

8. Wet Feet



Introduction

Every area has water hazards and they don't have to be deep to pose a risk. Know how to keep yourself and friends safe in and around them.

Activities

Ages 10 ½ - 14 ½ years (e.g. Scouts and Guides)

You're planning a wild swimming or kayaking trip:

- Stick the hazards on the water and talk about each one.
- Does anyone have any experiences they're happy to share? Talk about how accidents could have been avoided.
- Rescue a friend who has fallen in and is struggling to stay afloat; practice talk, reach and throw. Know about wade and row.
- Explain and where possible demonstrate actions emergency services might take if someone fell through ice.

Ages 14 ½ years + (e.g. Senior Section, Explorers and Network)

- Take part in a water activity such as canoeing or swimming and before you start talk about the potential hazards someone might face doing the activity in the natural environment.
- Demonstrate the position you should assume if you fall into moving water and the one to conserve heat in cold water.
- A friend is in trouble in the water and needs help. Practice talk, reach, throw and wade. Know about row!
- Explain and where possible demonstrate actions emergency services might take if someone fell through ice.
- Describe what happens to the body in cold water.



From Hill to High Water™



Equipment

Ropes, poles for reaching. Relevant short videos can be added.

Setup

Possible in any size group but it may be easiest to split a large group in half. Rope 'rescue' can be done on dry land in pairs, threes or fours depending on the number of ropes. Water hazards can be easily discussed in groups of up to around twelve. Use and add to the information below as you prefer.

This can also be integrated into any planned water activity you're undertaking.

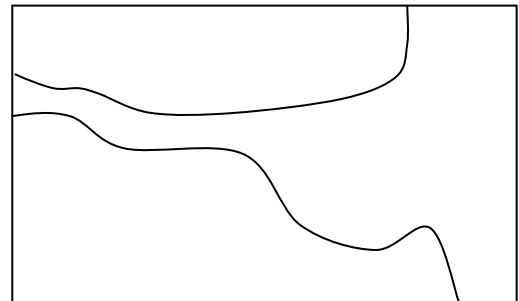
Further information

As always this doesn't cover everything but it should get you started, use your own knowledge and the group's input to learn more.

Water hazards

Take a large sheet of paper, stick several smaller ones together or use an old roll of wallpaper. Draw 2 wiggly lines long ways to look like a river that widens at one side of the page into a 'coast' as a starting point; like the drawing here.

As people name types of hazard they can draw, write or stick them on the relevant bit of the picture.



Alternatively, write the hazards on some paper and brief definitions on others; teams have to match them up then put them in a suitable place on the picture.

This could be done in patrols to see who can get the most, as a larger group where everyone gets a go or everyone could draw their own picture of hazards. Hazards can be guessed and discussed or each person can have a hazard given to them which they need to talk about.

Water hazards are anything that impedes a clear open channel. It's important to be able to identify and navigate through them. White, calm or coastal waters all have their own dangers. Hazards can vary with fluctuations in water level, downed trees, flooding, geological disturbances or bad weather.

It is worth pointing out that these hazards are multiplied during flooding in both rural and urban areas, the same, if not greater care should be taken then.

Biohazards and pollution

In water the main biohazards are microorganisms. If you accidentally drink unfiltered or un-boiled river/lake water you could end up getting an infection, usually resulting in flu-like symptoms, diarrhoea, cramps, headaches and nausea. 'Nasties' can also enter the body through open cuts and it's not advisable to enter water before a good scab has formed.

If bacteria are able to develop certain kinds can lead to life threatening organ failure or internal bleeding.

Examples include:

- Blue-green algae – naturally present in fresh water but under the right conditions it ‘blooms’ creating rafts on the water and capable of producing toxins. Toxins have caused animal deaths and in humans produce rashes following skin contact. Not all blooms create toxins but you can’t tell from its appearance.
- Leptospirosis: usually mild illness caused by contact with animal (mainly rat, cattle or pig) urine and faecal matter in water; known as ‘mud fever’, ‘swamp fever’ and hemorrhagic jaundice, amongst other things. Infection enters the body via cuts, the eyes, nose or mouth usually causing flu-like symptoms. In its severe form when it causes jaundice through liver and kidney failure it’s called Weil’s disease.
- E coli – water near agricultural areas may be heavily contaminated with livestock focal matter and will be loaded with E coli.

