

AMC Boston Chapter Mountaineering Committee

Ice Climbing Program

Winter 2007



Schedule

Course weekends

January 20 & 21

Friday Arrive, rent/acquire gear, get settled, prepare packs
Socialize at Harvard cabin

Saturday 7:00 am breakfast at Glen Junction Restaurant
Car pool to Frankenstein Cliffs

- Low angle French Technique
- Placement of ice screws
- High angle ice climbing on top rope

Dinner at the Harvard Cabin

Sunday 7:00 am breakfast at Glen Junction Restaurant
Car pool to Willey's Slide

- Low angle French Technique
- Self arrest
- Ice and alpine belays
- Multi-pitch climb at Willey's slide.

February 3 & 4

Friday Arrive, rent/acquire gear, get settled, prepare packs
Socialize at Harvard cabin

Saturday 7:00 am breakfast at Glen Junction Restaurant
Open climbing with the instructors of the AMC ice climbing program
Dinner at the Harvard Cabin

Sunday 7:00 am breakfast at Glen Junction Restaurant
Open climbing with the instructors of the AMC ice climbing program
Mandatory check-in required – you must show up

Other important dates

Harvard Cabin open weekends later this year:

Feb 24-25 Remember to call the cabin leader to reserve a space.
March 3-4

IME Mt. Washington Valley Ice Festival

Feb 8-11 Info at http://ime-usa.com/ice_festival/



Lodging

Harvard Low Cabin

If you haven't visited the "the Cabin" before, then there are a few simple rules that we ask you to observe. Life at the cabin is a true testament to communal living so we ask you to be considerate of others. The cabin boasts a large living area, kitchen, stove and refrigerator, one large sleeping loft, two gas heaters, electric lights, tent spaces on the front lawn, and an outhouse. We use the downstairs as a drying room.

We have limited sleeping space indoors and the spaces will be assigned prior to the first weekend. If you are inside you will need a three-season sleeping bag and a pad with you. Though the cabin is heated, it still can take a while on Friday nights to warm up. It's worth noting that if the power fails, as happens from time to time, we will have no heat. Please do not wear your boots upstairs. Hut shoes or slippers can be nice.

There is a large 'front lawn' for tents. You are welcome to bring your own if you wish. You will need at least a 0 degree bag and a pad or two.

Wherever you stay, it is nice to have a pad-side water bottle if you get thirsty at night so you don't have to get up and wake others. Earplugs can be a godsend. It's also a good idea to have a headlamp within reach.

The water at the cabin is safe to drink but has a strong sulfur smell. Some people bring bottled water. We are usually up by 6:00 or 6:30 and we go to the Glen Junction diner for breakfast in the morning at 7:00. Please tip your waiter well! Some people boil water for their water bottles at the cabin. Others get water at the Junction but it would not be o.k. if everyone did that.

Here are several important guidelines that we have developed over the years. Please respect them; in return we will all share a good experience:

- If you stay up to talk, remember that others will be trying to sleep so keep it quiet.
- No smoking of any kind permitted in the cabin.
- Please leave any electrical devices, radios, tape decks, hair dryers etc. at home.
- Please do NOT bring everything that you own into the cabin. And please do NOT bring your climbing equipment upstairs into the sleeping loft. The more you bring, the more you will lose, confuse, or forget.

On Sunday morning when you leave to go climbing, take all of your possessions with you as the cabin will be locked and not reopened.

Directions to the Harvard Cabin

The Harvard cabin is located on route 16 in Glen New Hampshire en route to Mt. Washington. The best route to get there is to go through North Conway, turn north staying on Rt. 16 at Glen (turn right at light), and continue on Rt. 16 for 6.1 miles. The cabin is on the right (while driving north) but it cannot be seen from the road. There is a cleared parking area on both sides of the road. Look for a path up the hill on the right side of the parking area. If you have driven as far as the Dana Place Inn, you have gone too far. Park off the road, **completely off of the blacktop surface**, or you will be towed in a snowstorm. Please think about carpooling.

