

Fishing

Fishing is quite popular from canoes and kayaks. Be aware that in some States an Instructor or Guide cannot take a paying group fishing without a commercial licence.

Know the local regulations.

Return unwanted and undersize fish to the water as soon as possible.

Take unwanted or tangled fishing lines with you. They can become death traps for fish and birds.

Collect only the bait that you require.

Walking (access)

Constructed walks are to be used where possible. The practice of short cutting corners, skirting wet sections or walking wide of the track is discouraged.

If there are no tracks, then spread out in vegetated areas to avoid track formation. Don't follow in each other's footsteps and stay at least a metre apart. Stay on rocks and hard ground wherever possible. Avoid walking on alpine and other soft vegetation that is highly sensitive to damage. Some plants can die after just one person steps on them.

Don't cut new tracks as this is not only detrimental to the bush but is also illegal in National parks.

Never mark a route by laying cairns, taping, or blazing trees. This is illegal in National parks and will incur a fine.

When walking on beaches, be aware that you could be sharing the beach with shore-nesting birds so walk below the high tide mark.

Sand dunes are extremely sensitive: always walk on tracks where present. Picnic on the beach and not in the dunes.

Transport, tracks and routes

Keep to authorised tracks, don't go off track.

Craft like canoes must be carried to the water.

Wash tyres and the underside of vehicles leaving base to reduce the risk of infestation of weeds or fungus such as phytophtora which can attack the root systems of plants.

Where possible undertake trips when conditions are dry and know when to call it off.

Lower tyre pressures to improve traction and to spread ground impact.

Drive slowly and appropriately for the terrain.

Steep slopes and water are responsible for much of the erosion evident on tracks. Minimise damage by avoiding steep tracks (especially greater than 30°) on erodible soils in winter and during wet weather.

Use existing entry and exit points when crossing streams and creeks where bridges and culverts are not provided.

Where possible, winch between vehicles, but if you have to winch from a tree, use tree protecting paddling or webbing.

Use wheel chains only as a last resort.

Cultural and historical heritage sites

As a visitor to new places of historical and cultural significance you should take care to respect those sites. They can be buildings, rock features inside caves, stone structures, landscape, sacred hills, plants, trees, etc. Exercise caution not to touch them, scrape, scar, or trample them.

Summary

It all comes down to respect for the environment, respect for others and respect for yourself.

Plan to minimse impact and for easy and simple rubbish removal.

Avoid doing multiple trips on the same section of riverbank to prevent bank erosion

Try to limit the group size. Large groups will compound your impact on the riverside environment. Some heavily used areas have an enforced group size limit (usually around eight).

Don't muscle in on other groups.

Acknowledgement

This resource was written by Ian Dewey

Leadership

Aim

This learner guide is designed to provide a background to leadership theory for Leaders, Guides and Instructors.

When used in conjunction with training and experience the student should understand:

- Requirements from leaders change from activity to activity and context to context
- Leadership is not a fixed personality or system
- Kayak and canoe Leaders, Guides and Instructors should be adept at matching groups to the activity aims and the environmental context.

Introduction

What is leadership in sport and recreation?

"The process employed by the person to assist individuals and groups in identifying and achieving their goals." (Edginton and Ford).

"The process of persuasion and example by which an individual induces a group to take action that is in accord with the leader's purpose or the shared purpose of all." (Gardner).

"A leader can be thought of as an individual who, guides, directs and influences the attitudes and behaviours of others." (Edginton and Ford).

Leaders should always remember that if they have the 'power to influence' then within the sport and recreation context they have a 'duty of care'.

Being a sound leader is all about preparation. Defence training often refers to the five 'Ps': 'Proper preparation prevents poor performance'. Leadership starts long before the activity and concludes only after it has been fully packed away. Leadership includes preparation in:

- Hazard identification and risk management
- Navigation planning
- Weather interpretation
- Equipment preparation
- Logistics

Activity leadership concludes with:

- Participant debrief
- Equipment cleaning, inspection and maintenance
- Activity review

Leadership is not about being out front of the group or being the centre of attention. Leadership is about assisting a group in achieving its goals.

Leadership qualities

A kayak leader requires a clear understanding of the aims and objectives of the activity and the risk management process involved with that activity.

The traits of a leader may include some or all of the following:

1 Guiding vision:

– where going and share that vision
– goals both personal and group
– assist individuals and group in identifying and achieving them
– create a sense of purpose
– visionary and practicality

2 Communication

– closely allied to vision
– communicating
– honest and open, no hidden agendas
– often put thoughts into verbal symbols to communicate intentions and visions: a very difficult task

3 Risk taker

– innovative
– risk taking often fullest demonstration of leadership skills
– seizing opportunity
– curiosity and daring

4 Passion

– allied to risk taking and confidence
– strong belief in what doing
– enthusiasm, inspiration to others
– motivation
– recognise and satisfy needs of followers
– stay excited

5 Seek to serve needs of others

– unselfish
– ability to work with others help and nurture them
– personality (empathy, integrity, trust, warmth, patience)
– basic conviction of human worth and dignity
– ability to work with others
– flexibility

Other qualities

– seek new learning experience
– self-motivating
– pleasure, even joy from profession
– able to handle criticism
– persistent in drive to be the best
– a sense of humour

Professional ethos

– Creating the vision (constructing a crystal clear mental picture of what the group) and transmitting this vision to the minds of others
– Developing the team (developing a team of highly qualified people who are jointly responsible for achieving the group's goals)
– Clarifying the values (identifying the organisational values and communicating these values through words and actions)
– Positioning (developing an effective strategy for moving the group from its present position toward the vision)
– Communicating (achieving a common understanding with others by using all modes of communication effectively)
– Empowering (motivating others by raising them to their 'better selves')
– Coaching/helping others develop the skills needed for achieving excellence
– Measuring identifying the critical success factors associated with the group's operation and gauging progress on the basis of these factors.

Leaders are just that: 'leaders', the people at the front. The list above can suggest that the leader is some kind of saint with the ability to maintain a number of possibly conflicting agendas and outcomes. Sound leadership comes from intelligent decision making.

Leadership styles

Leaders of groups may be required to perform many roles in the course of an activity. They may have to encourage a beginner, arbitrate a dispute around a campsite and inspire confidence when faced with some hazard.

As well as being aware of group dynamics, leaders need to have a feeling for the appropriateness of various styles of leadership for particular situations and different groups. While the underlying principles are similar, very different leadership behaviours are necessary to guide an experienced adult group from those needed to run the first day of a beginners youth group.

Leadership styles can be broadly categorized into three major styles. Each style has appropriate applications, depending on the group, the nature of the task and the range of outside factors influencing the situation. The styles are outlined below.

Facilitation

As a Leader, Guide or Instructor, often your role is to facilitate an activity or discussion. It is important to develop the ability to

- Plan for the learning activity or discussion
- Explain the required process or outcome
- Step back and 'chair' the activity or discussion
- Summarise the learning.

This may mean using components from the range of styles outlined below

Autocratic or directive leadership

The leader makes the decisions and the group is required to show agreement and act in accordance with the leader's decisions. The leader's decisions are not put up for questioned as there is usually no opportunity for discussion. In this style of leadership the activities of the group are closely supervised.

To be able to provide autocratic leadership when and if it is required the leader must establish a relationship with the clients that demonstrates that they are clear thinking, experienced and to be trusted and followed in emergency situations.

An autocratic leadership style is useful when the group experiences an emergency situation and there is limited time to make decisions, or a group activity includes potential dangers and the group requires the close guidance of an experienced leader.

Democratic or consultative leadership

The leader provides opportunities for discussion and consultation drawing ideas from the group under supervision. The group with the leader makes decisions about what the group will do and how they will function.

This style will only work in activities or for decisions where the group has the knowledge and experience to conduct a rational discussion and make sensible decisions.

Where a group decision is required on an area of the activity outside of 'normal' knowledge and expectations it is important that the leaders provides the group with sound background information prior to beginning the group discussion.

A democratic style of leadership is useful when:

- group commitment to decisions is required to successfully complete an activity
- group rapport is being developed
- there is time for discussion in the decision making process.

Laissez-faire or participative leadership

The leader and the group are involved in decision making. Limits to behaviour may be set but group members are responsible for their part in the activity. The participative leader's role is to advise and to co-ordinate the activities of the group members.

The laissez-faire style of leadership is useful when:

- group members are responsible for a part of a whole group activity
- group members are capable of performing activities without the aid of others.

Summary of leadership styles

Styles vary from being leader-centred to being group-centred. Ideally, leaders should be able to adapt their style to the situation. It is this versatility of style which helps to make an effective leader. In order to develop a versatility of style the leader needs to be aware of the kinds of behaviour used to influence groups.

Leadership behaviours

The term style speaks about an overall approach to leadership. Behaviours are short term approaches used within the leadership role. You will notice many of the behaviours below are clearly traits of the leadership styles.

The way a leader interacts with a group to help it progress towards group goals will affect the relationships in the group and the quality of the activity performed. A number of leader behaviours used to facilitate groups are discussed below.

Telling

The leader becomes aware of a problem, considers alternative solutions, chooses one of them and then tells the group what they are to do. Leaders may or may not consider what the group members might think or feel about the decision, but members clearly do not participate directly in the decision making. Telling is used frequently by those who have adopted the autocratic style as their preferred style of leadership.

Selling

The leader makes a decision without consulting the group. However, instead of simply announcing the decision, the leader persuades the group members to accept it by pointing out how the members will benefit from carrying out the decision.

Testing

The leader identifies a problem and proposes a tentative solution. Before making a final decision, however, the leader gets the reactions of those who will implement it. The leader says, in effect: 'I'd like your frank reactions to this problem, and I will then make the final decision.'

Consulting

The leader gives the group members a chance to influence the decision from the beginning by presenting a problem and relevant background information, then asking members for their ideas on how to solve it. In effect, the group is invited to increase the number of alternative actions to be considered. The leader then selects the solution regarded as most promising. Consulting is frequently used by leaders who have adopted the democratic style as their preferred style of leadership.

Joining

The leader here participates in the discussion as just another member and agrees in advance to carry out whatever decision the group makes. Joining is frequently used by leaders whose preferred style of leadership is laissez-faire or participative.

Preferred leadership style

We tend to have a personality style which will often fit into one of the leadership styles. Personality is set at a young age and it is hard for people to act differently to their personality.

It is important for leaders to understand their own personality type and be able to suspend it to use a range of styles and behaviours as appropriate.

Using collaborative processes

Collaboration involves working together to achieve goals. The benefits of using collaborative processes come from using the sum of the group's knowledge, skills and abilities.

The theory is thus: one person confronted with a new situation is limited in their problem solving to their past experience and their own knowledge. Add one other person with different experiences and immediately you have more to draw upon. Add many more people with all their different experiences and, so long as the process is managed so that all those people have the chance to contribute, you clearly have a vast store of experience, knowledge and skills available to solve the problem.

For the process to be useful, the group must possess relevant knowledge and experience. A novice group on a sea kayak expedition may not have accurate information to offer the process. Where collaboration is used it is important that the leader facilitates the discussion and ensures it is steered in an appropriate direction.

Beware the mob

It is well documented that large groups (mobs) can make decisions and take actions that individuals feel are unethical, immoral or similar. Groups will often take risks as a result of individuals willing to relax their own standards or feeling perceived leaders in the group are making the right decisions or because they don't want to be seen to be different.

The leader needs to ensure they stay outside the group and its processes and must ensure the group is acting on good information and guidelines.

Leadership proximity

Within a simple paddling activity a leader must consider carefully their proximity to the group and style of leadership.

At Meet and Brief a leader should be autocratic and pre-emptive. Safety briefings should always fit into the category of 'Telling' as defined above. Leaders should not expect the group to know the issues. This is also a point for setting tone and authority. Sun glasses have no place in briefings where eye contact and establishing trust is important. Leaders should also be correctly dressed for the activity. First impressions are critical to setting the whole tone of an activity.

Fitting people into kayaks is an area where a more relaxed style is important. People need to relax enough listen and try the seating position rather than sitting rigidly whilst the process occurs.

Where should a leader lead from on the water? A leader needs to be where they can see and monitor the group as well watch for approaching hazards. In flatwater and sea paddling this often means the leader sits on one of the rear corners of the group. Being out front is rarely useful: the leader can't see the group and is in a poor situation for fast response in the event of an incident.

Positioning becomes even more critical in whitewater where the leader's position may define whether they can react to incidents at all.

Launching, landing and areas such as rapids and surf are situations where being 'in control' of the group is important, however being relaxed and able to carry on encouraging conversations with participants is important to maintaining their confidence and completing the activity. In planning an activity, plan your proximity and leadership style.

Leadership ethics

Outdoor recreation activities can have consequences for the participants, the leaders and the environment. Choices and decisions must frequently be made. Choices are not always clear cut, and whether they are right or wrong may change with the circumstances.

Ethics

- a set of principles of right conduct
- a theory or a system of moral values
- the study of the general nature of morals and of the specific moral choices to be made by a person; moral philosophy
- the rules or standards governing the conduct of a person or the members of a profession
- "Ethics is the study or treatment of moral questions or dilemmas. Ethics is therefore concerned with determining why some situations or actions may be better or worse than others in determining a good act from a bad act... In outdoor leadership, ethical decision-making arises out of the need to resolve dilemmas of some sort where no clear right or wrong course of action is evident where no ways exist to find the right answer by measurement, calculation or testing. Ethics is concerned with judgements involving values not facts." (*Bushwalking, Ski Touring and Outdoor Leadership*, 2000).

Types of ethical decisions

There are many ethical decisions an activity leader may have to make. The leader will be involved in deciding which of alternative courses of action to take. The kinds of issues an activity leader may need to analyse, assess and decide on include the level of risk of an activity as opposed to the benefit of the activity to the client. For example whether a group of school children are sufficiently skilled to paddle through a section of rapids, an activity they would find exhilarating when safely

completed. The ethical decision making process needs to weigh up the benefit to the individual as opposed to the benefit to the group in the context of safety and group objectives

Leadership communication

The essential skills for a leader to establish and maintain a group are the open communication and information sharing skills of assertiveness, listening, questioning, clear expression of facts and feelings and the giving and receiving of constructive feedback.

Assertiveness

A person behaving assertively is able to communicate their feelings of self worth by the way they behave in a work team. They seek to have their goals and needs fulfilled but are at the same time concerned with helping others to have their goals met. Using 'I' statements is one way to behave assertively. An 'I' statement is a clear and structured statement of the way you experience a situation that does not threaten or blame the other party.

Listening

Listening is a skill which complements assertiveness. Listening involves hearing what the group member has to say and understanding the situation from their point of view. Listening is one way of providing support to group members.

Clear communication

Written and spoken language is the means of giving and receiving information in groups. It should be:

- clear
  - information is relevant and easily understood
  - information is presented logically and sequentially
- concise
  - information is stated in the fewest possible words
- complete
  - all information needed to make a decision is presented: correct, well researched and accurate.

Questioning

Questions are used in group situations to start discussion, to clarify information and to obtain responses. Two types of question can be asked: open and closed questions.

Open questions are used to encourage the other team members to explain their ideas in more detail or express their opinions more clearly.

Closed questions are used to obtain specific and usually factual information. They can usually be answered with one or two words.

Giving and receiving feedback

Feedback is a response given to a person who has said or done something.

Feedback should be specific rather than general; offer positive suggestions as alternatives to inappropriate behaviour; contribute to productive working relationships. Feedback is subjective and the suggestions given do not have to be accepted or acted on by the receiver. The receiver needs to be willing to accept feedback and determine whether to act on it.

Using these communication skills will aid group participation and co-operation. Their consistent use will also mean that the group will be able to place trust in the leader as a person who will treat them fairly and value their contribution to group members so that they will begin to trust one another. The leader will act as a role model. The leader can also devise a number of simulated activities which will help the group come to know and trust one another. These kinds of activities are known as icebreakers or warm down. During the course of an outdoor activity the group leader can introduce other simulated games which encourage co-operation among group members.

Addressing equity, gender, ethnicity and emotional well-being

Being part of a group sometimes requires facing potentially demanding situations. Issues such as equity, gender, ethnicity and emotional well-being may require strategies to handle sensitive situations. The facilita-

tor of a group must be aware of the needs of their group. If a person is showing signs of emotional stress (e.g. crying unexpectedly), the facilitator may use the following strategies:

- discreetly remove the person from the group
- ask if they would like to talk or need help
- refer them elsewhere (if appropriate)
- talk to the rest of the group (if appropriate).

Two types of conflict

In the workplace (and almost any setting), you are likely to find two forms of conflict. The first is conflict about decisions, ideas, directions and actions. We will call this 'substantive conflict' since it deals with disagreements about the substance of issues. The second form, 'personalised conflict' is often called a personality conflict. In this form, the two parties simply 'don't like each other much'.

