

Hazard Awareness, Safety & Prevention



Mike Wiegele
Helicopter Skiing



Welcome

To a week of helicopter skiing in the Cariboo and Monashee mountains of British Columbia. This week may prove to be one of the most exhilarating and challenging skiing experiences of your life. We have some of the finest skiing in the world and our entire staff is dedicated to making your holiday a memorable one.

We have prepared this brochure to help you become more familiar with helicopter skiing. We ask that you read this booklet, as it outlines the risks inherent to backcountry wilderness skiing, along with our safety and operational procedures.



HELICOPTER WILDERNESS SKIING AND BOARDING

We wish to make you aware that the type of skiing we do is classified as backcountry wilderness skiing. This means that when skiing in the backcountry wilderness terrain, the terrain is uncontrolled. There are no grooming machines, ski patrol, avalanche control personnel, direction markers, closed signs or ropes closing off hazard zones. There is only the helicopter, your guides and you.

The helicopter may land on uneven slopes. Use caution when approaching and leaving the helicopter, and loading and unloading the skis.

Severe and quick changing mountain weather is often encountered. A degree of risk is inseparable from the use of high alpine recreation areas. It is your guide's job to minimize these risks to the best of his ability. Your guide will give you directions which you are asked to follow. Your cooperation and trust is expected from the first day on.

Please do not challenge our instructions and guidelines.

Hazards associated with backcountry wilderness skiing and boarding

You should be aware that helicopter skiing has, in addition to the usual dangers and risks inherent in the sport of skiing, certain additional dangers and risks, including but not limited to:

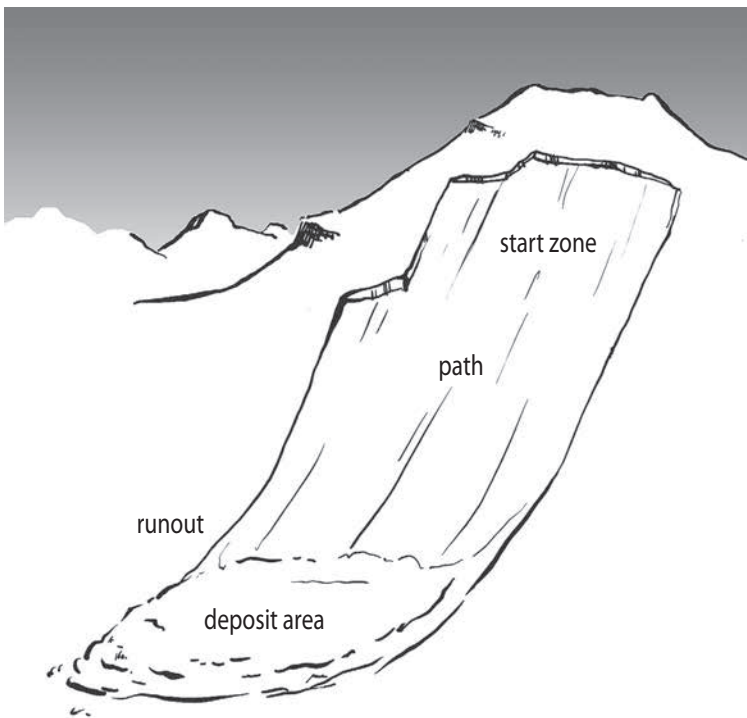
Avalanches	Changing terrain
Crevasses & bergschrunds	Changing snow conditions
Icefalls	Breakable crust
Cornices	Dense powder
Trees & branches	Ice
Treewells	Cold weather
Snow mushrooms	Hidden obstacles such as logs, stumps and rocks under the snow
Creek beds	Flat light
Cliffs	Falling trees
Wind drifts	Altitude sickness
Boulders	Snowmobile tracks
Logging roads	Helicopter
Cell phones	
Head phones	

AVALANCHES

Avalanches are our major concern. An avalanche can be defined as a mass of snow travelling down a slope in the fall line. It can be released naturally or by disturbances such as a skier or snowboarder. It can slide on steep open slopes and travel onto flat areas. It can also slide in the trees.

