



British Cave Rescue Council

The representative body for voluntary underground rescue in the British Isles

Underground Rescue

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Typical Causes of Rescues Underground

There are a number of causes that require action from cave rescue and mines rescue teams.

Explorers, and others, may become *lost* or may be *late in returning* to the surface. For a party venturing underground, it is always a wise precaution to tell a responsible person of your intended trip and the time you intend to complete the trip. In the event that you become overdue, that person can initiate rescue action.

An equal cause for cave rescue action is a caver suffering a *fall* of one form or another. These can range from a *slip* on slippery boulders in a passage to a fall of a great distance - and maybe over 100 metres - in which the casualty can suffer critical injuries.

Other significant causes are:

- incidents where a caver becomes *exhausted* and requires assistance
- incidents involving *flooding* in stream caves, where heavy rain can result in water levels rising and causing a passage to become impassable
- *rockfalls* causing cavers to be entrapped
- cavers becoming *physically trapped* in small passages

You can read more on the causes of rescues in the incident reports on this web site.

Although the primary task of cave rescue teams has always been to search for and rescue those in distress underground, over the years additional tasks have been undertaken. Notably, at the request of the police, underground searches have been



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made outside the customary remit of cave rescue either for missing persons or, on occasions, for such as searching for discarded murder weapons. In addition, the rescue of animals that have become trapped in cave or mine shafts has become an increasing feature of many team's work.

How a Cave Rescue is Initiated

If you need the assistance of a cave rescue team you should dial 999 and ask the police then for Cave Rescue.

A call for cave rescue assistance is made through the 999 emergency system. You will be routed to the police and onto the Cave Rescue service that will handle the incident.

Action Taken by the Police

The police will want to take your name and the telephone number from which you are calling. They will then ask you to stay by that telephone.

The police will then contact a controller or warden from the rescue team that will undertake the rescue. Your name and phone number will be passed on.

The warden or controller **WILL** call you back on that phone to ascertain as much detail of the incident and to determine what course of action is to be taken. Please be patient and pass on as much detail as you can.

Users of mobile phones should be aware that the controller/warden will phone back and thus be aware of low phone batteries or other problems associated with mobile phones.

Action Taken by the Warden/Controller

The action taken will depend on the information received.

It could range from asking the police to locate the vehicles of a missing party through to initiating a major callout of the rescue team.

When the rescue team is deployed, each team has its own callout system. Some - the busier teams - may use a pager system whilst other will do a telephone call to find and deploy personnel.

In any event, the team members will be contacted and will make their way to the site of the incident at a designated rendezvous point.



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Problems with the 999 System

With the rise of both mobile phone and with the centralisation of the 999 landline system, we have occasionally encountered problems with callouts being sent to the wrong place. Cave Rescues do not happen very often - in recent years there has been less than one a week. So the handling centres may well be unfamiliar with the procedure.

The call centre should direct your request for cave rescue assistance to the police force in which the incident has happened. You can expedite this in the case of problems by knowing where your callout should be routed. You can see the team list page for this information.

What Happens when a Rescue Team is Contacted

With the decision to deploy the rescue team, a number of further decisions have to be made. Included in these is how many people to call, what specialisation of expertise is required, what equipment is required, is support from the fire brigade required, what ambulance service and police support is required. In essence, the warden/controller will, with the co-operation and supervision of the police, direct the rescue from the point of contact by the police to completion of the rescue.

The team callout will be initiated. Modern technology may be used mainly in the form of pagers, but most cave rescue teams make the callout by telephone. A callout list is maintained and will be used in such cases.

The team equipment will be deployed to the site of the incident. One or two of the rescue team members contacted will fetch the appropriate equipment from the store used by the team. Some teams have rescue vehicles - often 4-wheel drive off-road Landrovers - equipped ready to go, so deployment of equipment will be expedited.

The controller/warden may ask for other statutory services to attend. This may occur for example in flooding situations. And Mountain Rescue teams may be asked to assist where the cave or mine is remote, or where radio communication may be required.

At the Site of the Incident

Exactly who arrives at the rendezvous and at what time depends on many factors - the locations, the difficulties of access, the weather...

A controller/warden will arrive quite early in the proceedings. He or she will take overall control at the site for the duration. This controller/warden may or may not be that warden contacted by the police. He or she will want to talk to the contact who



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initiated the call if at all possible. It will be necessary to get further details of the problem - injuries, detailed location, when the accident occurred and so forth.

Whether the police will attend an incident will depend on local policy, and on the nature of the incident. They will always attend when a fatality is involved, and will usually attend when serious injuries are reported. Quite often in other situations, the police will be in attendance should the rescue continue beyond a short period as the situation becomes more serious. In essence, the police over the years have built up a great trust in the ability and management of cave rescues by the cave rescue teams and simply allow them to get on with it.