Substantive conflict

Substantive conflict can occur on just about any issue, but its moving force is that the two parties simply disagree about an issue. This can be a good thing or a bad thing. Handled correctly, parties in conflict can create, for themselves and those around them, the ability to resolve an issue with something creative, something better than either party's original position.

Personalised conflict

While substantive conflict, if handled correctly, can be very productive, personalised conflict is almost never a good thing. There are several reasons.

- First—personalised conflict is fuelled primarily by emotion (usually anger or frustration) and perceptions about someone else's personality, character or motives. When conflict is personalised and extreme each party acts as if the other is suspect as a person.
- Second—because personalised conflict is about emotion and not issues, problem solving almost never works, because neither party is really interested in solving a problem... in fact, in extreme cases, the parties go out of their ways to create new ones, imagined or real.
- Third—personalised conflicts almost always get worse over time if they cannot be converted to substantive conflict. That is because each person expects problems, looks for them, finds them, and gets angrier.

Solution strategies

When involved in a conflict situation, it is important that you are aware of whether you and the other party are dealing with a substantive conflict or a personalised one. It isn't always easy to tell them apart, and it is difficult to look honestly at oneself. Ask yourself the following questions:

Do I dislike the other person or get frustrated with him/her?

Do I see the other person as untrustworthy, and undeserving of respect?

Is my emotional reaction to the conflict appropriate to its seriousness or lack thereof?

Do I really want to 'win'?

If the answer to any of these questions is yes, you may be setting yourself up for a personalised conflict that nobody can win in the long term. With respect to the other person, one good indicator of a personalised conflict situation is that the person will try to counter your substantive point on the issue with a series of different reasons why you are wrong.

Substantive issues

Even in situations where both you and the other party have personalised the conflict, you can work to focus on specific issues. You have not direct control over another person, but you have control over yourself. By moving to the issues, and staying there, you will also encourage the other person to do so. It isn't easy, of course. The trick is to try to put aside your negative perceptions about the other person, and not to dwell on them. That's an internal thing. Every time you think to yourself 'what an idiot' (or all the other negative things), you make it that

more difficult to stay focused on problem solving, rather than winning, or getting your own way.

Work to prevent personalisation

It is rare that personalisation occurs just on the basis of two incompatible personalities. Usually, personalisation occurs because conflict on substantive issues is handled badly. That is, one or both parties behaves in non-cooperative ways.

Stages of group development

Every time a new group of people are brought together they will interact in various ways.

Following is one of the traditional models of group development. It is provided as an example to assist you in understanding groups under your leadership. Do not be concerned that your groups do not resemble the interactions in this model.

The model

As a group develops it progresses through stages. Knowing the stages and what is required to advance the group to the next stage helps the leader to facilitate the group's tasks and to nurture group development. The stages of group development as defined by this model are described below.

Stage 1: Forming

In this stage, group members begin to interact in a tentative way as they become familiar with the group's goals. Group members assess the bounds of acceptable behaviour in the group. The leader plays a prominent role as members seek guidance and support. Members also try to find out about one another. Their main concerns are what role they will play in the group and whether they will be accepted as part of the group.

To move to the next stage members of the group are required to:

- take risks by expressing opinions which may prove to be contrary to the views of other group members
- make personal decisions about the role they will play in achieving the group's purpose.

Stage 2: Storming

Conflict occurs in the group during this stage. The conflict is usually about goals and how they are to be achieved, leadership issues and the importance of the roles to be played. Group members may make personal attacks or express disagreement by appearing to be uninvolved.

To move to the next stage members of the group are required to:

- establish clear roles for each member placing emphasis on group maintenance roles; listen empathically to the views of other group members
- accept the possibility that they are wrong.

It is important to note that groups which do not resolve status struggles do not move on to become effective in problem solving, nor are members of the group satisfied with the group's performance. The group will fulfill its task but the solution is not likely to be an optimal one; they never satisfy all group members and, at best, are products of compromise. If some degree of acceptance or trust is not established, decision making becomes hampered by closed and guarded communication. Decisions are made without deep commitment.

Stage 3: Norming

Members begin to feel more comfortable in the group and goals, tasks and roles are defined. The leader's role becomes less prominent. A team spirit emerges as members share information and develop a positive attitude to the group's endeavours. To move to the next stage each group member is required to:

- have confidence in their capacity to satisfactorily perform their own role
- trust others to complete the tasks assigned them.

Stage 4: Performing

The group begins to perform at optimum level. The group attempts to strike a balance between performing its tasks and maintaining interpersonal relationships within the group. Problems are seen as minor setbacks and the group works co-operatively to solve them.

Stage 5: Mourning

This stage occurs when it becomes obvious to members that the group's role is coming to an end. It may also occur for individuals who leave the group at an earlier stage in its development. In this stage members evaluate the achievements of the group and finalise outstanding issues. There is usually some confusion and concern about disengagement from the relationships formed over the life of the group. To disengage members are required to accept that the group is terminating; plan for the future by evaluating the knowledge and skills gained that can be transferred to work with other groups; assert one's individuality and separateness from the group.

Summary

We have touched on different leadership styles, behaviours and techniques in the sections above. Not all leaders have the qualities or traits that you consider are necessary to be an effective leader. Some people have only a few of the traits, yet are effective leaders while others who possess many of those traits fail as leaders.

Leadership is the ability to lead. It is good leadership when it achieves the stated aims in an efficient and ethical way. The most important quality in a leader is intelligent decision. A sound leader has the ability to monitor the group, the environment and the aims and objectives and create the best outcome.

Acknowledgement

This resource was written by Ian Dewey

Navigate in tracked or easy untracked areas

Description

This unit covers the basic knowledge and skills in off-road navigation in areas where there are tracks or other significant landmarks in situations where extreme environmental conditions are not likely to occur.

Objectives

On completion of this module, people should be able to:

- select and use a suitable map, understanding possible sources of error and inaccuracies, and map symbols and their use in navigation
- use a compass, with an understanding of its errors
- plan a route, including escape roues, in tracked or easy untracked areas, based on map information, including scale and bearings
- navigate in tracked or easy untracked areas, using map and other aids, estimating distances, bypassing obstacles, identifying features, and plotting an efficient course.

Maps

A map is a graphic representation of a particular part of the Earth's surface drawn to scale from a 'bird's eye' view. There are many types of maps, including topographic, guide books and diagrams, hydrographic, charts and aerial photographs. The amount and type of detail shown on the map will depend on the scale and purpose of the map. For example, a large scale street map that shows footpaths and buildings will be no use for driving long distances along a freeway.

Common features on maps include title, scale, directional reference, legend, border, longitude and latitude, and grid references. Maps can range from the simple to the very complex, but no map can be expected to show every feature of the Earth's surface. The features shown are usually selected to meet a specific purpose, with colour, symbols and shading used to illustrate how features are arranged and distributed.

Suitable maps for paddling are topographic maps, marine charts and guide books.

Topographic maps

A topographic map is a detailed large scale map representing features of landform and built environments. It shows relief and slope of the land, vegetation, buildings, watercourses, and so on. Being able to analyse topographic maps is an important skill. It allows us to:

- interpret and describe the surrounding land
- identify relationships between features
- locate particular points, areas and routes

Guide books

A guide book is a information usually in the form of a route plan written by fellow paddlers. Guide books contain detailed relevant information such as access, difficulty, hazards and obstacles of a a particular area. As the maps may not be detailed, guide books are best used in conjunction with topographic maps or charts.

Marine charts

Charts for marine use have some topographic detail, but concentrate on features at sea level and beneath. They will include tidal information, navigation lights and buoys, and submerged hazards. For marine charts, the legend is a booklet, Chart 5011, Symbols and abbreviations used on Admiralty charts.

Internet images

There is a growing number of Internet resources with aerial images and maps. Google Earth is perhaps the best known, however most state planning or environment departments and some universities have sites which allow users to view satellite and aerial photos with various ver-

sions of maps. These sites are extremely useful for planning and allow detail previously not available to be researched. It is important to check the scale of such images.

Features

Legends and map symbols

Map symbols are used to show the location of selected features. Many symbols look like the features they represent, and the importance of a feature may be shown by the size of the symbol, the thickness of the line and the colour used. The meaning of each symbol is explained in the map's legend. which allows us to interpret the features on the map, and provides us with information relating to the scale and contour interval being used. Although many maps use similar symbols it is essential that to check the legend. For example, a blue line may not always indicate a water system.

Scale

There is a direct relationship between the size of things on a map and their actual size on the ground. In other words, maps are a scaled down representation of part of the Earth's surface, and the map's scale must be shown on it. Scale is the ratio of distances on the map to distances on the ground, and can be expressed in three ways:

1 As a statement, in words: 'One centimetre represents 100 000 centimetres' or 'One centimetre represents one kilometre'

2 As a ratio or representative fraction: 1:100 000 or 1/100 000

3 As a linear scale.

On a marine chart the latitude scale on the east or west edge is the scale of distance: one minute of latitude is one nautical mile (1.852 km).

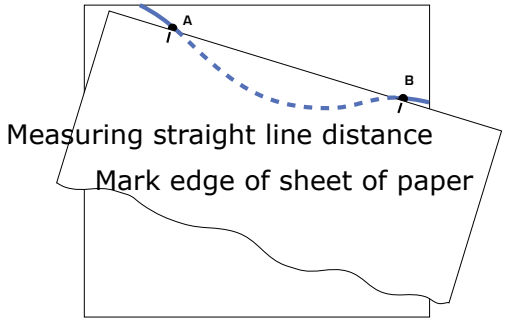
Maps drawn on progressively smaller scales increase the area of the Earth that can be shown, but reduce the amount of detail that can be included. Maps drawn on progressively larger scales decrease the area that can be shown but enable more detail to be shown. This means, for example, that a map drawn to a scale of 1:20 000 covers a smaller area of the Earth's surface but shows much more detail than a map drawn to a scale of 1:100 000. Because the scale of a map shows the relationship between distances on the map and distances on the ground it can be used to calculate distances and areas.

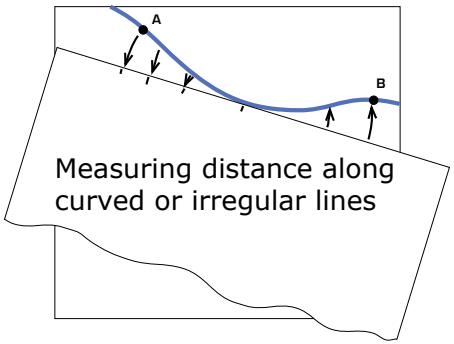
Using a map

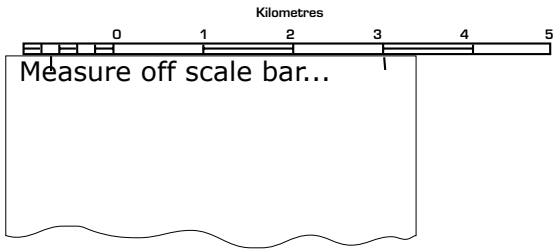
Measuring distance on a map

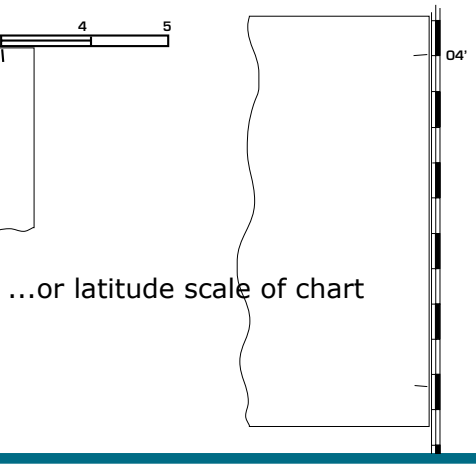
The distance between two points on a map can be found by first measuring the distance shown on the map and then converting it from centimetres to kilometres and/or metres, or on marine charts, nautical miles. The way in which measurement is done may vary. The following method is merely one example:

- To estimate a straight line distance, place the edge of a sheet of paper between the two points and mark on the paper the distance between the points. Place the paper along the map's linear scale. Read off the distance on the scale.









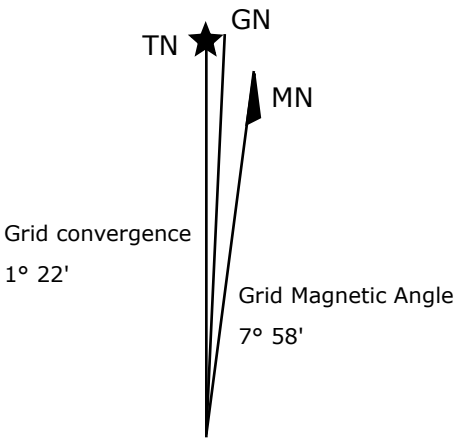
- To estimate distances along a curved or irregular line, place a sheet of paper on the map and mark off the starting point. Move the paper so that its edge follows the curve, marking each section as you do. Mark the end point and then place your sheet of paper on the linear scale. Read off the distance on the scale.

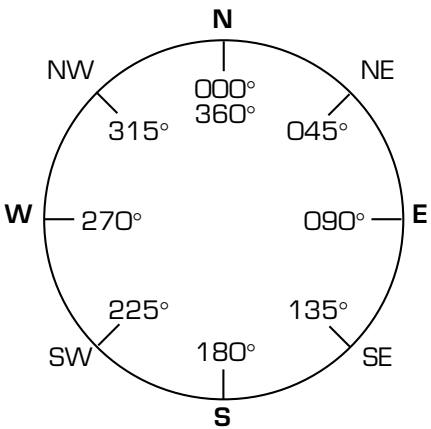
Direction and bearings

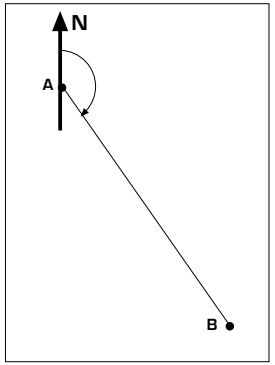
Direction helps us to determine the relative location of places and may be given as a bearing.

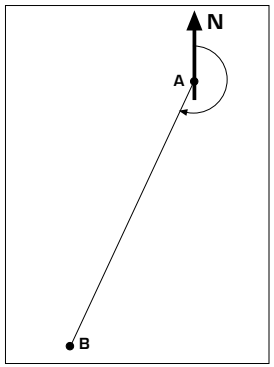
Most maps have a directional arrow indicating north, and topographic maps are generally designed so that north is at the top of the map. Just to make sure, check the direction arrow located near the legend. A compass can be used with a map in a number of ways. If we are observing a landscape, for example, we can lay out the map and then turn it around until the magnetic north arrow on the map is the same as the north shown on the compass. This is called orienting the map. It makes it easy to identify different features, which should be in the same direction as they appear on the map.

The bearing of a feature or place is expressed in terms of degrees from north, measuring the angle from north in a clockwise direction. North is 000°, east is 090°, and so on. (Note that bearings are always three figures to help avoid confusion.) True, magnetic and grid (i.e. map) bearings must be distingushed: 031° T, 038° M and 032° G may be all the same direction.



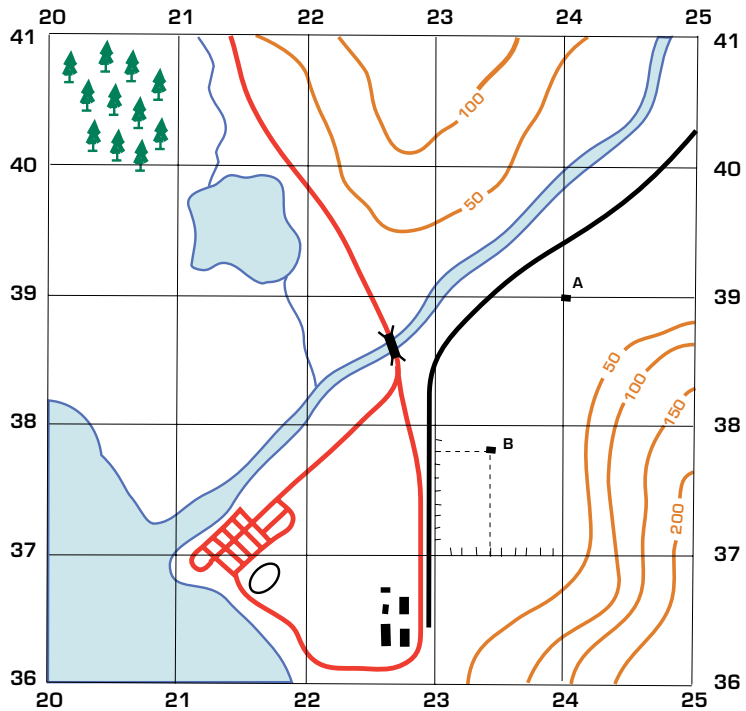






Grid references

The location of features on a topographic map can be found by using grid and area references. Grid lines are a series of numbered vertical and horizontal lines drawn on a map. The horizontal lines are called northings and the vertical lines are called eastings. Northings are numbered from the south to the north (bottom to top), and eastings are numbered from west to east (left to right).



