



Lifeboats



Flood Rescue Manual

NOVEMBER 2017

DEVELOPED FOR LOW-RESOURCE AREAS

About this manual

The RNLI *Flood Rescue Manual* contains essential skills, knowledge and guidance for those providing a rescue service in a flood environment.

The resource is designed for organisations based in areas with limited access to equipment. It is a guidance document and can be adapted to suit your local conditions.

The *Flood Rescue Manual* has been compiled by the RNLI, the charity that saves lives at sea.

This manual will be reviewed after 3 years. Please send any comments and feedback to: international@rnli.org.uk

November 2017

Piloted and developed by:



Lifeboats

Royal National Lifeboat Institution
West Quay Road
Poole
Dorset
BH15 1HZ
England

Telephone: +44 (0) 1202 663000
Web: RNLI.org
Email: international@rnli.org.uk

The RNLI is a charity registered in England and Wales (209603) and Scotland (SC037736). Registered charity number 20003326 in the Republic of Ireland.

This document may be reproduced without the prior consent of the RNLI. The RNLI takes no responsibility for any outcomes as a result of this manual.

Photos: RNLI/Mike Lavis, Shutterstock

Disclaimer

The content of this manual is for general guidance only. It represents best practice as at the date of publication and should not be considered as legal advice. Those using this manual should seek professional advice as and when necessary. The RNLI does not accept responsibility for any errors in this document.

Unit 1: Planning for floods	1
1.1 Developing a plan	2
1.2 Developing a site-specific plan	4
1.3 Stop, Think, Act, Review – Situational awareness	5
Unit 2: The study of water	6
2.1 Water flow	7
2.2 Speed of water flow	7
2.3 How objects affect water flow	9
Unit 3: Hazards	11
3.1 Types of hazard	12
Unit 4: Equipment	15
4.1 Personal protective equipment (PPE)	16
4.2 Putting on PPE	18
4.3 Rescue equipment	19
Unit 5: Communications	21
5.1 Hand signals	22
5.2 Whistle signals	23
5.3 Radios/mobile phones	24
Unit 6: Boats and other craft	25
6.1 Selecting a suitable boat	26
6.2 Types of rescue boat	27
6.3 Stability	30
6.4 Getting in and out of a boat	31
6.5 Paddling techniques	32

Unit 7: Flood rescue management	34
7.1 Incident command structure	35
7.2 Responsibilities	36
7.3 Operational zones	37
7.4 The essentials of flood rescue	38
Unit 8: Self-rescue	43
8.1 What you should do if you enter the water	44
8.2 Escaping from a strainer	46
8.3 Wading	47
Unit 9: Rescuing others	49
9.1 Flood rescue options	50
9.2 Shout and signal rescue	51
9.3 Reach rescue	52
9.4 Throw rescue – with a floating object	53
9.5 Wade rescue – wedge	57
9.6 Two-point tethered boat (or other craft) rescue	58
9.7 Tethered swim rescue	59



Learning outcomes

- 1.1 Understand the factors that need to be considered during the planning stage.
- 1.2 Understand how to develop a site-specific plan.
- 1.3 Understand Stop, Think, Act, Review.

Unit 1: Planning for floods

1.1 Developing a plan

Operating in a flood environment can be extremely hazardous. Before entering a flooded area it is important to know how capable the team is to work in the area. The team also needs to understand the hazards.

A plan should be developed before incidents happen and then used during the incident.

Firstly, the area of response must be defined before identifying any hazards present and developing a plan. Key questions that should be answered include:

- How big is the area?
- Are there any land-based hazards?
- Are there any water-based hazards?
- If the area covers agricultural and industrial land, are livestock, chemicals and slurry going to be hazards?
- Who is living in the area? Do they need to be evacuated? Is there an evacuation plan?

Managing the response

Once your plan has identified any hazards, you can identify the necessary personnel, training and equipment:

Personnel – who is available?

Having the appropriate number of competent people in the right place at the right time is essential for an efficient and effective response.

Training – what training is needed?

Personnel should have the correct training for the environment they are working in. A plan can help establish what kind of training might be needed.

Equipment – do the trained personnel have the correct equipment?

Trained personnel should have the necessary equipment to stay safe and be able to perform tasks when on scene.



Logistics

Once the basics of the plan are established, consider other aspects:

Mutual aid

Are other relevant departments or organisations working in the area?

If so, they may be able to share equipment, personnel or knowledge (such as where hazards or people are located).

Communications

How do the teams communicate with each other and with those in command?

Effective communication within teams, between teams and back to the command structure is vital to ensure everyone is aware of what activities are happening. It is also important to identify what communications equipment is available, whether it is suitable for the environment (such as being waterproof), and whether it is able to fully cover all areas of operation. Areas where communication may be difficult should be made known to all the team.



Welfare

How can you ensure the welfare of the responders?

Provision of refreshments and rest facilities are critical to the welfare of the responders, and of any casualties. Without appropriate welfare provisions, team motivation may drop, leading to ineffective rescues.

Shelter

Is shelter from bad weather available?

Having a safe and dry area is not only important for the welfare of the responders, but also the welfare of any evacuated or rescued people.



An easily accessible shelter may also be used to house the Silver Command close to the scene.

Transportation

What kind of transportation is available?

Responders and other personnel will need to be transported to, from and around the flood environment. Clear transportation routes – with back-up plans – should be mapped and a list should be made of the vehicles required.



Unit 1: Planning for floods

1.2 Developing a site-specific plan

A site-specific plan provides local information to the response team.



The following information will be required to make a site-specific plan:

- use local knowledge for the layout of the area and local hazards
- location of hazards, incidents and response teams/RVs (meeting points)
- detailed maps and plans of the local area
- access routes/egress
- communication issues, such as areas with no signal
- specific risks, such as dams or weirs
- special equipment requirements for the location
- team response plan – who will do what
- specialist training requirements for the response team
- who are you helping?



1.3 Stop, Think, Act, Review – Situational awareness

It is important that a rescuer takes time to make a good assessment of what is happening and consider all possible options before providing assistance. This can be done in a four-stage process: **Stop, Think, Act, Review**.

Stop

- Assess the task you are about to undertake.

Think

- How will you undertake your task?
- What equipment will you need?
- Are there any hazards that will affect you or your team?
- Will you need further assistance?

Act

- Carry out the task.
- Continue to assess the risks while undertaking the task.

Review

- Record the task/incident.
- Could anything have been done differently?
- Was the equipment used appropriately?
- Were the right decisions made?

Unit 2: The study of water



Learning outcomes

- 2.1 Know about the flow of water and common terminology within the flood environment.
- 2.2 Understand why water flows at different speeds.
- 2.3 Know how objects affect water flow.

2.1 Water flow

Swift-flowing water tends to be:

- **powerful**
Even when moving at only a few metres per second, water flow can create an incredible force on small surfaces like your legs. At higher speeds, it can be impossible to fight against. Where possible, use the flow to your advantage.
- **relentless**
The water will continue to flow and will not let you go until it recedes. With the help of experience and weather forecasting, it is possible to predict where the flow will go, how it will react, and even how long it will last for.
- **lazy**
Water will always take the easiest route possible.

Orientation

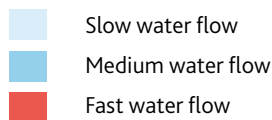
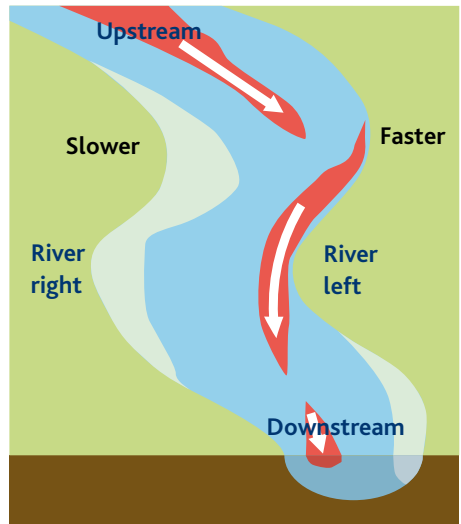
It is important to use common terminology when operating in a flooded environment.

When we refer to water flow we use the terms:

- **Upstream** – the direction the water is flowing from
- **Downstream** – the direction the water is flowing to
- **River right** – the right side of the channel when you are looking downstream
- **River left** – the left side of the channel when you are looking downstream.

2.2 Speed of water flow

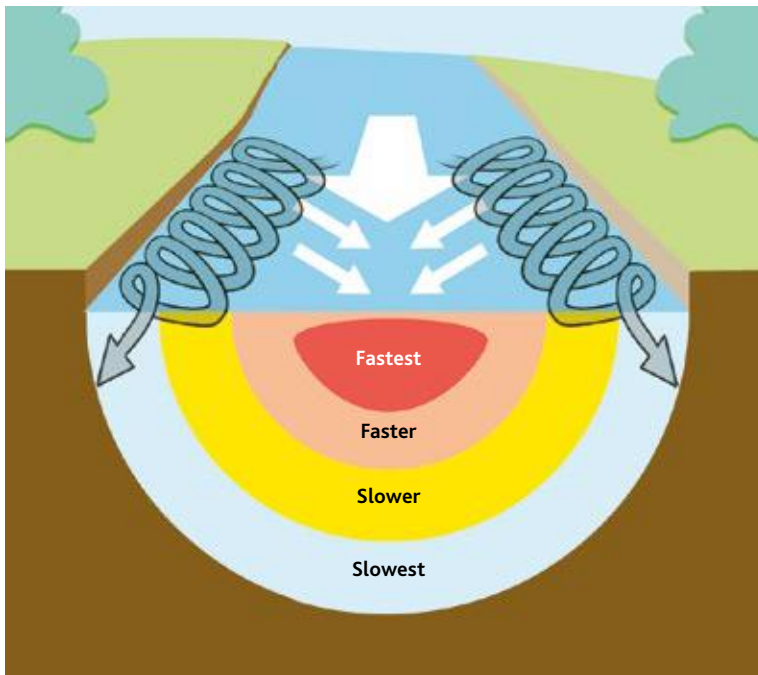
Water always flows in straight lines, which means that the flow of water is always faster on the outside of the bend and slower on the inside of a bend.