The size of an avalanche is classified into grades of one to five. Class one is a small release with a low hazard to a skier. Class two is considered large enough to bury a skier. Class five is a large destructive avalanche, tearing down trees, carving out new paths and destroying anything that stands in its way.

When snow stability is poor, we select less exposed and safer runs.



When skiing and boarding in potential avalanche terrain

1. Follow the instructions given by your guides at all times.
2. Never ski without your guide and group.
3. Stay within the boundaries designated by the guide.
4. Ski within visual sight of your guide, ski buddy or group.
5. **One person skis the slope at a time.**
6. Only one person at a time is exposed to avalanche danger; in other words, do not enter the slope until the skier before you has reached a protected area or as instructed by your guide..
7. Stay out of avalanche paths, especially out of release zones.
8. Do not make rest stops at the foot of an avalanche path. When pausing for a rest, stop at points of safety such as ridges, rock outcrops or islands of timber.
9. Wear your transceiver at all times under your clothing and make sure your guides check its function daily.
10. Beware of windloaded areas, the slopes beneath cornices and deep drifts, especially those with convex profile.
11. Beware of steep slopes between 30° and 45°, narrow chutes and gullies, even if short in length.
12. Do not assume that a slope is safe just because it did not slide when the first person crossed it.
13. Do not assume that avalanches are confined to open slopes. It can avalanche in the trees.
14. If the snow acts suspiciously – suddenly settling or fracturing – head to the nearest point of safety – let your guide know!



AVALANCHE TRANSCIEVER USE

It is mandatory that you ski with an avalanche transceiver when helicopter skiing and its function is checked daily. The avalanche transceiver sends out a radio signal which can be picked up by other transceivers. It helps reduce the time required to find an avalanche victim; however it is not an excuse to ski potential avalanche terrain when snow stability is poor.

Prior to skiing always check the transmit and receive functions of the transceiver with your guide.

When skiing and boarding

1. Always keep the transceiver on transmit.
2. Wear it under your ski clothes using the straps provided.
3. Always turn off cell phones or keep on "Airplane Mode".

In case of avalanche

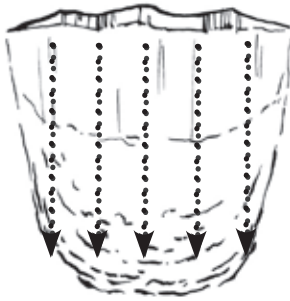
1. Move to a safe place until avalanche stops.
2. Identify number of people missing and the last seen point.
3. Turn all transceivers to receive.
4. Systematically search the likely areas using one of the two search patterns shown, depending on the manpower available. If there are enough searchers, spread yourselves out across the avalanche path 15 meters (50 ft.) apart. Head down the fall line in a parallel fashion until a signal is detected. If there are not enough searchers, use the zig zag pattern.
5. Once the signal is engaged, align the transceiver so that any of the three center lights are flashing and move quickly in that direction. Your direction of travel might be straight or slightly curved.
6. Make sure the number in the distance display is decreasing. If it is increasing turn 180 degrees. Inside ten meters, move slowly and try to keep the center search light engaged.
7. Within three meters, use your beacon close to the snow surface and look for the smallest distance reading.
8. Probe with an avalanche probe or inverted ski pole at the smallest reading (strongest signal) to determine the exact location of the skier before digging.
9. Dig the person out, uncovering the face as soon as possible.
10. Everybody must dig. Start on the downhill side approx. the burial depth away from the probe and dig into the hill. Switch people in the front every 1 to 2 minutes to avoid exhaustion.

If you are caught in an avalanche

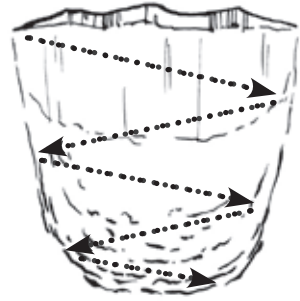
1. Call out so others in your party may observe your course. Try to ski out and to the side of the avalanche.
2. Discard poles, skis and backpack if you fall.
3. Try to swim in the snow and **fight to stay on top.**
4. Try to work your way to one side of the moving snow.
5. When the snow slows down, cup your hands in front of your face and mouth to make an air space. Attempt to thrust one hand to the surface.
6. If you are buried, avoid panic. Your transceiver will broadcast your location.
7. If you try to dig yourself out make sure you dig upward toward the surface.
8. Do not waste oxygen by shouting. Snow is a good sound insulator.
9. If you think you are near the surface, try to reach out a hand or thrust up a foot.