To locate relatively small features on a topographic map a six figure grid reference is normally used. The first three digits refer to the eastings and the last three digits refer to the northings. Each set of three figures is referred to as a co-ordinate. The first two digits of each co-ordinate refer to the eastings and northings that surround the map. The third digit is obtained by dividing each easting and northing into tenths.

Example 1: Grid reference of point A

Point A is located exactly on the intersection of easting 24 and northing 39. The easting is therefore 240 (24 and zero tenths towards 25). The northing is 390 (39 and zero tenths towards 40). The grid reference of point A is 240 390.

Example 2: Grid reference of point B

Point B is located four tenths of the way between easting 23 and 24. The easting is therefore 234 (23 and four tenths towards 24). The northing is approximately eight tenths of the way between northings 37 and 38 so therefore it is 378. The grid reference of point B is 234 378.

Area references

Some map features (for example a lake or forest) can cover a relatively large area within a grid square. These features are usually located by means of a area reference. An area reference has only four digits. To find the area reference of a feature we first identify the easting line immediately before it and then the northing below it. This means that we refer to the eastings and northings of the lower left-hand corner of the grid square.

Where a feature extends beyond the one grid squares, the area should be based on the lower left-hand corner of the square that contains the main part of the feature.

Example: The area reference of the lake is 2139.

Latitude and longitude

On a marine chart latitude and longitude are used, not an arbitrary grid. Latitude is the angular distance north or south of the equator, measured in degrees, minutes and seconds: Adelaide is 34° 55' 42" S

Longitude is the angular distance east or west of the Greenwich meridian, also measured in degrees, minutes and seconds: Adelaide is 138° 35' 12" E

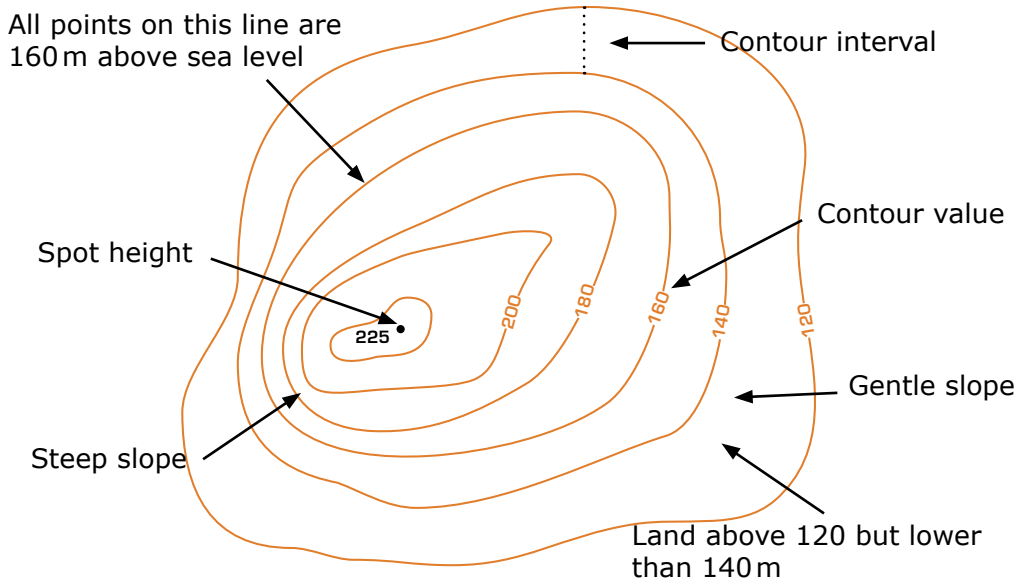
Minutes are often given in tenths rather than seconds (sixtieths).

Contour lines

Contour lines join places of equal height above sea level. Being able to interpret contour lines provides information about:

- the shape of the land
- the slope of the land
- the height of features above sea level.

Each contour line represents a particular height above sea level. The spacing of the contours on a map indicates the steepness of slopes. Areas where contour lines are close together have steep slopes, and areas where there are few contour lines widely spaced are very flat; where they are close the gradient is steep. The contour interval is the difference in height between two adjacent contour lines.



On the ground

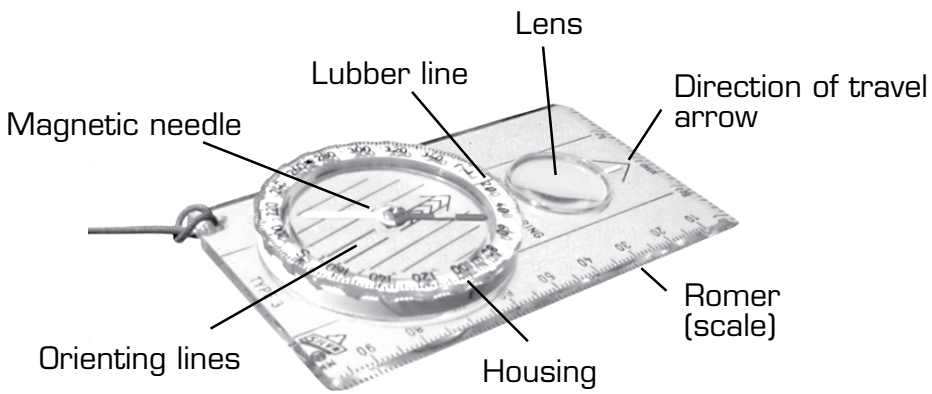
Estimating distances and time

An important part of trip planning to consider the distance ahead and the time needed to cover it. There are many different factors that will affect the speed of a group, including type of travel, load, weather conditions, terrain, and the ability and size of the group itself. Taking these variables into account, there are a few methods of judging distance travelled and the time still required to travel. For example, an experienced trekker who knows their paces over 100 meters can count their steps, establish the gradient of the route and thus estimate the distance travelled in a particular time frame. Alternatively they can measure the distance between two features on a map, and time their journey between these features to estimate their speed. As a paddler, similar techniques may be adopted with counting strokes and measuring time taken to travel between prominent features. Note that only practice and experience will enable accurate distance and time estimates.

For sea kayakers, a speed of 3 kn (3 nautical miles per hour) can be used in planning.

Compass use

A compass is a navigational instrument consisting essentially of a freely moving magnetised needle aligning itself with the Earth's magnetic field, indicating north and south. A compass is an essential item when navigating in difficult or trackless areas, and has these main features:



Compass errors

The magnetic compass is subject to two errors: variation and deviation. Variation comes about because the Earth's magnetic field is not aligned with the geographic poles: compasses point to magnetic poles, not the true poles. Variation varies across the Eath's surface, and through time. Maps and charts will indicate the amount of variation, whether it is east or west, the year it was measured, and the rate of change.

Deviation is caused by magnetic objects near the compass. Make sure you are not near iron, steel or electronic objects when you use the compass. In canoes and kayaks, stow the cans and radios away from the compass.

When you are navigating you will need to convert between Magnetic and True bearings. The rhyme 'Variation east, magnetic least; variation west, magnetic best' may help to remember whether to add or subtract.

Examples

True	Variation	Magnetic
227°T	7° E	220°M
050°T	5° W	055°M

Finding the direction to travel

A compass is primarily used as an aid to get from one location to another. It provides a direction in which to travel. To take a compass bearing:

1 draw the desired route on the map

2 orient the map to north using the magnetic arrow on the compass

3 line up the 'Direction of travel arrow' on the compass to the line on the map

4 rotate the compass housing so that the orientation marks sit over the magnetic north arrow

5 read off the compass bearing

6 add or subtract the magnetic variation as required

7 travel on this set bearing.

A kayak, especially a sea kayak, may have a fixed compass, mounted well forward on deck rather than a hand compass. The paddler will then use it to steer a course. The intended track will be drawn on the chart from departure point to destination and the bearing measured. On a marine chart it is customary to read the bearing from the nearest compass rose on the chart with parallel rules, but protractors can also be used.

Sea kayak compass: mounted ahead of forward hatch so that horizon is in paddler's peripheral vision

Route choice

An important part of planning a trip is choosing the route to be taken. Choosing a route in tracked areas is simple, as most of the trip will involve following a path or water course. In untracked areas, or areas where you will be relying on a compass bearing, careful route choice becomes essential. A number of factors will affect the final route selection. Some of these are:

- objectives of the session
- time available
- nature of terrain
- weather conditions
- type/amount of equipment
- ability of group
- specific logistical considerations of the trip (i.e. accessability, communications, emergency escape routes, etc.)

In untracked areas a thorough understanding of the area is vital, through diligent study of the map and, if permitting, a visual inspection of the route itself.

Some general principles can be applied to aid in route selection. A hiker, for example, might chose to follow a ridge-line where vegetation is sparse, rather than a creek-line where vegetation is thicker. Likewise, a paddler would find a journey easier following the tide or flow of a river, rather than moving against it. A group on an extended expedition might also need to remain near a water supply.

All these factors are interlinked, and most depend on the specifics of the trip itself.

Remember that sound route choice can only be made through thorough understanding of the area of operation.

Obstacle bypass

In untracked areas expect to come across an obstacle of some type, which could be anything from a cliff edge or waterfall, to a locked gate or sandbank. Likewise, obstacle negotiation could range from the simple act of walking or paddling around the obstruction, to changing the whole direction of the trip. Its size and effect on the trip will depend on the leader's evaluation of the circumstances (group's ability, risks involved, etc).

The method used to bypass an obstacle will largely depend upon the nature of the obstacle. In untracked areas and navigating on compass bearings it is critical that the obstacle can be bypassed without losing either the route or the set bearing.

An example: while hiking in an untracked area (on a bearing of 360°) you have encountered a body of water (Diagram next page):

1 judge the size of the obstacle

2 set a bearing 90° off from original (360–90 = 270°)

3 walk on that bearing (270°) until clear of obstacle face

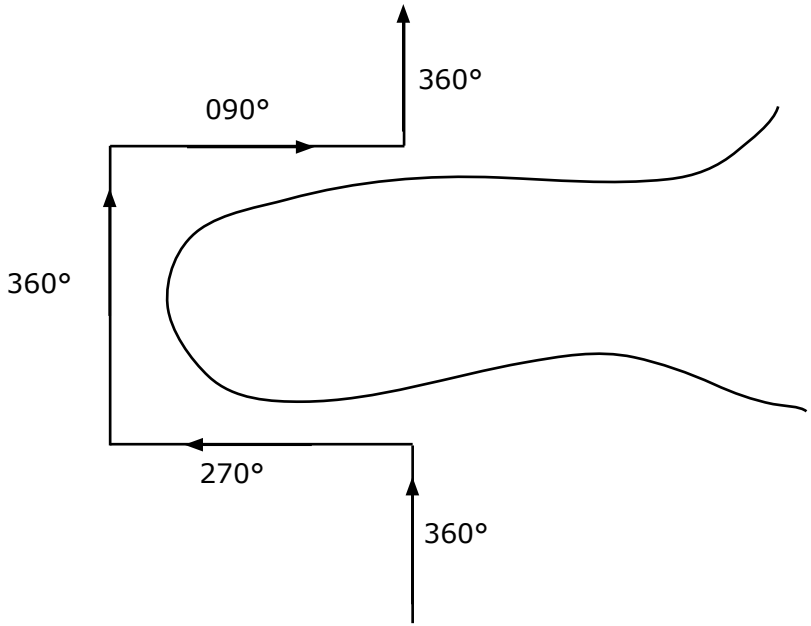
4 revert bearing to original (360°)

5 walk on original bearing(360°) until clear of obstacle width

6 reverse bearing 90° (360 + 90 = 090°)

7 walk on new bearing (090°) same distance as in step 3

8 Reset original bearing (360°) and continue.



Plotting a course

Unlike bushwalkers who can stop and spread out their maps paddlers have limited deck space and never really stop, even when they are not paddling. Everything needs to be prepared and plotted in advance: route, alternates, distances, estimated times...

The prepared map or chart should contain at least:

- the course(s) with bearings marked
- distance marked along the course
- expected times along the course
- any transits (lining up of features) should also be marked for easy reference
- any notes on hazards, etc. should also be noted

It then needs to waterproofed, either by lamination or enclosed in a waterproof case, and then fixed on deck, readily visible, but secured so that it is not washed off.

Navigation data sheet or float plan

As part of your planning you should complete a navigation data sheet (or float plan). It will not only help in the route choice, but will indicate specific information regarding the group's itinerary, estimated times, locations and trip specific considerations.

Once completed, a navigation data sheet should be copied and distributed to the leader or guide, the assistant leader or guide, and the organisation's office.

This will ensure that if any problems occur that enough people know of the group's whereabouts at specific times, so an effective response can be organised. National Parks and Wildlife in most States require that commercial or educational groups submit their plan to them. Often the requirement includes submitting the plan to the local police or rescue services as well. You need to check on the local requirements before embarking on any trip. Even on longer personal trips it is beneficial to submit your plans: it allows National Parks to inform you if back burning or other control processes are occurring in your area. It also gives them knowledge of your position in the event of bush fires or other environmental hazards. A minimalist format is shown on the next page, and a more comprehensive form is elsewhere in the resources.

Navigation techniques

Map to ground recognition

In difficult or trackless areas, it is quite easy to either lose the path (if there is one to follow), or lose your sense of direction. In these circumstances a compass is invaluable, but there will be an occasion where either the bearing is misread or misjudged, or the map is inaccurate.

The most important skill in navigating is the ability to visualise the map's description of the land and apply it to what you can see (and should see) around you. In simple terms, to visualise the map three dimensionally.

In this way an experienced navigator needs only a map to travel in even the most difficult trackless terrain. In thick vegetation it can be difficult to locate large features shown on the map, but the lie of the land can

Navigation data sheet

Group name: .....

Date commenced:..... Date due to return: .....

Maps used: .....

Contact details: .....

Stage	Objective GR	Magnetic bearing	Distance	Time	Height change	Comments
Start						

give you a clue as to your surroundings. Let's say you are trying to find a creekline, for example. The contour lines on the map can be translated to a gradient on the ground, and this can you give a direction to follow.

Similarly, translating the ridgelines and spurs on the map and applying them to the ground around you can be all you need to relocate your position. By doing this it is possible to navigate by the use of features, no matter how subtle, as well as (or even without) your compass.

Interpreting what a map says and applying it to the ground around you, map to ground recognition, is a skill that increases with experience and is fundamental to navigation in difficult, trackless areas.

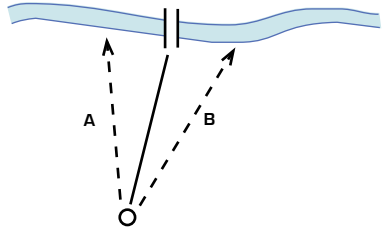
Searching

It may be necessary to conduct a search of an area, perhaps for a particular reference point or object. A common system of search is the spiral method. Simply start at a single point and move in a circular fashion outwards. As you move increase the diameter of the circle to form a spiral. This method is most useful for locating small point objects (e.g. a trig point).

Another method of search for smaller points (e.g. lost objects) is the sweep method. Identify an area appropriate to the size of your group, form an extended line and sweep through the area, making sure that each member keeps equal spacing and holds the line.

More appropriate in locating larger points, features or areas (e.g. campsite or water course) is the area box method. To carry out a box search, walk out from your start point as far as you can without losing visual contact with it (this is called one visual distance). Search around in a perimeter fashion from your central start point. If needed, walk out a second visual distance and again sweep the perimeter. With this box method, it is easy to search a large area in a fairly short time frame but it is not as thorough as the previous two search patterns.

Aiming off



When heading towards a particular point on a linear feature it is sometimes more prudent to aim off. In the diagram a group is travelling through an untracked area towards a bridge over a river. If the group aims directly for the bridge (unbroken line) and fails to find it when they reach the water they would be unsure of which direction the bridge lies. They would then have to conduct a search both ways along the river. If however, the group decides to travel slightly off their compass bearing (path A or B), they will end up definitely on one particular side of the bridge, so would be sure of which direction to find it.

Backbearings and resections

A backbearing is the 180° opposite bearing on which you are travelling. To work out a backbearing, simply add or subtract 180° from the original bearing. For example, if you are travelling on a bearing of 120°, the backbearing would be 300°, the exact opposite direction (i.e. the direction back down your trail).

Backbearings are useful in retracing your steps, guiding people into your location, and locating your position in reference to someone or something (i.e. a feature).