Unit 2: The study of water

The cross-section of the flow (shown below) shows us how water flows at different speeds, depending on how close it is to the riverbed or bank. The fastest flow will be in the centre near the surface. The closer the flow is to the edges, the slower it will flow due to friction with the riverbed.

The friction generated between the riverbanks, large objects in the water (such as people) and the main flow sends the water into a corkscrew effect. This pushes objects, or you, away from the bank.

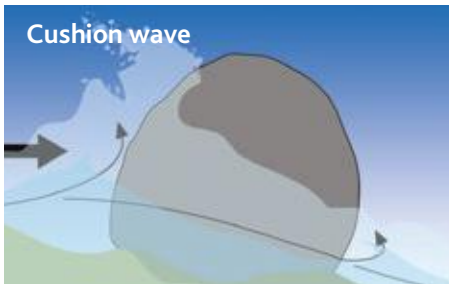


2.3 How objects affect water flow

Objects in the water will change the water flow.

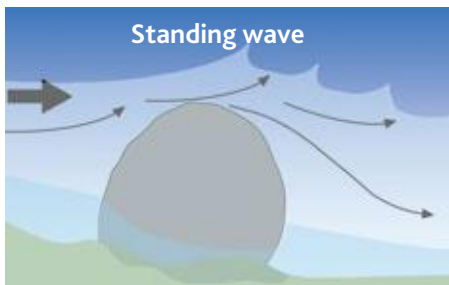
Cushion wave

An object that is higher than the water level will form a cushion wave on its upstream side. The water pushes up and against the object before falling away to the sides. Stay away from the cushion wave to avoid getting trapped.



Standing wave

If water flow increases, a cushion wave will change to a standing wave. A standing wave indicates that there is an object under the surface of the water. Water is pushed up and over it and creates turbulent water. Be aware that there will be a hazard below a standing wave.

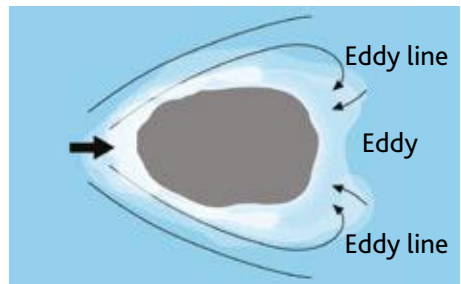


Eddy

This is an area of circulating water out of the main flow. It is a safe area identified by the slow swirling motion.

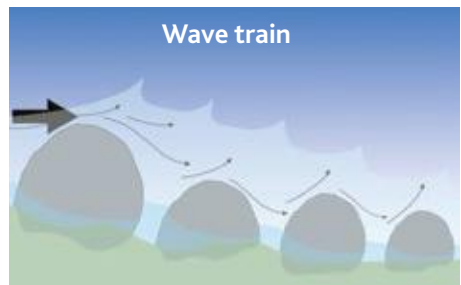
The line between the eddy and the flow is called the eddy line.

An eddy generally represents a safer area out of the flow, which can be used for a rest or as a safe place to plan a rescue.



Wave train

A series of standing waves is known as a wave train.



Unit 2: The study of water

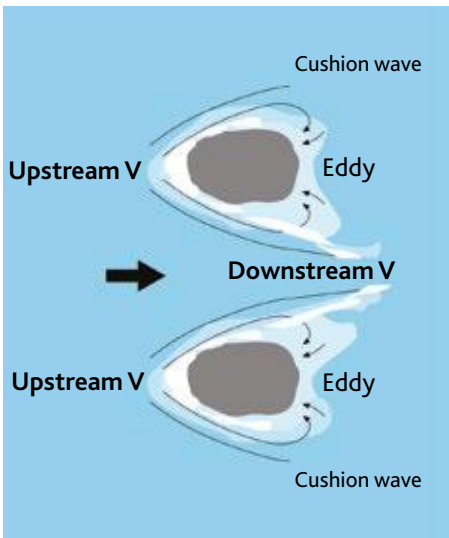
Upstream V

Once water has hit the upstream side (forming a cushion wave), it then flows out, past the object creating a V shape pointing upstream.

Downstream V

A downstream V is found between two objects in the water. This is an area of faster flow.

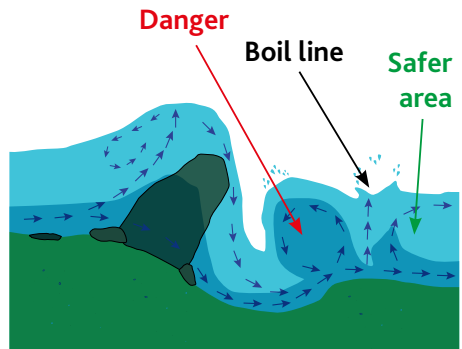
Any object in the flow will be pulled into this faster flowing water.



Hydraulic

Water flowing over an object creates a circulation downstream of it. The boil line shows where the circulation ends.

This circulation can be dangerous as it can hold an object or person.





Learning outcomes

3.1 Understand what hazards there are and how to reduce the risks associated with them.

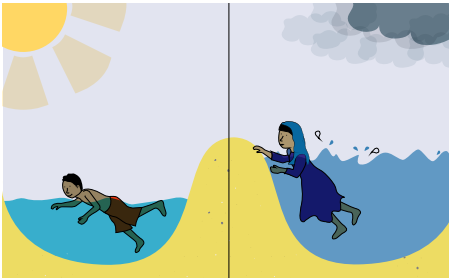
3.1 Types of hazard

The flood environment can have many different types of hazard that a rescuer should be aware of.

Weather

The weather can cause floods. Areas that were previously easily accessible may be inaccessible following heavy rainfall.

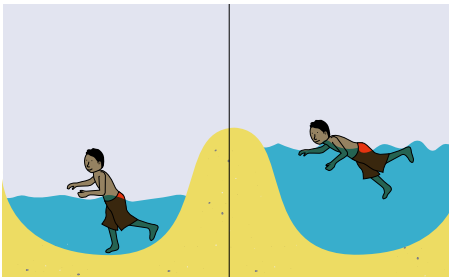
If there's fog, visibility will be limited.



Tides

Natural waterbodies can change very quickly depending on the tides.

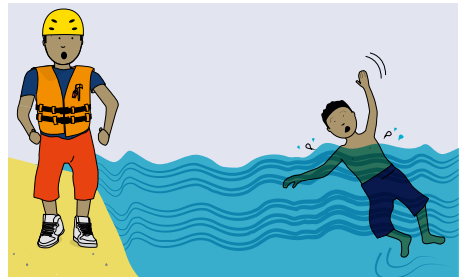
High tides can cause coastal flooding and make rivers unable to cope with the amount of water they are carrying.



Water speed

Even when moving at only a few metres per second, water flow can create an incredible force even on small surfaces like your legs.

At higher speeds, it can be impossible to fight against.



Water temperature

Water temperature can be a hazard both to the rescuer and casualties, especially if it is cold water.

Water depth

A sudden change in water depth may result in a person stepping or falling into deep water beyond their capability.



Entry and exit

Steep, slippery and unstable banks can limit access and exit from the water, and also be a danger to the rescuers.

You must consider the most effective and safe route, using local knowledge.



Entrapment

Entrapment occurs when a person gets caught on a submerged object or stuck in the mud.

You should never put your feet down if you find yourself caught in the flow of water.

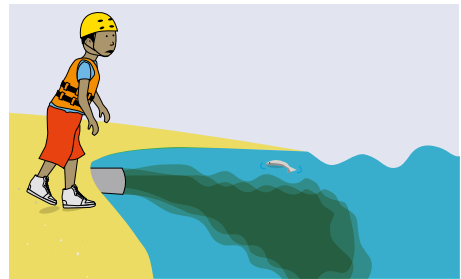


Pollution

Polluted water will be found in a flood environment. This may include sewage water or industrial chemicals. Some pollutants can be very dangerous and can also harm people's health.

Drinking water can also be contaminated, leading to waterborne disease.

Open wounds should be covered if possible. People should wash after being in polluted water and equipment should be cleaned after use.



Electricity

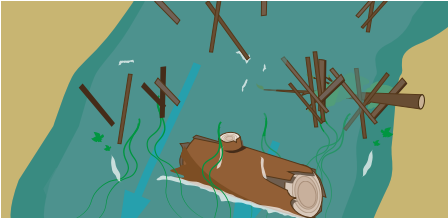
In an urban environment rescuers may be working close to electricity cables as the floodwater rises.

Stay clear of any electrical systems.



Floating debris

Within the flow, moving along with the water are likely to be floating objects. These have the potential to become hazards and can affect the flow of water.



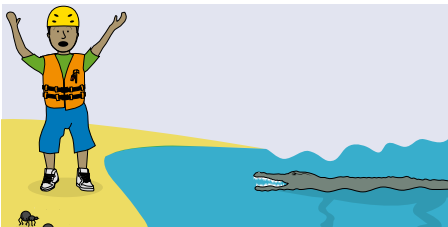
Strainers

Strainers are objects that allow water to pass through but hold larger solid objects. It can be a natural object, such as a tree hanging in the water, or man made, such as gates or railings. In either case, the responders should avoid operating upstream of a known strainer.



Animals

Dangerous animals may be found in the floodwater. Stay alert and keep away if you see any. Warn others if you can.



Visibility

Darkness or poor visibility (caused by fog or cloud cover) can make it very difficult for responders to work in floods. Consider using waterproof lights and reflective material.