If your guide is caught

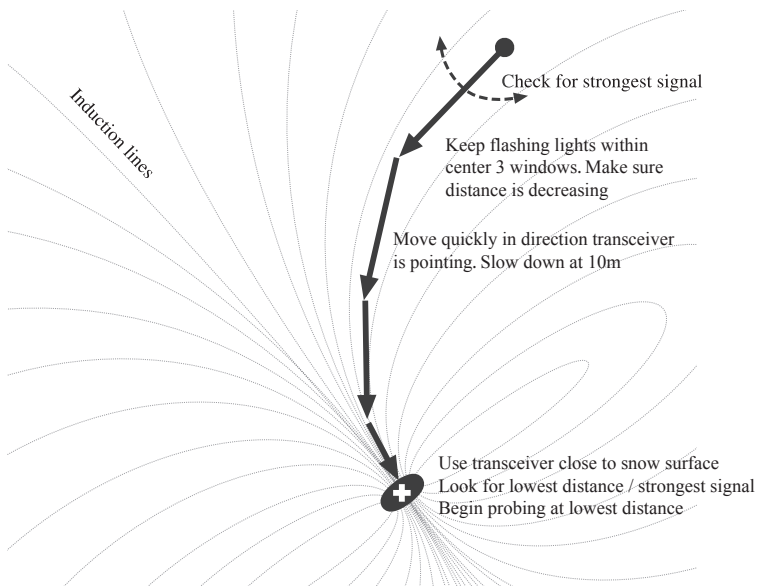
1. Do not panic. Check for further slide danger. If you wear a guest radio, inform the other guides and pilot.
2. Mark the last point your guide was seen.
3. Make a hasty search for clues such as a hand sticking out of the snow, helmet, goggles, ski poles, etc.
4. Organize a transceiver search.
5. Signal the helicopter or nearest guide or send two skiers by the safest route to report to the helicopter or other guides immediately.
6. After pinpointing transceiver signal use probe or inverted ski poles to locate skier.
7. Use a shovel to uncover buried skier. The helicopter will drop any rescue gear on site such as shovels and probes.
8. Uncover face first and administer First Aid.



Search pattern



Hasty search pattern



Once avalanche victim is uncovered

1. Clear snow away from airway and check for breathing and bleeding.
2. Check and treat for neck and back injuries. Begin CPR if victim is not breathing.
3. Check and treat for shock.
4. Administer First Aid.
5. Keep victim warm and avoid excessive movement.
6. Transport to medical aid.

Crevasse and Bergschrunds

A crevasse is a hole or crack in the ice caused by the slow movement of the ice downslope. These openings can vary from small cracks to large gaps 15 feet (5 m.) across and over 100 feet (30 m.) deep. Bergschrunds are a special kind of crevasse, resulting when the ice has pulled away from outcropping ridges.

The winter snowpack can cover many of the crevasses, forming a snow bridge. Some snowbridges may be firm and hard and can carry the weight of a skier, while others cannot. Some of the larger crevasses can be identified by visible hollows or openings on the glacier surface.

New snow, wind and flat light can obscure glacier features. Your skis distribute your body weight and minimize the chances of breaking through a snowbridge. Avoid skiing in hollows, but if one does ski across a hollow, avoid stopping or turning in it, as the extra weight or bounce may cause the bridge to collapse.



Icefalls

When a glacier flows over steeper terrain, the ice breaks up and forms an icefall. The ice is constantly breaking off, sometimes triggering an ice or snow avalanche.

Never stop to sightsee while under an icefall. Never ski past your guide. Make a habit of staying close to your guide's tracks.



Snow Cornices

Snow cornices are formed from wind transported snow building up on the lee side of mountain peaks and ridges. The deposited snow eventually overhangs the ridge. The cornice can break off well back from the overhanging part.