A resection is a technique used to locate your position on a map. It can be used if you know you are somewhere on the map, but unsure of the exact location. As with all of the skills of navigation, although fairly simple in theory, resections require practice for accuracy. The steps:

1 identify three prominent features on the ground and on the map (the more distinct, the better)

2 take compass bearings to them

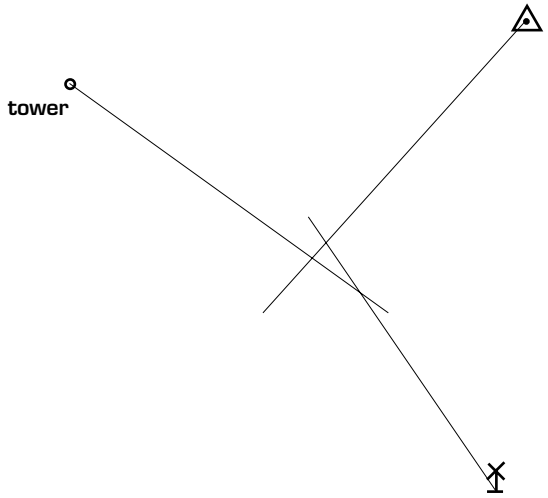
3 convert to grid bearings (add or subtract variation as required)

4 convert them to backbearings (+/- 180°) or simply use the compass backwards

5 draw in bearings on map to form a triangle of error (where the lines intersect)

6 locate your position inside the triangle using map to ground recognition.

A resection is a valuable technique in locating your position when you think you are lost.



Additional navigational aids

There are many more aids besides a map and compass available to the navigator. Mariners for hundreds of years have relied upon the use of the sun and the stars for precise position fixes. The Southern Cross constellation at night and the Sun during the day can be used to estimate direction.

To estimate true north during the day, for example, orient your analog watch — set to standard, not daylight saving, time — so that 12 o'clock faces the Sun (i.e. face your watch the opposite way shadows are falling). Identify the angle created by 12 o'clock and the hour hand. Bisect this angle to locate true north. Because of changes in day length between summer and winter, this method can be in error by as much as 30°.

The Global Positioning System (GPS) can locate your position by the use of satellites to better than 25 m accuracy. Although very user-friendly, GPS receivers are affected by tree cover, weather conditions and battery power. They are an excellent aid, but like all aids, should never be used without the backup of a map, compass, and — most importantly — knowledge of the location.

GDA94

In 2000 Australia changed to a new geodesic datum, GDA94, equivalent to the WGS84 datum used by GPS. Maps based on GDA94 will bear the GDA logo and a table for converting latitude and longitude and the Australian Map Grid between old and new data. Charts will have notes referring to WGS84 and satellite derived positions. Be aware of the need to convert if you are using a mix of old and new maps or charts, or are using GPS with old maps.

Acknowledgement

This module was written and illustrated by Peter Carter, based on earlier material.

Perform deep water rescues

Objectives

On completion of this unit, students should be capable of:

- using the relevant rescue for the environment and craft
- performing a safe and efficient rescue
- understanding the different types of rescues and their relevance
- competence in all aspects of deep water rescue

Rescues

By 'rescue' we mean the emptying of a kayak or canoe and the return of the paddler(s) to the cockpit after a capsize. Capsizes happen when paddlers are in conditions beyond what they can normally handle, either because they are trying something new, or because wind and waves have risen. The rescue must be achieved in the conditions that caused the capsize and the rescue will also put the paddler back into the conditions that led to the problem in the first place. The more buoyancy in the boat, the easier it will be to rescue, so add more buoyancy to your boat. All boats must have secure handholds at bow and stern, and those used on open water will be easier to handle with decklines as well. Toggles are the safest handholds, but many recent boats have simple handles that are difficult to reach and potentially injurious when capsized.

The first priority in all rescues is the capsized person. Make sure the person is calm and relaxed and ignore any floating gear until later.

A paddler who capsizes and exits their kayak close to a safe landing may simply be directed to move to the bow, grasp the handhold with one hand and the paddle with the other, and swim to safety. In moving water they should be upstream (or seaward) of the kayak to avoid injury should the kayak be driven towards them.

In extremely turbulent water maintaining contact with the kayak may be too hazardous, so the boat may be let go and the swimmer should then head to the safest location for rescue. (Rescues with throwbags are described in the resource on whitewater rescues.) The kayak is a danger to other users of the area so call out a warning to them if required. Be aware of other hazards in the area such as overhanging branches, rocks or possible underwater obstructions and other craft and avoid them. Once the boat is on shore, empty it by placing it on its edge: most of the water will flow out, then lift the bow and stern in turn to remove the rest.

If it is not possible for the victim to swim to a safe landing a partner rescue will have to be used. There are several common types and it is good to know all of these and be able to use the best one for any given situation, considering the equipment on hand, the boat type and the conditions. The most important element of any rescue is to get the victim out of the water and back into their boat as quickly and safely as possible. Immersion in cold water quickly saps strength and coordination and is hazardous. As the rescuer you must take control, approach the victim quickly but in a safe, controlled manner: do not risk your own safety. If the victim has let go of their paddle collect it if practical, otherwise leave it to someone else or later.

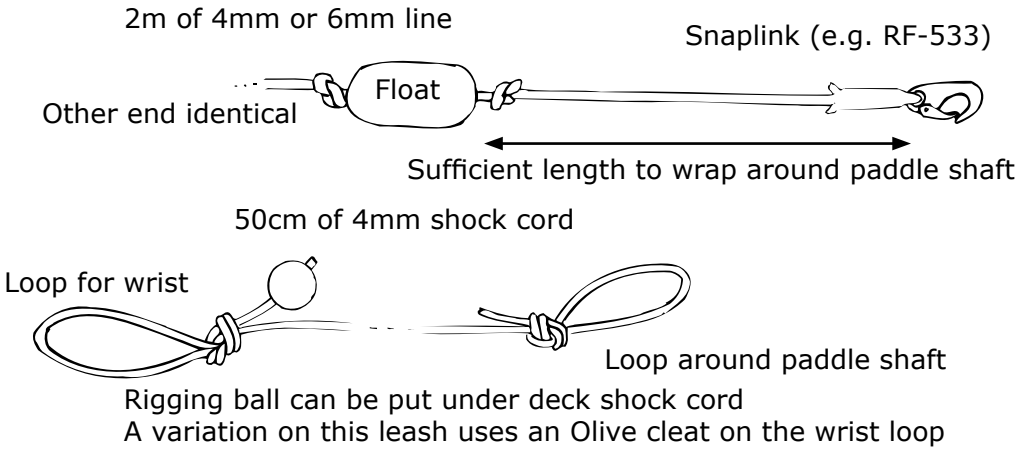
Check the condition of the victim and give reassurance and explain the rescue method: ensure they keep hold of the bow handhold of your craft: wind or currents can quickly separate the rescuer and rescuee. Carefully observe the victim throughout the rescue and look for signs of injury, hypothermia or shock. Once the rescue has been completed do not release the victim until you are certain that they are capable of continuing paddling. Remember the rescue has put the victim back into the conditions that caused them to capsize in the first place. If you are

unsure of their paddling confidence keep supporting them and organise a supported tow to the nearest safe landing.

There are conditions on rivers and in the sea where environmental hazards may make a partner rescue impracticable. In surf or caught in a rip traveling towards breakers, or when in or approaching rapids, see to your own safety first while keeping the victim in sight. When the hazard passes move in for the appropriate rescue. There is no point in becoming another casualty requiring rescue.

Equipment

As an instructor or group leader you will need to be prepared to do rescues and towing. Make sure your own boat is easy to rescue in case you have to rescue it yourself with minimal assistance. Keeping track of the paddle has always been a problem, and sea paddlers have long used some form of paddle leash or park. Two types are shown in the diagram. As with all ropes, be aware of the possibility of entanglement.

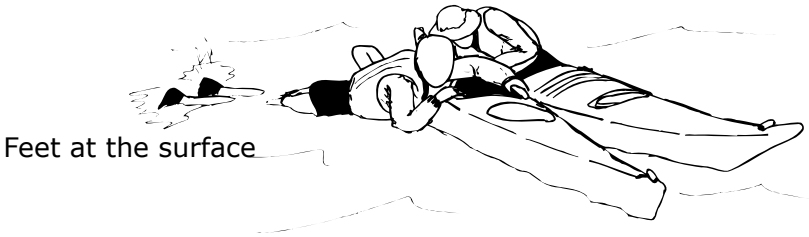


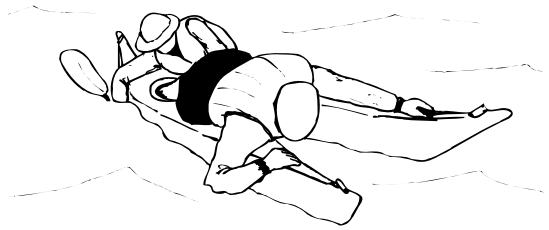
Reboarding

All rescue methods eventually have the swimmer reboarding, so it is worth considering first. There are alternative methods, depending on preferences and conditions, with all methods requiring a stable raft. That is achieved by having the boats facing in opposite directions and the rescuer putting as much weight as possible on to the swimmer's boat.

Reboarding over rescuer's kayak

Reboarding over swimmer's kayak





Lie face down, put feet into cockpit. Roll face up, wriggle forward, sit up when over seat

Reboarding is possible over the rescuer's or the swimmer's boat, with the choice often based on individual preference. By staying low and spreading weight across both boats the raft will be stable, and the swimmer less likely to slide off.

The rescue is not complete until the spray deck is in place and the rescuer satisfied that the rescuee is ready to continue.

Key points

Stabilise

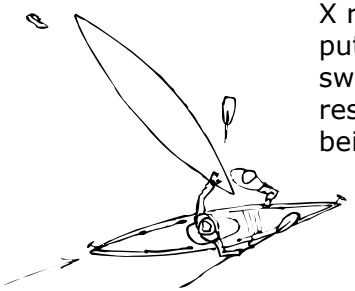
- Lean hard on the rescuee's boat, with the peak of the deck in your armpit. That hand can hold the rescuee's paddle
- Hold the cockpit rim with your other hand, ready to assist the rescuee if necessary

Reboard

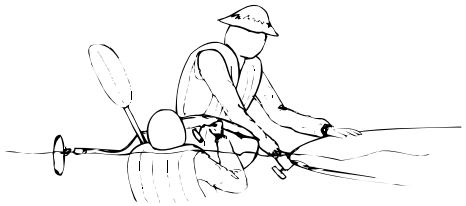
- Move around the raft to the cockpit
- Rescuer's weight on rescuee's boat
- Put one hand each side of the cockpit rim
- Kick the feet to the surface
- Make a breaststroke kick and pull with the arms to come across the deck
- Keep moving, face down, until the feet are in the cockpit
- Roll face up, and wriggle forward until over the seat
- Sit up

The X rescue

This rescue is a versatile rescue used for general purpose and white water kayaks. The victim of the capsize leaves the kayak inverted and holds the bow (preferably) or stern handhold. On approach the rescuer takes the bow from the victim who then grasps the bow handhold of the rescuer's kayak. The victim can take care of paddles. The rescuer then hauls the inverted kayak across their foredeck keeping both kayaks at right angles. It is advisable to keep the inverted kayak off your spray deck as it can cause damage. The water is emptied from the kayak by seesawing it.



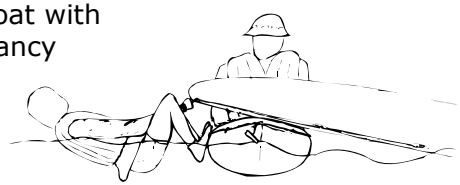
X rescue: contact The rescuer is putting leashed paddle aside, the swimmer is transferring to the rescuer's boat. The floating hat is being ignored



The initial lift: nearer hand on on the hull, other hand gripping the toggle

Seasawing the boat, both hands holding cockpit rim, nearer edge higher

Dealing with a boat with insufficient buoyancy



When the kayak is empty it is righted, then slid off the rescuer's boat and placed alongside the rescuer's kayak, facing the opposite direction, for the swimmer to reboard.

Although the victim can assist in hauling their kayak across the rescuer's boat, which may be necessary if the boat has insufficient buoyancy, the rescuer normally does the entire rescue. This makes it ideal for Instructors or leaders of inexperienced paddlers.

Key points

Swimmer:

- Leave the boat inverted
- Hold it by the bow (preferably) in one hand, with the paddle in the other
- Ignore anything floating away: let go of your boat and it can drift faster than you can swim

- Watch for your rescuer: if necessary swap sides so that your boat is between you and the rescuer's boat when it arrives

Rescuer

- Put your paddle into its leash
- Talk to the rescuee, giving clear, concise instructions
- Plan your approach to pick up the rescuee and boat in one move
- Have the victim transfer to your bow
- Place your nearer hand on the upturned hull
- With the other, grab the toggle or end loop
- Lean on the boat, and then push away to give some impetus for the lift
- Use the deck lines (if present) to haul the boat across: be quick at this stage to avoid the stern filling
- Grab the cockpit rim as soon as you can reach it, then drag the boat to and fro to drain it
- Have the nearer side slightly higher so that it clears your own cockpit rim
- Do not try to remove every last drop: you will not be able to do so and will waste time if you try
- Do not try gripping the upturned hull unless you have hands like octopus tentacles
- If the boat is waterlogged (because of insufficient buoyancy), you may find it difficult to handle: let the rescuee do some work:
  - the rescuee reaches across the rescuer's deck to grasp the handhold of the capsized boat
  - drag it across the deck
  - with feet on the gunwale, keep pulling until the cockpit is over the rescuer's deck
  - pull downward to begin draining
  - the rescuer must hold the boat by the cockpit rim as usual
  - the rescuee must stay in contact at all times, and return to the rescuer's bow

Launch

- Put the boat back into the water, on the side opposite from where you picked it up and facing the opposite direction

X rescue for open canoes

The method is similar to the X Rescue for kayaks, and for rescues from another open canoe, it is usually the stern paddler who does the work

- If necessary, and there is space among the gear, the bow paddler can turn round to assist
- The rescuee hanging on the bow of the rescuing canoe can help to stabilise it
- The canoe may roll itself upright as you begin the lift. If that happens, simply keep lifting and dragging the boat across your own gunwale, and water will spill out as the boat rises
- Ignore any floating drums and other packages until the rescue is complete

Flip and pump

This rescue is for sea kayaks fitted with a hands free pump and is the quickest way to get the victim into their kayak and paddling. That makes it the method of choice for rescues near surf breaks, where there is danger of being swept against a cliff, etc.

The capsized paddler rights their kayak after leaving the cockpit, and if the pump is electric, switches it on. The victim then moves to the bow of their kayak and holds on to boat and paddle. The rescuer moves alongside the victim's kayak to stabilise it for reboarding.

As soon as the paddler is back in the cockpit he or she can paddle away from danger, letting the pump do the work, and leaving the spray deck until in a safe position.

This rescue assumes minimum volume cockpits which can be paddled when flooded. (Some boats will need to have buoyancy material fitted in the cockpit.) It's something worth practising.

Wedge rescue

This is one of the fastest methods of clearing the cockpit of water. The victim rights the kayak after leaving the cockpit, moves to the bow and waits. The rescuer approaches the victim's bow with an angle of 45–60° between the two. As the rescuer's bow crosses that of the rescuee, the rescuee transfers to the rescuer's bow. The rescuer grasps the swimmer's kayak by the deck lines and pulls so that it rides up onto their foredeck.

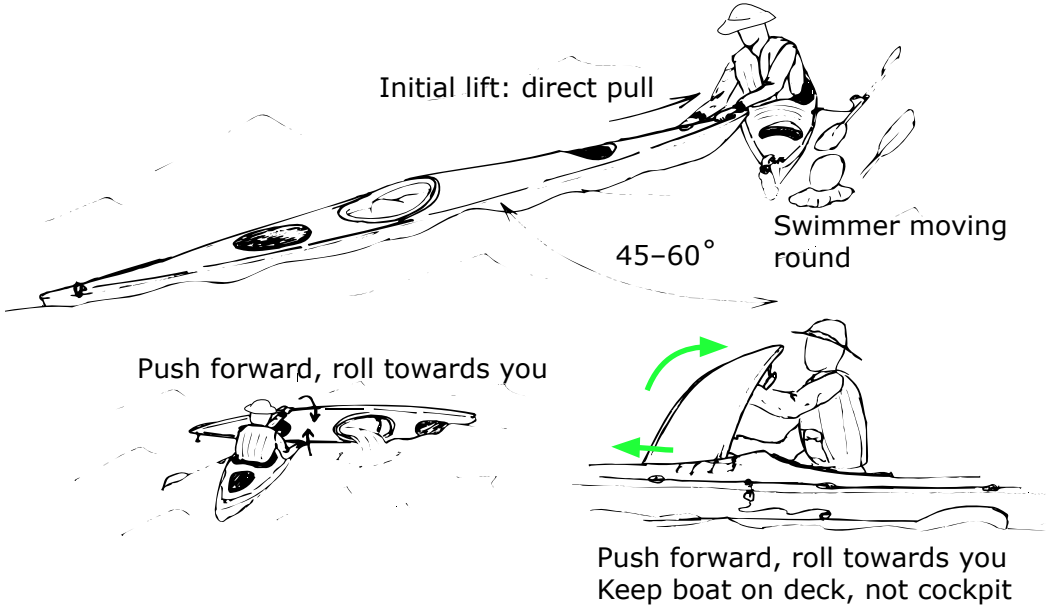
Time the pull with wave action to save effort and avoid being speared. When the cockpit is clear of the water the boat is pushed forward on the deck clear of the rescuer's cockpit, and rolled towards the rescuer to drain. The kayak is then righted and slid off the deck and supported for the victim to re-enter.