Remember to bring a shovel in case of snow to dig yourself and others out. Jumper cables, lock deicer, and other auto reliability items can be helpful.

The White Trellis Motel

In the old days, we would squeeze everyone into the Harvard cabin. It was a great, grand, raucous time. We drank all night, and no one got a wink of sleep. These days, however, we can no longer sleep everyone in the cabin due to changes in fire code. Some of you will sleep *outside* of the cabin. Others will stay *in* the cabin. And some of you will enjoy the comfort of the White Trellis Motel.

This year, we are using the White Trellis Motel as supplemental housing since we can no longer cram everyone into the Harvard cabin. The motel is located about a half mile north of North Conway on Rt.16.

First Weekend Curriculum

Day One – Waterfall Ice: Basics of Climbing and Anchors

AMC Ice Climbing Program

Day 1 Skills Clinic, Lost in the Forest, Frankenstein Cliff

SPIKY

- *piolet canne*, etc
- *pied en carrard*, etc
- switchbacks
- ascending & descending

STEEP!

- stemming
- stance
- monkey hang



Texaco Amphitheater

OPPS!

- Climb with two tools, one tool, then no tools
- Practice balance and footwork

SCREWED

- placement
- removal
- v-threads

Huntington Ravine



1) Water Ice Techniques

- Reading the ice: Is it blue, yellow, white or brown? Thick or thin? Brittle, water-logged or plastic? Bomber or chandeliered? Learn to understand temperature's effect on the ice, dinner-plating, hydraulics, and aerated ice insecurity.
- Placing the axe: finding your spot (concave spots, above or below bulges, etc.); swing with the tricep and shoulder, flick with the wrist; using the leash to relax the hand; pick setting -- not too deep, not too shallow!; removal techniques (up and down, not side to side!).
- Footwork: front-pointing basics like keeping the heel down, distributing the weight, leaning out to go over bulges, rest positions, stemming to get past overhangs and chandeliers, and stepping into axe placements and other divots to save energy.
- Movement on ice: separate your tool placements; hang from straight arms; choking up on tools and mantling off their tops, flat stepping for rests and traction on top of bulges, other technique tips
- Drills: two tools, one tool, no tools; low angle; clearing a steep bulge; steep climbing; hooking for efficiency; leashed vs. leashless climbing.

2) Anchors: Ice Screw Placement and Removal, and Other Stuff

- a) Placing an ice screw: pick a spot between shoulders and waist; place in a dish or other thick solid ice, not on a bulge; clear bad and lumpy ice with pick or adze; start screw with one hand with twisting motions; place screw perpendicular to –15 degrees (downward), not angled upward; do not tie off bottomed-out screws if at all possible! (it causes the tube to bend and break) -
- use a shorter screw; discuss use of load limiters and multiple screws (or other anchors like pins) equalized in bad or shallow ice, mixed climbing, etc.
- b) Removing an ice screw: to stay clipped or to unclip the screw? -- probably the later; using the axe as a lever on stubborn placements; tap the screw on the hanger end to remove the ice core and rerack with other screws.
- c) Natural Pro: slinging ice shafts, trees, rock horns and old V-Threads all can be o.k. – but use caution!
- d) Other anchors: The evil of Snargs and other pound-ins (it's the threads that hold an ice screw in place! And they are tough to remove); Ice Hooks (useless for all but bodyweight unless used as a piton); Pitons, the ice climber's friend – pound till you hear the high ring; Bolts – wait for your first M5; Rock gear, often a small selection can be quick and handy in gullies with rock walls.
- e) What is a good ice belay? Two screws, separated by about two feet diagonally in bomber ice, or a rock belay, or a combo of these, equalized and maybe even tied off (for no extension).