A cornice may break off and crush a skier or release an avalanche.

1. Never walk on a cornice. It can break off well back from the overhang.
2. Do not walk off from the landing spot without checking with the guide. There could be a cornice, unseen from above.
3. Never stop under a cornice.
4. Use caution when skiing and boarding slopes that are near cornices.
5. Always keep an eye on any nearby cornices.
6. Immediately move out of the runout zone at any sign of danger.



Trees and treewells

The snowpack often does not cover the base of a tree because of the overhanging branches and melting snow forming a treewell. A skier falling head first into a treewell can suffocate. We often ski in the trees when snow conditions are good, when the sky is overcast or when the helicopter pickup is on the valley floor. Tree skiing can be fun and exciting, but it can also be hazardous. Your guide has very little control of these hazards or skiers behavior and it is easy to lose sight of your guide.

When tree skiing, always ski in control to avoid hitting a tree and injuring yourself on the branches, or falling into a treewell.

Use the buddy system. Stay in contact with your partner and, together, keep your guide's tracks in sight. If you can, give treewells a wide safety margin.



Snow mushrooms

Snow mushrooms are large blocks of snow perched on top of trees and rocks. They are heavy and can fall naturally or if a tree is jarred.

Stay away from trees and rocks that have large mushrooms and do not stop below them.



Creekbeds

Deep uncovered holes may exist in creekbeds, usually in narrow gullies. These holes are at times difficult to identify, especially in flat light. Not only can you get wet and/or hypothermia, you may suffocate or drown if you are not able to help yourself. Ski under control and use caution when near creekbeds and gullies.



Hidden rocks, logs and stumps

Rocks, logs and stumps just under the surface can cause injury. Use caution when skiing and boarding over uneven terrain to avoid hidden hazards.

Be careful on ridges, where the snow cover is often thin because of wind transporting the snow.



Cliffs, rocks, wind drifts, logging roads, logs and bumps

These unmarked hazards can cause injury. Ski under control and keep in contact with your buddy.



Changing snow conditions, breakable crust, large snow debris, dense snow and ice

These are hazards that are often overlooked. If you encounter changing snow conditions, changing terrain and any other questionable situation: stop, evaluate the situation and adjust your technique and speed accordingly.

Backcountry skiing and boarding procedures

The following rules and procedures have been laid down for the purpose of avoiding hazards and accidents:

1. Listen carefully to your guide's instructions. Your guide will point out hazards either before or during your descent.
2. Your guide will lead the group. Be aware that your guide has limited control over your actions once he is skiing ahead of you.
3. Whenever we are near a hazardous area, you should all be alert and careful. Make a habit of keeping an eye on the guide and being aware of the surrounding potential hazards.
4. The guide will always ski ahead of the group. Never ski past the guide. He might be stopping just before a drop off or potential avalanche slope. If he wants you to stop immediately, he will hold out his arms and ski poles out to the side.
5. Avoid mass starts. Allow the person in front of you about 5 turns of distance, so that you will be able to ski freely and independently.
6. Alternate with the other guests so that each skier will have the opportunity for first tracks behind the guide.
7. Ski with your buddy. Keep a watch on each other, especially when skiing in trees, narrow chutes, gullies, creekbeds or very deep powder. You may help each other when needed.
8. If your group skis in the trees, make lots of noise ("Eeeoooh!"), so your buddy and your guide can determine your location while skiing.
9. Headphones and music player are not to be used during skiing with us.
10. Cell phones are to be turned to airplane mode.
11. Drugs and alcohol are not to be used before or during skiing with us.
12. The guiding staff should be informed of any allergies, sickness or disability on arrival. It will be kept strictly confidential.

Communication

The guide will give all the necessary instructions. At times you may not understand the guide's first explanation. We encourage you to ask for clarification. Understanding each other is very important.

If your guide shouts at you, he is not upset. Rather, he may need your immediate attention, or the wind is strong, or the group is talking too loudly, or the helicopter is making communication difficult. Please understand that your guide needs your full attention and cooperation.

All our guides have a great deal of experience and knowledge they are willing to share with you. If you have any questions on ski technique, the mountains or our operation, just ask.



