

## Introduction to Snow-camping (*happily!*)

*Objectives: to pass on basic knowledge of camping comfortably on snow and related snowcraft*

Snow camping allows you to travel further out into our high country under its winter snow cover and live right in the heart of our snow country for days at a time. There is little to compare to waking up on-snow with no-one other than those in your group, to our beautiful alpine landscape and its snow gums glistening.



Snow-camping trips mean you must be fully self-sufficient; requiring you to be properly prepared.

Despite the low temperatures and snow cover, living on-snow is not as cold as you might imagine.

It is *very snuggly* being cocooned in your warm sleeping bag whilst it snows or blows outside.



Waking up to a brilliant white snowscape next morning makes you want to be the first to put some new ski tracks in while it's still fresh.



## Broadly, what do you need to have with you?

- a strong, three or four-season tent with waterproof floor & vestibules to protect its entrances
- a sheet of 6x1200x2000mm foam (eg Artilon - Clark Rubber) as waterproof, insulating tent-carpet
- a sleeping mat for extra comfort and extra insulation from the snow, inflatable or otherwise
- a sleeping bag with a comfort rating (for your gender) for 5-10 degrees below 0degC
- Snow shovel for digging boot wells, kitchen areas and building snow walls
- Waterproof overmitts for handling snow blocks without drenching your gloves. You can also use XXL rubber dish washing gloves to go over the top of your existing gloves to keep them dry when snow playing or digging snow caves
- A waterproof, windproof jacket and overpants; a breathable fabric is far more comfortable
- Warmth layer of thermals or light fleece, beanie, several set of gloves and socks. Mittens are warmer than gloves.
- Eye protection – sunglasses at minimum; goggles for when it's snowing or sleeting in your face
- Sun protection – brimmed hat, sunblock, light bandana/neck gaiter/buff to protect your neck
- One or more 50x50cm 10mm foam sit-mats and, optionally, a longer 10mm mat for cooking
- A large, heavy-duty *garbag* to protect your pack when left out of the tent
- Personal first aid kit and normal toiletries; UV protecting lip balm
- Toileting gear – toilet paper (best as sheets stored in a *ziplock* bag) and a snow shovel
- Water bottles and water bladders to collect and hold water in camp; purifier optional
- Head-torch (*indispensable when camping, especially in short winter days*) **and** spare batteries.  
*NOTE: Lithium batteries are more expensive but are recommended as they don't lose their charge in the cold*
- Gas, shellite or Metho stove; sufficient fuel for the duration in a safe container marked **Fuel**
- All your normal cooking and eating utensils – forgetting billy-grips is very inconvenient!
- Food for breakfasts, lunches, nibbles when out & about, easy cooking sachet-style dinners
- Map, whistle, compass, camera, GPS optional

## What makes a tent snow-capable?

- Waterproof over-boots are handy about camp on the snow without getting it into your boots
- Only a strongly framed and streamlined tent can easily withstand the high wind pressure and/or the accumulated snow load from a blizzard. A tent's ability to withstand a snow load is mainly dependent upon the number of pole-crosses, as each crossing point braces the tent frame more thoroughly than several separate hoops.



- If it is snowing (and if you are awake), regularly give the tent frame a sharp shake from the inside to dislodge the accumulating snow to limit the build-up of the snow load on the tent frame and outer skin.
- It is much more useful if its outer skin, floor and seams are properly waterproofed, its zips working along the entire length of the zip and its skin sufficiently strong to keep driving rain, snow and sleet out. Tents with in-built pole sleeves or velcro loops to locate its poles help to minimise any distortion of the tent resulting from accumulated weight of snow.
- It also needs good flow-through ventilation, in the form of sealable flaps or zips that are sheltered, so your moisture-laden breath gets removed by an adequate rate of air change-over. If not, you may experience your very own rainstorm inside the tent, whenever the wind shakes the tent.
- Having a 2.5-3 person tent between two really helps living comfortably together on snow.