To avoid infection:

- Cover all cuts and abrasions with waterproof plasters.
- Always wear footwear to avoid cutting feet.
- Avoid immersion in suspect waters.
- Where possible, shower soon after canoeing.

Cold water

Water temperature off the UK coast can be as low as 5°C in February and rarely rises above 18°C in a good summer. They can be lower in rivers and lakes. The media often report water related deaths as if they are mysterious, as if we can't predict what will happen when we're in it, and therefore we should just stay out. This isn't true. We know how cold impairs swimming. Take time to acclimatise.

Even if the water temperature after a few minutes feels good, you can then start to get cold or may pass into a colder patch of water so your body starts to shut down and this leads to difficulties.

Risks of entering cold water include:

- Restricted hand movement: the inability to move your hands as normal means you may not be able to grab a rescue line, obstacle or flotation device.
- Cold water urticaria: an allergy where hives (urticaria) or large red welts form on the skin after exposure to a cold stimulus.

- Laryngospasm: an involuntary spasm in the throat which typically lasts less than 1 minutes but partially blocks breathing; breathing out is easier than breathing in. This will usually pass naturally and the victim simply needs to not panic as it increases the risk of submersion.
- Immersion hyperventilation: the first few seconds after falling in can cause involuntary deep gasps, followed by a minute or more of deep, rapid breaths which take in 5x more air than normal. Drowning can easily happen in this early stage, especially if you are plunged deep below the surface, or fall into rough water.
- In water around 15°C you can only hold your breath about a third of the time you normally can increasing the chances of drowning if you go under the surface for more than a few seconds.
- Cramp: blood is moved away from the limbs to keep the body's core warm resulting in acid building up in the arms and legs causing cramp. Even strong swimmers can drown from this.
- Cold shock: it only lasts a few minutes but is the cause of many deaths. On contact with cold water the blood vessels in the skin constrict and increase the blood flow back to the heart. This, together with an increased heart rate and hydrostatic squeeze from the water, raises blood pressure dramatically leading to death from cardiac arrest or stroke in susceptible individuals.
- Hypothermia: occurring after 10-15 minutes of exposure where core body temperature drops below 35°C (37°C is normal) stopping the body working normally and eventually it will lead to death.
- Heart attack: raised blood pressure as a result of fear or panic. People with heart defects or cardiac illness may develop lethal abnormalities.

The risks of cold water swimming can be moderated if you:

- Don't drink or use drugs which make you more prone to unplanned swimming!
- Wear a wetsuit, silicon hat, maybe even booties and gloves depending during planned cold water activities.
- Swim close to the shore where it might be shallower or you can reach safety if you struggle.

The stages of immersion as body temperature decreases:

- 1 Cold shock – possibly leading to drowning or cardiovascular problems.
- 2 Muscle and peripheral nerve cooling – possibly leading to weakness and drowning.
- 3 Hypothermia – possibly leading to unconsciousness and drowning.
- 4 Hypothermia – possibly leading to cardiac arrest.

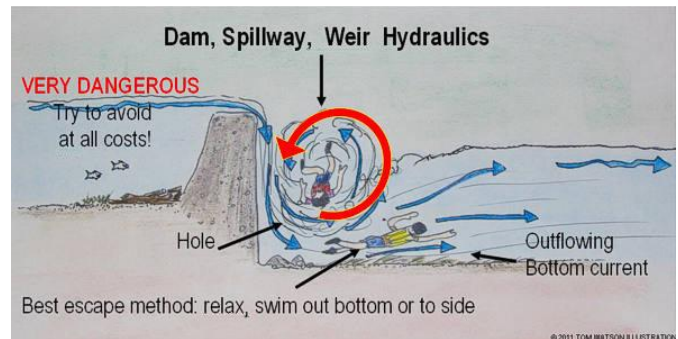
Currents

Safety on the water depends on developing respect for its power. Currents can be deceptive and should never be underestimated. Even a moderate current can exert a force of several tons on a capsized canoe, pinning it (and possibly you) against a rock. When swimming or boating in any water you must stay within your abilities and skill level.

Currents can be found in seas, rivers, estuaries and canals. In canals the top layer of water is often warmer and slow flowing with the mid level of water, where friction is reduced, shockingly cold and faster moving. It's easy to be dragged a long way before surfacing.

