

Avalanche danger

How to better assess the risks



The white danger

A large number of winter sports enthusiasts look for that extra kick off-piste, away from the marked trails, and this puts them at risk – the risk of losing their lives. Every year, 25 people lose their lives in avalanches in Switzerland, 90% of them trigger the avalanche themselves. An avalanche accident should therefore not happen in the first place. The bfu recommends obtaining information on the risk of avalanches, carrying appropriate avalanche safety gear and proceeding with the right amount of caution as the situation demands. If in doubt, stay on the marked piste or patrolled route.

Factors on how avalanches form

Avalanche risk is influenced by weather conditions, terrain and people.

Conditions: The heavier the snowfall combined with strong winds, the greater the risk of avalanches. In addition, unstable accumulations of winddriven snow may form. Snow transport by wind can be recognised by wind scoured mountain ridges, snow cornices and dunes.

Rapid and significant warming increases the risk of avalanche. With diurnal warming and strong solar radiation the risk increases during the course of the day in spring.

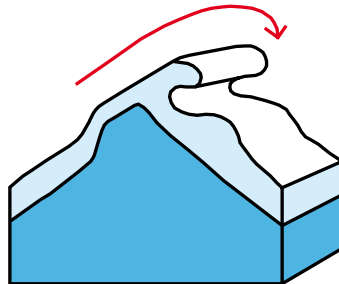
Recently released avalanches, «whumpf» sounds and cracks that shoot across the snow indicate an increased avalanche risk.

Terrain: Avalanches are possible on slopes steeper than 30°. The steeper the slope, the more dangerous it is. Avalanche-prone slopes are often shady, close to a ridge and loaded with winddriven snow.

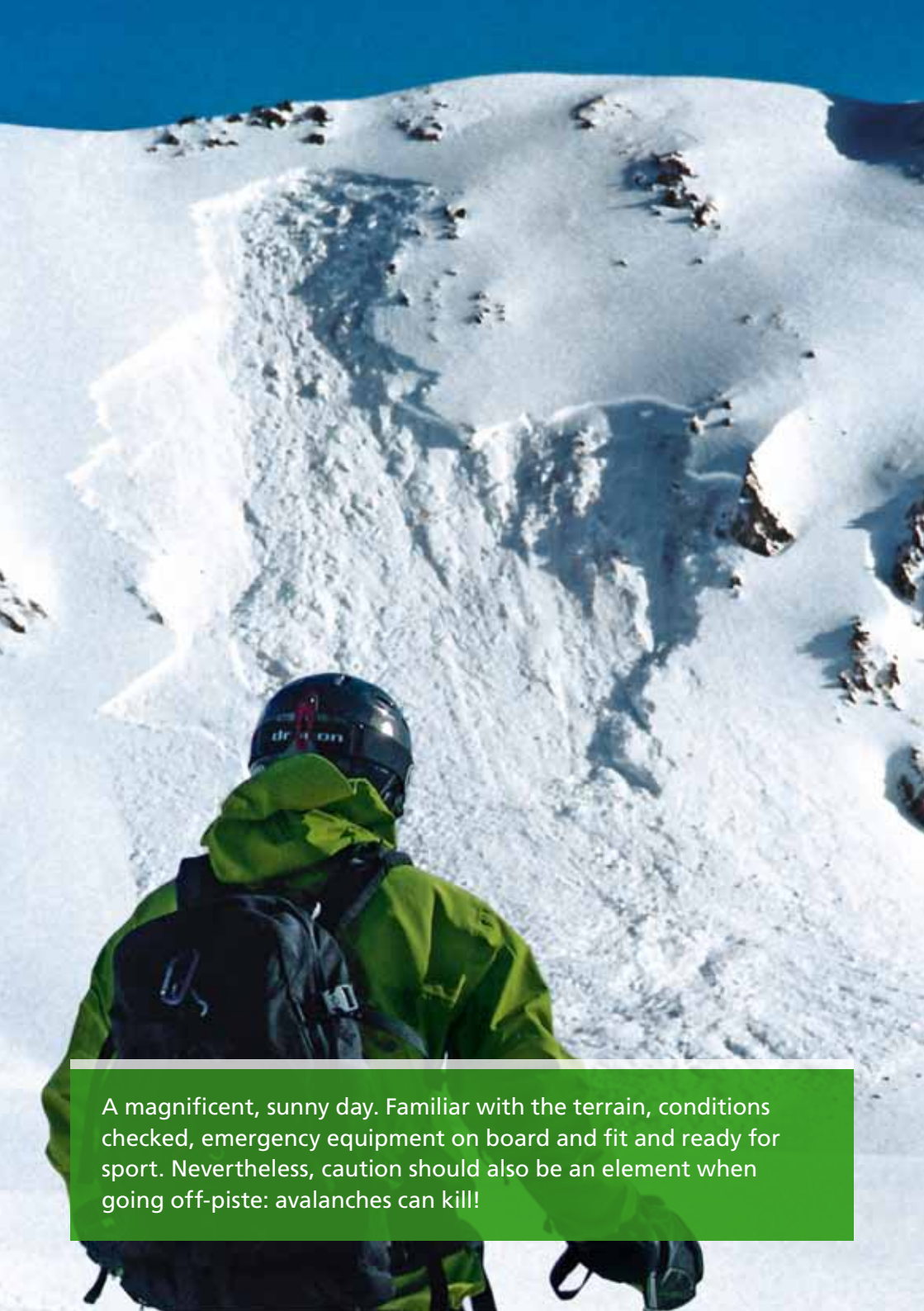
Human factors: Most slab avalanches are triggered by snowsports enthusiasts. Their behaviour can thus either increase or reduce the risk of an avalanche.