Arrival of the team equipment and arrival of the team will happen sometime after the callout - how long this take will depend on the distances and on the type of roads to get to the rendezvous. Quite often we have narrow, twisting lanes to negotiate.

At the scene, the controller/warden will decide a plan of action and brief the rescue team members. Some examples of rescues are outlined below.

Handling the Rescue

The following paragraphs describe some of the rescue scenarios undertaken in Great Britain.

A Search for Overdue Cavers

When the callout is made, the controller/warden will have evaluated the situation. In some incidents, we have an idea where the missing party may be; in others we may be told a party has gone caving 'somewhere in Derbyshire' (say). In the latter case, some considerable detective work may be involved before underground teams are deployed in over one thousand possible underground sites.

Eventually, the warden/controller will elect to deploy a search party or parties. These will be given instructions to search an area of a cave system, or to follow a particular route through a cave looking for the missing party. In large system where there are known places where people become lost, these may well be the first place to be searched. It is quite possible search parties will be dispatched to more than one cave.

Quite often, a missing party will be found quickly; it is not unknown to meet them on or near the surface, the cavers having under-estimated the length of time required for the trip, or possibly having had difficulty in finding the way through.

Most other overdue parties are found on or near regular spots or on or near the 'trade routes' through the caves. Such parties are fed and warmed, then assisted back to the surface. These rescues do not take too long provided the party is fit enough to get themselves out with assistance, as is often the case.



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If after searching the trade routes the missing cavers so remain, then the problem intensifies. At this point, it is likely more personnel will be called in. Additional investigations will be undertaken to ensure the cavers are actually in the cave, whilst further searches are planned.

From then on, more searches will be carried out. Hours can turn into days. Some of the British cave systems contain over 50 kilometres of inter-linked passages, often forming a three dimensional maze. So the planning of the search and the debriefing of teams completing their task becomes of paramount importance.

And clearly as time goes on, the physical condition of the missing party will deteriorate.

But it is extremely rare for a missing party not to be found. And when they are found, they will receive medical assistance and brought to the surface.

A Caver Has Fallen

When a call comes for a caver who had slipped or fallen, the rescue team knows that they could well be dealing with an injured caver. If a doctor is available, he or she may well be contacted in the early stages.

(Note that many cave and mountain rescue teams include doctors on the strength and they may well take on the role of the doctor at the scene, but equally they may be called up as a member of the normal team strength.)

The team will deploy to the site of the accident, and medical and associated equipment will be shipped to the site of the incident. This could be a considerable distance underground and require difficult caving to get there. Cavers are used to travelling 'light' - they will take minimum equipment to complete a cave safely. In a rescue, not only do you have such personal equipment to carry, but you have the rescue kit as well. In most cases, a rescue team will wish to re-equip a cave since a failure of the party's equipment may have been the cause of the fall.

The first party to arrive at the site of the accident will assess the casualty. Remember the accident will have occurred some considerable time ago - and often well past the Golden Hour defined in paramedic circles. So the casualty will not only be suffering from injuries sustained in the fall, but will be cold and possibly be hypothermic. Casualty care type





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first aid will be given - this will include pain relief, splinting, dealing with bleeding, insulation from the cold and many other aspects of care.

In less severe falls, the casualty will be encouraged to make his own way out of the cave - often with considerable assistance from the rescue team over and around the obstacles in the cave. This is very much the preferred option since it will hasten the casualty's return to the surface and to hospital quality medical care. And in some of the most difficult and remote caves *assisted evacuation* the only option because you cannot use a stretcher.

In many cases however, it will be necessary to carry the casualty out in a stretcher. This occurs particularly in the case of head, neck or spinal injuries where the dangers of further, irreparable damage may occur. Cave rescue teams have an excellent record in dealing with such injuries. In the event, a stretcher carry is a difficult and arduous job, potentially taking many hours. Look at the section describing the obstacles we encounter in the section below.

During the evacuation, it is vital to monitor the state of the casualty in an attempt to prevent deterioration of the casualty's condition. Frequent short rests will occur whilst the team arranges the next section of the cave.

During this time, regular communications with the surface will be made. Reports on the condition of the casualty will help the controllers decide on deploying further teams and equipment.

Cave rescue teams are extremely grateful to the ambulance paramedics that assume responsibility for the casualty on the surface, and also for the services of the Royal Air Force rescue helicopter, to which several cavers owe their lives.

A Party is Trapped by Flooding

Many caves are formed along stream passages that have disappeared underground in limestone regions. Such passages offer an exiting and exhilarating days entertainment for fit and adventurous cavers. But many such stream passages will become impassable with the onset of heavy rain on the surface. In the event, a party may have great difficulty making their way out, becoming exhausted in the process, or may even become trapped.