River currents are faster in narrow stretches, deep places and on the outside of bends – important to know for all water activities.

Re-circulating currents (also known as stoppers or drowning machines) are found at weirs or anywhere water drops over an edge. They are highly visible and should be given a wide berth whether swimming or in a craft. Even small features can hold items such as branches in their current and medium sized ones can hold a body. If trapped in a stopper in a kayak, paddle along the damn to a bank or wall and either exit via the bank or use the wall to help free you. If trapped under the water, swim down and along the bottom away from the current until you feel the backward-pull lessen. This is easiest done if you are able to reach the very bottom.



At the coast, swimming away from the shore in an outgoing tide can feel easy but remember swimming back is harder; always turn around before getting tired.

Another coastal risk is the possibility of people and inflatable dinghies getting caught in rip currents. Rips occur where wind and waves push water toward the shore but it's forced sideways. The water streams along the shoreline until it finds an exit back to the sea, usually in a trench between sandbars, under piers or along jetties. The current is strongest at the surface where it tends to dampen incoming waves, leading to the misleading illusion of a particularly calm part of the sea, enticing swimmers. To escape a current swim parallel to the shore until the out tide feels weaker allowing you to more easily swim to shore.



Debris, hidden objects, poor visibility and other water users

The closer your eyes to water level the harder it is to see approaching debris (above or below the water) and for other water users to see you. During water rescue a spotter is located upstream to warn of approaching hazards and to advise other users of rescuers presence.

Water entry should always be controlled and feet first; never jump or dive, we don't need more casualties. It's usually impossible to tell what objects are hidden under the water waiting to cause injury such as trolleys, trees or rocks. This is particularly true during or after flooding events.

A submerged object can be a hazard to unwary boaters, kayakers and swimmers. Rocks, stumps, logs and other objects can cause injury or death.

If swimming in a bay with boats around, be seen: consider wearing something bright or swimming with some form of buoy; this is especially important if you're snorkelling for example.

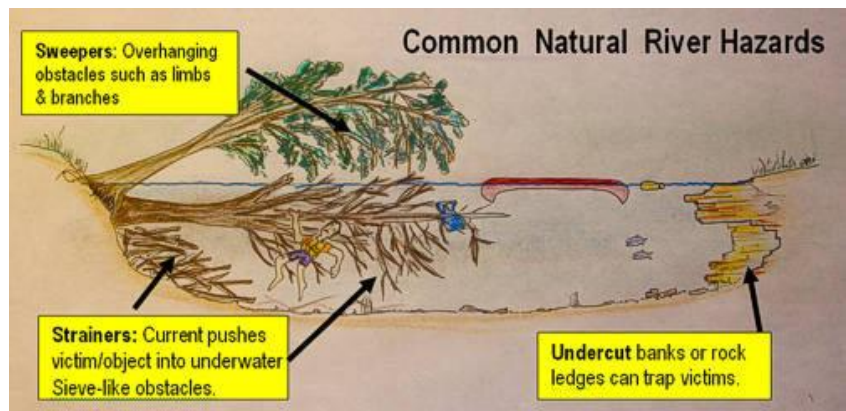
Strainers, overhanging obstacles and undercuts

A strainer is an obstruction that allows water to flow through but not solid objects such as boat or people. A strainer can completely block a narrow waterway. Strainers can include fallen or overhanging trees, reed beds or submerged fences for example. Wherever possible move around strainers or if needed swim over the top – see the 'swift water position' below.

Boaters in current need to keep a safe distance from strainers that they could be "pinned" against them.

Strainers are particularly dangerous because they look so innocent. Frequently they are also hard to see, especially when a fallen tree trunk is stripped of branches and is partly submerged.

Falling out of a kayak or swimming in a fast current can lead swimmers to be trapped in undercuts, unable to swim free to the surface.



Entrapment

One of the biggest dangers of an unplanned swim in moving water is entrapment, a general term for getting any body extremity, usually a foot or a leg, caught against the river bottom by the force of the current.

Often an unaware person who has been knocked off their feet will attempt to stand on the river bottom and walk to shore. This is an invitation to get a foot caught between rocks or in an undercut. Once caught, limbs are held in place by the force of the current. It can be impossible to fight the current to stand back up and drowning is common.