## Selecting your campsite

- Forget about campsites with good views; instead look for shelter from the prevailing weather direction. Ideally, you should camp on a fairly flat area below or at the tree line, away from the exposure of the ridge top, on the downwind side of a ridge where the wind passes overhead rather than straight through your campsite (and you).



Tent pitched on a levelled bench, with a band of snowgums behind as windbreak on the prevailing weather side, a distant view from the front door, which is oriented for full morning sun.

Could be worse!

- It helps to *place your tent where it will get direct sun early in the morning* and get the morning sun straight in the tent door. At least, it *feels warmer!* So site your tent clear of trees to the East to North-East and you will get a warmer breakfast spot, sooner next day.
- *Don't camp directly under snow gums* if they have a snow load already on them or it is likely to snow overnight. They can be weighed down by a lot of snow and shed it all in one big dump, swamping your tent with you in it and can bend or break your tent poles.
- First of all, create a firm, smooth base for your tent to avoid the discomfort of lumps in your back when trying to get to sleep. The tent site should also be relatively level, so you do not slide downhill across the tent floor on your sleeping mat, ending up against the tent wall or your tent partner.
- To do this, take a few minutes to stamp down your tent site (while still on skis) to make it firm and then use your ski's inner edges as a blade to scrape it smooth. While it is fresh, snow is soft and malleable, but if compressed and left for a few hours, it will set relatively hard, so *shape your tent site while the snow is still fresh and unfrozen.*

## Setting up your tent

- In addition to siting your tent in a sheltered spot, you can help the tent cope better (and you sleep better if the tent is not continually flapping) if you:



- Orient its entrance away from the prevailing weather,
- Build a snow wall on the windward side/s of the tent to deflect the wind from hitting it as hard, and
- Tie it down securely with guy ropes anchored to trees or skis or snow anchors (better still, attach loops of light shock cord to the tent guying points to absorb the gusts).

- If you are camping above a long slope be careful when you assemble tent poles prior to erecting your tent. Once assembled, tent poles can slide away downhill without warning and be very hard to find. Similarly, in very soft snow they can sink into the snow and be lost.



- Ordinary short and thin tent pegs don't work very well in the snow.
- If you're a regular snow camper, the long (250-300mm) curved aluminium snow pegs (shown to the right), which freeze in place overnight, are light and strong.

The flat-sided plastic garden edging pegs (about 250mm long) (shown on left) also work very well and cost far less.

- Alternatively, using snowgum stakes are perfectly good alternative pegs.
- Burying lengths of dead Snowgum or your skis into a trench makes a longitudinal snow anchor that is very difficult to dislodge, due to their larger surface area pulling against the snow.
- If using a longitudinal snow-anchor, remember to loop your guy ropes around the snow anchor at the right spacing for your tent's guying points or peg loops before burying it, though.



- Whatever pegging method you use, before inserting the peg, stamp the snow down until it is compressed to be a firm anchoring patch. Once the peg or snow anchor is in place, shovel or kick extra snow on top of it and then stamp on it to compress it into ice, and then leave it to freeze solid.



- Once the tent is up and solid, it makes sense to dig a 30cm deep and 50cm wide boot well in the vestibule/s of your tent.
- This makes it much more comfortable to sit in the vestibule for putting boots on/off, and to sit comfortably upright in the vestibule during wet/snowy/windy weather.

- It also gives you a sheltered place to light and use a stove for cooking with proper ventilation of fumes.
- There is much less danger of the tent catching fire by cooking with the tent door open and the stove being recessed 300mm or so below snow level in the boot well; well away from the tent fabric in case of stove or re-fueling flare-ups.



### Storage matters



- Having a large heavy-duty *Garbag* to store your empty, otherwise wet or snow-encrusted, pack outside the tent provides a lot more living space in the tent. Seal it with drawstrings and secure where it cannot blow or slide away. Storing your pack in the boot well of your tent's vestibule is another option, but you must move it in order to leave.