Slab avalanches are the most dangerous: Within a few seconds, an entire slab of snow slides away.



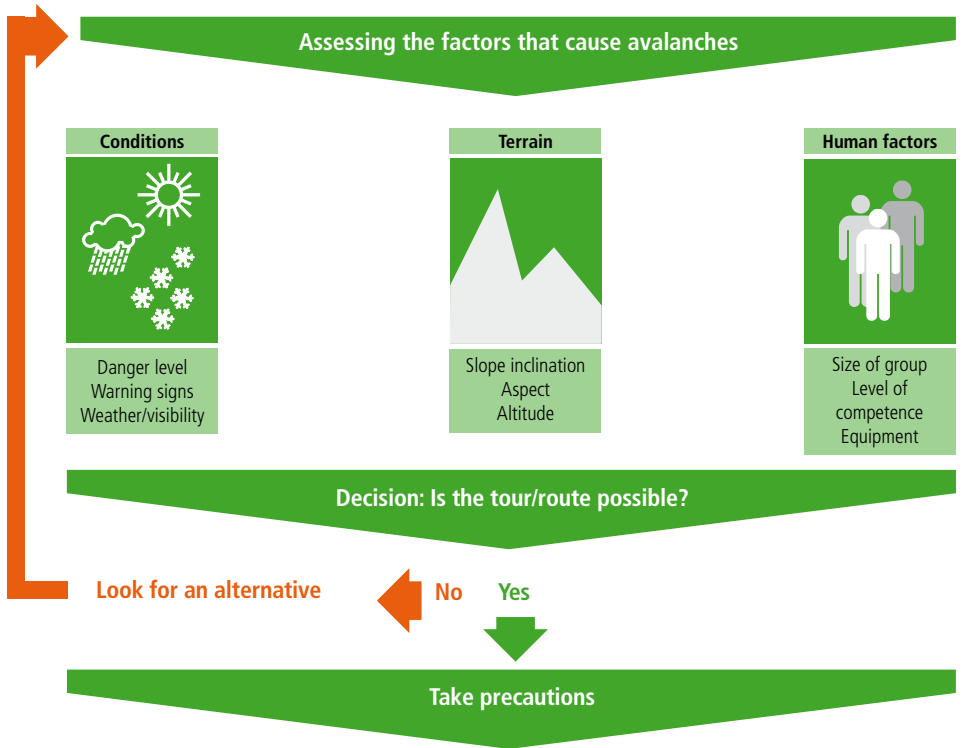
Deposit of wind-driven snow: risk of slab avalanche



A magnificent, sunny day. Familiar with the terrain, conditions checked, emergency equipment on board and fit and ready for sport. Nevertheless, caution should also be an element when going off-piste: avalanches can kill!