Underwater objects

Responders should beware of injuring themselves on dangerous objects such as sharp rocks, broken glass or underwater debris. Foot protection or shoes should be worn where possible.





Learning outcomes

- 4.1. Know the correct personal protective equipment to be worn in a flood environment.
- 4.2. Be able to put on and adjust personal protective equipment correctly.
- 4.3. Understand the different types of rescue equipment and their uses.

4.1 Personal protective equipment (PPE)

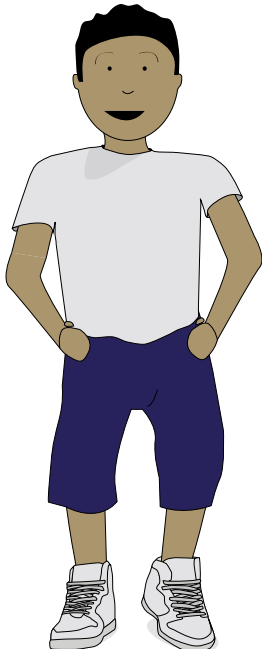
What is PPE?

Personal protective equipment (PPE) will protect the rescuer against health and safety risks. Due to the large number of hazards in the flood environment, it is important that a rescuer wears appropriate PPE.

To be effective, it is important that all PPE is the correct size and adjusted to the individual wearing it.

Heavy clothing that absorbs or catches water should not be worn.

Rescuer not near the water:



Rescuer wearing the correct PPE near the water:



DO NOT GO BAREFOOT

Buoyancy aid

A buoyancy aid will help keep the rescuer afloat but will not keep their head out of the water if they become unconscious.

Buoyancy aids are the preferred and most suitable option for rescuers as they allow for easy movement in and out of the water.



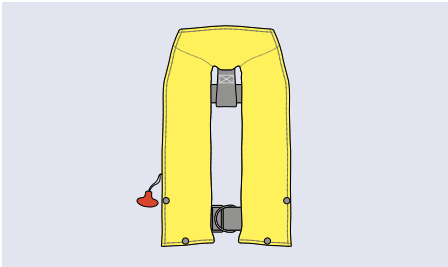
Lifejacket

There are many different types of lifejackets, including those with manual and automatic inflation. There are also foam lifejackets.

A lifejacket is designed so that if you become unconscious it should keep your head above the water and maintain a clear airway.

Lifejackets are sometimes larger than buoyancy aids and can be difficult to move in. Because of this, they are not recommended for rescuers.

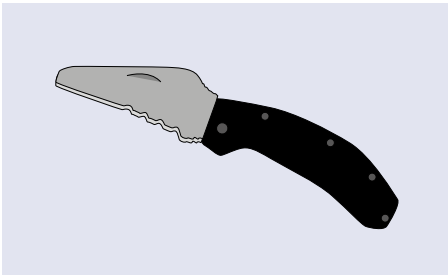
Ensure that all straps and buckles are done up tightly and minimise the amount of loose ends.



Knife

A sharp knife can be used to free the rescuers and others from entanglement.

It should be stowed in a sheath to avoid personal injury or damage to equipment.



Helmet

A helmet protects the rescuer's head against:

- striking against stationary objects such as rocks
- falling or moving objects such as boats.

Water rescue helmets are specially designed to allow water to pass through.

You should always use a helmet if it is available to you.



Do not use fire or motorbike helmets as they are heavy and do not allow water to pass through them.

Different coloured helmets can be used to identify key personnel when operating in a flood environment.

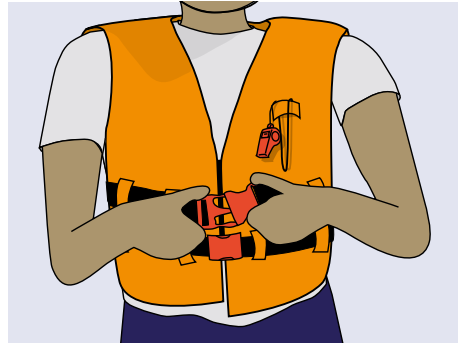
These colours should be standardised between all the different agencies that might respond to a flood.

Unit 4: Equipment

Cow's tail

Some buoyancy aids and lifejackets, also known as personal flotation devices or PFDs, come with a 'cow's tail'.

This allows rescuers to be attached to a rope. The cow's tail *must* be able to be released quickly if necessary.



Lifejacket

When wearing a lifejacket it is vital that you fit it correctly, otherwise there is a danger that it may come off if you enter the water.

Ensure that any buckles are done up and any webbing straps are tightened.

Tuck away any excess webbing, so it does not become a snag hazard.

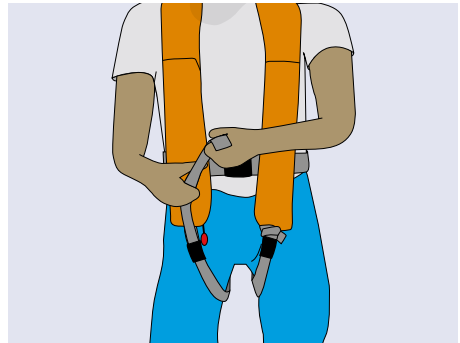
4.2 Putting on PPE

Buoyancy aid

Buoyancy aids come in a wide variety of designs. Some can be put on like a jacket while others are put on over the head and adjusted at the side.

The most important features of any buoyancy aid are that it fits comfortably, allows freedom of movement and gives you flotation, especially if you enter the water.

Make sure that any buckles are done up and straps are pulled tight so that the buoyancy aid fits properly.



Helmet

When wearing a helmet make sure it is a comfortable fit around the head. Helmets come in different sizes and they should be adjusted to fit properly. Ensure the chin strap on your helmet is done up securely.

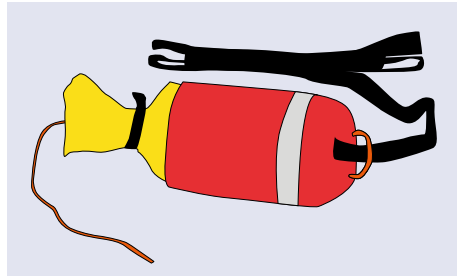
Never use motorcycle or fire helmets to operate in floodwater.



Throw bag

A throw bag consists of a length of rope (a throw line) stored inside a quick-release bag.

It is used to rescue casualties in moving water. It is recommended that anybody working in the flood environment has access to a throw bag.



4.3 Rescue equipment

You may have to help someone who has fallen into the water. The casualty will have the best chance of being rescued if you use the right equipment.

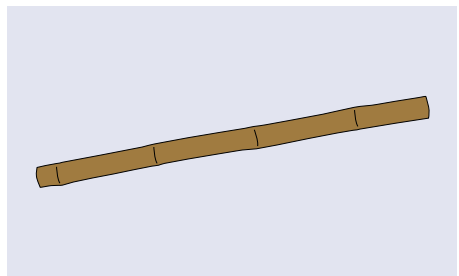
Specialist rescue equipment can be very expensive, but equipment can be made locally out of low-cost materials.

Wading poles

Wading poles can be made out of natural or man-made materials. They are used to check for water depth and underwater hazards while wading.

They can also be used for reach rescues from the water.

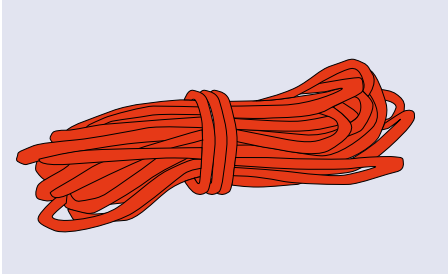
A raft paddle or bamboo pole can be used as a wading pole.



Unit 4: Equipment

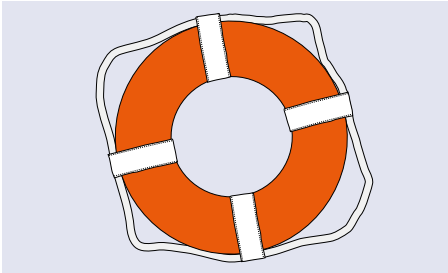
Rope

Try to use brightly coloured rope that will float as this will help the casualty and rescuer see the rope on the surface of the water.



Floating objects

Floating objects can be used to keep both the casualty and rescuer afloat during a rescue.



In some countries, specialist floating objects have been developed that are specifically designed for rescue. However, in areas where specialist equipment is not available, alternative locally sourced equipment may be used.

A floating object should be:

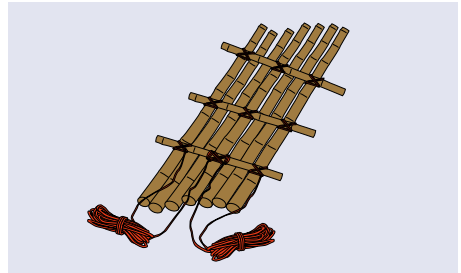
- easy to hold on to
- easy to move through the water
- capable of keeping a person afloat.

An empty water container (at least 5 litres) can easily hold the weight of an adult. Most containers have a handle that a casualty can hold onto in the water.



Rescue raft

A simple, locally produced, stable raft can be used during a rescue.





Learning outcomes

- 5.1 Be able to communicate effectively using hand signals.
- 5.2 Be able to communicate effectively using whistle signals.
- 5.3 Understand the benefits and drawbacks of using radios and mobile phones in a flood.

Unit 5: Communications

Communications

Rescuers must be able to communicate with other team members and casualties, often over long distances.

Hand signals and whistle blasts are used to attract the attention of other team members and casualties, and to pass on important information.

5.1 Hand signals

It is important that rescuers understand hand signals to avoid confusion during an emergency. All agencies should use the same signals. The hand signals illustrated below should be used:

Meaning:

OK

Signal:

One hand flat on head (either left or right hand).



Meaning:

DISTRESS

Signal:

One arm raised above the head with a clenched fist.



Meaning:

STOP

Signal:

One arm outstretched in front of chest showing an open palm of the hand.

