

Hill Skills: Avalanche awareness by Andy Nelson

Just imagine. Several days of Atlantic storm cycles have just passed, and a bitter, black night is followed by a blue alpine dawn. Eager to get started, you leave the car in knee-deep snow and stride towards No. 6 Gully. An hour later you're wading through chest-deep soft slab up the gentle apron slopes, regular sluffs washing past you. So, do you continue?

In the winter hills you need to constantly make informed decisions, some of these relating to avalanche conditions. The first step is to acknowledge that avalanches do occur in Scotland, as well as further afield, the second to realise that they can happen to anyone - including you and me.

Be BAD

You need to be alert, and paying attention to the crucial factors - **B**efore, on **A**pproach to, and **D**uring your ascent. There are four factors - three physical and one human - that can contribute to a high avalanche hazard. The physical factors are terrain (30 - 45° slopes are the most susceptible), weather (when new snow is combined with wind or with a rapid rise in temperature) and weaknesses in the snowpack. The human factor is simple - 90% of people trigger the avalanche that hits them, so you need to be aware of what you, and others in your party are doing.

Before your ascent

Before you set foot on the hills, think about:

- **Terrain.** Use maps and guidebooks to check your intended route. Pay particular attention to slope angles, aspects, altitudes, sportsScotland Avalanche Information Service (SAIS) reports, avalanche blackspots and recent history.
- **Weather.** Using mountain forecasts and synoptic charts check the weather conditions for the previous week. Has wind or heavy snowfall featured? Have temperatures fluctuated or has it been cold and clear?
- **Snowpack.** Use SAIS reports to find out about the deepest deposits. Have weak layers within the snowpack been highlighted? Has windslab formed? Have fluctuating temperatures affected the snowpack stability?
- **People.** Just who is in your party? What's their level of fitness and experience and their weight on the snowpack? What equipment is carried (i.e. transceivers, shovels and probes)?

Approach

On the approach keep an eye out for the following:

- **Terrain.** Check the 'three A's'. Are Angles of 30-45° avoidable? Are your Aspects affected by strong sunlight, or sheltered from prevailing wind and collecting transported snow? How much snow is at your Altitude? Do you see any terrain traps; gullies, bowls and exposed traverses above large open slopes or cliffs? Are there any ridges or

buttresses that you can follow instead?

- **Weather.** How are conditions overhead? Do you have visibility? Is it cold or unusually warm? Is it snowing or raining? Is there a strong wind at altitude transporting snow? Is strong sunlight an issue, are there signs of 'sunwheels' - melting and drooping of large cornices?
- **Snowpack.** Where and how much snow cover is there? How does the snow feel? Are there any dry squeaking or 'whumphing' sounds? Are cracks shooting out from footsteps? Are there any obvious changes in colour or texture - such as areas of hail and ice.
- **People.** Check your group's fitness and awareness of conditions. Be ready to react to any potential events, and check your avalanche safety equipment. Is anyone else about, also loading the snowpack?

During your ascent

To go on, or not to go on. That is the question.

- **Terrain.** Assess your immediate surroundings - is your route particularly snow laden? Can you avoid avalanche prone angles? (30 - 45°). Are there localised slope convexities above steep terrain, where the snowpack may be under tension? Think of an avalanche as a fluid - where will it flow, where will it take you - over cliffs, into rocks or hollows? Identify any escape routes. Identify safe locations to dig snow profiles and test blocks, relevant to the slopes you intend to cross. Dig and explore layers (hard/soft, dry/wet, crystal types) and identify any major disparities between adjacent layers.

Expert Q&A



This issue's expert is Allen Fyfe. Allen has spent most of his life living and working in the Scottish Highlands, and is synonymous with the development of Scottish winter climbing for several decades. He is the co-author of two authoritative mountain training handbooks, and the current Secretary of Mountain Leader Training Scotland.

Q. Does wearing a transceiver make winter mountaineering safer?

A. Transceivers make it easier for other members of your party to find you if you're buried. But this is dependant on all members of the group not only wearing them, but being proficient in their use. Transceivers should never be used as a justification for venturing into hazardous avalanche terrain and avoiding normal safety precautions - they won't stop you being injured if you're swept away, but just make it easier for your body to be found.

Q. What is critical when trying to rescue people buried in an avalanche?

A. Speed is of the essence in an avalanche incident and an immediate search is vital. If uninjured and totally buried in an avalanche there is a 90% chance of being recovered alive if dug out in less than 15 minutes. If you witness someone caught in an avalanche, try to mark the point where they were last seen and work out where they are likely to end up. Try to attract the attention of others in the area who can help. Be aware of the danger of further avalanches, especially from above. Search for

signs of burial such as clothing, blood or equipment and then probe with axes and walking poles in the more likely places. Only send someone for help if there's a large number of people - otherwise they're better off assisting with the search.

Q. What are terrain traps?

A. Terrain traps are ground features where avalanche debris can accumulate. These can be hollows, streambeds, gullies, the bottom of rock steps or behind large boulders. These can present very real but unobvious dangers, as the snow can build up to considerable depth

Test stability by isolating a block and applying and increasing load. It requires experience to interpret snow profiles accurately - get advice then accrue a personal 'database'.

• **Weather.** What's the visibility? Is it snowing or raining? Is the temperature rising? Is the wind transporting snow? Is strong sunlight affecting your area or the slopes and cornices above?

• **Snowpack.** Visualize the snowpack as a fragile veneer of tissue over the ground. Where would it tear if pulled apart, particularly if 'serrated' with footsteps? Avalanche activity or recent debris on similar slopes is a big clue to stability.

• **People.** Assuming that you've now gathered the optimum level of information, can you make correct decisions, or are ego and ambition likely to cloud judgement? Whether you're out for a day, or an expedition of a lifetime, your decisions should be the same. Go with a gut feeling, and respect the views of all the party.

Safe travel techniques

Despite the best planning, at times you'll find yourself in high avalanche hazard territory. Stack the odds in your favour by:

- Following ridges and buttresses
- Following wind scoured ground.
- Going straight up and down slopes - it's better than a rising diagonal
- Traversing high under buttresses or below runout zone



Be aware of winter hazards.
The Ben Nevis summit plateau.
Photo: Andy Harbach.

- Crossing suspect slopes one at a time, aiming for rocky islands of safety
- Deploying the rope - if practicable

Finally

The earlier you can get the information about snow stability the better. But the fact that you have to get out there before you can make a fully informed decision is half the fun. Dealing with the uncertainty is

the challenge, the reward is being productive when conditions are tricky. Stay aware and have flexible plans and you're on the right track. ■

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in them, making even a minor avalanche a killer. Looking for terrain traps is essential when assessing the overall avalanche danger.

Q. What is windslab?

A. When snow crystals are broken up by the wind and re-deposited they become windslab. Slab can be deposited very quickly and its hardness varies depending on wind speed, temperature and humidity. With our variable weather, slab with different characteristics commonly builds up in loosely bonded layers - bad news for slope stability. Slab avalanches are the most common - and most dangerous - avalanche type in this country.

FURTHER INFORMATION

A Chance in a Million

£13.50 / £15 (non-members)

Scottish Avalanches - a fully revised and updated edition of the classic handbook. Two of Britain's leading avalanche experts look at the avalanche phenomenon from a variety of perspectives. Full of both technical information and practical advice.



sportscotland Avalanche Information Service
www.sais.gov.uk

Mountain Weather Information Service
www.mwis.org.uk

BMC Safety and Skills information
www.thebmc.co.uk/safety

Plenty of archive articles on all aspects of avalanche awareness.

