

ACC Ottawa Guidelines - Alpine Backcountry Skiing Leader

Scope

This document provides advice on "best practices" for ACC Ottawa amateur leaders leading Section alpine backcountry ski touring trips with Telemark and alpine touring (AT) gear as well as backcountry snowboards with a touring set-up. It is intended to help leaders plan and manage club trips. It should be read in conjunction with the "[ACC Ottawa Guidelines - Introduction](#)". These guidelines also apply to snowboarding unless otherwise indicated. [Nordic backcountry skiing](#) is described in a separate guideline.

Introduction

Touring is self-propelled on ungroomed and unpatrolled terrain with participants breaking trail. This requires a very high level of fitness. Skins are normally used on the ascent. Grip waxing may occasionally be used on long, flat sections. Touring can be below treeline, at treeline or in the alpine. Strong skiing technique is essential as every imaginable type of snow can be encountered, sometimes in the same day (deep powder, crud, dust-on-crust, corn snow, sheer ice, boiler plate wind crust, breakable crust, etc). Travel is frequently in avalanche terrain. Consequently, alpine backcountry skiing is potentially the most hazardous Section activity.

Terrain Assessment

Terrain is the single most important determinant of avalanche risk. The Avalanche Terrain Exposure Scale (ATES) rating system is widely applied to common backcountry ski touring areas in the Canadian Rockies and increasingly elsewhere. The ATES system is defined by a "Public Communication Model" shown below and a more detailed "Technical Model" for professionals. The Trip Leader should understand the ATES system and know where to find terrain ratings, if available, for the planned destination and tour.

Avalanche Terrain Exposure Scale (ATES)

Public Communication Model (v.1- 04)

Description	Class	Terrain Criteria
Simple	1	Exposure to low angle or primarily forested terrain. Some forest openings may involve the runout zones of infrequent avalanches. Many options to reduce or eliminate exposure. No glacier travel.
Challenging	2	Exposure to well defined avalanche paths, starting zones or terrain traps; options exist to reduce or eliminate exposure with careful route finding.

		Glacier travel is straightforward but crevasse hazards may exist.
Complex	3	Exposure to multiple overlapping avalanche paths or large expanses of steep, open terrain; multiple avalanche starting zones and terrain traps below; minimal options to reduce exposure. Complicated glacier travel with extensive crevasse bands or icefalls.

Avalanche Risk

The most desirable slope angle from a skier's perspective (~ 30-40°) is also the highest probability range for avalanches. Skiers should be proficient in terrain assessment, snow pack analysis and stability assessment, avalanche risk assessment, route selection and planning, and efficient track setting in a wide variety of terrain. The primary strategy should be avalanche avoidance. Should the party nevertheless be caught in an avalanche, all members should be skilled at self-rescue, which is the group's only realistic hope for live recovery.

Leaders and participants should display good judgement and teamwork. If the avalanche risk is too great for the planned activity, do not hesitate to go to Plan B or Plan C. The mountain will be there another day. Remember - *There are old skiers and bold skiers but no old, bold skiers.*

Avalanche Safety Equipment

All trip members must be equipped and skilled in using modern avalanche rescue gear (beacon, probe and shovel) on trips involving travel in avalanche terrain. This will be verified by the Trip Leader. Avalanche beacons should be of a modern design. Three-or-four antenna digital beacons are preferred; two antenna digital beacons are acceptable. Old analog or single antenna digital beacons are inadvisable, except for experts i.e. professional rescuers.

Avalanche Skills Training (AST)

The recommended level of Avalanche Skills Training (AST) for both Trip Leaders and trip participants on ACC Ottawa alpine backcountry ski trips is defined by ATES terrain rating and can be found later in this [document](#).

Avalanche Self Rescue

It is essential that ALL members of the party are skilled at self-rescue and have a common understanding of the process to be followed in the event of an avalanche, such as the [self-rescue protocol](#) issued by the Canadian Avalanche Centre. Trip members should be encouraged to print a copy of the protocol, laminate it and carry it with them at all times while skiing. Pre-printed copies of the card are available on most AST courses and at some ski shops. The level of self-rescue proficiency required is high, such that all members of the party follow the process quickly, automatically and function well as a team. Time is of the essence for live recovery.

