

Chapter 2

Principles of outdoor risk management

There are a number of terms, concepts and principles that apply to the management of risk in adventure activities. Some of these apply equally to risk management in other fields and are drawn from the body of knowledge concerning safety management in industry and elsewhere.

Hazard and risk

In everyday life these terms are used loosely, with overlapping, almost synonymous meanings. Professionals concerned with risk management use them in a much more specific way and it is useful to understand the distinctions usually drawn.

A *hazard* is anything with the potential to cause harm (loss or injury). Examples of hazards in adventure activities include falls from height, drowning, falling objects, lightning strikes, equipment failure, assault, cold injury and many more. It is an unfortunate party that meets all of these on a single day.

Note that identifying the hazard alone does not directly tell us anything about the likelihood of occurrence of the possible harm, nor its possible severity, although in practice these may be quite apparent. All we know is that a hazard exists. The crater on Mount Etna during a period of volcanic activity undoubtedly contains many hazards which could injure or kill someone who goes there to explore. If I choose, instead, to stay away from the crater, then the risk to me of, say, falling into one of its hot shafts is effectively zero – but the hazard remains attached to Etna itself.

The severity of harm that may ensue when a certain hazard comes to bear gives us an important indication of how seriously we should take that hazard. To describe a hazard in this way, we may employ adjectives such as 'slight', 'moderate' or 'catastrophic'. So we may talk of a slight chance of moderate injury or a high danger of critical injury. We might describe falling into a red hot volcanic shaft as a catastrophic hazard, but would probably describe the rough, ankle-twisting ground on the ascent to the crater as a moderate hazard. In neither case does identification of the hazard tell us how likely we are to be injured – to do this we must consider risk itself.

Risk is a measure of the likelihood that a particular hazard will cause harm. It is affected by both the frequency of exposure to a hazard and the severity of the hazard itself. We really are asking:

- How often might we meet the hazard?
- How bad is it if we do?

Risk can be described qualitatively or quantitatively.

Qualitative descriptions of risk

These usually describe the level of risk by also drawing on an escalating string of adjectives such as insignificant, 'slight', 'moderate', 'significant' or 'high risk' and so on.

With all the available adjectives relating to hazards and risks, we should avoid becoming slaves to semantics but recognise instead that we are engaging our best efforts in trying to address the balance between opportunity and possible loss. Identifying and classifying risk is a worthwhile process, but the end result is only as useful as the effect it can have on our practical management of risks. How the risk was described and identified makes little immediate difference to the victim of a serious accident, though it may be highly significant at a later stage, such as during possible litigation.

It is clear to most people that a combination of frequent occurrence and severe consequence should ring very loud alarm bells. A teacher who allows a class of ten year olds to play, dodging large waves crashing regularly on to an undercut rock ledge would have allowed both frequency and severity to apply – and would be justifiably criticised in the event of a child being swept away.

An even more extreme example would be if an instructor chose to operate a beginners' rock climbing session on a steep ten-metre cliff without using ropes. The fact that slips by beginners are not at all uncommon, and that the consequence of such a slip from five metres or more would be severe, explains why no reputable provider adopts such an uncontrollable (and unjustifiable) approach.

Frequent incidences with slight consequences can, in most situations, be considered an entirely tolerable risk, we might even say a trivial risk. The risk of a broken fingernail while operating a sailing dinghy is unlikely to be seen as a reason for a provider to remove sailing from the activity menu or for an individual to avoid taking part.

Of course each individual has different priorities and, occasionally, some circumstance will render an activity unsuitable. A model for hand cosmetics or a professional violinist may both find a broken nail a very strong deterrent to taking part in the sailing session, though, of course, neither would be likely to consider that their lives were being put at risk. I would not expect a provider to warn me that I might break my fingernail – we must surely see this as part of the general wear and tear of bumps and scrapes that physical activity inevitably entails.