Assess the risk, take precautions

The diagram below will help when assessing the risk of avalanches.



- Enter key areas one at a time, maintain distances (approx. 10 m) between riders/ skiers in ascents.
- Avoid the steepest sections of any slope.
- Assess recent snowdrifts critically.
- Pay attention to rising temperatures during the day.

- Make sure that your beacon is set to «Transmit» and is working properly.
- Never set off alone.
- Turn back if visibility is poor or cancel the tour.
- Do not follow other tracks if they lead into unknown terrain.

The risk of an avalanche depends on the danger level and the inclination of the slope. The lower the danger level, the steeper the slope you may cross with the same risk. The higher the danger level, less steep slopes should be chosen.

The detachable card in the back of this brochure will help when assessing the risk. It gives additional information on avalanche bulletins and measuring the inclination of a slope.

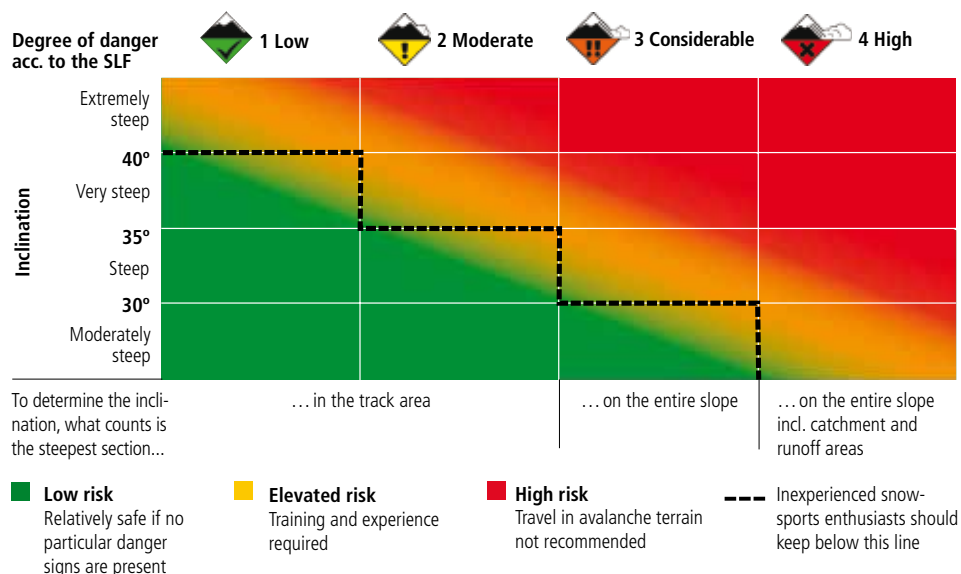
Avalanche bulletins

The WSL Institute for Snow and Avalanche Research SLF in Davos assesses the avalanche danger on a daily basis in winter with the 5 degree danger scale used throughout Europe. Bulletins and further information are available on: www.slf.ch.

Inclination

Inclination is measured on a map (with an inclination scale) or estimated in the terrain (with ski poles). The steepest part of the slope is used for the measurement (approx. 20 m x 20 m). Slopes steeper than 30° are marked on 1:50,000 skitouring maps.

Avalanche risk in the exposed aspects and elevations mentioned in the bulletins



Sample interpretation: At danger level 2 «Moderate», those with less experience should avoid slopes steeper than 35°.

Local avalanche warning signs

In the snowsports areas, those responsible for the local piste and rescue services assess the risk of avalanches. They close off endangered pistes, descents and snowsport trails.

Flashing warning lights are switched on when the danger level is 3 «Considerable» or higher in off-piste areas. Freeride checkpoints provide updated information on a daily basis.

Achtung Attention Attenzione
Hier keine markierte und kontrollierte Abfahrt
ICI pas de descente balisée et contrôlée
Qui nessuna discesa demarcata ne controllata
Here no marked and controlled run


This sign shows the start of an unpatrolled, off-piste area.




**Freies Gelände
Domaine non contrôlé
Zona non controllata
Off piste areas**

**Lawinengefahr
Danger d'avalanches
Pericolo di valanghe
Danger of avalanches**

Warning when the danger is «considerable» (danger level 3) or higher.