Electronic Interference with Avalanche Beacons

Like the rest of the planet, skiers seem to be carrying more and more electronic gizmos into the backcountry without regard to the potential interference with their life-saving avalanche beacon, whether in transmit or receive mode. Recent studies have shown that any electronic device within 50 cm of the beacon could compromise the search function. This includes cell phones, handheld radios, chest-mounted video cameras, any device with an active wireless or Bluetooth controller, iPods, heated gloves, heart rate monitors and magnets or metallic objects on the front of jackets. Trip Leaders should discuss this subject with trip participants prior to the trip, including ways to minimize electronic interference. It is best to keep all electronic devices except avalanche beacons turned off while in avalanche terrain. During an active search, use of emergency communication devices (satphone, VHF radio, SPOT beacon, PLB, etc) should be restricted to short-lasting emergency calls or messages at a minimum distance of 25 m from the closest searching rescuer. Avalanche beacons should be worn close to the body securely under a jacket, such that they cannot be wrenched away during the turbulent motion of an avalanche. It is inadvisable to wear ear buds and listen to music in avalanche terrain whether on the uptrack or while skiing, as it is essential that skiers have all of their senses tuned to the environment.

Daily Avalanche Risk Assessment

Having researched the terrain, route, recent trip reports, weather reports, [public avalanche bulletins](#) and other information sources, the trip should begin with a good sense of snowpack conditions and the general avalanche risk for the tour area. In some cases, the group will continue to have access to outside communications for external sources of professional avalanche-related reports and forecasts, as some huts now have low speed satellite internet connections. More often than not, however, self-guided groups will be on their own for on-going weather forecasting and avalanche risk assessment upon departing the trailhead.

It is advisable to follow a methodical avalanche risk assessment process during the tour. Involving all or at least the most experienced participants achieves two goals: (1) getting many eyeballs and brains on the task and (2) getting buy-in from the entire group regarding the conclusions drawn and the ski touring plans and safety measures derived from the process. This can be achieved by collecting weather, snowpack and terrain information throughout the day and holding avalanche risk assessment meetings each morning and evening. See the attached "[Daily Avalanche Risk Assessment Worksheet](#)". Download the form [here](#).

Avalanche Safety Drills

Comprehensive avalanche self-rescue practice is advisable before a multiday trip. This should review avalanche rescue protocols; beacon search, probing and shoveling technique; and finish with a multi-burial rescue scenario involving all trip members. The group should demonstrate a high level of self-rescue proficiency and team work before entering avalanche terrain.

A gear check will be performed each day before starting to ski:

- 1) The leader (or a designate) will perform a receive beacon check on each member of the group. One member of the group will then perform the same for the leader.
- 2) The leader (or a designate) will check that all participants have their skins. Do not accept a verbal confirmation; insist on visually sighting each participant's skins. Getting to the bottom of a run to learn someone has left their skins in the hut can lead to an epic.

Tree Wells

A tree well/snow immersion suffocation accident can happen when a skier or snowboarder falls – usually headfirst – into a tree well or deep loose snow and becomes immobilized and trapped under the snow and suffocates. In an inverted position, they can become trapped under the snow and be unable to release their bindings. Without immediate help from their partner, they may suffocate. Prevention is the key. When tree skiing, it is a good idea to caution the group about tree wells, to pair skiers of similar ability and have pairs leap frog downhill whilst keeping in voice and visual contact.

Glacier Travel

When travelling on glaciers, team members should be equipped and trained for crevasse rescue. A number of questions need to be considered. How good is the visibility? How well do you know the terrain and could it be conducive to crevasse? How deep is the snowpack? If there is any uncertainty to any of these questions, a rope should be used to travel safely.

Releasable Bindings

Risk of serious trauma and deep burial in an avalanche increases dramatically if skis or snowboards remain attached. Whereas most AT bindings are releasable, only a few Telemark or snowboard bindings are releasable. Freeride AT skiers with high DIN binding settings are also at risk. When applicable, the Trip Leader should ensure participants consider the risks of proceeding with non-releasable bindings. And, of course, hand straps should never be used on ski poles in the backcountry – many experienced skiers permanently remove ski pole straps.