Day Two – Alpine & Multipitch Techniques

- 1) Self-Belay
 - a) The first line of defense: driving the shaft into the snow while ascending, using both hands and one hand
- 2) Self-Arrest
 - a) Forward, with ax
 - b) Upside down, with ax
 - c) Both without ax (handed off while sliding)

Reminder: No crampons during this drill!
- 3) Uphill French Techniques:
 - a) Footwork: *marche* (straight), *canard* (duck or 45 degrees), *a plat* (or sideways to fall line), or front-point.
 - b) Ice Ax (*piolet*): *canne* (cane position holding the adze), *panne* (pick in, hand on top), *ramasse* (across the body, pick in), *ancre* (with pick driven in)
 - c) Common Combos: *troisieme*, or American-style (one flat, one front-point), *panne*/front-pointing (neve scrambling), rest positions
 - d) Two Cane positions: self-arrest (pick to back) vs. self-belay (pick to forward) and when to use each
- 4) Down-climb Techniques:
 - a) *Marche* & *cannard* with cane & anchor
 - b) *A plat* with *ramasse*
 - c) Reverse front-pointing
- 5) Belay and Roped Travel Techniques
 - a) Hip belay, seated and standing (remember to clip the rope through 'biner on harness!), and with ax back up, ice ax belay (optional)
 - b) Ledge cutting with pick and ax: for belays and setting anchors
 - c) Munter and self-locking belay device (reverso) use (optional)

Reminder: leave the Gri-Gri at home!

 - d) Short-roping (or traveling in coils) using a Mountaineers Coil with a bowline: coil, use doubled bight to wrap coil then tie bowline, clip off end to harness. For use in treed areas, rocky ridges and for climbing with running pro.

Reminder: Do not use on open hazardous slopes/climbs without running pro. Without pro, short-roping is suicide-pact simulclimbing, and should only be done in specific circumstances by highly competent parties. It would be safer to solo.
- 6) Rappel Anchor Techniques
 - a) Ice and snow bollards (demonstrate)
 - b) V-thread (demonstrate) and other natural anchors, and why a few tied runners on the rack are a good idea.
 - c) Body rappel and carabiner brake rappel: for when the rope is too icy to use a regular device (use at practice area)
- 7) Multi-pitch techniques
 - a) Putting it all together: Climb efficiently and quickly on lower angle terrain, hooking in hard ice to save time and energy, rerecking gear as you go
 - b) Finding safe, comfortable belays; hip belays and other techniques for fast movement.



Photo by Chris Dame

Gear

Equipment List for the Program

Warm clothing

- Polypropylene, wool, or capilene long underwear
- Wool, Schoeller, micro-fleece or wind-bloc climbing pants
- Wind pants or Gore-Tex type pants or bibs
- Heavy polypropylene, capilene, or DryClimb style shirt
- Sweater or fleece for extra-cold days
- Wind proof parka or Gore-Tex type jacket – should have a hood
- Gloves or mittens and waterproof shells – bring extra pairs so you can experiment with what works when climbing.
- Hat or balaclava that fits under your helmet. Bring a spare.
- Insulated plastic or winter/ice-designed leather boots. If you are not renting these, you must have an instructor check them out.

- Socks: Silk or synthetic thin liner and a thicker layer of wool or synthetic, sized to help your boot fit well. It is worth experimenting with vapor barrier socks if you plan to climb at altitude or over long expeditions.
- Gaiters: They need to be large enough to cover the tops of the large mountaineering boots and generally do not need to be insulated in New England.