- Other things that you don't want taking up space inside the inner tent, such as boots, pots, stoves, and fuel, can be stored in the tent's vestibule overnight on sit mats or folded garbags on either side of your boot well, as shown in the photo.
- Don't leave things outside the tent uncovered overnight or they may be lost under any snow that falls while you're sleeping. Stand your skis, poles, ice axes & snow shovels upright.



## Snow Wall construction

- Snow-walls are used to protect your tent from being buffeted by high winds – build walls to whatever height is necessary to deflect the wind from your tent, its opening and kitchen area.



- To build the snow-wall, cut oblong blocks (300-350mm long x 200-250mm wide x 200-300mm deep) of firm snow in a series of rows away from the tent using a snow shovel or snow saw. Carry each block to the wall in its upright position, balanced on the blade of the snow shovel from which it can be set in place.



- Start the wall by establishing the first course of quite substantial blocks as the foundation layer.
- For each subsequent layer of the wall, position each block firmly into position across the join of the blocks below – placing it down forcibly helps to fuse the block to the blocks supporting it.
- Then secure the block in place by packing loose snow into the spaces between, both beside and underneath the blocks; compress it into the gaps to act as icy mortar and strengthen its structure.

- It helps to keep your gloves dry (and therefore your fingers warm) by using waterproof gloves – the rubberised woven ones shown are best. Normal waterproof over-mitts are fine too. You can use XXL rubber dish washing gloves to go over the top of your existing gloves to keep them dry when snow playing or digging snow caves

## Water supply

- Access to liquid water will always be an important consideration, so don't waste it. Count on wanting at least two litres per meal per person, plus some extra to top up with overnight to ward off dehydration; try to have 4 litres or so at the tent ready for breakfast.
- If camped near a hut with a tank, be very wary of its water quality. It will generally be better to camp within reach of a creek with running water, taking your water from as far up its watershed as practicable. Keep your toileting areas well clear of the watercourse supply zone.
- If in any doubt of the water quality, use a water purifier or water purification tablets if you have taken them with you or boil the water vigorously for some minutes before use.



- To collect water from a creek, follow larger gullies down until you find a flow you can scoop water from.
  - Be careful when accessing snow-covered streams, as overhanging snow on its banks or snow-bridges can easily collapse, dumping you into near-freezing water.
  - When completely snow-covered, probe down to the stream with a ski or pole, then supporting yourself from the side, enlarge the opening by hand or snow shovel until it is large enough to scoop water from; create a snow platform from which to reach it.
  - Using a big mug to progressively fill water bottles or water bladders works pretty well. A mug with a hand grip helps keep your fingers out of the cold water while dipping.
  - Taking your foam sit-mat along gives you something dry to kneel on while you reach down from above, if you've had to dig down to running water.
- Try and avoid wasting fuel by unnecessarily melting snow into water on a camp stove. If you must do so, the melting process is far more effective if you start it with some liquid water in the bottom of the pot. Only feed extra (nice clean) snow into the pot once the snow already added has melted fully into water and has been allowed time to heat up a bit. Putting straight snow into a very hot pot actually burns the snow and leaves a strong taste! It is also very fuel inefficient.
  - A litre of snow packed into a billy should yield about a cup of water, so it will take a while to melt a useful amount. If not done sparingly, melting snow can run you short of fuel later on in the trip.
  - Keep your source of fresh snow for melting clear of contaminants while camping, for example, by taking it from an opening burrowed into a nearby snow bank.

## Living comfortably on snow

- Insulating yourselves from the snow surface by using a sheet of “tent carpet” across the inner floor of your tent is the best investment in comfortable on-snow living that I know. It makes living in your tent on-snow much, much nicer (drier/warmer/softer).

Sheets of around 1200 x 2000mm of 6mm closed-cell foam - cut to fit the floor of your tent, or kept slightly oversize so the sheet turns up the tent wall to follow the tub floors of modern tents, are suitable. The best 6mm closed-cell foam we've found to use as tent carpet is ARTILON, available from Clark Rubber, cut from a 2m roll.