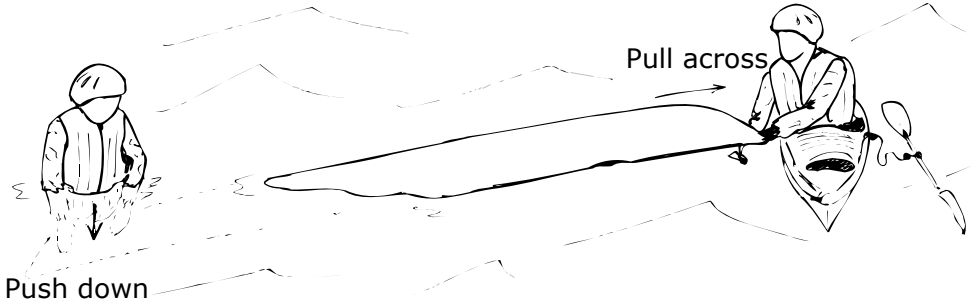
Key points

- Grab the bow of the boat by the deck lines, with an angle between the boats of 46–60°
- Pull the bow: it will come up and across in front of you
- Keep pulling until the cockpit is clear of the water
- Push the boat forward on the deck and roll the boat towards you and watch the water draining. (Do not try to remove every last drop: you will not be able to and will waste time if you try)
- Roll the boat upright and slide it back into the water facing the opposite direction
- Re-entry is by any of the methods shown above

The Swimmer assisted rescue

In this rescue the victim leaves the boat inverted and moves to the stern. The rescuer approaches the bow with kayaks at an angle of 90° and grasps the bow. The victim pushes down on the stern to lift the bow as the rescuer draws the kayak over their deck until the cockpit is clear of the water, allowing it to be drained. The kayak is then righted and pushed back into the water and supported for the victim to re-enter.

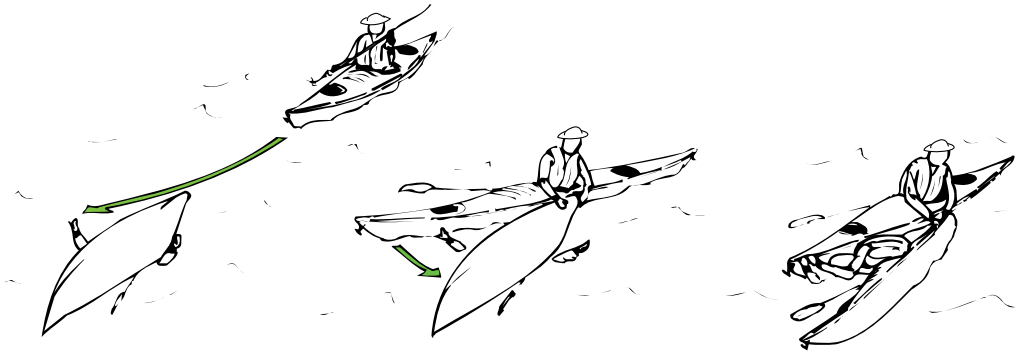




Eskimo rescue

The Eskimo* rescue is useful, since the victim does not have to leave their kayak. On capsize the victim remains in their kayak in the tuck position and bangs hard on the hull to attract attention. The arms are then moved slightly away from the hull and waved back and forward waiting to feel the rescuer's bow. The rescuer aims at the nearer end of the victim's kayak, grabs it with both hands, and swings their bow within reach of the victim who can then roll up on it.

*The word 'Eskimo' means 'eater of raw meat', a derogatory term. The Arctic peoples called themselves Inuit, 'the people'.



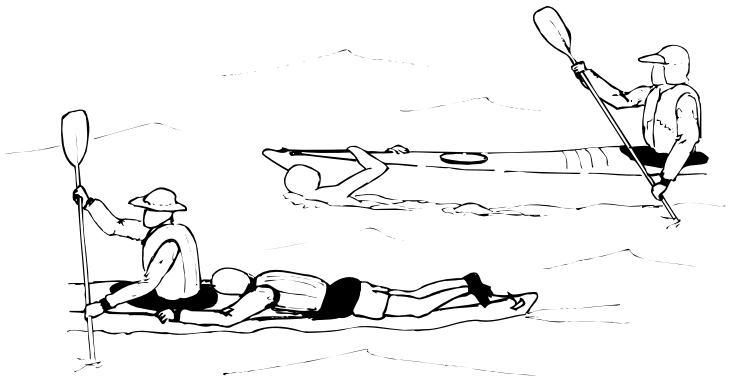
There are other variations of this technique, however this is the safest and preferred method.

Key points

- The rescuee waits in the boat, tapping on the hull, running their hands along the sides of the boat, and swimming up for air if need be
- The rescuer aims at the nearer end of the rescuee's boat, grabs it with both hands, and swings his or her own bow within reach of the victim, who can then roll up on it.

Deck carries

If a paddler has been separated from their kayak or their kayak has been severely damaged it may be necessary to carry them to safety on the rescuer's boat. A paddler may also come across a swimmer in need of assistance. There are several carry methods.



Towing

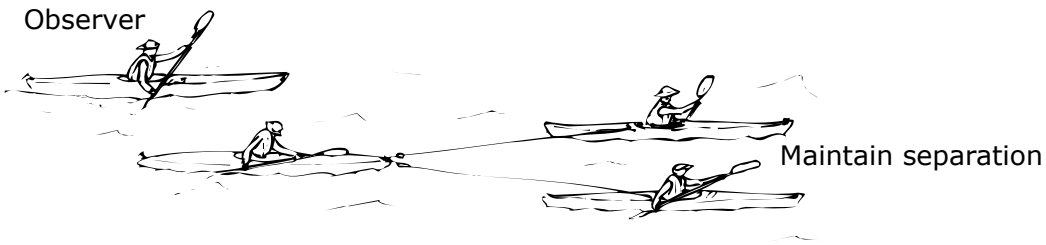
There is always the possibility that a group member may become incapacitated by illness or injury, and is then unable to keep up with the group's pace or even paddle on at all. This paddler will need to be assisted to a safe landing.

If the distance is short, the tow can be done by having the incapacitated paddler lean on your foredeck while you continue paddling, reaching over the other boat to put the blade in on that side. Short tows can also be done using paddle leashes, loops in deck lines and so on. For paddling any distance however, a proper towline is necessary.

Towlines exist in two main forms: those attached to the paddler, either as a belt or as part of a PFD harness, and those attached to the boat. The latter is preferred at sea, where the forces can be considerable, and tows tend to be over longer distances. (Towing at sea is described in greater detail in the 'Perform deep water rescues: Sea' module.) A length of shock cord in the system can be used to take up the 'snatch'. Whichever system is used, it must be easy to deploy and have a reliable quick-release system.

Towing requires skills that should be developed in calm conditions before they are needed in a real situation. Towing in heavy seas and high winds or fast flowing water is demanding of both paddling skill and energy reserves. Towing also requires effective group management. Regular practice is worthwhile.

At the start of a tow it is essential that all group members are aware of their role. The paddlers who are in good condition should perform the tow. If one paddler is having difficulty there are usually others who are also not coping as well. The towline should be attached to the bow of the patient's kayak and deployed gradually as the tower moves forward to prevent entanglement. This should be done quickly as there is a risk of impact injury or equipment damage if kayaks are thrown together in rough conditions. Towing requires more energy and concentration and should be rotated through the group at regular intervals. Compatible towline systems make it possible for a single line to be passed from paddler to paddler in turn.



Another paddler should be positioned alongside the patient to provide emotional support and monitor their condition. If the patient appears in danger of capsize the support paddler should quickly form a raft with them. A capsize in these circumstances will most certainly lead to complications.

Communications from the towers to the patient are difficult, particularly in windy conditions. As a tower it is difficult turning around to check the condition of the patient, and a 'point' paddler out to the side of the tow can keep an eye on the whole set-up and relay messages.

There are several towing methods that can be used depending on the conditions, the ability of the group, and the level of incapacity. A single tow is used where the incapacity is slight or for a tired paddler who is able to provide some power and directional control.

Towed boats have a tendency to wander, and must be kept in line behind the towing craft by the paddler steering as necessary. Care must also be taken to avoid catching up to the towing craft or jerking the towline suddenly.

A double tow is performed by two paddlers assisting the incapacitated paddler and can be an in line or V formation. This may be useful when battling into head winds or where the patient is unable to paddle. The tow will be faster, but the towers must be careful to maintain their direction and separation.

Supported tows are necessary when the incapacitated paddler cannot support him or herself. Another kayak can be rafted to the patient's boat for support and reassurance. A double tow is essential if good progress is to be maintained. The supporting paddler will use considerable energy controlling the patient's kayak and keeping the raft together, so supporters need to be changed at regular intervals.

Key points

- For flat water use the towline can be short, 5 meters or so, while sea boats will need towlines as long as 15 metres
- Stow the towline where it is readily accessible, but not where it will be in the way
- Single tows require that the rescuee steer straight behind the towing kayak, otherwise the boat will veer from side to side. If necessary, have a third person supporting the incapacitated paddler
- With someone completely unable to paddle and requiring constant support, the double tow may be required
- Keep the towing boats parallel about two metres apart (interesting in heavy conditions)
- Having the strongest and fastest member of the group tow the slowest member can be a useful method of keeping a group together: almost like putting the two together in a double

Acknowledgement

This resource was written and illustrated by Peter Carter, with additional material by Ian Dewey.

Undertake risk analysis of activities

Objectives

On completion of this topic, students should be capable of:

- defining and understanding hazards and their associated risks
- facilitating the risk management process
- using a risk management tool
- competently identifying hazards and assessing risk

Risk is part of our daily lives and is an integral part of sport and recreation. As individuals and as a society we continually manage risk: sometimes consciously, often without realising it, but rarely systematically. Once, the management of risk was driven by self-preservation and a moral duty of care for others. Now this has been overshadowed by more powerful legal and economic imperatives.

The systematic management of risk is now refined as a modern management tool essential to all areas of business. A good deal of risk management is common sense. The complexity for paddling activities lies in the diversity of situations, organisations and activities to which it may be applied, and the human factors associated with interpretation and implementation.

Definition of key terms is needed to understand the process.

Hazard

Hazard means anything (including work practices or procedures) that has the potential to harm the health or safety of a person. In the broader sense a hazard is anything that may stop you achieving your objectives.

Risk

Risk is the significance of the hazard in terms of likelihood and severity of any possible injury, illness or outcome.

Risk assessment

The process of evaluating the likelihood (probability) and consequences of injury or illness arising from exposure to an identified hazard or hazards.

Risk management

The systematic application of management policies, procedures and practices to the task of identifying, analysing, assessing, treating and monitoring risks.

Concept of risk

One of the appeals of paddling activities is that they involve a level of risk.

Risk may be absolute, real or perceived.

Absolute risk is the uppermost limit of the risk inherent in a situation (no safety controls present). The absolute risk for any activity at a certain point in time is constant.

Real risk is the amount of risk, which actually exists at a given moment in time (absolute risk adjusted by safety controls).

Perceived risk is any individual's subjective assessment of the real risk present at any time. Paddlers' perception of risk is based on their knowledge and experience, and also their perception of how well their skill level matches the challenges they are presented with. For these reasons, the perceived risk for any activity differs from person to person and may not be related to either the real risk or the absolute risk.

Whitewater paddling example

In a section of river is a small waterfall with a hole underneath it and a moderate stopper: the hazard is the stopper:

- its absolute risk could be drowning (as the consequences) with a likelihood of 'unlikely' due to moderate flow
- its perceived risk, by a novice paddler, could be capsize and getting wet
- its real risk may only be limited to capsize due to the presence of instructors controlling the route and on-site for immediate rescue
- the outcome may be that everyone gets through without incident.

The key to achieving both the goals of the activity and ensuring an acceptable level of risk is to ensure a good match between the real risks of an activity and the competence of the participants to meet those risks. Competence in the activity in itself allows a realistic appraisal of risks, reducing the gap between real and perceived risk to safe levels.

Reasons we should manage risk:

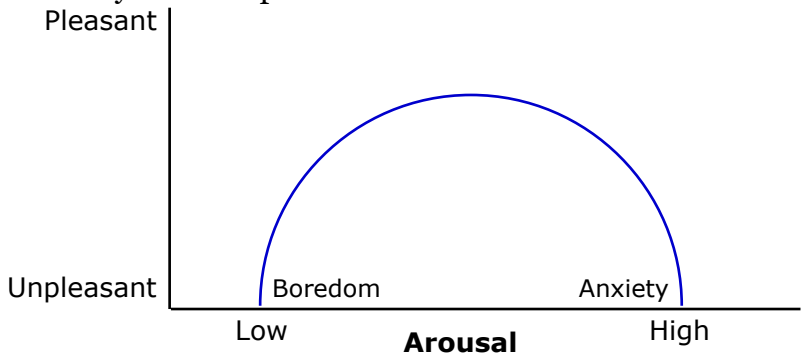
- safety of participants
- liability control
- insurance
- compliance with the legislation and organisational procedures
- image control.

Flow and arousal, why running rapids is part of executive training

An increase in perceived personal risk results in an increase in the production and release into the bloodstream of adrenaline which in turn increases heart rate, breathing and oxygen uptake as well as the release of endorphins and other chemicals preparing a person for action. To some, often termed 'adrenaline junkies', this is highly addictive. These adrenaline junkies can't get enough of high perceived risk activities. To a lesser extent much of society get a mild high from the adrenaline 'hit' and experiences a sense of relaxation as the adrenaline release subsides after the activity.

In a different but no less addictive way, exercise releases endorphins which prepare the body for further exercise or muscle and tissue repair. Again, people can get hooked on even mild releases of these endorphins. Both of these effects can lead to people working at higher than normal levels of risk 'just for the thrill of it'.

In 1955 Hebb suggested a concept called 'optimal arousal', proposing that humans could gain feelings of pleasure from activities that provided a 'medium' level of stress (or perceived risk). Activities with little or no risk are perceived as boring, activities with too much risk cause high levels of anxiety and less pleasure.



Outdoor activities are used as a medium for personal growth, development and team building. The perceived risk in these areas is used as part of the catalyst for growth.

"The best moments usually occur when a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile." – Mihaly Csikszentmihalyi

Csikszentmihalyi pioneered a concept called 'flow' in an attempt to give understanding to times when activity gives euphoric feelings. Note studies have failed to record any physiological changes when people report achieving flow, suggesting it is 'simply a good feeling' that occurs when 'it all seems to go right'.

The concept of a Peak Experience is similar and also very important. Peak Experience is defined as the pleasurable feeling someone gets when performing to their physical and sensory potential. When a person's competence matches the activity demands, they tend to enjoy the

experience, often to a euphoric state. Both risk and uncertainty play an important role in Peak Experiences by heightening concentration.

It should be noted that sensory overload leads to a limiting of the capacity of a person to process further input, confusion and distraction and a lowering in general performance. Sensory overload can and does occur when a person feels a very high level of personal risk.

We want risk on a personal scale, risk assists in training, risk is part of life, however risk requires management.

Effect of high profile accidents/incidents/losses

Frequently, media coverage of accidents, incidents and losses affects:

- the community's perception of the risk associated with a paddling activity
- the community's standard of an acceptable risk associated with an activity or program.

The risk management process

Every State in Australia has a body that regulates Occupational Health and Safety. As part of their scope, they define a risk management procedure which must be followed in the workplace. They include the identification of hazards and the elimination or control of risks in the workplace. For an Instructor or Guide, the workplace is wherever you take a group. Copies of all of the acts and their relevant regulations are available freely on the Internet. You should know the sections relevant to your State and activities.

Professional or volunteer

There are various acts and legal precedents, state and federal, that alter the obligations and responsibilities of people in regards to risk management depending on their professional standing.

Various acts and precedents exist under the term of 'Good Samaritan' acts. These are things such as rendering first aid to someone who collapses near you in the street. These acts protect people who act to the best of their ability to help those in need.

There are also various state acts, loosely termed civil liability acts, that cover the conduct of volunteers reducing their obligations in regards to 'reasonable' acts and limiting their liability in the event of civil claims.