Infrequent occurrences with slight consequences are by definition trivial. No reasonable person could expect a school to have a policy to deal with such things.

Decision-making when risks are judged as very high or very low is relatively simple (simple but not easy) – it is usually clear to any competent person that things are either unacceptably dangerous or that risk is at a trivial level. The greatest difficulty for providers of adventure activities who are dealing with a wide spectrum of possible risk is in the area where actual harm could result and where risks might be judged as ‘moderate’. There is no quick solution, so careful consideration must be given to the factors outlined in the section below on how safe should safe be.

The risk spectrum

Figure 2.1 gives a sense of the spectrum of risk. It is included mainly to stimulate critical thinking about how you should regard the risks which you have to manage. It is obvious that everything depends on what meaning is given to individual terms such as ‘moderate’ or ‘high’.

		Severity of harm			
		Catastrophic	Critical	Moderate	Slight
Frequency of occurrence	Frequent	HIGH RISK	HIGH RISK	SERIOUS RISK	Moderate risk
	Likely	HIGH RISK	HIGH RISK	SERIOUS RISK	Moderate risk
	Occasional	HIGH RISK	SERIOUS RISK	Moderate risk	Low risk
	Unlikely	SERIOUS RISK	Moderate risk	Moderate risk	Low risk
	Remote	Moderate or low risk	Moderate or low risk	Low risk	Low risk

Figure 2.1 The risk spectrum

As a broad generalisation, situations of high and serious risk are not acceptable in the provision of outdoor activities and programmes, except in very specialised circumstances, such as in the case of informed and experienced adults who have willingly entered into a risky undertaking – for example an ascent of a Himalayan peak. This takes us into the territory of risk contracts and the acknowledgement of risk – further discussed in Chapter 14. These comments are confined to *provided* programmes –



Coastal traversing – great fun until the big wave arrives ... so where are we on the risk spectrum?

individuals operating independently and not offering services to others are usually free to make their own decisions, though would be wise to consider exactly what they are taking on.

Correspondingly, activities accurately assessed as low risk would be considered to be acceptable in almost all cases and should probably describe the great majority of activities undertaken by a particular organisation or leader.

As implied above, almost all of the difficulty of management, and a deal of professional interest, lies in the zone of moderate risk. If anything is assessed as other than low risk then careful case by case analysis is needed. We should not simply blunder into a situation of higher risk without heeding the possible consequences.

So how safe should safe be?

There is no absolute standard of safety and one person's misadventure is another's gentle recreation. To simply ask this question is an excellent starting point for making good choices about a particular individual or group. The answer can only come from a process which:

- Assesses the client group:
 - adult or minor
 - level of experience of the activity
 - physical ability
 - attitude to risk
 - resilience
 - expectations.
- Assesses the activity:
 - level of risk
 - level of difficulty and challenge
 - protection arrangements
 - match to the client's capabilities and expectations
 - expertise and experience of leader in that activity.
- Assesses the location:
 - remoteness and access to help
 - expected conditions and weather
 - remoteness and access to help
 - match to the client's capabilities and expectations
 - previously used by leader?

- Assesses the degree of supervision:
 - proximity of instructor
 - supervisor/participant ratio
 - experience of staff
 - availability of competent assistance
 - expertise and experience of leader.

During an activity session it can be illuminating to imagine ourselves on a line which at one end has a virtually guaranteed level of safety and at the other a high level of risk. It is obvious that the limits at either end of this line vary from activity to activity, but in all cases it is worthwhile for instructors to have an awareness of where on the line they and their charges are at a particular moment. A common situation leading to loss is an unnoticed escalation of the level of risk with which the party is engaging.

Getting the balance right

It is clear that clients will have varying expectations of what is tolerable risk. A group of young mountain bikers who are taking up snow boarding are likely to be fit, 'up for it' and willing to take some real risks in the new sport; a middle-aged person recovering from illness and using hill walking as a way back to fitness is unlikely to welcome an aggressive pace or an apparently careless approach to risk.