Daypack items

- Synthetic or down belay coat: not too bulky, stuff sack can be helpful
- Spare mittens and clothes: keep weight and bulk to a minimum
- Glacier goggles or sunglasses: Ski goggles and facemask are usually only needed for above treeline, like in Huntington Ravine
- Headlamp with spare battery and bulb: LED lamps last long and are light enough
- Two water bottles insulated in wool socks or foam lined containers
- Food: lunch and high-energy munchies; meats tend to freeze solid
- Knife
- Small first aid kit: ace bandage, tape, pills, etc.
- A watch is useful
- Hand warming packets
- Cell phone
- Thermos bottle of tea, cocoa, miso soup or something good
- Toilet paper, handi-wipe, matches, and baggie

Climbing gear

- Helmet: A hard hat must be worn during all instructional days. If you don't own one, make sure to get a club helmet to use.
- Ice tools: If you have them, bring them, but the program has ice tools to lend to all participants. Tools can often be borrowed from leaders.
- 12-point crampons, either rigid or hinged: The actual point count varies more today than before. The key aspect is that there are front-points pointing outward.
- Slings and carabiners: A locking 'biner on a sling or daisy chain girth hitched to your harness is handy for clipping into belays. Also bring a couple lockers and shoulder slings. Ice clippers or 'biners are useful for racking screws when you are seconding.
- Climbing harness: Adjustable leg loops are handy but not a necessity. Just be sure your harness fits over all of your layers.
- An ATC, Reverso, tuber, or large belay plate of some kind. Belay devices that require a sharp bend in the rope do not work well on iced up ropes. **Gri-gris are not o.k. – leave them at home.**

Where to Get Gear

Ice program sponsors:

- **IME North Conway NH: (603) 356-6316** <http://ime-usa.com/> rents double boots and crampons. They will also rent just crampons. Crampon-only rentals are for plastic boots in good shape. Please allow time for them to fit the crampons to the boots. They close at 9:00 p.m. on Fridays.
- **EMS Boston MA, (617)254-4250 also in North Conway NH (603) 356-5433** www.ems.com Only the North Conway store rents boots and crampons. They rent boots and crampons together only.

Others:

- **Ragged Mountain Equipment, Intervale NH (603) 356-3042** <http://www.raggedmt.com/> They rent boots and crampons as well as sell them. They do not rent crampons without boots.
- **REI, Reading, Boston or Natick, MA: Look online for phone numbers** <http://www.rei.com/> Rents double boots and crampons. The crampons are suitable for climbing, but they may tell you that they are not for technical climbing for liability reasons. It may be advisable not to mention that you plan to climb technical ice with them if you would like to rent from them.

Many places on the web, make sure you allow time for delivery!

- <http://www.killerdeals.com/>
- <http://www.sierratradingpost.com/>
- <http://www.rei-outlet.com/>
- <http://www.mtntools.com/>
- <http://www.blackdome.com/>
- <http://www.promountainsports.com/>
- <http://www.barrabes.com/>
- <http://www.backcountrygear.com/>
- <http://www.gearexpress.com/>
- <http://www.mgear.com/>

Boots & Crampons

IME, EMS, Ragged Mountain Equipment, and REI all rent boots. ***If renting, call early to reserve boots in your size, as you may be disappointed if you don't reserve a pair.*** You will likely need to go to the store to size them.

If you have boots but just want to rent crampons remember that crampons need to be fitted to the boots that you are using. This can take as little as 15 minutes or long frustrating hours (even without drinking!) so plan accordingly.

Crampons come either rigid or flexible, and have three different mounting schemes: step-in bindings, straps or a hybrid of the two. Rigid crampons climb better on steep water ice than flexible crampons. Flexible crampons "walk" better, especially nice for trekking on a glacier. Most crampons today use the step-in attachments; some flexible crampons have straps so they can be used on a wider variety of boots. Step-in bindings hook onto the welt ridge above the sole of the boot. Strapped crampons have the advantage of fitting leather boots or boots that don't have significant welts for the wire bales to clip onto. Hybrids have tension levers in the rear and straps in the front.

The best set-up for this class is a step-in rigid crampon, either dual- or mono-point, on a plastic or leather boot made for ice climbing.

Tools

Tools are a matter of style, and the choice depends on the type of climb that one wishes to climb. Below is a collection of notes to consider in selecting tools.