Clothing and Equipment

Cold and windy weather is another hazard to be considered. Dress the same as you would for a similar day at a ski resort. The helicopter might be warm, but even on clear days at high altitudes, the mountain tops and ridges can be windy and cold and the helicopter pickups can be in the shade. It is a good idea to have extra clothing on hand in case of delay, but you must carry it with you.

We recommend a multiple layer of clothes (Gore-Tex, down, wool), good quality gloves or mitts, warm hat, neck gaiter or scarf. Good quality sunglasses are recommended on sunny days and fog-proof goggles when the powder is deep or the air misty. There is no space in the helicopter for extra items. You may carry these extra items in your shovel pack.

Frostbite

When the weather is extremely cold, it is important to guard yourself against frostbite. An oil based high altitude cream will help protect your face, nose and ears. Properly fitted boots that allow free circulation will maximize your feet's resistance to cold. Boot muffs, boot heaters and electric socks will keep your feet warm as well. Be sure your boot liners and feet are dry. Talcum powder will also help keep your feet dry during the day. Mitts are best for cold days. Carry Hot Shots with you for additional warmth.

Skis/Boards

You are welcome to use the equipment that you are most comfortable with. However, our ski shop carries specially designed skis/boards for unpacked, deep snow. We strongly recommend that you try them.

Bindings

Make certain your bindings are checked out and adjusted the night prior to your skiing day. There is no charge for a binding check or minor adjustments. A cold windy mountain top or waist deep powder is an unpleasant place to adjust your bindings.

Shovel pack

Every guest has to carry a shovel pack to maximise safety in the mountains. Your guide will provide you with a complimentary shovel pack to use while you are here at the resort and show you how to use its content.

THE HELICOPTER

The helicopter is a potentially dangerous machine. Many of our landings are on uneven terrain and communication between you and the guide may be hampered by the noise of the machine. In the nose of the helicopter is the HF antenna and air speed indicator. Touching these could result in burning or electrocution. At the rear of the helicopter is the tail rotor. It is invisible when turning. The main rotor can also dip very low. Please use caution when around the helicopter and adhere to the following procedures.

Approaching the helicopter

Case 1 – The helicopter is waiting for your group

1. Your guide will stop well out of the rotor arc. No one should ever ski up to the helicopter. **Stop behind your guide. If by chance you are the first to arrive at the helicopter, stop 300 feet (100 m.) from the helicopter and wait for your guide.**
2. Disarm avalanche airbag backpacks outside of the rotor area. Take the backpack off and carry it in your hands towards the helicopter. During flight keep the avalanche airbag backpack on your lap.
3. Take off your skis and tie your skis and poles into a tight bundle.
4. Follow in your guide's footsteps to the helicopter. Your guide will approach it from the front and downhill side, in full view of the pilot.
5. Stay crouched.
6. Drag your skis by the tips—always keeping them below your waist.
7. Be alert. Keep your eyes on the guide, pilot and helicopter.
8. Never go past the ski basket or door towards the rear of the helicopter. Stay away from the tail rotor.
9. Do not chase any objects that get blown away by the rotor blast. Let your guide know and they will take care of it.

Case 2 – The helicopter has not yet arrived and your group is preparing for pickup.

1. Tie skis and poles in a tight bundle.
2. Skis are stacked together in one location indicated by your guide.
3. The group will huddle by the guide's pack at the front-left side of the landing area in full view of the approaching helicopter.
4. The helicopter will land between the skis and skiers. Keep low and watch the helicopter as it lands. Make sure you keep your gloves and goggles on and hold on to your backpack
5. Wait for the signal before approaching the helicopter.



Approaching the helicopter (always from the downhill side and in view of the pilot)



Unloading skis

Loading and unloading the skis and boards

1. The guide will open and close the ski basket.
2. One guest may be assigned to help the guide load the skis.
3. When loading or unloading the skis or snowboards, one person will hold the tips while the other person holds the tails.
4. Keep the skis horizontal, preventing the possibility of lifting the skis into the rotor.
5. Always watch each other.
6. The guide will be at the rear of the basket.