- Don't forget sun protection for eyes and skin!
  - wear your sunnies consistently, even on relatively overcast days, as lack of eye shielding over half a day can result in snow-blindness, which REALLY spoils your day.....and night – as you spend that night lying there trying not to move your eyeballs because it feels as if someone has rubbed a handful of wet sand into your eyes. Not fun! Same as welding flash!
  - keep your skin covered by clothing and protected by sunblock as sunburnt head, neck, lips and nose, shoulders, arms, back of legs and knees can seriously take the enjoyment out of a ski trip for a day or two.
- Having some hand-warmers tucked away for when your hands or toes need some help coming back to life can prove very useful post snow-wall building or whenever you are really COLD.
- When snow-camping, the normal rule that “one person moves at a time in the tent” applies even moreso than usual. Don't get in each other's way. Use extra consideration by telling your tent partner what you plan to do so they can stay still or move a bit if necessary.
- Keep your personal gear organised at the ends of the tent and in its pockets. Keep wet things separate, in a garbag and/or out in the vestibule.
- Don't allow snow into the inner tent on your boots or outer clothing layers when you enter. If it does, then gather it up early with a foam washcloth or a paper towel and toss it out. Be careful not to spill liquid water in the inner tent as it can travel into your clothes and sleeping gear FAST.
- Foldable paper towels are very good for wiping up most of the things that flow or get stuck to things. I take a small stack on my trips. Once used they are very compact and go straight in your rubbish bag. One or more small microfibre towels, which can be dried and re-used, are also good to have on hand.

## Cooking

- Build yourself a comfortable cooking area or snow kitchen by digging trench about 40cm wide and 30cm deep. Then you can sit on your foam mats on one side of it and use the other side of the trench as your food preparation, cooking and eating surface.



- Place your stove on a firm insulating layer so it doesn't sink as the heat melts the snow below it.
- If it's windy while you're trying to cook, shield yourselves and your stove from the wind with snow wall barriers upwind of it.
  - and consider using a purpose-built folding wind shield of aluminium segments or foil around your stove.

- Don't forget your billy-grippers! Very hard to do much safely when handling hot billies without them.

Similarly, it is ***much more difficult*** to cook as night descends without a head-torch. *Make sure you take it!*

- It's best to clean up after each meal so that the food residue doesn't freeze into place overnight, making it much more difficult to clean and get your morning cuppa happening.
- Old, grainy snow makes a great pot scrubber. A cut-down piece of scourer/foam is also fine.
- Hygiene in your food preparation is important so that you do not become sick. Washing hands regularly and using alcohol-based hand-cleaners regularly all make sense.
- Take some robust plastic bags to be your rubbish bags – so you put non-organic waste straight into it, compressing it progressively and then pack it out when you leave.



## Food options

- Organise your food in tent pairs; decide what to bring as shared meals – eg, share dinners only, but bring the breakfast, lunch and nibbly foods that you prefer individually or buy and share them all.
- Start your day with slow-release but high-energy density foods – things like porridge or mueslis with fruit and honey, made creamy with full-cream milk powder work for me.
- Having eaten well the night before and slept properly makes most difference.
- Keep in mind that you have a perfectly good fridge just outside your tent; store only those perishables that are not destroyed by freezing out there; keep fruit or leafy vegetables inside.



## Staying snugly overnight

- Tenting with someone else helps - as two bodies warm a tent better than one does.
- A good dinner is essential of course. *No food : no fuel in your system : no warmth.*
- Use a 4-season sleeping bag with around 700gms of good high-loft down for snow-camping.
- Snug-up the sleeping bag hood around your head straight away. Wearing a beanie or balaclava to bed is one of the best ways to keep warm. Keep your head warm and your feet will be warm too.
- Using a good liner inside your bag can boost the retention of your heat next to your body. On especially cold nights, wearing an extra loose fitting warm layer to bed can retain more heat too.
- Warm up the bag when you get in. Pull your head inside the bag and breathe down into it for the first few minutes; all that lovely warm breath will get the bag warmed up fast.
- Filling an aluminium water bottle with recently boiled water, sealing it securely and wrapping it in a suitably thick sock or other cover makes an effective hot water bottle to warm your feet & core quickly.