- It is traditional to climb with one ice axe and one ice hammer. More recently, at least in New England, climbers usually use two hammers.
- When climbing with a single tool (lower angle climbs), the climber will generally want to use an axe in order to cut steps, bollards, bivy ledges, anchors, etc. as well as using the pick for climbing.
- Straight or mildly curved shaft tools enable the climber to plunge the shaft into snow for anchors or support while climbing snow or soft ice. This is a mountaineering concern.
- Aggressively curved shaft and multi-grip tools are best for steep ice. The curve allows placements on top of bulges, and clearance for your knuckles. Multiple grip positions allow for different hand holds and mantle positions.
- Ice hammers enable the climber to hammer objects such as pitons.
- Tools longer than 60cm tend to be difficult to swing.
- Tools shorter than 50cm tend to be too short for general mountaineering, snow climbing, etc., and are not as good to use for self-arrest.
- Steeply drooped picks on tools make them less effective for self-arrest situations.
- Steeply drooped picks enable the climber to climb vertical or overhanging ice much more easily.
- Tools are most commonly sold with a removable pick, and there may be alternative picks of different styles available for each tool.

- The composition of tool shafts is mainly a matter of personal preference in terms of feel and design. Composite (e.g., carbon fiber) tools tend to have a dampened feel, while aluminum shafts can be more stiff and sensitive.
- Recent developments in climbing style have led some climbers to abandon leashes on tools, especially on shorter steep and mixed climbs. Leashless climbing can be more fluid and flexible. Leashed climbing can be more secure and comforting on longer climbs, especially in the mountains where losing a tool can have dire consequences.
- Carrying a spare pick in your pack and the proper tools to change a broken pick can either lengthen your climbing day (when cragging), or substantially shorten it (if in the middle of a long route).

Environmental Conditions

Conditions in the mountain regions can be severe. If you are on Mt. Washington, Cannon, or at Lake Willoughby, you can expect to get cold. Consider this excerpt from a local guidebook:

During the winter months, between December and March, the weather in the mountains of northern New England can only be described as Arctic. Mount Washington [elev. 6,288'], the highest mountain in the northeast, has often been described as having the worst weather in America. High winds, below zero temperatures, and low visibility are common on Mount Washington in the winter. The land wind speed record of 231 mph was recorded on the summit in 1934, before the meter blew away! With "normal" winter temperatures of -10 degrees to -30 degrees Fahrenheit on the mountain, the wind chill can easily drop to below -100 degrees Fahrenheit. When there is an unfavorable weather forecast or avalanche danger on Mount Washington, it is prudent to climb in the more sheltered areas of the Mount Washington valley or Crawford Notch.

Avalanche, falling ice, low temperatures and high wind, are the major objective dangers of which the winter mountaineer must remain vigilant when climbing in New England. Wind slab, powder snow, and wet snow avalanches are all possible depending on the conditions and circumstances. Likewise, climbing below other parties, warm spells of weather, or a south facing location could result in great danger from falling ice. Low temperatures and wind chill are constant problems, yet easily dealt with if you wear the proper clothing. Just remember that a rapid change in the weather can transform a casual, minor climb into the epic of the year.

-S. Peter Lewis and Rick Wilcox, [An Ice Climber's Guide to Northern New England](#)

Conditions in the valleys, where many ice crags are, are usually milder. Normal daytime temps are 15 to 30 degrees and the trees usually break the winds. But you are out in the cold nonetheless.

Philosophy of Staying Warm

In the winter, staying warm and comfortable while you are outside requires you both to generate heat and to keep it from dissipating. You generate it by feeding your internal furnace with adequate food and water. You maintain your warmth by insulating your body from the elements.

If you feel cold it is usually the result of not eating enough food or drinking enough water. Most climbers find that three liters of water is about what they use during a full day though this is somewhat dependent on body type. Drink as much as you would in

summer for the type of activity you are undertaking – more for long slog days, less for cragging. Consider the following a baseline for average days. Start by tanking up at breakfast with a half-liter. Carry two during your day out climbing and try to finish them. Rehydrate before and after dinner. You will find that you stay warmer, climb stronger, and recover faster if you are diligent in staying hydrated. A little powdered energy drink in your water can help you feel strong.