Emergencies and Self-Reliance

These trips are characterized by carrying a day pack, short winter daylight hours, cold temperatures, potentially severe alpine weather, variable and possibly difficult snow

conditions, high altitude gain/loss per day and rough backcountry terrain remote from quick outside assistance. Consequently, both leader and participants should be fit, self-reliant and able to deal with the worst case medical emergency - an unscheduled bivouac taking care of an accident victim. This does not mean enough gear to go winter camping i.e. go lightweight but have the essentials to survive an unplanned night on the mountain (not necessarily in comfort).

Communications

Some form of external emergency communications is highly advisable. With few exceptions, cell phones do not work in the alpine backcountry. The Trip Leader should consider alternatives such as a Sat Phone, VHF transceiver, SPOT message device or PLB. Each has pros and cons. FRS/GMRS radios can be useful for short range (~2-3 km) intra-team communications.

Participant Screening

Careful participant screening is essential for safety. Do not ski tour with anyone you don't know personally without researching their training, experience, skill level, equipment and fitness.

Group Size

A group size in the range 4-8 is probably best for a single leader. Less than four may be problematic in avalanche terrain, as there is a risk of the entire group being caught in an avalanche event. A group of more than about eight can become unwieldy due to the need to space out for avalanche safety and may be best handled as two parties with separate leaders.

Winter Backcountry Travel with Custodial Groups

Parks Canada has stringent rules regarding winter backcountry travel with "[custodial groups](#)" in national parks. Also see ACC National policy on participation of [minors](#) in club events.

First Aid Qualification

Either the Trip Leader or an Assistant Trip Leader should be "[AWFA-qualified](#)". It would be prudent to ensure that some trip participants are also AWFA-qualified.

Guidelines for Alpine Backcountry Ski Trip Leaders

- 1) prepare for an alpine backcountry ski trip:
 - a) after in-depth research, select an area, terrain and potential routes; this should include a Plan A (good conditions) and Plans B or C (poor conditions)

- b) monitor weather reports, avalanche bulletins, snowpack profiles and trip reports from the targeted area, starting well in advance of the trip and maintaining awareness up to the departure date
 - c) estimate trip travel times, considering the short winter daylight hours, group size and experience level, terrain, snow conditions, distance, elevation gain/loss, etc.
 - d) consider whether the planned terrain is suitable for both ski and snowboard touring; if so, decide how to manage the somewhat incompatible modes of travel
 - e) prepare and publish a trip notice in conjunction with the Mountaineering Coordinator, clearly defining the level of trip difficulty, group size limit and participant fitness, skill, experience and equipment requirements
 - f) carefully screen trip participants, offering constructive suggestions for alternatives to those who do not possess the necessary fitness, skill, experience or equipment
 - g) advise participants on gear, clothing and supplies appropriate for the trip:
 - i) a modern avalanche beacon, probe and shovel are mandatory for each participant for any trip involving or potentially involving travel in avalanche terrain
 - ii) skins should be in good condition, (notably the glue and attachment hardware)
 - iii) participants should carry replacement parts and tools unique to their binding system
 - iv) a headlamp, layered clothing and a personal micro-first aid kit
 - v) ensure adequate water and high energy food and snacks for the trail
 - h) consider appropriate group safety gear: snowpack analysis and recording kit, combination snow/wood saw, group first aid kit, tarp, insulated pad, small pot, small stove, fire starting kit, spare batteries, spare pole basket, spare sun glasses, micro repair kit (wire, tape, cord, electrical ties, pliers, knife, multi-bit screwdriver)
 - i) consider organizing pre-trip avalanche safety training
 - j) advise participants regarding pre-trip training and acclimatization
 - k) organize trip logistics such as transportation, hut bookings, meals, etc. as appropriate
 - l) research emergency contacts for the area, mid-trip bailout routes, communication options and conceptualize how an accident would be handled
 - m) ensure all participants read and sign the trip waiver prior to the trip; pass the signed waiver to the Mountaineering Coordinator at the earliest opportunity
- 2) essential knowledge and skills related to travel in avalanche terrain
- a) [avalanche skills training](#) requirements by ATES terrain rating
 - i) Trip Leader:
 - (1) Non-avalanche terrain: AST1
 - (2) Simple terrain: AST 2 recommended; AST 1 minimum
 - (3) Challenging terrain: AST 2
 - (4) Complex terrain: AST 2
 - ii) Participants:

- (1) Non-avalanche terrain: no firm requirement but basic avalanche safety awareness is recommended (e.g. ~2 hours of classroom instruction)
 - (2) Simple terrain : AST 1 recommended; otherwise one day of private avalanche safety training prior to the trip
 - (3) Challenging terrain: at least one with AST 2; remainder AST 2 recommended, AST 1 minimum
 - (4) Complex terrain: at least 50% of participants with AST 2, remainder AST 1
- b) proficient in terrain assessment, snow pack analysis and stability assessment, avalanche risk assessment, route selection and planning
 - c) safe and efficient track setting in a wide variety of terrain
 - d) highly skilled in leading avalanche self-rescue
- 3) other core knowledge and skills:
- a) skilled backcountry navigator with map and compass in all types of weather and terrain, including whiteout conditions above treeline; skilled in GPS navigation
 - b) bushcraft skills: improvise an emergency shelter both above and below treeline, light a fire under adverse conditions
 - c) knowledgeable about clothing layering options for efficient backcountry travel
 - d) minimizing sun exposure
 - e) preventing, recognizing and treating hypothermia
 - f) monitoring and interpreting alpine weather signs
 - g) mountaineering route finding skills
 - h) recognizing and dealing with alpine backcountry hazards: changing weather, widely variable snow conditions, avalanche risk, equipment failure, tree skiing, tree wells, creeks, terrain traps, steep ascents and descents
 - i) glacier travel skills, including crevasse rescue (if applicable to the trip)
 - j) resourceful in making field repairs to equipment with minimal tools and supplies
 - k) level-headed, calm and resourceful in an emergency
- 4) supervise trip safety:
- a) delegate tasks to assistant trip leaders and engage other experienced participants
 - b) double-check items of participant gear and supplies considered critical to the trip, to include avalanche safety gear and group safety gear
 - c) if applicable, ask participants to check the DIN release settings on rental bindings as the rental agency may have reset them to the lowest setting by default
 - d) brief participants on trip-specific safety hazards and safety procedures, with particular emphasis on avalanche safety
 - e) set a turnaround time
 - f) the default option for glacier skiing is to rope up; unroped glacier skiing requires benign glacier conditions, good visibility, good judgment and experience

- g) when tree skiing, caution skiers about the tree well hazard, have them buddy up, stay in voice contact and leap frog down slope to a pre-defined regrouping point
- h) maintain situational awareness with respect to terrain, snow conditions, weather, location, speed of travel, time of day, participant energy level and frame of mind, etc. and be ready to change plans, if appropriate
- i) good judgment to make tough, perhaps unpopular, safety-related decisions
- j) understand the club Emergency Response Protocol and take charge in an emergency

Useful References

1. [Avalanche Terrain Exposure Scale \(ATES\) Technical Model](#)
2. [Companion Rescue Card \(Canadian Avalanche Centre\)](#)
3. [Daily Avalanche Risk Assessment Worksheet](#)
4. [Tree Wells and Snow Immersion Suffocation Accident Hazard](#)
5. [Avalanche Terrain Ratings in National Parks](#)
6. [Avalanche Terrain Maps in National Parks](#)
7. [ACMG Mountain Condition Reports \(MCRs\)](#)
8. [Canadian Avalanche Centre \(CAC\) Avalanche Bulletins](#)
9. "Backcountry Avalanche Awareness", Bruce Jamieson, 8th Ed., Canadian Avalanche Assoc.
10. "Technical Handbook for Professional Mountain Guides", Association of Canadian Mountain Guides (ACMG) and American Mountain Guides Association (AMGA), 1999.