## Toileting

- If you are near a pit or composting toilets, be sure to use it.
- The usual rule of burying everything under soil gets difficult in the snowfields. Some books emphasise the need to dig a hole 150 mm deep in the soil without admitting this is impossible when there may be one or more metres of snow on the ground.
- Bury your toilet wastes well down into the snow using your trusty snow shovel, but remember that the snow will melt in the spring. Use the same hole over successive days to minimise spread. Locate your toilet area well away from watercourses and amongst trees for privacy and so the mess will disappear into the scrub when the snow melts. Try to minimise the amount of toilet paper used and left behind. Using compressed snow as a “snow bidet” is simultaneously cleansing and bracing! - leaving markedly less toilet paper.
- Another method for managing faecal waste whilst camping/travelling on-snow backcountry is to collect it and remove it when you leave by carrying and using a poo tube.
- A poo tube is a sturdy plastic tube with a screw-on lid; you can use PVC pipe, empty Gatorade tub, or 1L Nalgene jar used to securely contain faecal waste collected on the trip in plastic bags.
- Toilet wastes are “placed” into plastic shopping bags (that don’t have holes in them). Use the shopping bag handles to position the bag correctly when toileting, and once you’re finished place the used toilet paper into the bag, squeeze out as much air as possible, and tie the bag. Some silica crystals or kitty litter inside the bag will minimise leaks and smells. Then double-bag it and place both bags into the poo tube and seal it tightly. Dispose of the accumulated faecal matter into a toilet and the shopping bags into the garbage once out of the bush.
- A far more environmental method is to poo onto a piece of baking paper. After the job roll up the your deposit like a cigar and pop it into the poo tube. The whole thing can go straight into the next composting toilet you come across. No plastic involved!

## Hygiene in camp.....

- Be conscious and cautious of the water quality available to you. Boil to sterilise or purify using tablets or purifying pumps in any qualms.
- Regularly use of alcohol gels before cooking and after toileting.
- Use Tampons or sanitary pads as necessary; bag soiled products to take home for disposal.
- A good guide to dealing with menstrual matters whether on snow or other camping trips is

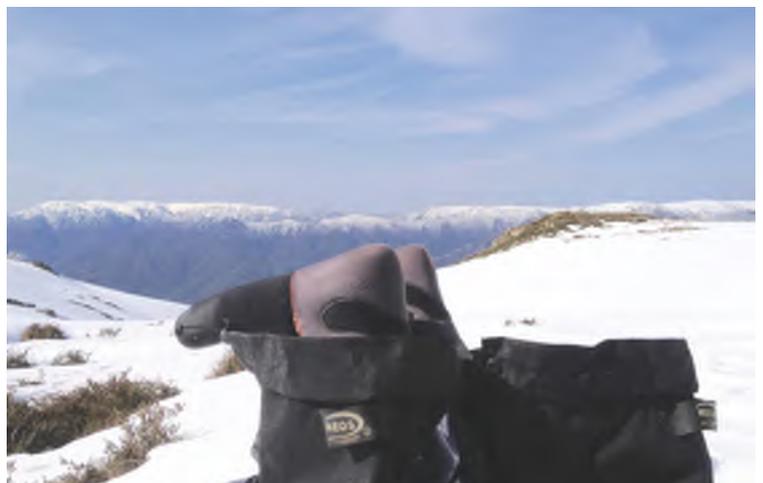
### [How to Manage Your Period Camping](#)

- Wet wipes are good for any extra freshening required; similarly bag soiled wipes to take out, double-bagged for security in a freezer bag, Ziploc bag or similarly robust wrapping.
- Minimise rubbing your eyes or mouth with your fingers to limit any transfer of infection.