Eat breakfast and especially lunch, even if you do not feel hungry. Lunch might just be a couple energy bars, but you need something. Find a mix of protein and carbs that feels good. Keep your bars in your pocket, or in your water bottle warmer.

Remember that your metabolism will create more heat if you are more active. If you find that you are often too cold, maybe it is because you are not moving fast enough. Ramp up your mental energy, motivate yourself to climb with an enthusiastic attitude, and you will be warmer. Judicious use of caffeine and sports gels, like GU, can quickly boost your energy and attitude.

Even high tech modern clothing does not work so well when wet. In New England you will get wet mostly from sweat. You must make a conscious effort to prevent your clothes from getting soaked with perspiration during heavy exertion. Pay attention to that feeling of beading sweat on your forehead and in your pits. As soon as you feel it, stop and strip off a layer or two.

If you have ever watched a runner out in the cold early morning in Boston you will note that they are often just wearing a pair of tights and a dry-clime shirt - maybe a hat. Think about that when you are hiking up hill with a pack in deep snow to approach your climb. Set out from the car a little underdressed for how cold you feel then. You can bet that in a couple minutes you will be ready to strip yet another layer off. Shoot for the 'comfortably cool' feeling when hiking and climbing, and you will avoid the 'freezing your ass off' feeling at the first belay.

A layering system will allow you to easily adjust the amount of clothing to correspond with the work being performed. Think about the two basic states of ice climbing: a) hiking in with a pack and climbing steep ice, and b) sitting at a belay. When you reduce the day into these two basic states the details of the layering system follow easily. Wear light insulation layer like a capiline shirt under a Gore-Tex or soft shell for movement times. Pull off the shell if it is too warm. Throw on a belay jacket when sitting around. Your hat, gloves, pit-zips, and pant side zips make for small tweaks.

Sometimes, even the best layering system will be inadequate for some people to stay warm, especially in New England during a cold spell. Learn how to spot the early signs of frostbite and hypothermia in yourself and others. Cold toes can become numb toes can become missing toes. Wind, especially above treeline, can multiply the effect of cold and quickly damage exposed skin, or even prevent movement in short order. Prudent planning, alternative exit routes, and a willingness to turn around are the best and lightest first aid kit you can carry.

Eye Protection

When on snow in bright sun and especially at higher altitudes, eye protection must be worn. These glasses should have side guards and the lenses that block out ALL (100%) of the infrared and ultra-violet rays. Ski goggles are sometimes useful during high winds and blowing snow.

For regular cragging, a pair of cheap sunglasses with a keeper string is great. You will not care too much when you step on them with your crampons. Helmets with visors can be the best protection for your face if they do not fog up. Some climbers wear impact resistant safety glasses (the kind used for carpentry for example) when they are climbing difficult thin and mixed routes, to protect the eyes from tools that pop off hold unexpectedly.

Traditional Snow Climbing Technique

We do not cover much French technique or snow climbing technique in the weekend sessions so the following information is an addendum to the curriculum for those with interest in general mountaineering technique. From more complete treatments, see Yvon Chouinard's book *Climbing Ice*, and *Mountaineering: Freedom of the Hills* (listed in appendix).

Terminology for snow & ice climbing

piolet:	ice axe
piolet canne:	ice axe held as a cane or walking stick
piéd marche:	normal walking motion
piéd en cannard:	feet splayed, duck like motion
piéd a plat:	feet pointed in same direction; ascend by side stepping diagonally
German technique:	straight kick stepping: climbing on toes or forward part of feet, front-pointing on crampons; sometimes called Austrian Technique
piéd en avant:	same as German technique.
American technique:	one foot straight in kick step, the other en cannard.