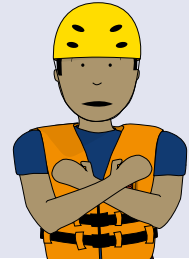


Meaning:

NEED MEDICAL HELP

Signal:

Both arms crossed in front of the chest.



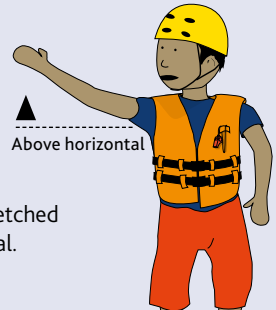
Meaning:

GO

(in that direction)

Signal:

Pointing with one arm outstretched above horizontal.

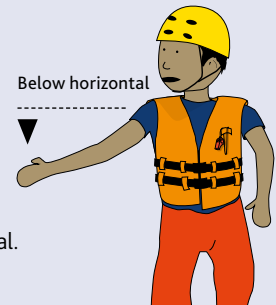


Meaning:

HAZARD IN WATER

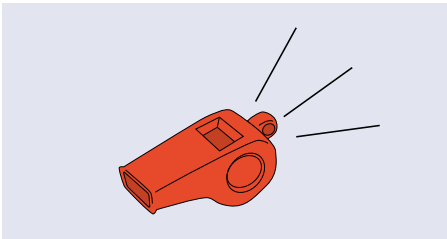
Signal:

Pointing with one arm outstretched below horizontal.

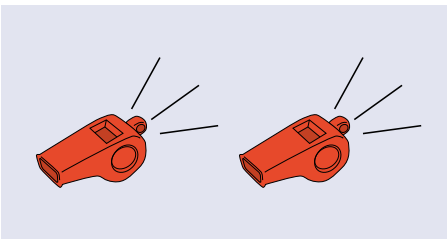


5.2 Whistle signals

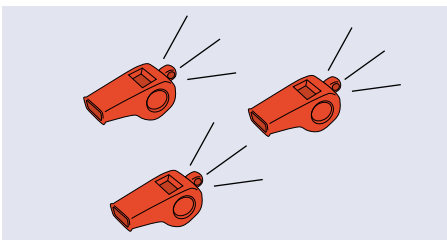
A whistle should be carried by a rescuer at all times when at a scene. They can be heard over fairly long distances to attract the attention of both a casualty and another rescuer. Always remember, if a whistle is used too often then its significance will decrease and people will take no notice when it is used.



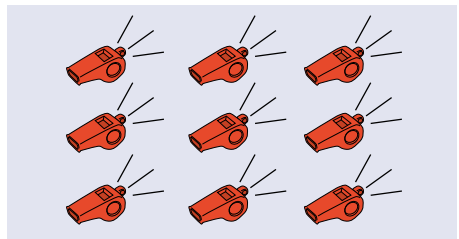
1 blast – Attention



2 blasts – Attention upstream



3 blasts – Attention downstream



3 blasts, 3 times – EMERGENCY

5.3 Radios/mobile phones

Radios and mobile phones allow good communications between team members. They enable a team to give regular updates to people in charge and other groups.

If radios and/or mobile phones are to be used then a thorough communications plan should be established prior to an emergency situation.



The communications plan should include the following:

Radio channels

Radios can operate on different frequencies, which are often called channels. To ensure you can communicate clearly it is important to make sure that the channel you use is not being used by others in the area. Identify alternative channels in advance so that you can switch to them if necessary.

Call signs

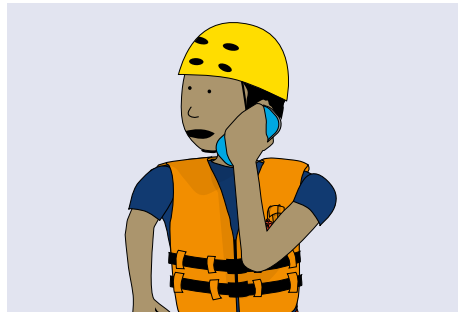
A call sign is a name or number given to each person, team or equipment. Team members should only use allocated call signs. This helps to identify the correct resources and reduces confusion. Using the wrong call sign can result in the message being unnecessarily repeated and also increase the length of the message.

Voice procedure

A voice procedure is used to ensure clarity of spoken communication and reduces misunderstanding. It involves using words with specialised meanings.

Back-up plan

Many things can go wrong with communications. Equipment may stop working or the signal may be lost. A communications plan should always include a back-up plan with alternative communication methods if needed.





Learning outcomes

- 6.1 Understand the considerations needed to select an appropriate boat.
- 6.2 Understand the different types of rescue boat.
- 6.3 Understand the factors that affect the stability of boats, rafts and other craft.
- 6.4 Understand how to safely get in and out of a boat.
- 6.5 Be able to paddle a boat safely.
- 6.6 Understand what to do during a capsize.

6.1 Selecting a suitable boat

There are currently many types of boat available to the rescue services. It may be difficult for an organisation to find a single solution for all rescue needs in one particular craft.

Rescue organisations must identify critical requirements that their rescue boats must be capable of achieving. The following points should be considered before selecting a particular type of rescue boat:

- What will the boat mainly be used for?
Rescue?
- What type(s) of water will the boat mainly operate on – estuary/river/flood/swift water?
- How many crew are required to operate the boat safely?
- How will the boat be transported?
- Where and how will the boat be launched – from a trailer/manually handled?
- How will the boat be maintained?
- The carrying capacity (number of people and weight).
- The speed of flow in the flood where the boat will operate.
- The position of crew and casualties.
- The potential of free surface water effect.

Before making a decision, remember that flood and swift-water environments present ever-changing conditions and, as a result, different response needs.

The conditions might range from fast flowing strong currents, where a high-powered and fast boat is preferable, to slow moving water covering a flood plain, where a more robust craft might be the better option.

6.2 Types of rescue boat

Inflatable boats

What are they?

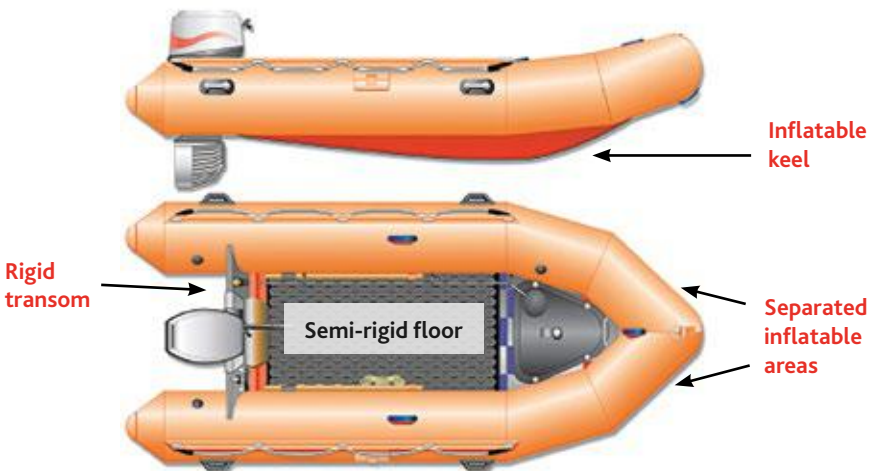
- Usually with a semi-rigid floor and rigid transom.
- The inflatable areas are separated to isolate damaged areas.
- They sometimes have an inflatable keel fitted to aid manoeuvrability in rough water.

Advantages

- Good handling abilities.
- Rescuers can wade easily in shallow water and transport people easily.
- Easy to repair.

Disadvantages

- Can be unstable when overloaded.
- Punctures easily when it comes into contact with sharp objects.



Unit 6: Boats and other craft

Rigid-hull boat

What?

- The rigid hull is the most common boat type with the greatest variety of hull shapes.
- It can also be constructed with the greatest variety of materials.

Advantages

- There are many varieties available, which means that there is probably a model available that is suitable for most rescue needs.
- Most can be launched from a slipway.

Disadvantages

- Higher sides than an inflatable boat, which may make it harder to get casualties into the boat.
- May not be as stable as an inflatable boat, especially if it has taken on water.



Rigid-inflatable boat (RIB)

What?

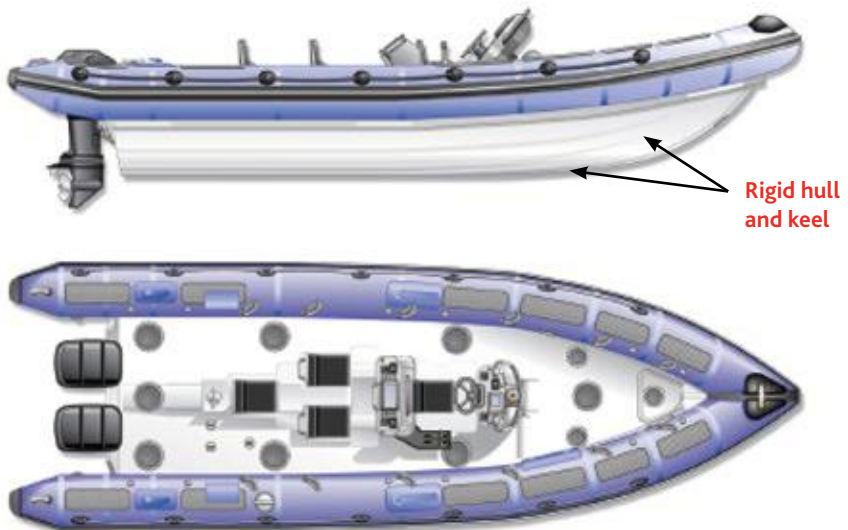
- The RIB is a combination of the inflatable and rigid hull boats, with a rigid hull and keel.

Advantages

- Tends to be larger than inflatable boats, and therefore has a larger carrying capacity.

Disadvantages

- Most RIBs are large so they need to be launched from trailers.