## Clothing and Equipment tips



- On sunny days, remember to put damp clothing, boot liners and your sleeping bag out to air and dry them off fully.



- Arrange your pack contents to cluster soft, non-fragile things in one area so you can sit on it during breaks in travel. Carrying one or more sit-mats of around 400 x 350mm or larger of 10mm closed cell foam, are extremely useful too. Cut sit-mat sheets from a larger 10mm mat.
- Keeping warm is something you can largely work out for yourself. *Layering is the key to comfort in the snow.* According to conditions, wear a base layer of thermals; add a mid-layer of fleece for extra heat retention when it's really cold; and wear a breathable shell layer for water and wind-proofing as necessary.
- ***Take off a layer or open it up*** when you are exercising to prevent overheating, and ***open it up or put an warm layer back on*** when you stop to limit heat loss, so prevent becoming cold.
- In addition to normal hiking and ski gear, carry thermal underwear and a warm hat. Always have a few layers of clothes that you can easily adjust. *A down or thick fleece jacket, fleece leggings and down/fleece tent slippers/booties make living on-snow much more comfortable.*
- Gloves easily get wet pitching a tent in the snow or in the course of the day, so it is only sensible to carry a spare pair or two. Carrying waterproof over-mitts to wear over your warm layer gloves is sensible for when building snow-walls or when wet snow or rain is falling.
- Batteries often seize up in low temperatures, so if your torch or camera isn't behaving, take out the batteries and put them somewhere warm on your body for at least five minutes. Equipment that previously showed no sign of life should be restored to robust good health... until the batteries cool down again. *Take spares along to compensate for the shorter lifespan.*

Overnight, it's a good idea to place battery-powered devices in the foot of your sleeping bag. *Lithium batteries* last far longer under cold conditions and are worth the extra cost for things that matter such as GPS devices, Emergency beacons and head torches that you rely on.

- Gas stoves with less than 30% propane in their fuel canisters sometimes suffer from the cold too, the solution is to put the gas cylinder in your sleeping bag or outer warmth layer for 15 minutes. Choose gas cylinders that have a 70/30 butane/propane fuel mix, which shouldn't present any problems for cooking in slightly sub zero temperatures.
- Liquid fuel stoves are better for snow camping at high altitudes and very cold environments.
- When feasible, use your stove in a kitchen area away from your tent. If weather conditions cause you to use the stove within the shelter of the tent vestibule, it is better to light it outside then bring it into the vestibule only once the flame is stable and leave the vestibule door as far open for ventilation that prevailing weather conditions allow. Never use a stove inside the inner tent as its materials are highly flammable and you cannot get it outside as quickly! Using stoves in a sealed tent risks carbon monoxide poisoning from which people have died.

## Things can go wrong.....

### **Risk Management plan for snow activities**

It makes sense to review the Risk management plan in relation to your trip and to modify or add to it in order that it be comprehensive and up-to-date. [A draft Risk Management Plan is available on the Resources page of the State Ski Touring team website.](#)

### **Mobile communications**

It makes sense to take your mobile phones for communication if necessary – even if turned off until you need to use it. Have your Leaders mobile numbers in your phone in case its needed.

### **Know who to call**

Carry a list of your Group's key contacts and the contact numbers and email addresses – Group Leader, other leaders, parent list; local ski rescue.

### **Personal Information sheets**

Personal information sheets must be completed and brought along to snow-based activities or details entered into Caremonkey with a printed summary provided to your leaders in advance of the trip.

### **Emergency beacons, sled, snowshoes and snow shovels**

The Ski-touring team has for loan:

- a SPOT Beacon available for loan to groups wishing to have EPIRB backup on multi-day snow trips. Available for the price of the AAA replacement batteries.
- A snow-going Pulk sled and towing harness
- Seven pairs of snow shoes
- Three snow-shovels

Simply send an email request to the team to arrange to access these resources.