French Technique

French technique is a series of methods to ascend using the bottom points of the crampons. The motivation to use this technique today is that it is easier on the leg muscles, more sustainable for long climbs of a modest angle. Historically, the original crampons did not have front points so these were the only techniques used short of cutting steps.

Slope	Method	Feet	Axe	Emphasis
Mild	piéd marche	normal walking	piolet canne	Feet apart, don't catch crampons on clothing.
	piéd en cannard	splayed out: duck like walk	piolet canne: in uphill hand or piolet marche (in both hands, plant spike uphill of feet)	Feet apart, don't catch crampons on clothing.

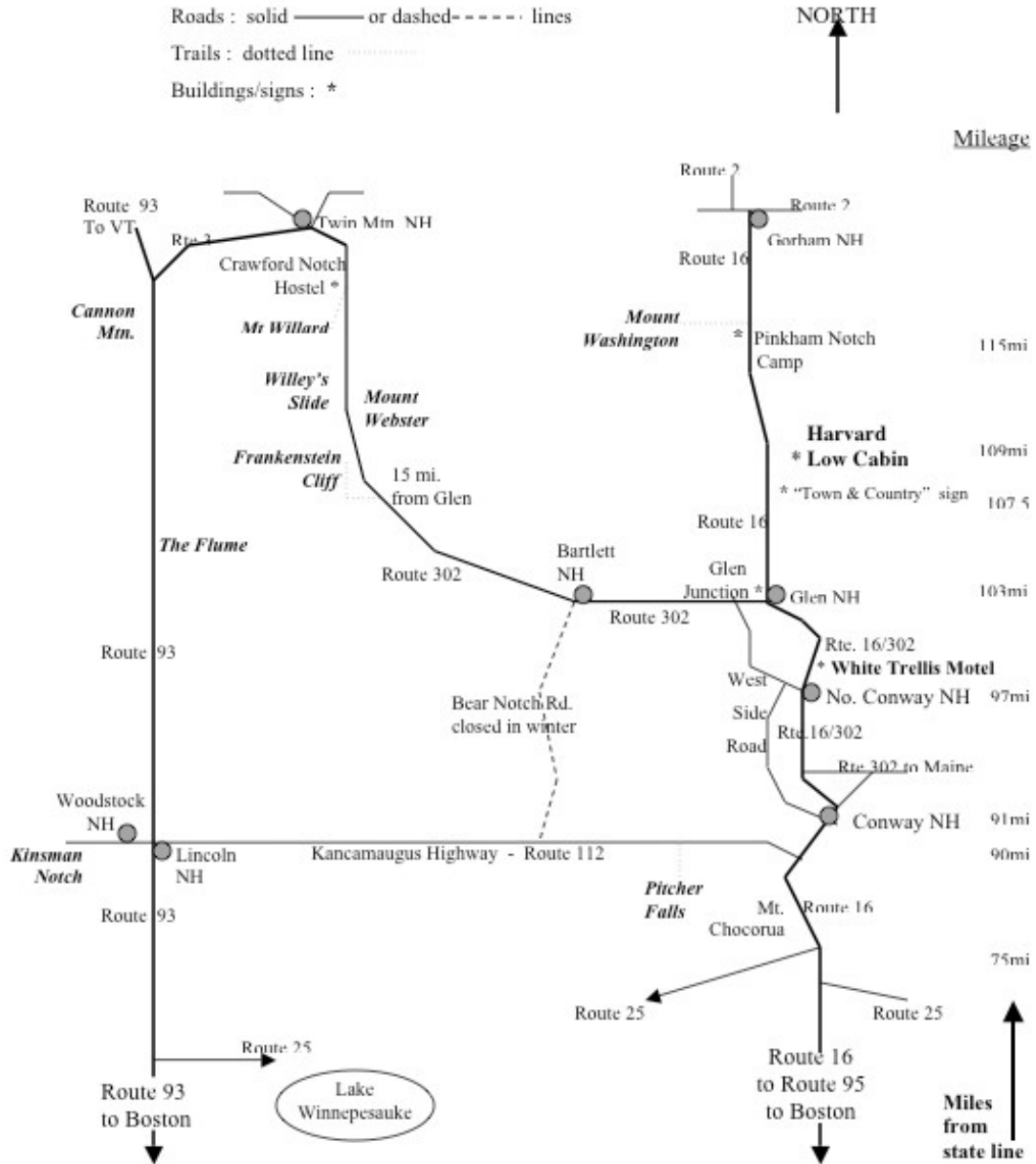
less mild	pied a plat	parallel, climb diagonally up slope.	piolet canne: in uphill hand.	<ol style="list-style-type: none"> 1. Position of balance 2. Progression of returning to position of balance: move axe, cross over step with lower foot, move upper foot. 3. Don't move axe and feet at same time. 4. pacing & rhythm. 5. show turning sequence.
Steep	piolet ramasse/pied a plat.	parallel, climb diagonally up slope.	piolet ramasse: hold axe across body in both hands, plant spike.	<ol style="list-style-type: none"> 1. Same foot movement as pied a plat. 2. Bend ankles to keep all or most points on ice.
steeper and steepest	piolet ancre		piolet ancre: swing axe in one hand and plant pick in ice above.	<ol style="list-style-type: none"> 1. Maximum flex of ankles 2. Option of switching to American or German tech for short bulges. 3. Climb past axe: mantle on adze of axe.
Steepest	pied asis	bend one foot at knee to put all crampon points on ice.	piolet ancre	Usually used as a rest position, stance to place pro.