Entering the helicopter

1. Your guide will open and close the doors.
2. Guests enter one at a time.
3. Do not clean your boots on the step of the helicopter.
4. Your seatbelt must be fastened immediately upon entering. Do not unfasten until signalled to do so.
5. The second guide is the last to enter the machine.
6. The guide will close the door and sit up front.
7. Do not make any unnecessary noises in the helicopter.
8. No smoking in or around the helicopter.

During flight

1. The guide and the pilot will discuss field observations, snow conditions and weather changes.
2. From these observations the ski zone is decided upon.
3. Possible landing sites are discussed well in advance.
4. Before landing, the pilot may circle the top once or twice. He is checking wind strength and direction, as well as up or down drafts.
5. The pilot will make his final approach only when he feels confident and comfortable.
6. Weather conditions at a landing spot may be such that the pilot decides not to land. These include strong wind gusts, downdrafts, blowing snow and flat light. In this case an alternate landing site will be chosen.
7. Do not unbuckle your seatbelt until your guide/pilot gives the signal.



Unloading of guests, skis and boards

1. The pilot lands the helicopter.
2. Keep your seatbelt fastened until the guide gives the signal. The pilot may lift off again if not satisfied with the landing.
3. Once the pilot is satisfied with the landing area, the guide will signal to unfasten your seatbelt and open the passenger door.
4. You may exit the helicopter in a safe manner.
5. The guests will huddle around the guide's pack in view of the pilot unless the guide directs otherwise. The guide may ask for a helper to unload the skis.
6. The guide and his helper will unload the skis.
7. Check that nothing is caught on the helicopter or hanging out of the door (i.e. seatbelts or backpack straps).
8. Kneel and keep low.
9. The guide will give the signal for the pilot to take off.
10. Always watch the helicopter as it takes off.
11. Do not move from the designated spot until the helicopter has departed.

Note

1. Do not walk away from the group, unless you have consulted with your guide.
2. When landing on narrow ridges or pointed tops, guests might be told to huddle closer to the helicopter due to hazards close by, such as steep slopes or cornices.
3. Landing areas are marked with black landing sticks.
4. After unloading, put on equipment in a timely manner to make it to a safe spot away from incoming helicopters.
5. In small helicopters with only one guide a guest will be assigned door duties and will be in charge of the safe operation of the helicopter door.



**Guide signalling
all clear**

THE SKIING AND BOARDING GAME

Normally you will make turns of your choice. The guide will ski first, and you will join in on either side of his tracks or as instructed by the guide. You will ski down, one following the other, about five to ten turns apart. Occasionally you will be asked to ski one at a time on steep or narrow slopes.

Avoid mass starts

Alternate between guests as to who will follow the guide. Allow enough space between each other to give you greater freedom while skiing. We encourage you to join in the following skiing games.

Figure "8"

Pair up with another skier. One skier leads and the other follows crossing the tracks halfway through each turn. The result is a chain of figure 8's. Alternate leaders as you like.

Figure "S"

With the guide leading, join in from the side skiing about three feet beside the other tracks. This creates a spectacular wave effect.

These games help develop better skiing skills. They also add to the enjoyment and challenge of helicopter skiing and make for great pictures.