However when you act in a professional capacity, you are required to provide a duty of care that includes a requirement to:

- Warn — duty to warn about hazards
- Instruction — provide instruction prior to activity where required
- Suitable Equipment — suitable and in good condition
- Vigilance — internal and external lookout for hazards during the activity
- Hazard Identification — preliminary and ongoing
- Instructor competence — provide competent instruction and leadership

Risk management process summary

The process involves the following sequence of steps:

- define the scope
- establish the context
- identify the risks
- assess the risks
- treat the risks
- monitor and review

Define the scope of application

Decide what you are applying the process to. An organisation? A program? An activity?

Establish and understand the context

This step establishes the strategic, organisational and risk management context in which the rest of the risk management process will take place. The strategic context is the relationship between the organisation and the environment in which it operates — the external influences on the organisation.

The organisational context is the understanding of the organisation and its capabilities, goals and objectives—the organisation and its operations.

The risk management context will establish the criteria and standards against which identified risks must be evaluated—the risk profile of the activity for which the organisation exists.

External influences on the organisation include the following:

- There is a greater public awareness of legal rights, which has increased the exposure of sport and recreation organisations to litigation
- There is a greater tendency for people to accept less responsibility for their own actions and to seek to blame others for their misfortune
- The diminishing 'halo effect' pertaining to non-profit organisations. Such community service organisations once had some immunity from adverse actions in the past, but it would be most unwise for any group to reply on this effect for protection now
- A tightening economy has resulted in a wider application of the 'user pays' principle. With this has come increased expectations of the level of service provided
- A commercial focus on the management of sport and recreation facilities has seen an increase in charges as owners/managers seek to break even or make a profit
- The increasing complexity of today's world means that sport and recreation volunteers require a higher level of expertise and training, and are harder to recruit and retain
- With more opportunities to participate in a wider range of activities, organisations are being introduced to the realities of a competitive market place
- There is an increasing number of casual participants who want the opportunity to participate, but do not wish to make any long-term commitment to the sport

Internal influences on the organisation include its structure, membership, goals, activities and method of operation is also important in establishing the context in which we should view risk. Consider the following questions:

- What statutory requirements must the organisation/activity meet?
- What standards exist that apply to the organisations operations?

(Australian Canoeing has a Safety and Risk Management Policy and Safety Guidelines.)

Identify the hazard, determining the risk

Risk identification is the process of determining what potential harm can happen, what will cause it to happen and how it will happen. Identification of risk requires a mix of knowledge, experience, lateral thinking and pessimism. It is necessary to look beyond the familiar.

A thorough approach to the identification of risks involves three steps:

- identify the hazards (sources of risk): what are the hazards?
- identify what could be the outcome(s): what are the effects or consequences?
- identify how likely the outcome is: what is the likelihood of the effects or consequences?

It is also important to consider the factors that may increase or decrease likelihood and consequences of the event.

Sources of risk can be broadly classified into external and internal risks.

- external sources of risk are all those eventualities that are not under the control of the organisation (e.g. natural events, bankruptcy of a subcontractor)
- internal sources of risk are eventualities that are subject to the organisation's control (e.g. group management, equipment failure).

In addition to the division between external and internal sources of risk, we can also classify them according to the headings listed below:

- environmental: those sources of risk associated with external environmental influences, such as weather, terrain or a building

- human/people factors: those sources of risk which are associated with aspects such as poor communication, lack of knowledge of rules or important information, or behaviour
- equipment/product: those sources of risk that result from poor equipment such as faulty footwear, damaged vehicle
- process/procedures: those sources of risk which arise if regulations and safety guidelines are not followed, such as failure to 'warm up' clients prior to activity, failure to use protective equipment or not providing a first aid kit when guidelines specify it.

Risk identification approaches

Broad thinking and research will help in identifying a list of potential risks. Information sources for identifying risks include:

- brainstorming
- checklists
- scenario analysis
- personal experience and judgement
- industry experience
- records
- survey, questionnaires

For example, you might use:

- accident report records to determine the risk of physical injury during paddling activities at a particular location
- checklists of usual risks associated with an activity at a venue
- brainstorming by experienced paddlers about the risks that may be encountered during a trip on a new river
- past weather reports for a particular date/time of the year to determine the risk of bad weather when conducting a paddling trip

Understanding your context

It is rare that incidents and accidents occur during the main paddling program. This is the result of a number of factors including:

- The low impact nature of much of paddling
- The high level of activity skills amongst guides and instructors
- The focus given to the main activity

Most accidents and incidents occur when the activity and its participants impact with a factor outside the main activity such as

- Hazards in the carpark (broken glass, skateboarders, etc.)
- Unexpected powerboats in the area
- Group dynamics concerns

To conduct a thorough risk management process it is important to consider the aims and objectives of other people both in and out of your activity

- The parents who see you as cheap child minding
- The fishermen who see you as 'in the way'
- The participant who only attends your activity to meet people

It is also important to consider the wider context of your activity. Court guidelines on incidents state that whilst you have the power to influence you have a duty of care.

Never forget the changing nature of the outdoors. Nothing is stationary: at any time the temperature will be increasing or decreasing, cloud cover changing, light increasing or decreasing, etc. The context of an activity will vary during the activity, varying greatly if you are slowed by unexpected events.

Finally, give thought to both long and short term risks. Much of the focus on risk management is drawn by high profile events such as a car crash, fire, capsize or getting caught in a stopper, however longer term risks such as a sore lower back leading to injury due to poor seat design and bad posture accounts for a greater number of people who exit the sport of paddling.

Evaluate the risks

Assess risks

Risk assessment is the process used to determine priorities by evaluating and comparing the level of risk against program standards or other criteria. It should be noted that OH&S guidelines require that you 'minimise the risk to the lowest level reasonably practicable'.

Possible methods in analysing risks:

- qualitative: experience, judgement and intuition
- quantitative: gathering of numerical data for full analysis

In sport and recreation, quantitative analysis is rarely used. Those with reasonable knowledge and experience will find qualitative assessment the most practical to use.

The key questions asked in assessing risks:

- what are the current controls that may detect or prevent potential or undesirable events/outcomes?
- what is the likelihood of the event occurring?
- what are the potential consequences of the events if they occur?

Qualitative analysis

While some hazards may produce a severe impact, others may be less serious, but happen more often. Hazards must be risk evaluated in terms of (i) how severe the potential impact/event may be (to providers, participants or consumers), (ii) the likelihood of the impact/event happening and (iii) the consequences of the impact/event.

A method of evaluating hazards is to classify the level of the risk according to pre-set definitions. Table 1 is an example of a 'risk calculator' that can be used to evaluate the hazards that have been identified in step 1 of the risk management process. First, evaluate the likelihood of an impact/event occurring, and then evaluate the consequences if the incident occurred. Find the intersection between the likelihood and the consequences and that will calculate the level of risk. The level of risk that is calculated will help in deciding how to treat the risk.

Likelihood	Extreme	Very high	Medium	Low	Negligible
almost certain	severe	severe	high	major	significant
likely	severe	high	major	significant	moderate
moderate	high	major	significant	moderate	low
unlikely	major	significant	moderate	low	trivial
rare	significant	moderate	low	trivial	trivial

(*Guidelines for Managing Risk in the Australian Public Service*, 1996)

Likelihood defined

Almost certain: very possible; it is almost expected to happen

Likely: probable; it might well happen or prove to be true

Moderate: there is a reasonable possibility that it might happen

Unlikely: not probable; slight chance that it might happen

Rare: seldom found or occurring; uncommon

Consequences defined

Extreme: the consequences would threaten the survival of the organisation

Very high: the consequences would threaten the continued effective function of the organisation

Medium: the consequences would not threaten the organisation, but would mean that the organisation could be subject to changed ways of operating

Low: the consequences would threaten the efficiency or effectiveness of some aspect of the organisation, but would be dealt with internally

Negligible: the consequences would be dealt with by routine operations.

Level of risk defined:

Severe risk: must be managed with a detailed risk management policy, as the potential could be devastating to the organisation

High risk: requires detailed management planning, as the potential is damaging to the organisation

Major risk: attention is needed to control risks, which will have a great impact on the organisation

Significant risk: will have an impact but will not be as harmful as a major risk

Moderate risk: the risk can be managed by specific monitoring or response procedures

Low risk: the risk can be managed by routine procedures

Trivial risk: unlikely to need specific application of resources

For example, in a flatwater paddle situation a qualitative risk analysis would be 'moderate' for the risk of a shoulder injury to a novice paddler when an adequate warm up had not taken place. For an experienced paddler with a warm up, the risk of a shoulder injury would be 'low'.

Following is an example of risk analyses of the likelihood and consequences.

Risk	Control	Likelihood	Consequence	Likelihood x consequence (Assessed level of risk)
Head injury during a river trip	Clients must wear helmets	Moderate	Very high	Major
All group members capsizing at the same time on a flat water trip	Group members must remain within close proximity to the guide	Rare	Medium	Low

This analysis will indicate the level of risk that exists. The second step is to assess this against the established context and criteria to determine whether the risk is acceptable or unacceptable.

Having set contexts and criteria allows consistency in the assessment. Obviously unacceptable risks should be treated.

For example: When instructing a group of six paddlers on flat water, an instructor sees two other novice paddlers getting onto the water. The instructor assesses the risks associated with supervising a group of eight, and considers this against the recommended ratio of six paddlers to one instructor. Using this reference of recommended ratios, she decides that the risks are too great and asks the novice paddlers to stay off the water.

Criteria used to determine acceptance of risk include:

- costs of risk treatment and cost of rectifying the loss, versus
- opportunities afforded by taking the risk

For example, to determine the acceptability of taking the risks associated with paddling across Bass Strait, a group of experienced sea paddlers will need to weigh up the advantages of gaining tremendous satisfaction and enjoyment against the disadvantages of the cost of EPIRBs and possible rescues, and the low possibility of loss of life.

The final question is: What is the priority of the risks?

What level of risk should be managed

If a hazards and its impact is identified as **highly likely** then the hazard should be noted and a level of appropriate action taken. For example

Blisters — first aid kit with water resistant bandages available

Sunburn — SunSmart procedures in place

Low level dehydration — drinks available

If a hazard has a low consequence such as blisters it does not require a procedure, etc, however once you have identified the hazard carry the bandages.

In the same way every foreseeable hazard assessed with **extreme or catastrophic** consequences requires action appropriate to the above criteria regardless of its likelihood.

Treat the risk

Every State's OH&S Act and regulation has a specific hierarchy of measures to be used in the control of risk. As an instructor or guide you need to be aware of the specifics for your State.

The options for treatment of unacceptable risks must be considered in context. Treatment should be appropriate to the significance of the risk, and the cost of treatment commensurate with the potential benefits.

- avoid the risk
- reduce the likelihood of the occurrence or the consequences if it occurs
- transfer the risk
- finance the risk
- accept the risk

One or more options may be used to treat the same risk. The list above provides a rough hierarchy with those options listed first being preferred. The flow chart below illustrates process by which options can be considered.

Avoid the risk

The organisation may avoid the risk completely by consciously not entering into the activity or by removing the hazard from the activity or by changing the activity so that participants do not come into contact with the hazard.

Reduce the risk

It may be possible for a control to be introduced to reduce the risk to an acceptable level.

Reduction of risk is achieved in a number of ways:

- reduction of the likelihood of occurrence — for example:
  - regular maintenance to avoid equipment failure
  - more skills training prior to running a rapid to improve performance
  - careful guidance through a route to avoid stoppers
  - smaller group size to ease containment
- reduction of the consequences — for example:
  - installing a permanent dropline across the top of a rapid at the venue to assist rescues if/when needed (contingency planning)
  - wearing helmets when in white water or surf
  - carrying rescue equipment in an easy to reach situation

Such controls may not prevent an event from occurring but they can reduce the consequences or prevent them from escalating. In particular, controls that focus on the preparedness for an event, and the ability to respond and recover, are very important

Transfer the risk

The mechanism for the transfer of the risk is generally a document with some legal standing. Predominately this will be an insurance contract, but other forms include leases, the contracting of certain expertise, disclaimers for participants, and warning signs.

Insurance is normally an important part of any risk management program but is not a substitute for other more appropriate treatments, which provide for safety. It should be regarded as the last option for risk management.

Disclaimers or similar forms are now common in those sports and recreational activities that may be considered to have a moderate or high risk. The purpose of such forms is to waive or limit liability for negligence of the provider, coach, instructor, etc. In effect, such forms principally serve as a formal liability. Current legal advice suggests it would be foolish to rely on such forms alone for the defense of a damages claim. However the forms do ensure that participants read and sign an understanding of the risks they are undertaking.

Finance the risk

Risk financing is a form of self-insurance where the frequency and likely cost of an event are estimated and a financial reserve is built up over a period of time to cover the potential loss. For example, a canoe club reserves a percentage of membership fees each year to cover the cost of rebuilding its slalom course in the event of it being demolished during a major flood.

Retain the risk

A certain amount of risk is an important factor in the enjoyment of many paddling activities, and treatment of that risk may compromise the objectives of the activity. Treatment may therefore be regarded as undesirable and the risk accepted by the organisation and participants. For example, there is the risk of capsize in paddling a Grade 2 rapid, however this element of risk adds to the excitement and sense of accomplishment if the capsize doesn't occur.

The risk evaluation may also reveal that the likelihood of an event is small, that it can be managed by regular monitoring and review. For example, the likelihood of shoulder dislocations when paddling is present in all activities, but it is very low. No further treatment of this risk is needed unless monitoring reveals that regular shoulder dislocations have been occurring during a particular activity.

Once the best option has been selected, a normal planning process should be adopted to guide implementation.

Monitor and review

Monitoring and periodic review are essential to an effective risk management program. It is important to document all stages of the risk management process.

Questions that need to be asked are:

- has any aspect changed?
- are there changes in the relevant regulations?
- have any additional risks become part of the situation?

Each step requires consultation and must be followed in sequence with all decisions being documented. Upon completion, a time is set for review. Documenting procedures, such as reports of inspections, is necessary to establish that the plan is being used properly. These records can also be used to show evidence that an organisation is meeting its legal obligations.

Risk register

All leaders of paddling activities should complete a Risk Register before taking groups on to the water. It does not matter if the work is recreational or professional, if the water is flat or white, open or closed. A risk register should be kept on file for each location the groups may attend and these reports must be updated annually. The leader of the party must check the risk register before undertaking the activity, to ensure they are aware of the hazards, the associated risks and the consequences if it occurs.

How to fill in a risk register report

Using the system above, identify the hazards. Then work out all the risks related to that hazard.

Determine the likelihood of its occurrence in direct relationship to the consequences to obtain the assessed level of risk.

Lastly, work out the best measures to control the identified risks.

Risk	Assessed level of risk	Risk treatment

Emergency management

Even after completion of a thorough risk assessment process, some events can still occur:

- The lightning storm unforecast and not seen due to formation in your immediate area.
- Medical emergencies the participant neglected to mention

For these situations we have Emergency Management Procedures (EMP). An EMP covers the actions to be taken in extreme events. Most EMPs include the calling of outside assistance or evacuation of clients. An EMP should have a clear set of parameters of when it should be used, who should enact the procedure and a logical set of actions to be taken.

When creating your EMPs ensure they are easy to follow. Often EMPs have a laminated card that includes contact phone numbers and the main actions to be taken.

Acknowledgement

This resource was written by Ian Dewey.

Questions

1. In the table below, enter a list of risks associated with a paddling activity and complete the remainder of the table.

Risk	Control	Type of risk analysis	Likelihood	Consequence	Likelihood x consequence

2. From the list of risks above, fill in the table below, ranking them from high to low. Fill in any criteria that might be appropriate for evaluating these risks.

Risk	Criteria	Type of risk analysis	Likelihood	Consequence	Likelihood x consequence

– Is there a clear place to draw a line that separates the acceptable from the unacceptable? If not, why not?

– If the line is clear, are there any circumstances that you can envisage that might shift the line, or change the order of ranking?

3. Transfer the risks from the table above into the table below. Complete the columns by deciding:

– what risk treatment would involve

– what treating the loss would entail

– the cost of each of these (estimated)

– opportunities afforded by taking the risk

Risk	Risk treatment would entail... and cost	Treating the loss would entail... and cost	Opportunities afforded by taking the risk	Accept/don't accept
1				
2				
3				
4				

4. Provide two examples of each of the risk treatment options mentioned in the table.

	Avoidance	Acceptance	Reduction of likelihood	Reduction of consequence	Transfer of risk
Example 1					
Example 2					

5. For each of the following examples, provide an example of risk treatment

Risk	Risk treatment
A paddler becoming hypothermic on a flatwater trip in cool conditions	
A paddling group failing to return from a trip	

6. Outline a monitoring and review process for a paddling venue.

Instruction and training

Aim

This learner guide is designed as an introduction to the skills required to plan and deliver a series of training or instructional sessions. At the conclusion of reading this resource and attending the appropriate training students should be able to:

- identify training requirements
- develop outlines of training sessions
- plan training sessions
- develop training materials
- deliver training sessions
- review training sessions.