Rescue teams will be familiar with the caves in their region and may well know of bypasses to the difficult sections of caves, and would thus be able to reach a trapped party and





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guide them out. They may be able to arrange ropes in a different way to avoid the worst of a flooded passage and again rescue the party.

If these options fail, the party may well remain trapped. In such cases, rescue experts will assess the problem and the options - can the flooded stream be diverted or dammed, can sufficient water be pumped away, can cave divers get to the missing party

Sometimes the only option is to await the flood to subside.

Eventually, a rescue party will be able to get into the cave and locate the party. They will be given food and warm drinks and, hopefully, will be able to make their own way out. It is unusual for members of a flooded party to be stretcher cases, although it may take considerable effort of the rescue team to assist an exhausted party to the surface.



A Rockfall Has Occurred

Caves are living entities containing exciting streams and rivers, stalactites and stalagmites that grow at varying rates, mud and silt banks that are moved with floodwater, and rocks. Sometimes the rocks will move or collapse, possibly falling some distance. It has not been unknown for small earthquakes to cause rock falls underground.

Loose rocks resulting from breakdown activity may be dislodged and fall upon a passing caving party. Whilst uncommon, this is not a very rare event and can cause serious injuries to a caver.

Cavers passing through such unstable areas may dislodge boulders causing a rock fall and trapping the cavers. This is an extremely rare event.

Parties trapped on the wrong side of a rockfall may well have a considerable wait before the alarm is raised. The cave rescue team will respond according to the description above. Whilst searching, they will inevitably find the rockfall, and may be able to contact the missing party through the rocks. If not contact is made the controllers/wardens will have to decide whether the party is trapped.

The extent of the rockfall and the problem to extract the missing party will be judged. Equipment will be transported into the cave to facilitate the engineering of a route through the fall. This will include spades, crowbars and the like, together with scaffolding and shoring as appropriate. The team will then dig their way through,



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scaffolding and shoring as appropriate as progress is made. Sometimes rock splitting techniques will be used in this process.

Eventually a way through will be engineered and the party rescued. They may well be cold and exhausted, but will normally be able make their own way out. Hypothermic victims will need carrying out thus making for a lengthily and difficult rescue.

Typical Obstacles in a Cave

Underground rescue has its own unique set of problems. Obstacles such as vertical shafts and climbs often with waterfalls, constricted and twisting passages and squeezes, static and flowing water sometimes completely flooding a passage, mud, loose rock, foul air, route finding and communications problems abound as, of course, does absolute darkness. Caving is a continually developing sport and each year, new underground systems and passages are discovered and explored providing additional challenges for the rescue teams who must be prepared to go wherever it is necessary to search for missing cavers and recover casualties. Rescue from such an environment requires techniques that are often unique to cave rescue teams and with which other rescue services are normally unfamiliar. In essence cave rescue is a service by cave and mine explorers to other cave and mine explorers who, for whatever reason, require help.

Vertical Shafts and Climbs

Moving a casualty through a cave presents many obstacles, but one of the most difficult are the vertical shafts and climbs encountered in most caves.

It may well be possible to manoeuvre a stretcher up a small climb using raw muscle power.

But inevitably, it will be necessary to arrange a hauling system to raise the casualty, not least to ensure their comfort and safety in the lift. This requires ropes, pulleys and other devices to be put in place. To do this correctly requires great skill and experience - a badly rigged haul will usually be difficult and may well be dangerous. The first objective is to ensure the safety of all concerned - this includes the casualty and the rescue team.

Sometimes the rigging of such hauling systems must take account the number of people available - pulleys and special systems will implement a 2:1, or possibly a 3:1 ratio to reduce the load to be lifted. The setup must also allow for the shaft up which the casualty is to be raised. Often such a shaft may be roomy at the bottom, but





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as it nears the top will become narrow and twisting. Indeed it may well not be possible to lift the stretcher up vertically when it becomes necessary to move it into the widest part of the shaft.

Constricted and Twisting Passages

Many British caves begin as small, sometimes flat-out crawls and develop through gradually larger passages into the big passage that appears on many a Hollywood movie. Such passages are easy to negotiate for a fit, strong caver. But bringing an injured casualty back is fraught with problems.



In the first instance, a rescue party will need to reach the site of the accident. They must transport equipment to the site - getting first aid, stretchers, exposure management, communications and other necessary equipment presents significant problems.

The casualty may then need carrying back to the surface.

In the larger passages, many cave rescue teams will use a rigid stretcher - this is easier to carry and offers greater protection to the casualty.