6.3 Stability

Rescuers should be aware of the limits of the boat/raft they are operating. This will include the maximum number of people and the maximum combined weight of people and equipment that should be carried onboard.

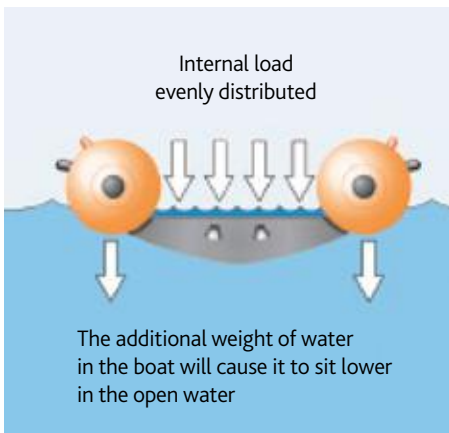
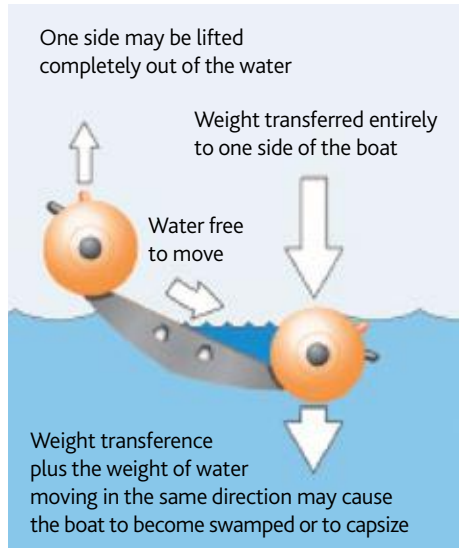
The rescuers are responsible for making sure the boat/raft is correctly balanced.

Do not overload the boat/raft.

Uneven distribution of weight

The movement of weight around the boat will affect its stability. This weight may be a member of crew, a passenger or load. In flowing water there may be occasions when water is moving freely inside the rescue boat. The movement creates instability, which may lead to the boat capsizing.

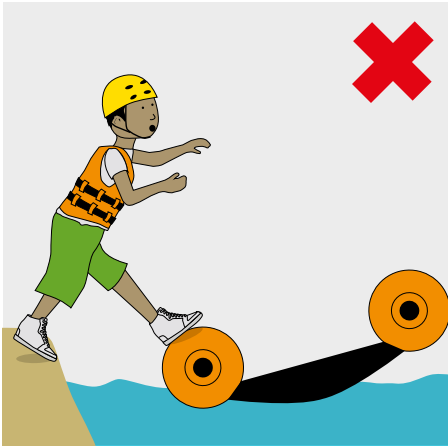
The rescuer should ensure that only a minimum amount of water is allowed to collect in the boat, and that load is evenly distributed.



6.4 Getting in and out of a boat

NEVER

- step on the edge of the boat
- jump/step across a large water gap.



ALWAYS

- step into the boat
- check the boat remains balanced when a person steps into or out of the boat.

If possible, ensure the boat is secured with ropes to fixed objects on the bank before getting in or out of the boat.



6.5 Paddling techniques

Paddling a boat effectively means that all members of the team must work together.

The team should select a person in charge to lead the group and give directions.

As a rule, the person leading the group should position themselves at the back of the boat.



The team leader should use clear commands to keep the group working together:

- "Paddle left"
- "Paddle right"
- "Paddle forwards"
- "Paddle backwards"
- "Stop paddling"

6.6 Capsize

If a boat capsizes, it is vital to verbally and visually check that all crew are accounted for. All crew must maintain contact with the upturned boat at all times by holding onto any lifelines. If you find yourself under the upturned hull following capsize, exit as quickly as possible while remaining in contact with the boat at all times.

The boat team leader will then make a decision to either:

- **swim to safety** – if hazards are present
- **reright the boat** and paddle to safety – if no hazards are present
- **sit on top** of the upturned boat and ride down the flow to a safer point.

Entrapment

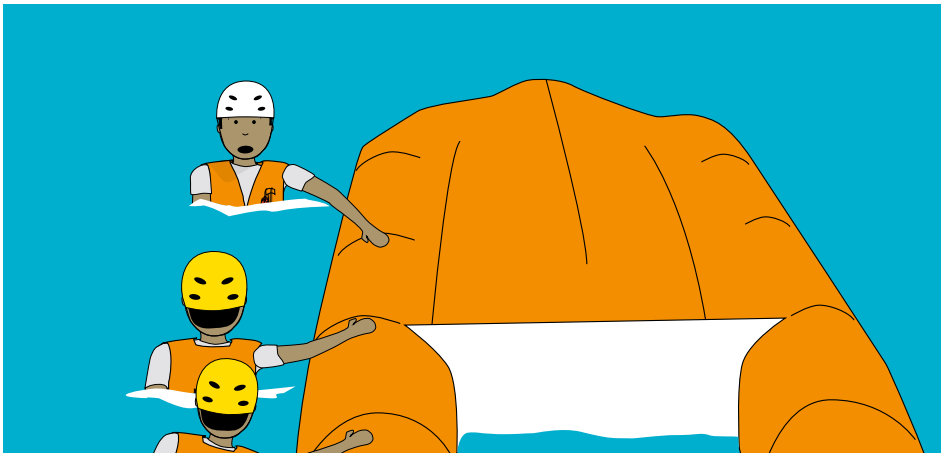
Do not enter a capsized boat unless it is to assist a trapped fellow responder.

If you get trapped, use the air pocket under the boat if available.

If no air pocket is available, act quickly and try to force yourself out from underneath the upturned hull.

To free yourself from under the boat, try pushing away from the boat and reaching for something outside the boat that you could use to pull yourself out with.

If you find yourself trapped and snagged, try to release whatever is snagging you. If you have a knife available, use this to cut yourself free from the snag.



What should you do if you fall in

Communicate with the boat and if safe to do so wait for them to pick you up.

If this is not possible, try and self-rescue using defensive or aggressive swimming.

Unit 7: Flood rescue management



Learning outcomes

- 7.1 Understand the components of an incident command structure.
- 7.2 Know the hierarchy of responsibilities during a rescue.
- 7.3 Understand the different operational zones of a flood environment.
- 7.4 Know the eight essentials of flood rescue.
- 7.5 Understand the different lookouts needed during a rescue.
- 7.6 Understand risk versus benefit.
- 7.7 Understand what a rescue team needs to ensure their welfare.

7.1 Incident command structure

The command structure

The purpose of a command structure is to ensure that:

- resources are deployed correctly and efficiently
- rescuers understand their roles and responsibilities
- rescuers are suitably trained and equipped.

Command structures for emergencies and disasters are generally split into three levels:

Strategic gold

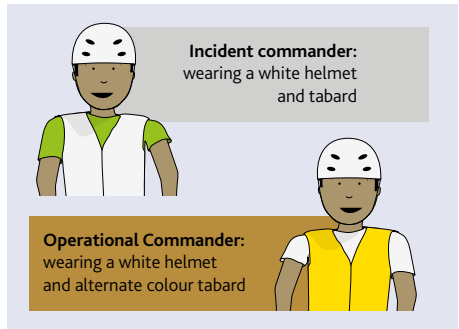
The Gold Command is responsible for the strategic management of the emergency. They provide resources, prioritise demands and determine plans for normality. The Gold Command may not be on site, but will be in regular contact with the Silver Command.



Tactical silver

The Silver Command ensures that the actions taken by the Bronze Commands are coordinated to achieve maximum effectiveness and efficiency.

Silver Command will usually be the most senior officers of each agency at the incident. The Incident Commander heads the Silver Command and can be recognised as they wear a designated tabard that may also be marked with Incident Commander.



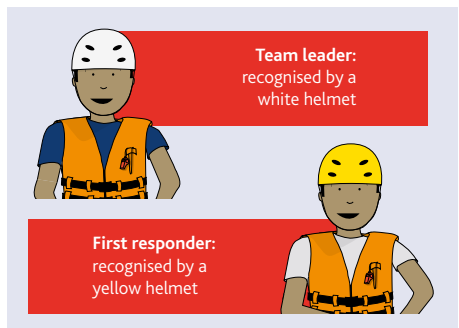
Operational bronze

The Bronze Command is the operational level, which undertakes work at the emergency site.

Personnel who are first on the scene will take immediate steps to assess the nature and extent of the problem. They will formulate a plan and concentrate efforts and resources on the specific tasks within their area of responsibility.

Rescue team

The rescue team is made up of a small number of trained people, usually seven who actively undertake the rescue. There will be a team leader, who is identified by a white helmet which differs in colour to the ones worn by his or her team.



7.2 Responsibilities

Priorities

In all rescue situations there is one overriding set of priorities, which is to maintain the following hierarchy of responsibility at all times.

Yourself

- Your safety must always come first. Ignoring this priority may place you at risk of becoming a casualty, along with your team.
- Personal safety involves working within your own capacity. It is your responsibility to relocate yourself to a position of safety if you feel you are working beyond your capacity. You must always be aware of fatigue and tiredness.
- You cannot save someone else if you can't keep yourself safe.

Team

- Always consider the collective ability of the team to carry out the rescue task within the limits of the operational briefing.
- To function successfully as a team, communication between all team members must be clear, concise and relevant.

Equipment

- Equipment for rescue and transportation is a valuable asset to both the team and to any casualties when operating and carrying out rescues in a flood environment.

Although flood rescuers go to the aid of a casualty, the primary role of our equipment is to transport us to safety or aid in self-rescue if the situation becomes too dangerous.

Casualty

- When rescued the casualties become the responsibility of the team and must be provided with instruction on personal safety and where to place themselves.

7.3 Operational zones

There are three operational zones in relation to the floodwaters.