When I was a young activity instructor an old hand said to me 'When you are working with clients and you have two alternatives, always choose the safer one.' I have come to learn that, unfortunately, things are not always quite so clear cut. The advice is, on the face of it, perfectly sound and widely applicable, but if we always choose the 'safer' option we are in danger of losing the spark of adventure. Travelling by car may be a safer choice (though that is arguable!) for the journey than walking the Coast to Coast Walk, but who could claim that it is more rewarding?

A skilled instructor has the judgement to make this balancing act work but newer leaders can get into difficulties if they choose an exciting and challenging option without having considered the possible consequences. We have to take particular care to be sure of our justification when we are taking what might be considered by some to be a more risky option. I suggest that the advice to would be leaders might be given a more relevant slant if we were to say:

When you are working with clients and have not chosen the safer alternative, think of how, in the worst case, you would justify your choice to the Coroner's Court.

Worst case analysis is a useful tool for any decision-maker. It does not mean that we think there is any real chance of a fatality, but does help us to focus critical analysis on the important decisions.

Quantitative descriptions of risk

Quantitative or numerical measures give an impression of great precision but this can disguise what is often a lack of useful content.

For example, a statement such as ‘Men aged 35–44 have an annual risk of death from all causes of 1 in 590’ takes an overview of an entire population and gives a numerical indication of risk. While of great interest, particularly to men in that age range, this tells us little about the risks faced by a particular individual, who may be a couch potato, a trained athlete or an individual with a penchant for a particularly hazardous activity such as cave diving. What the bald statement means is that, on average, if we find 590 men in the stated age range, after one year, one of them will have died. A gambler might say that the odds of death during a single year are 590 to 1 for a man in this age range.

It is unusual for adventure activity providers to have access to useful public information concerning numerical risks for outdoor activities and, as mentioned previously, such information is often confined to statistics about death. We should recognise that fatality rates do not generally give useful guidance to those managing the risks of outdoor activities because they describe very infrequent and often atypical events.

Larger-scale providers can generate a database containing a wider range of incidents and this can start to give valuable information about rates and patterns of occurrence and how best to manage specific situations in future. This topic is explored further in Chapter 13, but it is worth mentioning here that some of the most useful indicators are those of the trend and ranking of reports. For instance, if we detect a large increase in the rate of occurrence of scalding during camp cooking we need to focus attention on how to reduce its occurrence. Similarly, finding that the most likely cause of serious incidents is common assault tells us that we need to address the problem of conflict and aggressive behaviour as a matter of priority.

Uncontrollable hazards

The Office of National Statistics gives the annual risk of death from lightning in England and Wales as 1 in 15 million. This is a low level of occurrence of what is literally a ‘bolt from the blue’ and few would dispute that lightning is a good example of an uncontrollable hazard.

However, three groups appear to feature prominently in the statistics for lightning strikes – anglers and golfers (who each wave metal or carbon conducting rods in the air) and hill walkers, whose frequent aim is to be above all surrounding land.

So it is clear that, although we may not be able to prevent a lightning strike, we can certainly influence our exposure to it, and that is the key to managing uncontrollable hazards. Mountaineers cannot prevent ice falling from seracs but they can avoid the areas raked by ice debris, or, if this is impossible, at least travel at maximum speed to reduce exposure. Sailors may not be able to weather a hurricane, but they can avoid known storm tracks and periods of frequent or forecast occurrence and so on.

Actual and perceived risk

Within adventure activities a distinction is often drawn between ‘actual’ or real risk and ‘perceived’ or apparent risk. This distinction does not really stand up to detailed examination because in any activity, even the most innocuous, there is likely to be a small residual level of risk that could result in loss or injury. However, it does usefully separate activities such as ocean sailing or alpine mountaineering, where there is an inevitable level of actual risk, no matter how competent and well equipped are the party, and activities such as a high ropes course, which, if competently designed, built and operated, carries only a very small level of residual risk but a very high component of thrill and challenge – which we call perceived risk.