The trainer will gain the knowledge of how to communicate with different groups with different delivery styles while emphasising the appropriate message. It is important to establish a clear pathway of communication between the trainer and learner, so trainers can tailor their information and learners may maximise their learning experience. The initial relationship starts with planning, organising and finally welcoming your participants.

Learning

As a kayak instructor there are a variety of learning outcomes you will wish to achieve and each requires its own specific method. Examples of the variety of different skill and knowledge levels you can be required to impart include:

- providing novices with a fun and splash session
- guiding novices on a flatwater trip
- guiding novices down Grade 2–3 rapids
- guiding novices on a sea expedition
- instructing Duke of Edinburgh students on a flatwater program they wish to undertake
- training whitewater guides
- training advanced sea instructors

There are also different individual learning types and styles, therefore, there area myriad of pathways to achieving learning outcomes. There is no 'perfect' teaching model, and although there may be some more popular methods, they may not cover all learning categories.

Example of learning types:

Kinaesthetic: practical or hands on learning experience. The skill is learnt through practice and the 'feel' of the action. The best type of teaching is repetition of the skill in a realistic setting, such as out on the water or with a paddle in their hands

Auditory: learning through listening as the skill is spelt out. This is usually in the form of lectures and the person can build an understanding through thorough information of all the surrounding principles and mechanisms controlling the skill.

Visual: is to replicate what is demonstrated. This should be accompanied with a verbal representation of what is happening. The student learns by seeing the complete picture then it is broken into smaller components. The skill should be repeated numerous times to give the student a picture they can repeat.

Identify training needs

As an instructor your students will attend with a range of different desired outcomes. It is important that you establish their needs in the early planning stages so that the program can be correctly tailored. The

ability to structure a program to satisfy a range of needs is an important skill.

When identifying training needs:

- Establish the need and reasons for training. Is it a requirement for a qualification, or a desire to achieve a personal goal or a need for training to avoid further injury?
- Confirm the required outcomes (competencies) in knowledge and skills
- Identify the current skills and knowledge of the learners
- Identify the training requirements from the gap between the required outcomes and the current competencies of the learners.

Identifying the current skills and knowledge of the learners

It is important to find out what the learner already knows and often more importantly what they don't know or what incorrect knowledge they possess.

Training should be pitched at an appropriate level to both the learning abilities and current skills and knowledge. The focus of the training should be on the skills and knowledge that the learners do not have. These skills and knowledge are what the learner will expect to gain during the training.

Training goals and outcomes

The training outcomes for any program should be very clear descriptions of the skills and knowledge that you will be helping your learners to gain during their training sessions with you. A training program may have a single training outcome, or the training outcome may be the result of a sequential attainment of aims.

Examples of training outcomes:

Interpreting weather information

Applies knowledge of weather forecasts to determine if weather conditions are likely to be suitable for a proposed trip.

Paddles effectively on Grade 3 water

Makes suitable selections of clothing for a paddling trip. Describes how to negotiate a safe route through a rapid. Selects a suitable kayak after consideration of a range of design features.

The training outcomes must be measurable, so it is important when setting them to think about how they will be measured, or the learners assessed.

Before being assessed, the trainer should check and monitor the learners to see if they have achieved the competency, and if they are ready for assessment. The way in which training outcomes are written can help to decide the checking and assessment methods.

Once the outcomes are clearly defined we can then focus on developing the training program that achieves those outcomes.

For our example of weather interpretation above we could structure the program so that the students:

- have a classroom based lesson on reading weather charts and forecasts
- have a series of practical exercises where each morning the students gather the weather and predict its outcome for their daily activity
- at the end of a week or so have a review lesson where the students compare their forecasts, interpretation and observations.

Characteristics of learners

The type of activities and tasks chosen should meet the characteristics of the learners. Characteristics to consider include:

- language and literacy needs
- cultural and language background
- gender
- age
- physical ability
- level of experience
- level of confidence.

Examples

When training people in practical outdoor activities, gender, age and level of confidence can be very significant factors to consider when determining the type of training activities.

Gender: Female learners may prefer to be grouped together when practising paddling skills in small groups within a mixed gender learner group.
Male learners may need to be presented with more challenging practical activities earlier than female learners, who may prefer a more steady increase in the degree of difficulty.

Age: Adult learners tend to be more analytical and slower to pick up practical skills in unfamiliar activities. More technical explanations may need to be provided, and more practice time allowed.
Children may respond better to learning through games.

Activities that will assist in raising **levels of confidence** may be important for some learners.

Venue

Training venues should be carefully considered and can include:

- appropriate outdoor locations
- simulated settings
- in a workplace
- in indoor venues.

Appropriate, safe outdoor venues should be selected to match the requirements of the training outcomes. For the teaching of skills in whitewater and sea it is better (but not always possible) to use venues where the environmental factors (water flow, rapid grade, surf size, swell size, wind strength) can be gradually increased as the level of participant skills increase. Indoor venues should offer access to all teaching aids needed and provide a pleasant learning environment.

Resources and equipment

Once we have a clear picture of the desired outcomes, the training program, the learners and the venue, we need to establish what equipment and resources we need to deliver the program.

By nature of the activity the majority of paddling training takes place on or beside the water. This places the kayak instructor in a very different situation to classroom teachers.

Consideration needs to be given to the following:
- will I have access to power, shelter, whiteboards, etc
- will it be wind and or rain affected
- will the sun effect my visual presentations
- can it handle wetness?
- can it float?
- do the students need chairs, tables, clipboards for writing, etc.
- when should I hand out notes so they don't get wet, damaged, lost, blown away or simply not read?

Even in 2008 the Chinese proverb 'even the weakest ink is more powerful than the strongest memory' is still correct.

Support may be needed for learners with special needs, including additional personnel to assist learners or to help conduct sessions.

Correct instructor to learner ratios should be observed according to requirements during practical sessions. All mandatory personal and safety equipment should be organised and used. Remember that section of training that include rapids or surf can lead to a 1:1 supervision ratio. What are the other students doing? Who is supervising them?

Develop plans for training sessions

Session plans are critical to achieving outcomes. The trainer should know what they wish to achieve and the path they are going to take the learners to achieve this outcome. Simply having a session plan written down or even a clear list of objectives is useless unless the trainer works toward achieving those objectives:

- ensure the structure works in a sequential way
- ensure all topics are covered

- give the trainer a clear idea of how the session will be structured
- have clear timing guidelines.

Review each training session for future refinement.

Effective session plans:

- describe the learning outcomes clearly
  - for complex skills such as rolling, have the 'sub outcomes' clearly defined
- are easy to understand
- are quick to refer to during the training session.

For on water sessions laminated or plastic cards may be required to help the trainer when they are delivering the session plans.

Each training session can be split into three main parts:

- the introduction
- the body or middle
- the conclusion.

Introduction

In the introduction, or beginning of a session, the trainer is trying to focus or engage the learners interest by:

- describing the topic and its main points
- revising what is already known
- outlining the plan for the session
- describing the new things they are going to learn
- encouraging them to think positively about what is coming
- describing the relevance to their desired outcomes.

It is very important to get the attention of the learners right at the start. Learners who switch off their attention at the start of a session may decide that they do not want to be fully engaged in the session at all. If the introduction doesn't raise their interest, the rest of the session may as well not take place.

The letters of the word GLOSS describe the things to include in an introduction. They can be used as a reminder of what should be included in an introduction:

G: grab their attention

L: link the new things in this session with something they already know about

O: outcomes: tell the learners what will be happening in the session

S: structure: tell the trainees what will be happening in the session

S: stimulation: encourage and motivate the trainees to be involved.

Example

The trainer is beginning a practical session on deep water rescue:

"Who has ever fallen out of their kayak? Was it fun? Was it cold? Did you want to get out of the water as quickly as you could?

"Well, today I'm going to show you three ways to get yourself, and other people, out of the water and back in the boat as quickly and safely as possible.

"Yesterday, when you were practising capsize drills in the pool, I asked you to do something with your boat and paddle. Do you remember what it was? That's right. Hang onto them and leave the boat upside down.

"That's going to be really important today, because if you want to complete a full rescue and get back into your boat ready to paddle as quickly as possible, you need to do this. And we don't want your gear drifting off down the river.

"The rescue techniques we're going to look at today are X rescues, deck carries and towing rescues. Each of these rescue techniques is best suited to different situations, so as I describe each technique we'll discuss when and where to apply it.

"I'll start with demonstrating and explaining X rescues, then give you time to practise in pairs. Each person will need to practise the rescue as both the rescuer and the swimmer. Then we'll do the same with

deck carries and then towing rescues. This session will involve you being in the water for several short periods of time, so make sure you dress warmly.

"Just for fun, we'll finish with a special rescue challenge to see just how efficiently you can rescue each other. The first team to finish gets the warm drinks first."

The conclusion

The trainer uses the conclusion to:

- remind the learners of the training outcomes they have covered in the session
- give the learners some constructive feedback on their overall performance during the session
- tell the learners where they can go from here.

These three aspects give learners a useful summary of the key points from the session and help them to remember these points. It also helps to make them feel confident about their progress. Questioning can be used to reinforce the key points of the session. The letters of the word OFF can describe these three aspects of a conclusion. They can be used as a reminder of what should be included in a conclusion:

O: outcomes

F: feedback

F: future

Example

"Today you have performed X rescues, deck carries and towing rescues. We've discussed where and when to apply these rescues. What is the most important thing that each of you have learnt today?

"Remember these priorities in checking for hazards in any rescue situation: yourself, others in the group, then the swimmer. If there is more than one swimmer, try rescuing the swimmer in the most hazardous situation first. Try to keep any rescue situation a stable as possible.

"As you have seen from today, efficient rescues can make swimming a much less traumatic experience, and knowing how, when and where to apply them is really essential knowledge for any paddler.

"All of you have performed these rescues as both rescuers and swimmers extremely well. Everyone managed to meet the X rescue challenge and complete their rescues in under one minute which is fantastic. Now you can apply these rescues when you are paddling.

"If you want to further develop your rescue skills, there is a river rescue course that deals with more difficult rescue situations. As your paddling skills increase it is a good idea to keep your rescue skills in line with the type of water that you are paddling.

"Well done. Excellent rescuing today!"

The body of the session

The structure of the body of a session varies greatly according to the type of session that will be delivered, particularly if it is a theory or practical session.

Practical sessions have training outcomes that involve doing things such as paddling, rolling, surfing, packing, setting up.

Theory sessions have training outcomes more related to thinking such as explaining, describing, discussing.

Many sessions involve both a practical and theory component, but will usually include more of one of these components. The body of the training session should be based upon which training methods and activities are most appropriate for:

- the training outcomes
- the learner group
- the resources available.

When starting out as a trainer, following the session plans of more experienced trainers, using existing training materials and using references can be helpful. With time, however, every trainer will develop their own training methods. Through trial and error, experience and

personal preference, training methods will be refined to suit different groups, circumstances and competencies.

Training methods and activities

An instructor should have a large set of skills. Training a group of learners usually involves some or all of the following steps:

- Presenting information using methods such as:
  - presentations
  - explanations
  - demonstrations
- Applying this information by using activities such as:
  - discussions
  - skills practice sessions
  - games
  - written exercises
- Summarising the information using techniques or activities such as:
  - reports
  - whiteboard lists
  - games
  - handouts
- Checking the learners understanding of the information or the skill by:
  - observation during activities
  - performance during set tasks
  - questioning
  - input during discussions.

Different Instructional Models

Everyone has a slightly different learning style. The following are examples of models instructors may use to communicate a new skill or knowledge to a student.

Direct Instruction: lectured style teaching. This method is often a favorite as it requires less amount of preparation. The focus is on the teacher who directs the learning. This is often the best way to 'front load' safety and injury prevention information to novices who would not have the experience to consider the various aspects required.

Indirect Instruction: this is more student focused. The student works their way through the problem/skill at their own rate. This however, is often time consuming and students must be self-driven.

Interactive Instruction: relies on group discussions and interactions. A single issue is explored from different angles as each member of the group inputs ideas and suggestions. The end result is for the student to take what is relevant to their learning and incorporate it into their knowledge.

Experimental/Experiential Instruction: learning through activities, hands on experience, deduction and trial and error approaches to come up with a solution.

Independent Study: students drive their own learning by researching and using various resources.

Teaching Models

Game Sense

Game Sense was originally formulated for team sport but has been implemented into paddling coaching. The unique method is for the student to take an active role in the learning by 'owning' the decision process. The learner is given the problem; e.g the student wants to cross an eddy line. The teacher acts as a facilitator and prompts the learner into making a decision. It is then the student's response to act on that decision and experience the outcome and then re-evaluate.

As an example:

Instructor: You are going to paddle yourself out of the main current and into an Eddy. Is there a transition point or area of importance?

Student: The Eddy line

I: Why is it important?

S: The opposing currents can spin me or cause instability

I: Do you think you want to be fast or slow across the eddy line?

S: Powerful, I will want some speed to get cleanly across the eddy line

I: Where do you want to aim the boat?

S: Not sure what you mean?

I: Where do you want to cross the eddy line

S: As far upstream as I can cross it and get a boat into the eddy

I; So to recap; where are you going to aim for?
Are you going to be totally focused on getting there?
Are go you going to go hard?

The student tests out their decision under supervision. The Instructor should lead their decision pathway into the right direction and only allow them to test out their decision in safe conditions. A student who thinks about their responses and put them into practice will learn more from the experience than someone who simply accepts what they are told without considering the consequences.

Methods of correction

To correct in the game sense method, firstly ask the person for their own feedback then ask questions that lead to the correction required, for example;

Instructor: How did you feel as you crossed the eddy line?

Student: The paddle 'twitched' in the water and I felt unstable

I: What do you think made the paddle feel like that?

S: It was in the eddy line

I: So is there somewhere you should aim with the first stroke across the eddy line to keep you stable?

S: Yes reach deep into the eddy

I: So what will you do this time

S: Aim for the top entry point, paddle full bore toward it, as I reach the eddy line, reach across it and plant hard into the eddy.

In conclusion

Techniques are still taught in a normal progression with safety/injury prevention/posture at the beginning. However we now introduce each technique, not with its name but with its outcome in the form of a question, getting them to decide how it is best achieved so they are not trying to do what you have described or demonstrated, they are trying to do what they have decided is the best way to achieve their outcome.

The demonstration method

Instruction of practical skills and techniques can follow a series of steps:
D: demonstration
E: explanation
D: demonstration (emphasising key components)
I: imitation
C: correction
T: trials

Demonstrations are given at the introduction of the skill and are of the whole skill applied in a normal manner.

Explanations of the skill include:
- the applications
- the main points of how to perform the skill
- breaking skills down into components that may be demonstrated and practised separately before being put together
- the components of a skill should be introduced in the sequence in which they will be applied
- safety considerations
- special features or exceptions
- common difficulties.

Demonstrations are then given of:

- the components of the skill

- the whole skill with special emphasis placed on each component.

Imitation of the trainer's demonstrations are then done by the learners as they attempt to perform the skill. **Corrections** are provided by

the trainer to the learners, if necessary, after having observed the learners' attempts at the skill. **Trials** are applications of the skill that the trainer may assess to see if the learning outcome has been achieved.

Example

A trainer uses the DEDICT method to teach how to perform a roll. The following steps are used:

- Demonstration of a roll
- Explanation of:
  - the application of rolls
  - the components of the roll, in the order in which they are performed:
    - setting up the paddle and body in the correct starting position
    - hip flick
    - body and head movement
    - stroke
  - common difficulties:
    - insufficient hip flick
    - head brought up too early
    - disorientation with the paddle stroke
  - Demonstration again, performed slowly, with special emphasis on performing the key components of the roll very clearly
  - Imitation by the learners of each component of the roll. The components are practised in the order in which they are performed during the roll, with each step mastered before the next step is practised
  - Correction of errors and poor technique are given by the trainer. The trainer also helps the learners with each step, providing physical assistance, feedback and additional explanations and clarification

Trials of performing the complete roll are done.

A training method for theory sessions

It is frequently thought that theory sessions must be boring because they are simply about learning information. This doesn't have to be the case though. There are many different ways in which information can be learnt, and these ways can be stimulating and fun.

When planning the body of a theory session, try following these steps:

- decide what information the learners need to have to achieve the training outcomes:
  - divide this information into bite sized chunks
  - put these chunks of information into an appropriate sequence
  - prepare a number of activities that give the learners an opportunity to apply the chunks of information in relevant tasks.

As described earlier, the following steps can be used as a guide for planning the training methods:

- the trainer presents the new information or guides the learners toward finding it for themselves
- the learners apply or use the new information in an appropriate activity
- the trainer (or learners) summarise the information
- the trainer checks the learners' understanding and ability to apply the new information by asking questions and observing.

In any topic, there is a certain amount of information that the learner must know to achieve the outcome, and other interesting information that the learner could know about the topic if there is time, but is not vital in helping them achieve the training outcomes. It is important to be able to discriminate between these two types of information when planning for the session.