HOT ZONE

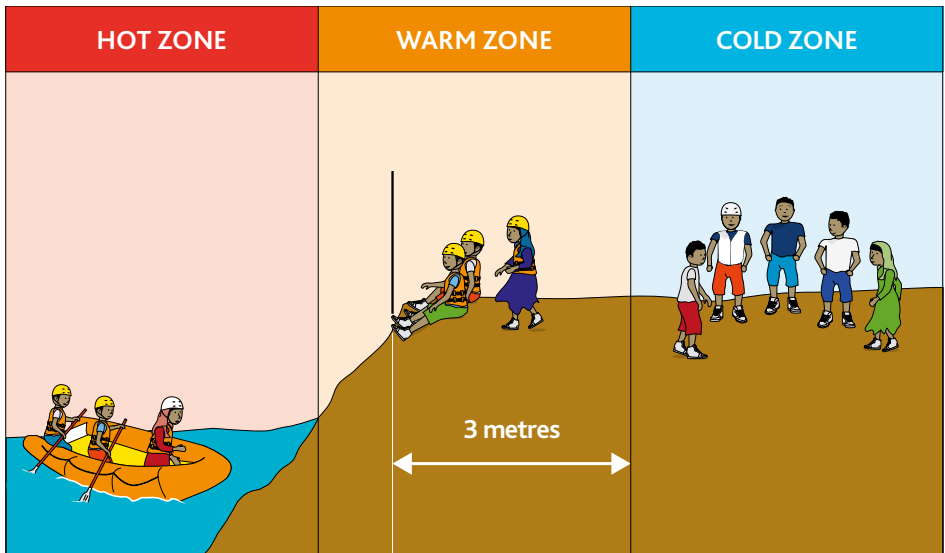
- This is the area covered by floodwater.
- Full water rescue personal protective equipment (PPE) is required.
- This is the area of highest risk and is only for appropriately trained personnel.

WARM ZONE

- The warm zone extends 3 metres back from area of danger.
- Talk, Reach and Throw rescues are undertaken from here.
- Full water rescue PPE is needed for teams performing rescues.

COLD ZONE

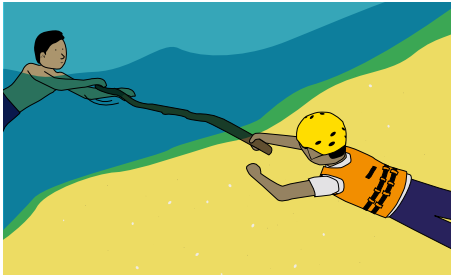
- This is where the incident commander will be based.



7.4 The essentials of flood rescue

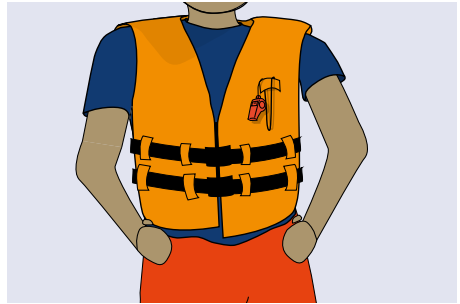
Keep it simple

Don't make the rescue more complicated than it needs to be. A complicated rescue means more things can go wrong.



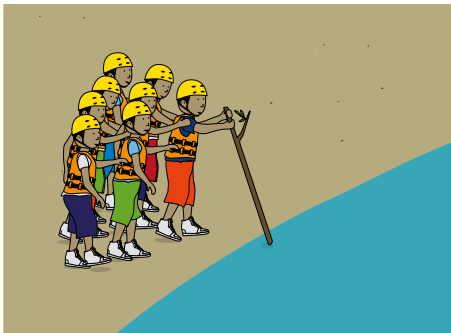
The right equipment

Always use the right equipment, and only use equipment you are trained to use.



Priorities

You need to ensure your own safety first.



Have backup

Always have appropriate backup.



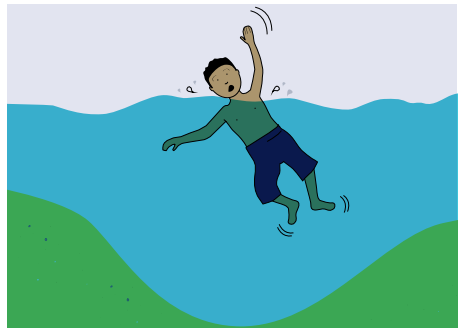
Work carefully with ropes

Ensure that all ropes can be released easily.



Casualty caution

Never rely on a casualty to help you.



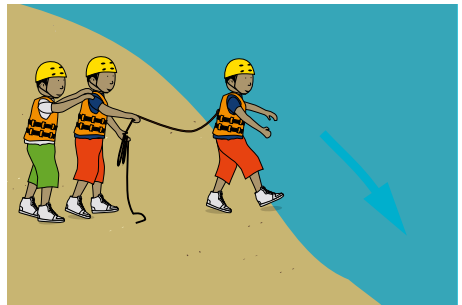
Mind your feet

Never put your feet down if you get swept away. Your foot may get caught under an object.



Technique

Always use the most appropriate technique for the resources you are using.

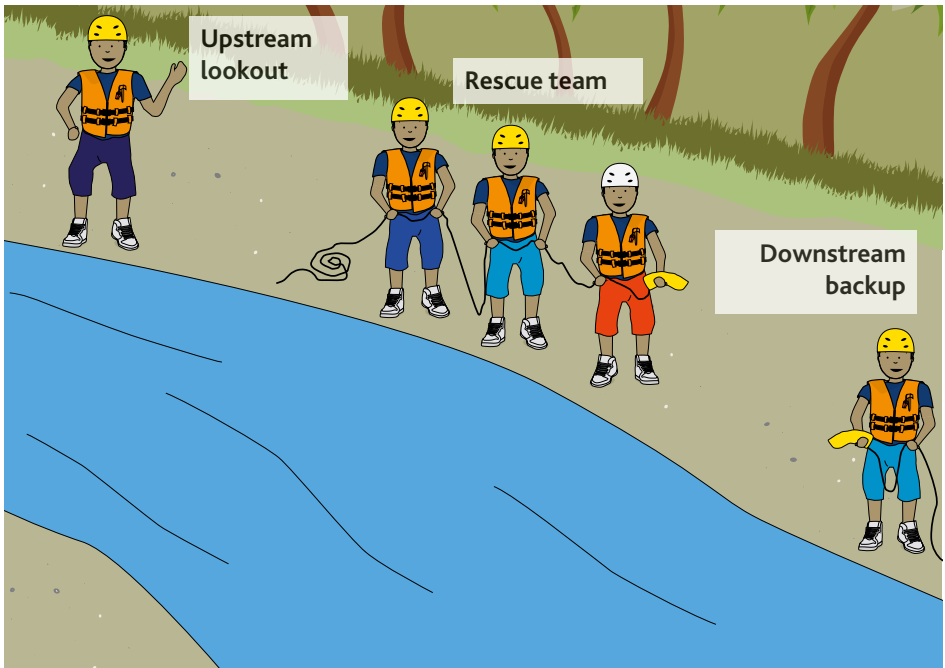


7.5 Lookouts

A team rescuing a casualty in moving water should consist of:

1. Upstream lookout – able to keep a lookout for approaching debris and communicate any hazards to the rest of the team.
2. Trained rescue team – with the necessary skills and equipment to rescue the casualty.
3. Downstream backup – with the necessary skills to rescue the casualty or the rescue team if the rescue is unsuccessful.

The downstream backup should have resources and skills equal to or above the rescue team.



7.6 Risk versus benefit

Before undertaking a rescue, the rescuer must decide if the risk to themselves and their team is worth the likelihood of a successful outcome.

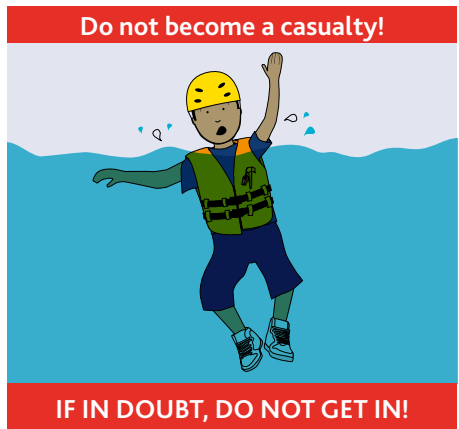
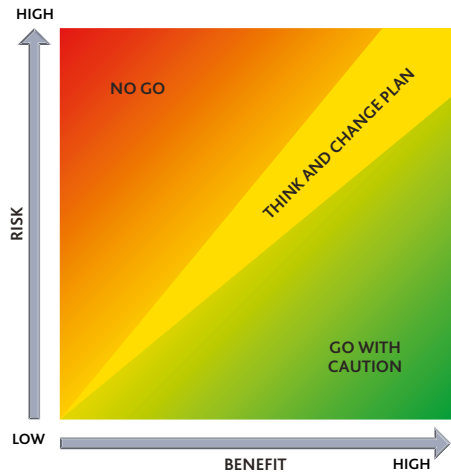
The rescuer should:

- take account of the hazards and potential risks when considering a rescue
- develop a plan that minimises the risk to both rescuers and casualties.



The risk versus benefit chart is a simple graphical means of evaluating the identified risks and possible benefits of a rescue plan.

This process can be completed as a mental model before a rescue, and re-evaluated during the rescue.



7.7 Team health, safety and welfare

Floodwater is a difficult environment to work in, and can present unseen hazards that can affect rescuers and casualties during or after any water rescue.

For a team to stay effective it must ensure that its members are healthy, safe and comfortable. Things to consider include:



Hygiene

Good personal hygiene is very important in helping to avoid contamination with waterborne diseases:

- Wear protective clothing whenever possible. Always wear it while in contact with chemicals, pollutants, human waste and other contaminated materials.
- Before eating or drinking, wash your hands with soap and clean water.
- After being in water, wash your body and all equipment with soap and water as soon as possible to reduce the possibility of infection.