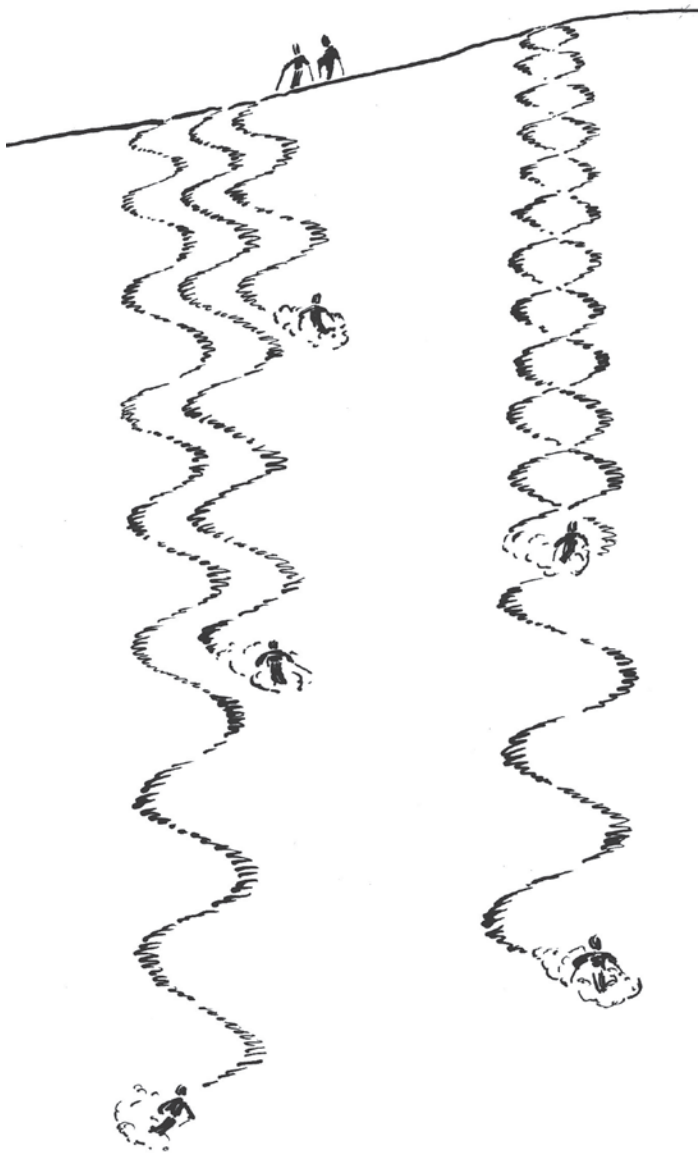


Figure "S"

Figure "8"

THE SKIING AND BOARDING PLAN

Despite the size of our area, we are limited to what we can ski by a variety of factors, including the avalanche hazard and other potential dangers, the present weather conditions and the projected forecast, the helicopter and its needs such as fuel, the time of day, the number of groups and their skiing ability. Sometimes these factors are straight forward and we can move on to another mountain or area quickly. Other times, these factors are more time consuming and it might be a while before we can move on.

Avalanche, snow and weather recording

This is done on a daily basis at 7:30 a.m. By monitoring the snow and weather conditions every day, we are able to assess the present conditions in the mountains as well as foresee any developing conditions.

If you are interested in our forecasting methods and operational procedures, your guide will be more than happy to explain them and show you around the Guides' Haus.

Snowpit

Part of our forecasting system requires certain field observations. During the day, your guide may stop and dig a snowpit. He will be mapping the layers in the snowpack, determining their relative strengths as well as looking for potential weaknesses.

We ask that you cooperate with your guide and wait, as this is done for the purpose of evaluating snow stability. It is essential for our forecasting system and your safety. Get involved in the snowpit and have your guide explain the current snow conditions.

Bad weather and poor snow conditions

Please be aware that we have absolutely no control over Mother Nature. However, your guide's experience and knowledge will provide the greatest chance of finding the safest and best available snow conditions for the day.

Please be patient!
Help us make helicopter skiing safe and fun!



W A R N I N G

High alpine mountain and wilderness backcountry skiing under any condition may cause serious bodily injuries and sometimes death. At all times use extreme caution when skiing in the backcountry as well as when approaching, entering and exiting the helicopter. Anyone taking part in helicopter backcountry skiing activities assumes the risk inherent with such sporting activities. Any of these hazards exist in many different variations, shapes and forms in back country mountainous wilderness skiing terrain, on any given run.

H A Z A R D S



AVALANCHES



CREVASSES



CORNICES



ICEFALLS



OTHER SKIERS



ROCK FALLS



ROCK CLIFFS



CREEKBEDS



LAKES



WILDLIFE



TREES



TREEWELLS



TREE MUSHROOMS



FORESTS



ICY SURFACES



LOGGING ROADS



FALLEN LOGS



TREE STUMPS



SNOW DRIFTS



WEATHER



FALLING TREES



WHITEOUT CONDITIONS



HELICOPTER



SNOWMOBILE TRACKS



ELEVATION

C.S.G.A.

C.W.S.A.A.

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