Example

The following 'must know' items of information have been grouped and placed in sequence:

- Training outcome: Plan to participate in a supervised paddling trip
- Factors to consider when choosing a suitable venue or activity

- How to get permission, if necessary, to access the venue
- Basic design features of kayaks and canoes
- Check to see that you can fit in the craft and make any adjustments necessary
- Advantages and disadvantages of different design features
- How to select a paddle of a suitable length
- PFD Types 2 and 3 are recommended for use
- Spray decks should fit both the person and the craft: check this fit
- Be aware of the range of different clothing suitable for paddling
- Features of suitable footwear
- How to waterproof and pack spare clothing
- Nutritious food is needed in the right quantities to match the energy used
- Fluid intake is important, so establish if you can get some at the venue or if you need to take some with you
- Pack emergency snacks
- Work out how to get to the venue
- Tie the craft on the roof racks securely
- Organise car shuttles.

Selecting appropriate presentation methods

Presentation methods are those methods used for passing on new information.

There is a wide range of presentation methods, some more appropriate to passing on types of information than others. Selecting the appropriate methods will help make the training sessions more effective. Using a variety of methods can help to maintain learner interest.

These are some presentation methods:

Talk or modified lecture: The trainer talks about the subject to the group of learners for about 10–15 minutes. After the talk the learners apply the information in an activity.

Demonstration: The trainer demonstrates and explains a skill, procedure or process.

Excursion: The learners visit a site or venue that provides information.

Interview: An expert is asked a series of questions in front of an audience.

Pictorial: Showing and discussing pictures, maps, charts, slides, OHPs.

Printed word: The learners read information from a range of written resources.

Video: The learners watch a video and then answer questions or discuss aspects of the video.

Case study: The learners discuss a problem or scenario that is presented to them.

Guest speaker: A guest speaker talks about their area of expertise.

Research presentation: A learner researches a topic and then presents the findings to the group.

Example

During a training session about rescue techniques, the presentation methods include:

- a short lecture using diagrams
- a video about rescue techniques
- a guest speaker who presents...
- a case study about a real rescue situation
- an excursion to a venue where a commonly found hazards exist and...
- a demonstration of rescue techniques is performed at the venue.

Selecting appropriate activities

Learning activities are those activities that the learners do to apply the new information that they have been presented with. You can be as creative as you like when designing learning activities, as long as they help the learners to achieve the training outcome, apply the information in a relevant way, help the learners. to understand and remember the information and the resources required for the activity are easily available.

Activities could include:

Brainstorming: The learners think up lots of ideas about a topic quickly without making any judgement about them.

Game: A fun game that involves relevant information, or the opportunity to practise skills.

Group discussion: Small or larger groups discuss the topic, and might report back on the results of their discussion.

Role play: The learners, and sometimes the trainer, act out roles in a hypothetical situation.

Problem solving exercise: The learners are given a real or simulated problem and use the new information to try and solve it.

Quiz: Oral or written questions on the topic.

Practical exercises: Practising and applying skills and techniques.

Written report: Researching and writing about a topic.

Survey: The learners obtain sample data by questioning, research or observation and analyse the data to draw conclusions.

Experiments: Learning occurs through discovery.

Develop training materials

Materials available to support the training program should be checked for relevance and appropriateness in terms of the language, style, characteristics of the participants and copyright. New resources can be developed to enhance learning, and to better cater for individual needs.

Prepare trainees

First impressions are very important. From the first point of meeting between the trainer and the training participants, the atmosphere, or environment, for learning is created. It is important that this atmosphere includes a sense of mutual respect and trust based on the recognition of the skills and knowledge of not only the trainer, but the training participants too. This mutual respect acknowledges that everyone has the potential to contribute something of value during group training. A sense of trust is essential because the training participants need confidence in the trainer and the learning situation for learning to occur. In situations where there is a lack of trust, the training participants may be reluctant to contribute to discussions, not believe what they are being told or have no confidence in trying new skills.

Establishing a sense of trust can be helped by:

- the self-confidence (not bravado) of the trainer
- the trainer's manner; happy, smiling, pleasant tone of voice
- obvious knowledge and experience of the trainer
- the trainer consistently treating everyone equally and fairly
- appropriate learning activities and presentations
- establishment of boundaries, guidelines or rules where necessary to ensure safety or fair conduct of activities
- the trainees knowing that they are in a safe outdoor location when doing practical activities
- the trainer treating the training participants with trust and respect
- encouraging questioning and feedback.

Clearly explaining the training program with the trainees is also an important step in establishing a good atmosphere for learning. This establishes appropriate expectations for the trainees and the security of knowing what is going to happen and why.

It is important for the trainees to know:

- the goals of the training program
- the training outcomes for the session
- the activities for the session to develop particular competencies
- the structure or sequence of activities within the session
- the method for any assessment.

Following the introduction of the session, the trainer should establish appropriate methods of checking the level of understanding of the instructions and information given. These methods may vary according

to the characteristics of the trainees, and may include direct or indirect questioning.

Presenting training sessions

One-to-one training sessions

One-to-one training sessions are particularly effective for practical skills where close supervision and immediate feedback and assistance can be given to the learner.

Group training sessions

Group training sessions allow a wider range of learning activities to be used. The group can be presented to as a whole, and try individual activities, or the trainees can work as a whole group, in smaller groups or in pairs. The catch is that people have to co-operate and communicate with each other to some degree for any form of group work to be successful. People don't automatically communicate openly with each other. It may require some time and some warm-up activities to break down any barriers and help people to feel comfortable about working together.

Presenting the new information

This step involves the trainees being given each chunk of new information. There are many ways this can be done including:

- the trainer tells or explains the information
- the information is read in books, handout or articles
- using videos or electronic presentation
- a guest speaker.

The new information should be delivered in a manner that is appropriate to the characteristics of trainees.

Variations in delivery include:

- the language used
- pace of the delivery
- balance between theory and practical activities
- the size of chunks of information delivered
- oral versus written activities
- individual versus group activities.

The delivery style

There is a range of training delivery styles:

Distance learning involves sending the trainee workbook activities and resources, assessing assignments and providing feedback using email, post and phone calls. Precourse reading can be done in this style.

Self paced learning involves working through a program of set activities independently.

Partly self-paced learning involves working independently until set points, then receiving additional instruction from the trainer before working independently again.

Lock step training involves the trainer keeping all of the trainees involved in the same activity at the same time.

The training style may be autocratic (trainer centered) or permissive (learner centered), or a mix of these styles. The trainer centered style involves the trainer delivering the session with little trainee interaction. The instructor tells the trainees what they need to know, and directs any practical activities in a closely controlled manner. Some situations are best managed, and types of content more effectively delivered, in the autocratic style. The learner centered style is a more interactive delivery of a training session. Knowledge, concepts, attitudes and skills are developed through discovery and interactive activities.

These instructional styles may be used in combination. A single session may move from a learner centered introduction to engage the trainees' interest to a teacher centered style for imparting the crux of the information. Alternatively, a competence may be developed by firstly imparting knowledge in a trainee centered style, with the application of that knowledge then practiced in a learner centered style.

Responding to the learning environment

A trainer may change delivery styles during a session in response to situations that arise. A planned approach may not be working, environmental conditions might change or safety issues may arise.

Presentation skills

When talking to a group, one should be aware of the following:

Posture: You should be standing straight in a relaxed way. Be open to your group.

Movements: Some movement is OK, but not too much. Pacing the floor can be distracting. Try not to sway. Hands should be used in a naturally expressive manner rather than trying to keep them totally still. Nervous gestures often occur without you being aware of making them, such as scratching your nose or checking your watch.

Facial expressions: Facial expressions are very clear indicators of what you are thinking and feeling. A natural smile is the most encouraging and friendly expression to have. A frown will reveal your worry or displeasure.

Eye contact: Sunglasses off. Establishing eye contact with an individual indicates that your full attention is focused upon them as you speak to each other. In a group situation, eye contact should move to include all members of the group without resting on one individual for too long. Watch out for broad brimmed hats that hide your face when presenting.

Voice: The aim is to have a clear strong voice and not to speak too quickly. A pleasantly modulated tone is much easier to listen to than a dull monotone. When conducting on-water sessions, it is important to speak loudly enough to be heard over the volume of the water. Speaking more slowly in these conditions can also help. You should ask the training participants if they can hear you.

Position: Don't stand in front of your presentation, neither stand with a good view behind you. It will distract the learners. Similarly choose a place on the coast or river where the learners are not totally fixed on the next rapid or beach.

Presentation methods

Using a variety of presentation methods can provide greater stimulus to trainees than one method. Training resources and equipment can greatly enhance presentations as the information is received in more than one way and sometimes by more than one sense.

Facilitate individual and group learning

Carrying out the activities that apply the new information. Once the information has been delivered the next step is for the trainees to carry out an activity that applies the new information to help them:

- understand the new information
- use the information in a realistic manner
- remember the information.

When using activities, it is important to remember the following:

- the activity steps should be sequenced in the order in which the steps are applied
- new information should be supplied at appropriate times
- the training outcomes should be kept in mind during the activities as the progress of the trainees is checked
- sufficient time needs to be allowed for practising skills
- additional time should be allowed for practice following feedback or further instruction.

Monitoring progress

The trainer needs to monitor progress so they can:

- check to see how the trainees are developing the competency
- check how effective their training has been so that it can be modified if necessary
- provide constructive feedback to encourage the trainee and assist their learning.

Monitoring progress can be achieved by:

- observing the trainees
- questioning the trainees.

An important note on learning: our bodies learn by doing (often referred to as muscle memory). Thus if we practise the wrong action or technique, we learn the wrong movement. The more we practise it, the

harder it is to change or 'break' the technique. Careful observation and skilled correction can save a lot of time in remedial work.

Encouraging and giving feedback

Encouragement and feedback should be provided in a manner that everyone feels comfortable. Touch should not be used, as it may be considered too personal an intrusion into an individual's personal space or incorrectly interpreted and viewed as harassment.

Feedback should be provided at suitable times. Verbal feedback helps trainees to identify their weak spots and work out ways of overcoming them. As the trainees are observed during the training session, the trainer should choose times to pass comments to the trainees about their progress. It is easy to forget to give words of encouragement and praise to those who are doing well. It is natural to focus on those who are having some trouble. Trainees who are doing everything correctly need to be told so and given encouragement to continue.

Feedback should be constructive and positive. Tell the trainee what they are doing well first, before you tell them something else. Phrase feedback so the trainee can move towards a positive goal.

Sometimes trainers are asked or required to spend some time giving feedback to an individual trainee after a training session.

The following steps can be helpful:

- ask the trainee what they think or feel that they did well
- ask them what they would do differently next time
- add constructive feedback about things not covered by the trainee
- end on a positive note.

The following list outlines eight aspects of feedback, using the letters of the word FEEDBACK to help you remember. Using these strategies during and after training sessions will help to create an atmosphere of trust in the learning environment.

Feedback 'sandwich': Feedback should always start and end with a positive comment. Anything negative should go in the middle.

Esteem: How will the self esteem of the trainee be affected by the feedback you give them? Will they still feel respected and capable? Help them to see your feedback as a form of encouragement.

Environment: Choose an appropriate time and place to give the feedback.

Does the trainee understand?: Check that the trainee understands the feedback by asking questions or getting them to repeat it back in their own words.

Be honest and sensitive: It is your responsibility to let a trainee know that their performance isn't of the required standard, but use tact to let them know.

Actions: It is the actions, not the trainee, that the feedback should be given about. e.g. "The meal was overcooked", rather than "You were careless and burnt the meal."

Confidentiality: Feedback to individuals should be given confidentially. The sensitivity and right to privacy of the trainees should be respected.

Keep it short: Keep the feedback relevant and precise.

Encouraging trainees to assess their own learning Trainees need to learn how to assess their own learning and progress toward developing a competency. This is important during times when the trainer is not present, such as individual practice and work situations.

Techniques for self assessment include:

- reflecting on their own progress during and after sessions
- keeping a record of how things went in a diary or log
- setting personal goals for improving at certain tasks
- seeking feedback from a suitable person.

Using open and closed questions

Questions can be preset, or arise during a session and are used for:

- focusing attention
- encouraging interest and curiosity

- checking on the trainees' understanding
- extending knowledge
- provoking deeper or lateral thinking.

Closed questions are usually answered with "Yes" or "No" or other short responses. They do not provide the opportunity to give more detailed responses and cannot reveal the depth of understanding of a topic: e.g. "Have you paddled in surf this size before?"

Open questions cannot be answered with "Yes" or "No". These questions provide the opportunity to give detailed answers that can reveal a depth of understanding, and a range of thoughts and feelings: e.g. "How does this river compare with some of the other rivers you have paddled?"

Open questions are useful to use with new groups to get to know the group members and start discussions. Consider the difference in effect between using a closed or an open question at the start of a session.

Review the delivery of the training session

The training session can be reviewed through:

- self assessment
- evaluation
- feedback.

Receiving feedback

Although a trainer might feel nervous about it, receiving feedback can be an important part of improving the delivery of training sessions. If open and honest opinions are sought, the atmosphere of the learning environment must be safe and comfortable enough for these opinions to be expressed. Feedback should be received with an open mind, and reflected upon, then acted upon if necessary. Some feedback given will be straightforward, gratefully received and quickly acted upon.

Sometimes the feedback can carry some longer term implications, or you might disagree with it. In these cases it is best to sit down and discuss the feedback to reach a mutually agreeable solution: e.g. when a trainee tells you that your style of delivery is sexist and doesn't encourage women trainees.

A few points that can help in receiving feedback:

- thank the giver of feedback and respect their openness: value their comments and point of view
- clarify the feedback
- reflect on the feedback and consider if it is reasonable
- check it out honestly with others rather than relying on just one source
- if it is reasonable, act upon it quickly
- if it is not reasonable, try to work through the issue with the people involved
- be prepared to learn from the experience.

Evaluate training

In evaluating training, it needs to be determined if:

- the trainees have achieved the training outcomes
- the activities and techniques that were used were the most effective ones available for the purpose of helping the trainees to achieve the learning outcomes

Have the trainees achieved the training outcomes?

This may be answered by:

- monitoring and checking the trainees' progress through the delivery of the training, which will give some indication of whether the set training outcomes have been achieved
- observing their performance following the training
- checking with their assessor
- discussing with a work supervisor.

Have the activities that were used been the most effective ones available for the purpose of helping the trainees to achieve the learning outcomes?

Peer mentoring

Peers can observe a session and provide a professional opinion. They can also preview the session plan and make suggestions regarding delivery and activities. Peers can help in the debriefing process after a session, particularly one that went badly.

Self evaluation

Self evaluation is checking your own thoughts and feelings about how a training session is going, or how it went. It can take place during a session as you consider how things are going and make immediate changes. It can also occur after a session when more time for reflection allows a more detailed analysis. Self reflection should also occur as a response to feedback that is obtained from others. It is important that self evaluation be constructive rather than destructive. It should be an opportunity for deciding how things can be improved, not for self criticism about things that went badly.

How is self evaluation done?

Self reflection

Self reflection can consist of asking yourself questions such as:

"Did I pitch the session at the correct level in terms of the characteristics of the group?

"Why didn't the trainees complete the activity? Did it take too long or were my instructions unclear?"

"Did I do enough to help those trainees with low confidence?"

"Did I manage to give each trainee some individual attention during the session?"

"Can I find a more attention grabbing start to my introduction?"

Video or tape analysis

Some trainers may like to video or tape themselves delivering all or part of a training session. The trainer can watch the tape alone or with a colleague. This method can be extremely helpful for some aspects of a delivery. A lot of people may feel quite self conscious with this method though, and the delivery of the session may not be as natural when they know it is being recorded.

Record training data

Records are an important part of managing a training program as they provide details that enable good planning and sources of information for future reference. These records may be kept manually or on computer. Each organization will have its own system and requirements for record keeping.

The procedures for record keeping should be known by the trainer. Training records should always be kept confidential and be viewed only by authorized people.

Records of training may include:

- session plans
- activities used
- resources used
- specialist personnel
- training conditions
- incidents or accidents
- new resources developed
- trainee details
- checklists of competency development and attainment
- feedback and evaluation reports given to trainees
- organization specific data
- financial information

Evaluation of the training

Records of training are important for many reasons, including the Following:

- for trainees to check on their own results
- to indicate who has turned up for the course and paid course fees

- details of trainees can be known for future reference
- for collection of training data by the organization or training manager, such as the number of trainees who have attended a particular course within a period of time
- knowing the costs of running the course to allow future budgeting
- to make session planning easier for next time
- to assist other trainers to plan and conduct sessions
- to assist in the review and continuous improvement of the delivery of training.

Conclusion

Training, it is all about preparation 'proper preparation prevents poor performance'.

Identify the outcomes required by your participants, tailor the training to the participants, match the venue to the outcomes.

Once you have delivered the training, stand back and carefully review the outcomes.

Acknowledgement

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