Food and water

Working in a flood environment can be hard work. To stay focused you need to have energy and stay hydrated:

- Always ensure that you have an adequate supply of clean food and fresh water.



Rest

Rescues can take a long time, working in difficult conditions. Exhaustion is a serious concern, so:

- Ensure every member of the team takes regular breaks.
- If possible, rotate positions.
- Ensure backup is available if needed.





Learning outcomes

- 8.1. Be able to swim defensively and aggressively in moving water.
- 8.2. Know how to escape from a strainer.
- 8.3. Be able to do a line-astern wade across shallow water.
Be able to do a single-person wade across shallow water.

8.1 What you should do if you enter the water

If a rescuer enters the water they should be aware of:

- the dangers of the water and objects under the water
- others in the water who may panic and grab the rescuer.

A rescue that requires swimming should only be attempted if the rescuer has been trained in how to swim and conduct rescues in moving water.

Swimming in flowing water is extremely dangerous. However, if you find yourself in water you should attempt a self-rescue using the following techniques:

- defensive swimming
- aggressive swimming.

Defensive swimming

Defensive swimming is designed to reduce the risk of injury and potential foot entrapment.

In the defensive swimming position, the swimmer is on their back with their feet pointed downstream. Their hips are as close to the surface as possible. This position helps to minimise the chance of impact injury in moving water, as the swimmer can fend off objects using their feet.

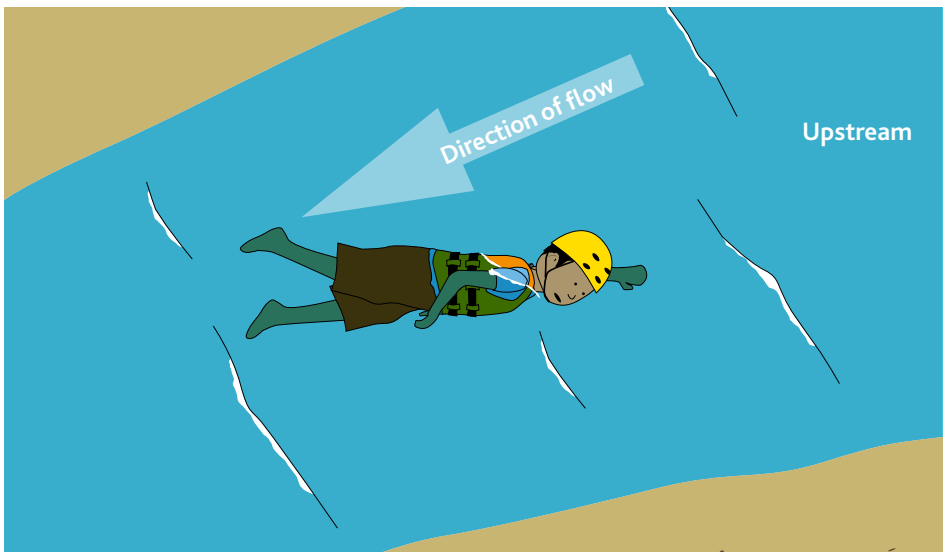
The arms can be used in a large backstroke action, which slows the swimmer down and allows the swimmer to angle their body so the current can push them in the right direction.



Aggressive swimming

Aggressive swimming techniques can be used to cross river currents, and make rapid progress to a safe area.

To swim aggressively, the swimmer rolls onto their front in the water. The swimmer can now use a more powerful front crawl style stroke to move in the water at a faster rate. They can then use their body to angle themselves to the point of safety.



8.2 Escaping from a strainer

If you cannot avoid a strainer then the safest way to escape is to try to swim over it:

1. Swim strongly towards the strainer.
2. Extend your arms just before reaching the strainer.
3. Grab the strainer and push your body over it, kicking hard at the same time.



8.3 Wading

This can be dangerous in fast flowing water

Line-astern wade

When?

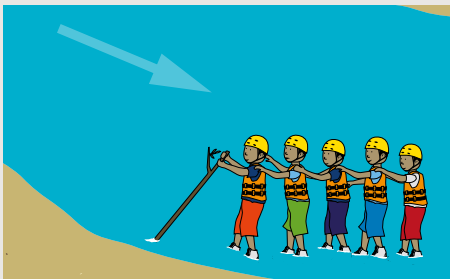
- If it is too dangerous to stay where you are and the water is shallow.

Why?

- Reduces risk to the rescuers – there is no need to swim.
- Safer than a single-person wade as it provides more stability.

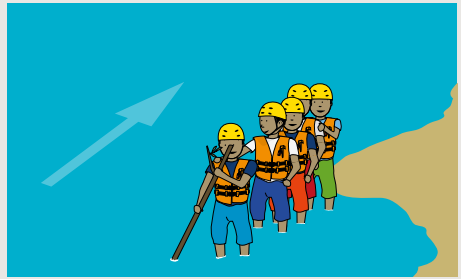
How?

- Follow steps 1 and 2 below.



Step 1

- The rescue team should make a line, with the tallest member of the team at the front, facing upstream, with a stick/pole to test the water depth and feel for underwater objects.



Step 2

- Keep the line tight and slowly move sideways into the river.
- Check for depth and underwater objects.
- Be aware of the dangers underfoot.
- The bottom of the buoyancy aid is the wade limit.

Single-person wade

When?

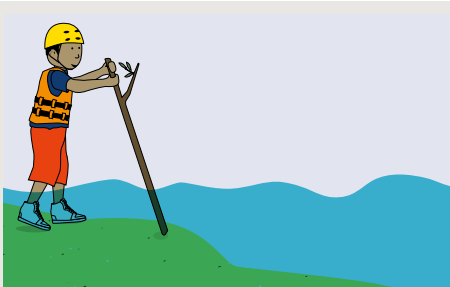
- If it is too dangerous to stay where you are and the water is shallow.
- If no other people are available.

Why?

- Reduces risk to the rescuer – there is no need to swim.

How?

- Follow steps 1 and 2 below.



Step 1

- Enter the water carefully, taking a stick/pole with you, if possible, for you to test the water depth and underwater objects.
- Be aware of the speed of the water, faster moving water will lower your wade depth.



Step 2

- Move slowly across the water, using the stick for support.
- The bottom of the buoyancy aid is the wade limit.
- If you start to float in the flow of water, consider using the defensive swimming position and look for safe exit points.



Learning outcomes


- 9.1 Know the level of risk associated with different types of rescue.
- 9.2 Be able to carry out a shout and signal rescue.
- 9.3 Be able to carry out a reach rescue.
- 9.4 Be able to carry out a throw rescue.
- 9.5 Be able to carry out a wedge wade rescue.
- 9.6 Be able to carry out a tethered boat (or other craft) rescue.
- 9.7 Be able to carry out a tethered swim rescue.

Unit 9: Rescuing others

9.1 Flood rescue options

When deciding which method of rescue to use, you should work through the sequence starting with the lowest risk (shout) until you find a suitable one.

Ensure that only those who have received an appropriate level of training attempt to conduct the advanced Row and Swim rescue options.

Type of rescue	Level of risk	Level of training	
Shout	Low risk	Flood Safety and Flood Rescue	
Reach		Flood Safety and Flood Rescue	
Throw		Flood Safety and Flood Rescue	
Wade		Flood Safety and Flood Rescue	Entering the water puts you at a higher risk.
Row		Flood Rescue	
Swim		Highest risk	

9.2 Shout and signal rescue

When?

- When the person in trouble is close to shore.

Why?

- It requires no equipment and the rescuer stays out of danger.

How?

- Follow steps 1 and 2 below.



Step 1

- Get the attention of the person in the water.



Step 2

- Use your voice and hand signals to encourage the person to swim to the side.

9.3 Reach rescue

When?

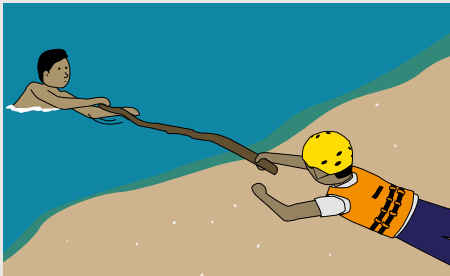
- When the person in trouble is close to shore.

Why?

- It is the safest type of rescue when the person cannot swim and you have equipment.

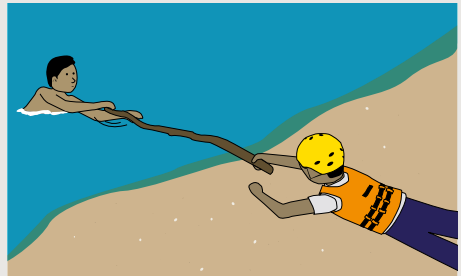
How?

- Follow steps 1 and 2 below.



Step 1

- Reach the person using a long rigid object, such as a stick or pole.
- Stay low on the ground so that the person cannot pull you into the water.



Step 2

- Pull the person to the side.

9.4 Throw rescue – with a floating object

When?

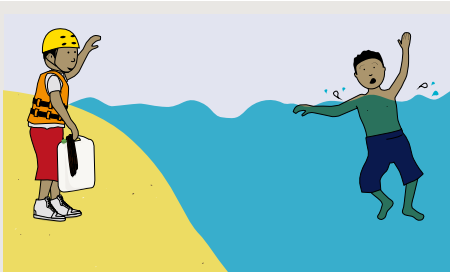
- If the person in trouble is close to shore but too far away from the shore to conduct a reach rescue.

Why?

- Reduces the risk to the rescuer – there is no need to swim.

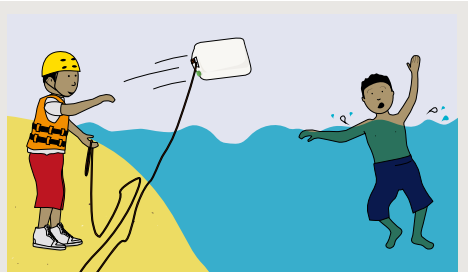
How?