In moving water, never attempt to stand up; use the 'swift water position' below to avoid entrapment.

Mud and quick sand

A danger around rivers and estuaries; beware especially of incoming tides.

Water level changes

Water levels vary on almost every waterway due to rainfall and in tidal areas due to tides. Even a few inches difference in depth can make the difference between 'smooth sailing' and an abrupt end to boating. Running aground at speed can result in people being ejected from a craft. Boaters can protect themselves by keeping a sharp lookout for changing surface water patterns that indicate objects in the water and changing bottom structure.

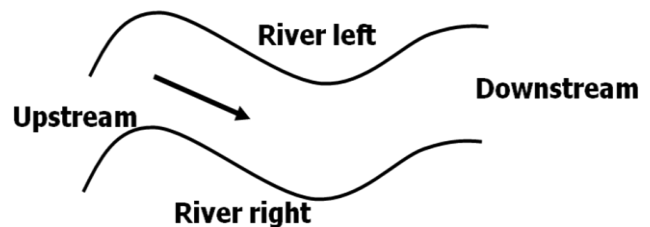
Be aware also that areas where it's normally 'safe' to jump in may not be during a drought's low water levels, or after a high flow as debris may have been washed into pools. Even when the water level hasn't obviously changed there's the possibility of water hiding dumped objects; everyone's seen the remnants of a shopping trolley or traffic cone...not something you want to land on.

What to do if someone falls in

Know where they fell

If someone falls into the water, where possible use land features to identify where they fell in, in case they don't come back to the surface. For example, "in front of that tree" or "diagonally between me and that buoy" etc. This is the best way to help the rescue services.

If you want to make sure rescuers come to a particular bank, when giving locations over the phone ensure you know which 'left' is 'river left'!



Searchers will use the following information to guide their searching;

- In flat water, the average casualty, under average conditions, will surface, or will be found, within 1.5 x the water depth of where they were last seen, for example:
 - If the water is 10 feet deep
 - The casualty will be within a 15 foot circle; centered on the spot where they were last seen.
- In moving water, casualties will usually be within 100 to 150 yards downstream. Common locations include:
 - Deep holes
 - Eddies downstream of large objects
 - Strainers

Talk, reach, throw, wade, row, swim, helo (helicopter!)

The last thing you should do when someone falls into water is jump in too. There are many news stories showing rescuers who have become victims whilst trying to save someone. Follow this simple hierarchy of rescue actions for the best chance of everyone ending up safe.

- **Talk:** falling into water can be disorientating and cold, easily causing panic. In a state of panic casualties may forget what they need to do. With clear and calm instruction they can often rescue themselves. Talk to the person, reassure them that they're ok and instruct them to swim to the shore or bank.
- **Reach:** four out of every ten drownings happen within two meters of shore or the pool side and one-quarter happen in shallow water one meter deep or less. At these distances reach with an oar or branch to pull the person to safety.
- **Throw:** a buoyant object such as a life ring or rope can be enough to give a casualty reassurance to swim to shore. Remember to keep talking to them.
- **Wade:** AVOID THIS IF YOU CAN. Wade into the water and give the casualty something to hold on to, and then lead them back to shore. In moving water, never wade past knee-high water as current above this level makes standing unstable. In still water, never wade past water mid-chest high; if a casualty grabs you directly in a panic you need to be able to maintain remain stable on your feet.
- **Row:** row out to the victim and help them into your boat or give them a float to tow them back to shore.
- **Swim:** AVOID THIS IF YOU CAN. In the KSAR Challenge we never advise swimming. Never get close to a casualty in water you cannot stand clearly in; it is common for panicked casualties to 'climb' on rescuers, pushing them under the water and drowning them. In-water rescue should only be attempted by suitably qualified people, such as lifeguards.

When training for or carrying out bank and water rescues, rescuers should only ever use floating ropes to avoid rescue lines sinking, snagging and presenting further drowning risk.

Swift water position

If you capsize in fast moving water, always adopt the swift water position to avoid injury and speed your safe exit.

- Float on your back, feet-first downstream.
- Use your arms to direct you.
- Keep your head facing forward and look ahead to spot upcoming obstacles.
- Always approach obstacles feet first and use your legs to push off into clearer water.



