A 60 SECOND GUIDE TO . . .

# Managing Avalanches

Royal Geographical Society with IBG

www.rgs.org

## Types of Management

Avalanches are very difficult to predict due to the wide range of factors that can have an impact on where and when they take place. Actions to manage them can be categorised into the following forms:

**Active**: Methods that aim to disrupt the snowpack to create small, controllable avalanches, or stop snow from packing in the first place.

**Passive**: Methods that aim to reinforce the snowpack and stop it falling.

**Precaution**: Methods that accept the possibility of avalanches taking place but which aim to protect the people who use the mountain side more directly.

## Active Management

A common form of active management in ski resorts is to use **small explosives** to create small avalanches which can be shielded from main resorts and in the longer term prevent larger avalanches which can be far more dangerous. Machinery, such as **industrial aerators** that jolt the snowpack and cause it to move, is sometimes used too. Whilst highly effective in controlling when avalanches happen, explosives can inadvertently create larger than necessary snow shifts as well as cause damage to vegetation in some sensitive areas.

## Passive Management

**Snow fences** and **snow walls** are sometimes used in ski resorts to keep the snow pack in place. These large fences run along the mountain contours and prevent loose snow from running down the hillside. Despite being expensive to install and an eyesore for some visitors (especially in summer when their full size is revealed by the snow melt) they can be highly effective.

Snow fences in Switzerland / Tim Venchus

Other passive methods include **tree and shrub planting** where the lower branches of the plants can stabilise the snowpack. This tends to happen around common avalanche tracks but there is growing concern that the need to keep ski runs plant free has exceeded the need for avalanche management in some areas.

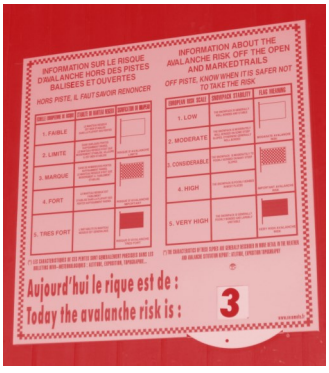
Snow shed in Washington / Washington State Dept of Transportation

Large barriers known as **avalanche dams** can be built around settlements and key transport hubs such as railway stations. **Snow sheds** are also used to deflect avalanches over roads too.

## Precaution Management

Skiers themselves are encouraged to carry equipment that will help them find and rescue each other should an avalanche occur. **Small shovels, emergency shelters** and **wearable tracker beacons** that give GPS coordinates to rescue services are starting to become standardised kit to skiers who prefer to explore the mountains off-piste. **Inflatable air bags** are also becoming popular. These are packed inside a skier's back pack and designed to increase the size of the wearer in the event of an avalanche. This has the effect of 'sieving' the wearer to the top of the loose snow, making it far more likely they will be able to 'ride' the avalanche or at the very least be found more quickly by rescue services.

A commercially available avalanche air bag / Unofficial Squaw




Avalanche risk notice, Chamonix / Hatters

In 1993, the **European Avalanche Warning Service** produced an avalanche risk table that is used to warn skiers via coloured flags about the chance of an avalanche on particular slopes. Collating data from all over Europe, it has become the standardised warning system for resorts to use.