- Follow steps 1, 2, 3 and 4 below.



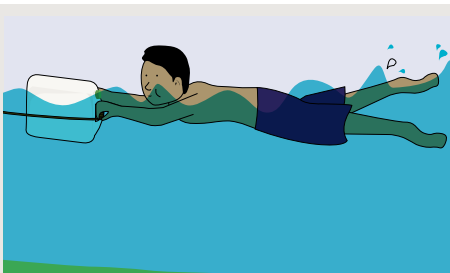
Step 1

- Attract the attention of the person in trouble.
- **Remember to adjust your throw to take into account the wind and flow of water.**



Step 2

- Throw a floating object, such as a rope or water container, to the person. If possible, attach a line to the floating object to help pull the casualty to the bank.



Step 3

- Tell the person to kick their legs and swim to the side.



Step 4

- Help the person out of the water.

Unit 9: Rescuing others

Throw rescue – with a throw bag

When?

- If the person in trouble is close to shore but too far away from the shore to conduct a reach rescue.

Why?

- Reduces the risk to the rescuer – there is no need to swim.

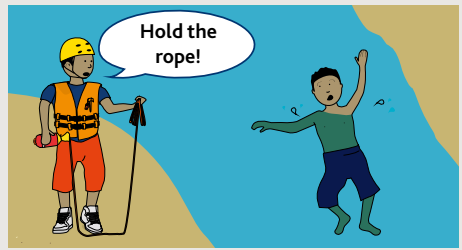
How?

- Follow steps 1, 2, 3 and 4 below.



Step 1

- Remove some line from the throw bag.
- Hold the end of the line in one hand and hold the throw bag in the other hand.



Step 2

- If in flowing water, identify a suitable area downstream to land the casualty.
- Make eye contact with the casualty and shout: "Hold the rope!"



Step 3

- Throw the bag, aiming beyond the casualty (see Types of throw on next page).
- Be prepared for the pull on the rope and brace with your feet.



Step 4

- If needed, repack the rope into the bag quickly and throw again. Otherwise, help the person out of the water.

Throw bag – types of throw

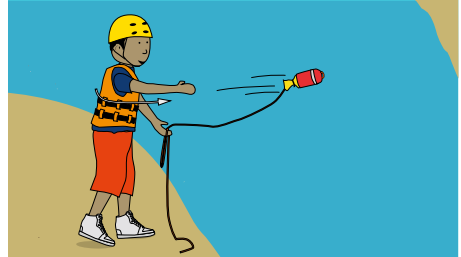
There are a number of different ways to throw a throw bag. Each must be practised regularly to ensure the rescuer can competently use them.



Underarm

An underarm throw is generally the most accurate in calm conditions. However, it is also the slowest.

It is also the throw with the most height so an underarm throw may be affected by the wind and overhanging objects such as trees or electrical cables.



Side swipe

A side swipe is used to avoid overhanging objects or bridges.



Overarm

With practice, an overarm throw may be more accurate than an underarm throw or side swipe. It can also be used if the rescuer is standing in deep water.

Care should be taken when using an overarm throw in environments with low hanging objects.

Unit 9: Rescuing others

Receiving a throw bag

To minimise the likelihood of entrapment, the casualty should be encouraged to:

- hold onto the line or bag with both hands
- lie on their back
- hold the line over the shoulder opposite to the responder to help swing towards the responder.



Throw bag – from a boat

Throw bag rescues from a boat follow the same principles as those carried out from the side of the bank. They differ only in the fact that the boat is a moving platform that requires the following additional considerations:

- The boat should be positioned downstream of the casualty so that the crew can maintain a constant view of where they are going.
- The person throwing the bag must be in the front of the rescue boat and should avoid standing up. This is to make sure that the person maintains their own stability.
- The person should use an overarm throw to throw the bag.

9.5 Wade rescue – wedge

When?

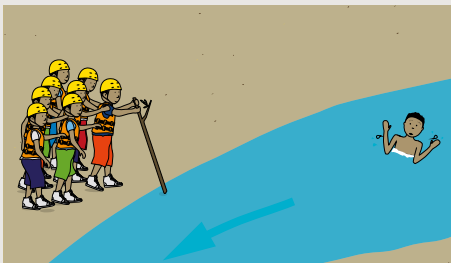
- If the casualty is in trouble close to shore and in shallow water.

Why?

- Reduces risk to the rescuer – no need to swim.
- Does not require a floating object or rope.

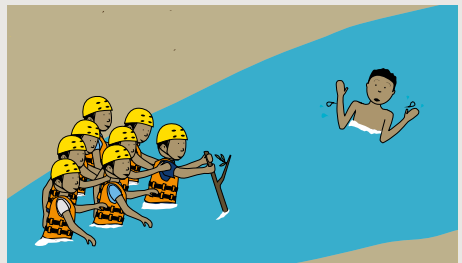
How?

- Follow steps 1, 2 and 3 below.



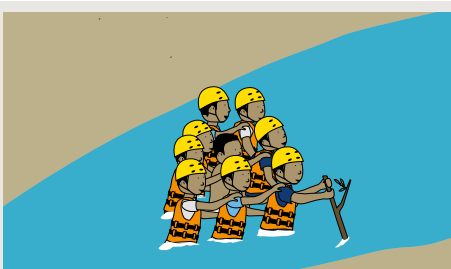
Step 1

- Attract the attention of the person.
- The rescue team should make a wedge shape, with one of the team members at the front, facing upstream, with a stick/pole to test the water depth and feel for underwater objects.



Step 2

- Keep the wedge tight and slowly move sideways into the river.
- Check for depth and underwater objects.
- The bottom of the buoyancy aid is the wade limit.



Step 3

- Bring the casualty into the middle of the wedge and bring them to safety.

9.6 Two-point tethered boat (or other craft) rescue

When?

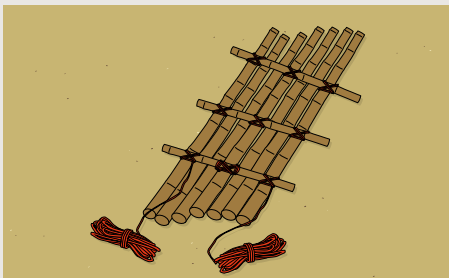
- If the casualty is injured or cannot be reached by a reach, throw or wade rescue.
- A two-point tethered boat rescue works well when the current is flowing in one direction. This means the rescue craft will always be pulled in that direction.

Why?

- Reduces risk to the rescuer – no need to swim.

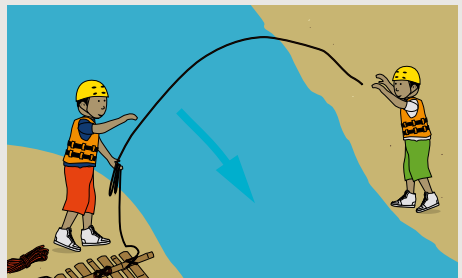
How?

- Follow steps 1, 2, 3 and 4 below.



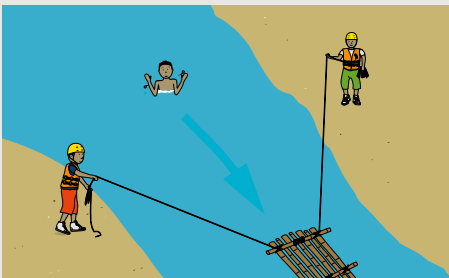
Step 1

- Attach ropes to either side of the rescue craft.



Step 2

- Throw the far-side rope to a rescuer on the other bank.



Step 3

- Slowly manoeuvre the rescue craft towards the casualty.



Step 4

- Let the casualty climb into the rescue craft, then pull them back to the bank.

9.7 Tethered swim rescue

When?

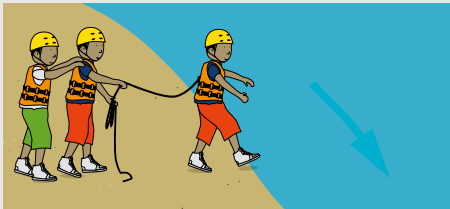
- If the casualty is injured or cannot be reached by a throw or reach rescue, or if the flow of water is too fast for the casualty to reach the side unaided.

Why?

- Allows the rescuer to have physical contact with the casualty.

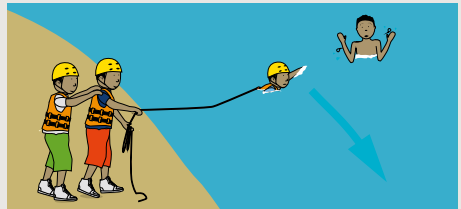
How?

- Follow steps 1, 2 and 3 below.



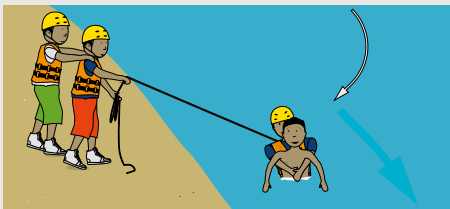
Step 1

- The rescue crew should be wearing PPE.
- Identify a safe exit point downstream for the swimmer and casualty to swim into.
- One end of a floating rope should be attached to a quick release cow's tail on the rescuer's buoyancy aid.
- The other end of the line should be held by a rescuer on the bank, who is supported by another rescuer holding their buoyancy aid.



Step 2

- The swimmer should enter the water at a shallow entry point.
- The swimmer should swim to the casualty.
- When the swimmer reaches the casualty they should shout: "Contact."
- The swimmer should hold the casualty under the arms.
- The rescue team on the bank should let out the rope as needed, and prepare for a sudden weight on the line.



Step 3

- Allow the flow of water to bring the swimmer and casualty to the side.

TP-INT-06

Produced by RNLI Learning Resources