The crucial difference is that an error by the participant on the high ropes (a situation of perceived risk) will be much less likely to have serious consequences than one made on the deck of a sailing boat in mid Atlantic – where the risks are real.

In general terms, large-scale, far-ranging activities:

- are more complex, with more to go wrong;
- tend to put those taking part more at the mercy of nature and further from assistance;
- often have a significant exposure to uncontrollable hazards;
- are more likely to entail actual risk.

Examples of these activities would include:

- sea kayak journeys;
- coastal and offshore sailing;
- winter mountaineering;
- ski mountaineering.

Experience is at a huge premium for leaders in activities of this kind, because the proven way to deal successfully with highly complex and variable situations is to have already developed appropriate generic skills in countless other comparable situations.

In contrast, the more confined activities are generally easier to control because they:



Ski mountaineering – a magnificent but committing activity. The evidence of previous avalanches indicates that we are probably dealing with a situation of actual risk.

- are less complex and so may be less uncertain and more controllable;
- are close to assistance and external supervision;
- have little exposure to uncontrollable hazards;
- may have few actual risks (though the opposite may be true).

Examples of these might include:

- lawn games;
- running a zip wire;
- climbing on a climbing wall;
- raft building on a confined body of water.

At their simplest, the more confined activities can be adequately operated with a narrow set of skills and limited previous experience, so reasonably able and sensible instructors can be specifically trained and authorised to lead the activity in a relatively short time. To be successful we would normally expect the training to be set up and delivered by a person of wider experience and greater expertise who would be able to recognise and communicate any pitfalls.

When we apply the general principles of risk to real, practical situations we are engaging in a process of risk assessment. This is covered in Chapter 6.

Where to focus our attention?

One would expect that those who are responsible for others in adventurous environments, who regularly balance their duties of care against a passionate desire to pass on the sacred flame of adventure, to be unchallenged experts in the difficult balance of risk and security. Perhaps we are, but it seems possible that we have allowed the combined effects of an exaggerated fear of litigation and the influence of a systems-focused approach to regulation to deflect us from what we are good at and to persuade us to chase the wrong hare.



Spider's web: a fun activity that needs teamwork and planning. Although a controllable situation of relatively low risk, there is residual actual risk, such as if the person being supported is dropped to the ground.

Stated simply, the danger is that increasingly we build systems and controls that shift attention away from the critical importance of human error and human fallibility. Let me give an example. Ropes courses have been a popular component of adventure programmes for more than fifty years. Participants follow a high-level constructed path, with some protection against the possibility of falling. This is often achieved by the use of ‘cows’ tails’ – rope links with one end attached to the person, the other clipped to a protection cable. Until a few years ago, such courses had an improvised, sylvan appearance that many enjoyed, but this has been overtaken by a much more high-tech approach. Where once were only lashings and spars are now to be seen pylons, stainless steel cables and shear reduction blocks. There are important side issues such as the avoidance of damage to trees and the reassuring appearance of such facilities to anxious clients, but I understand that the main thrust behind these expensive changes has been an admirable commitment to improve the safety of the activity.



At the heart of the forest on this improvised ropes course – protection is by ‘cows’ tails’.

It is certainly unclear whether the hundreds of thousands of pounds invested in such a way has had any proportional positive effect on the safety of those taking part. By far the most important threat to the safety of participants on the usual form of ropes course is their own error in the clipping and unclipping of safety links or that of the instructor in setting up and supervising the activity. In most cases, the risk of the entire structure failing seems a less immediate threat.