- Do NOT attempt to stand up; there's the risk of getting your foot stuck. The force of water can then push a casualty forward, face-first into the water and the water's force can hold the casualty down, drowning them.
- Cover your mouth, nose where the water is choppy.

Useful things to know include:

- Water moves slower on inside of bends.
- Eddies on the downside of objects may flow slowly upstream, giving you a calm spot to escape the main current.
- Look for a calm V-shaped pattern on the water's surface which indicates a smooth path between objects.

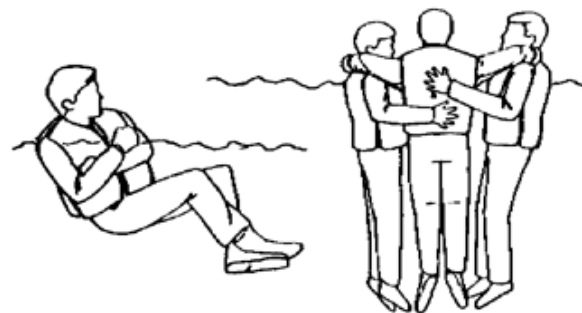
Cold water survival position

Maintaining body temperature is crucial to cold-water survival. When you're in cold water, do not swim unless you can reach a nearby boat, fellow survivor or floating object. Movement lowers body temperature - even good swimmers drown while swimming in cold water.

If a nearby floating object is large, pull as much of your body as possible out of the water and onto the float. The more your body remains out of water, the less heat it will lose. Do not use survival flotation methods that involve submerging your face in cold water. Keeping your head above water will conserve heat and increase survival time.

Floating in the HELP (Heat Escape Lessening Position) position will lessen heat loss. If others are in the water with you, HUDDLE together for warmth. Keep a positive outlook - it will increase your survival chances. Always wear your lifejacket. Even if you become helpless from hypothermia, your lifejacket will help keep you afloat.

Holding the top of the PFD (personal flotation device) in your hands and raising your knees to your chest will reduce your heat loss rate by 60% and lessen the energy expended on floating.



**H.E.L.P.
(Heat Escape
Lessening Posture)**

**HUDDLE
to maintain
body heat**

Where there is more than one person, huddle together in groups to help maintain body heat further.

Ice rescue

Falling through ice into frigid water can quickly lead to suffocation, hypothermia and drowning. No matter how prepared you are there is always the possibility of falling through. In the UK ponds, lakes and rivers are nearly never thick enough to walk on safely.

If you see someone fall through ice:

- STOP! Do not run towards the ice! If the ice was not strong enough to hold the casualty then it is not strong enough to hold a rescuer. Follow the same steps you would use to save a drowning victim: talk, reach, throw, row (or 'slide' a raft/flat bottomed boat).
- Once the casualty is out of the water, immediately begin treatment for hypothermia.

If you fall through the ice (source: Minnesota Department of Natural Resources '*Ice Safety*')

- DON'T PANIC! This is the most important thing to remember; panic causes you to lose focus. Focus on being calm, this will make breathing and thinking easier.
- Turn around and face the direction you were coming from. This area supported your weight already; it's better to go in a direction you know will hold you than to try an unknown.
- Leave all your layers on. While it seems that heavy winter clothing would weigh you down, it actually traps air and makes you more buoyant.
- Lay your hands and arms flat on the unbroken ice. Use ice picks if you have them. If not, use anything that can give you a bite into the ice - screwdrivers or knives, for example.
- Kick and pull to work your way back onto the ice. If your clothing is soaked with water, you may have to pause halfway out to let your clothing drain.
- Once you are out of the water, lay flat on the ice. DO NOT STAND! Laying flat will spread your weight out over the ice and help support you.
- Roll away from the hole. This is the best way to keep your weight spread out.
- Get to shelter quickly! Once in a warm, dry shelter, follow the steps to treat yourself for hypothermia. Strip your wet clothing off and begin to warm up. Cold, wet clothing will speed the onset of hypothermia more than anything else.

Prevention

Prevention is always better than cure so here are some of the top tips:

- When doing water activities cover all cuts and avoid swallowing water.
- Wash hands thoroughly before eating or drinking and wash all equipment and clothing regularly.
- Wear a life jacket or buoyancy aid during planned water activities when both on and near water.
- Avoid alcohol before or during water, or water-side activities.
- It is NEVER safe to walk on UK open water ice.