But as the passages become difficult may not be possible to manoeuvre a rigid stretcher around the twists and turns. In this case we have two choices - either use a flexible stretcher or move the casualty out of the stretcher. A flexible stretcher, often known as a drag stretcher, offers less bulk and will allow some movement in the narrow passages meaning that the stretcher can be *forced* through. This is not always an elegant process and some brute force and ignorance may come into play.



In the event that even the drag stretcher will not go through, then the casualty will be pulled through difficult or constricted passage outside the stretcher. To aid these cases, the casualty is often placed in a harness so that a pull can be given from in front, and as much protection as can be afforded is used.



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Static and Flowing Water

Inevitably there will be water in a British cave. The water can be flowing as a streamway or just standing water.

A streamway presents many hazards - and particularly so if water conditions are high. The passage size of the streamway can range from a large, walking passage to a low wet crawl. A rescue team struggling to carry an injured caver carefully may have to contend with concealed ledges and boulders, and the force of the water pushing them over. In lower passages, rescuers will have to crawl through the water to move the stretcher along. They will lie in the water and drag the stretcher over their legs or bodies to keep the casualty out of the cold water as best possible. And the passage can twist and turn as described under the previous heading.

Standing water presents different problems. But these are not usually as difficult as flowing water. It only becomes a serious problem when it forms deep pools. Just how these are handled will depend on the length and depth. The rescue team will attempt to avoid such obstacles in the first place. But if this is not possible, then a way of negotiating will be required. This may include using ropes assist the stretcher across, using inflatable boats or other floatation aids, or simply but crudely having members of the rescue team stand in the water and man-handle the stretcher across.

Mud and Loose Rock

From time to time, such areas of unstable areas of cave breakdown will move - an small earthquake can precipitate this. This may result in previously open routes becoming obstructed. Cavers may as a result be trapped on the far side unable to return to the surface – this was discussed above.

When faced with loose rocks a rescue team will take extreme precautions. If we need to extract a party, then the first thought is to find a safe alternate route. This is often not possible.

A team facing the need to dig their way through a collapsed boulder choke will used mining techniques, shoring upon excavated passage as it goes. Large boulders may need breaking, when 'feathers' or explosives may be used. Feathers are a means of forcing a number of chisel devices into drilled holes stressing the rock until it splits.

But bringing an injured casualty back through such an area of a caver is fraught with hazards. It is the equivalent to manoeuvring through the narrow and constricted passage outlined above - only the passage may collapse on you! Rescue teams report this is a rare problem.



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Complex Cave Systems

Some of Britain's caves contain over 50 kilometres of passages interwoven in a three-dimensional maze. It is not uncommon for caving parties to be reported missing after trips into these caves. So how does a cave rescue team go about these incidents?

Well, many such incidents are caused by parties under-estimating the difficulty of the trip and therefore under-estimating the time. These parties will be found on or very close to the surface.

Otherwise, the rescue team will carry out searches of what are called the **trade routes** through a cave- the routes most often used by visiting parties. It is usual for such parties to indicate where they are going in the cave helping the team narrow the search area in the first instance. And many are found on or close to such routes having been unable to find the way on.

Once the trade routes have been checked, then we have a much more serious problem on our hands. A search of all the relevant trade routes will have taken many hours and will have exhausted a portion of the rescue team. A search plan will be evolved based on the known plans of the party, the knowledge of the cave by the team, likely scenarios that may have caused a change of plan, and any other influencing the problem.

Further cave rescue members and members of other nearby teams may be called in. It is also possible that cavers from the clubs or have specialised knowledge of that particular cave will be called in to assist. Searching will then continue until the missing party is found. Such searches have been known to take many days.

After the Rescue

Clearing up and cleaning the equipment

After the casualty has been handed over to the ambulance, then the final stages of the rescue have been reached.

All personnel and equipment deployed in the cave must reach the surface. On large rescues, this could be a considerable exercise and take almost as long as the casualty evacuation itself and carries on after the casualty has been handed over.

All equipment must then be returned to the rescue depot or headquarters. It will then need cleaning and checking, and consumable items will need replacing. Often, with the extreme conditions in cave rescue, some equipment will be destroyed or broken beyond repair. This must be replaced as soon as possible, and indeed the busier teams will carry spare equipment in case of breakages.



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Debriefing and Reporting

Often a team will debrief following an incident. From this, lessons will be drawn and applied to future incidents.

The team will submit an incident report to the BCRC – this is used to compile the Incident Report. These can be studied on the web site.

Contacts with the police

Exactly how much contact with the police depends on the cause of the rescue?

Usually, relatives or contacts of casualties must be informed. This may require inter-constabulary contacts if the relatives are outside the area of the rescue.

The relatives themselves may come to the scene, a situation that requires careful handling by both the police and by the rescue team.

If a fatality occurs, then the police will always be involved and will want to take witness statements from team members and members of the caving party.

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