Unfortunately, taking defensive action against human error is a more complex and difficult process than, for instance, strengthening a support cable, and may force us into the uncertain world of behavioural science rather than the concrete realities of engineering. We might estimate that errors in clipping are many times more likely to cause serious injury than structural failure and yet deploy our resources in the reverse of this proportion, largely because changing the behaviour of people is difficult. (I should point out that, for the example chosen, clipping errors can be effectively addressed by engineering solutions, albeit rather expensive ones. However, these ‘continuous rail’ systems are not in widespread use. The general point still applies.)

Inspection

Heisenberg’s Principle indicated that for sub-atomic particles, just by being there, an observer distorts the system and makes things behave differently. Inspectors tend to inspect

what can be readily inspected and this can, in turn, distort the way providers operate. I have now seen a number of Adventure Activities Licensing Authority (AALA) inspections and nearly every one has included a request to see the logging and recording system for climbing ropes. Nobody pretends that such a system is likely materially to improve the safety of participants, since, for all practical purposes, climbing ropes simply do not break, especially during the kind of use that most outdoor centres make of them. So why is it done? AALA inspectors do a very competent job within the limited time available to them for an inspection, but if they are frequently focusing attention on inessentials there is a danger that outdoor providers start to behave as though those inessentials are the core of effective risk management. I believe that outdoor providers need forcibly to reject a mechanistic view of risk management and re-establish what our cumulative experience tells us – that it is addressing the possibility, indeed the inevitability, of human fallibility, variability and error that must be the cornerstone of our risk management.

The other growing influence (and this one seems largely malign), is the fear of litigation. I recently heard providers discussing whether they should keep participant disclaimers for five years or ten. It is hard to avoid the impression that outdoor operators are amassing filing cabinets full of this and similar stuff, which may have an importance in any subsequent litigation but which add precisely nothing to the safety of the clients in the field.

The precautionary principle

This principle is one that has recently gained great currency and which is often invoked in relation to the introduction of new technology, as in the case of genetically modified foods or health scares such as the outbreak of bovine spongiform encephalitis (BSE) in cattle.

At its simplest, the precautionary principle states that it is better to be safe than sorry. It places the burden of proof of the safety of anything new on to the innovator or developer. This is instead of there being a presumption that the innovation should proceed unless the public, or a special interest group, are able to demonstrate that it is unsafe or in some other way undesirable.

It seems hard to argue against the application of the precautionary principle, but there is a danger that, without appropriate rigour in the arguments and research, superficial objections or irrational fears can put near insuperable obstacles in the path of worthwhile technology. Some claim that the principle blocks action on the basis of what we do not know rather than what we do know.

The principle itself has little application to adventure activities but it does seem to contribute to a growing climate of risk aversion where safety is valued above all things. This climate is threatening to any form of education or experience where actual risk may be present. Proponents of adventure activities should be ready to show the other side of the coin, to communicate the tremendous benefits of adventure as a counter to the risks, which tend to have undue prominence in the public view.

Key features of outdoor risk management

When we look at what can affect the safety and success of an outdoor activity session we soon identify a great many diverse influences that might include:

- the quality and experience of the leader;
- the health and fitness of the participant;
- the quality of the equipment in use;
- the location used;
- the attitude to risk;
- the communication arrangements;
- the briefing of participants;
- the weather conditions;
- the availability of food and water;
- the identification and control of hazards.

The list can become almost endless. Fortunately, many of the necessary skills to manage these items have become second nature to experienced leaders. If we consider how we might monitor, control or utilise these influences to our benefit, we can broadly group them into:

- people
- culture
- systems.

We will examine each of these in turn in the following chapters.

Chapter summary

- A hazard is anything with the potential to cause harm.
- Risk is a measure of the likelihood that a particular hazard will cause harm.
- Risk can be described qualitatively or quantitatively.
- Providers should decide where they are, and where they should be, on the risk spectrum.
- The identification of *actual* or *perceived* risk is strongly influenced by the nature of the activity provided.
- Human error and human judgement are of central importance to effective risk management.