**gesperrt
barré
chiuso
closed**



Under no circumstances must closed pistes, descent routes and snowsport trails be used.



Check your gear

Minimum equipment should comprise an avalanche beacon, avalanche shovel and probe. They provide no protection against avalanches but can increase your chance of survival. Other emergency systems (e.g. avalanche airbag) are recommended depending on the situation. A helmet is particularly protective for descents. Your rucksack should also contain maps for orientation, a mobile phone for alerting the rescue service (N.B. coverage not optimum everywhere), a first-aid kit including an emergency space blanket as well as protection against the sun and the cold.



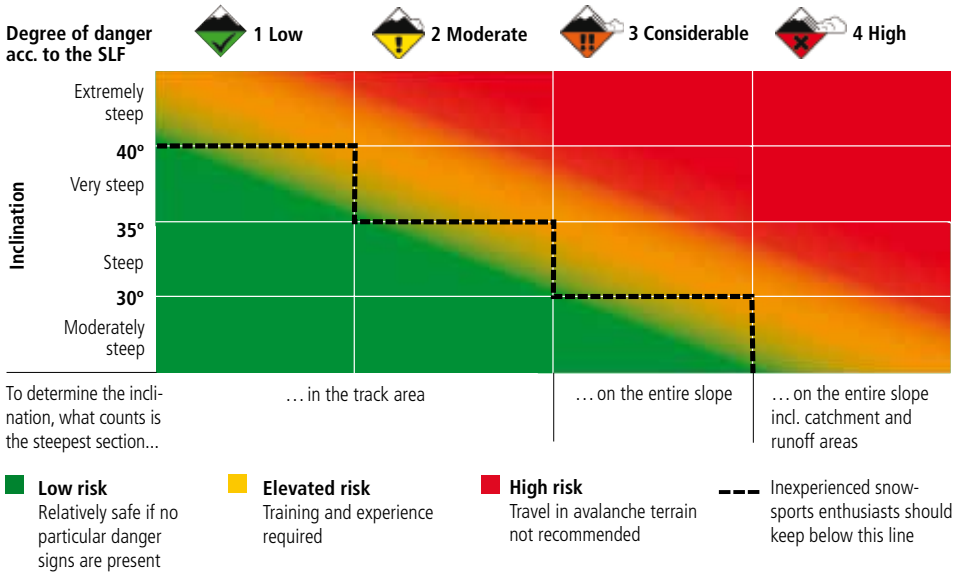
The 3 most important tips



- Take training courses or join a group with a professional guide.
- Obtain the necessary information on the weather, avalanche situation and terrain.
- Carry emergency equipment and familiarize yourself with its use.

Reduce the avalanche risk

Avalanche risk in the exposed aspects and elevations mentioned in the bulletins



Avalanche bulletins

Avalanche bulletins provide information on snow and avalanche conditions for all regions of the Swiss Alps (local variations are possible, transitions are smooth!). The degree of avalanche danger depends on: the likelihood of an avalanche happening, the distribution of dangerous slopes, size and type of avalanches (mass of released snow layers).

National avalanche bulletin (issued daily at 6.30 p.m.)

- www.slf.ch
- wap.slf.ch
- Tel. 187 (from outside Switzerland: +41 848 800 187)
- Teletext: page 782

- MMS: Send an SMS with the text «LAWCHD» to 162
- iPhoneApp «White Risk Mobile»

Regional avalanche bulletins (issued daily at 8 a.m.)

- www.slf.ch
- MMS: E.g. send an SMS with the text «LAWZCH» to 162 for the regional bulletin for Central Switzerland. Additional keywords available with an SMS text «LAWINE» to 162
- iPhoneApp «White Risk Mobile»

Avalanche situation in Europe:

www.avalanche.org

Weather:

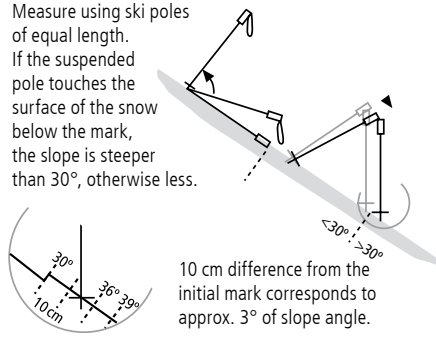
www.meteoswiss.ch

Avalanche danger scale

1 Low 	Generally favourable conditions. Go onto extremely steep slopes (> 40°) one at a time! Be aware of the danger of falling!
2 Moderate 	Mostly favourable conditions. Choose your route with care. Avoid all extremely steep slopes (> 40°) as well as fresh accumulations of wind-driven snow! Go onto steep and shady slopes (> 30°) one at a time!
3 Considerable 	Partly unfavourable conditions. Avoid steep and shady slopes (> 30°). Inexperienced people should stay on-piste or join a group with a professional guide!
4 High 5 Very high 	Unfavourable conditions. Pay attention to avalanche runout areas. Confine activity to marked, open runs/routes under all circumstances!

Steepness

Measure using ski poles of equal length. If the suspended pole touches the surface of the snow below the mark, the slope is steeper than 30°, otherwise less.



10 cm difference from the initial mark corresponds to approx. 3° of slope angle.

Rules of thumb:
 Kick turns required during ascent: > approx. 30°
 piles of rubble under cliff faces: around 35°
 steep, rocky terrain: > approx. 40°

Take precautions

- Enter key areas one at a time, maintain distances (approx. 10 m) between riders/skiers in ascents.
- Avoid the steepest sections of any slope.
- Assess recent snowdrifts critically.
- Pay attention to rising temperatures during the day.
- Make sure that your beacon is set to «Transmit» and is working properly.
- Never set off alone.
- Turn back if visibility is poor or cancel the tour.
- Do not follow other tracks if they lead into unknown terrain.

How to react to an avalanche accident

The probability of being found alive decreases drastically after just 15 minutes. Only half of any victims who are completely buried will survive an avalanche accident. Every minute counts. You should therefore act quickly and prudently/not hastily, following this procedure:

- Gain an overview, assess the situation and act without putting your own safety at risk.
- If possible without any loss of time: Alert the Swiss Air Rescue Rega (Tel. 1414) or the KWRO in Valais (Tel. 144) or the nearest ski lift or funicular station. The international emergency number 112 can be reached by all mobile phone networks.
- Use your eyes and ears to search the avalanche deposit and start searching immediately with the rescue beacon (switch off any beacons not needed).
- First free the head and chest of any people found buried and start life-saving emergency measures.
- Protect an accident victim from losing body heat.
- After the search, reset all beacons to «Transmit» again.
- If you have not already done so, raise the alarm now.

Live safely: your bfu.

bfu is committed to safety by public appointment. As the Swiss Competence Centre for Accident Prevention it conducts research in the sectors road traffic, sport, home and leisure and passes on its knowledge to individuals and specialist circles by means of advisory services, training sessions and communications. More about accident prevention at www.bfu.ch

Further information

We also recommend the following brochures:

- Caution – Avalanches!
(can be obtained directly from the SLF)
- 3.001 Tobogganing*
- 3.002 Skiing and snowboarding
- 3.003 Swimming, diving, inflatables*
- 3.010 Hiking*
- 3.018 Cycling*
- 3.020 Mountain biking*
- 3.086 Diving on vacation*
- 3.121 E-bikes*

* in German/French/Italian

These brochures or publications on other topics can be obtained free of charge or downloaded as *.pdf files: www.bfu.ch.



Partners: WSL Institute for Snow and Avalanche Research SLF

Alpine Rescue Switzerland (ARS), Association of Swiss Mountain Guides (ASMG), Federal Office of Sports (FOSPO), Friends of Nature Switzerland (FNS), MeteoSwiss, Rescue Organisation of the Canton of Valais (KWRO/OCVS), Swiss Air Rescue (Rega), Swiss Alpine Club SAC, Swiss Army (Cen exce A mtn tng), Swiss Association of Mountaineering Schools (SAMS), Swiss Cableways (SCW), Swiss National Accident Insurance Fund (Suva), Swiss Ski Federation (Swiss-Ski), SSBS – Swiss Snowsports Association for Instructors and Schools, SWISS SNOWSPORTS

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