Directions

General map of North Conway Area

Directions to Harvard Low Cabin, and other important places:

- Note: Ice climbing areas in *bold/italicized* text
- Roads : solid ——— or dashed- - - - - lines
- Trails : dotted line ······
- Buildings/signs : *



Recommended Readings

1. ***Climbing Ice*** by Yvon Chouinard -- Emphasis on classic climbing techniques and mountaineering skills. Great photos that illustrate techniques and principles. The text gives a good sense of the mental attitude and "feel" of the sport, written by the climber who practically invented the modern iteration of the sport 35 years ago. (Supposedly out of print, but still seen in stores.)
2. ***The Ice Experience*** by Jeff Lowe -- Excellent text that stresses techniques for climbing steep frozen waterfalls. The associated video is great, but Jeff's monotone can get to you after a while.
3. ***Ice World Techniques and Experiences of Modern Ice Climbing*** by Jeff Lowe -- Another Excellent text that details techniques for climbing and protection, particularly in mixed ice & rock terrain. Great photography and close ups of protection and gear usage.
4. ***Mountaineering: Freedom of the Hills***, edited by The Mountaineers (Seattle) -- Well respected general mountaineering text with solid sections on ice and snow craft.
5. ***An Ice Climbers Guide to Northern New England*** by S. Peter Lewis and Rick Wilcox (3rd Ed.) -- The guide book you will want for the New England area.
6. ***Extreme Alpinism*** by Mark Twight and James Martin -- A useful collection of insights, guidance and stories that may help you take your climbing into the mountains onto longer routes. Twight's treatments of speed, light-weight ascents and training are especially insightful.
7. ***The ABC's of Avalanche Safety*** by Ed LaChappel -- A handy pamphlet providing the very minimum of information and ice climber should know about the metamorphic and mechanical phenomena associated with snow avalanches. Required reading for a long and safe climbing career.
8. ***Climbing in the Adirondacks***, by Don Mellor -- A guide to the rock and ice routes in the Adirondack range.
9. ***Cold Climbs***, edited by Ken Wilson -- Description of classic British ice climbs with terrific photographs. Great to impress your friends with.

On-line resources

report@neclimbs.com and www.neclimbs.com -- Maintained and authored by Al Hospers, a fun and reliable monitor of recent ice conditions, new climbs and other info

http://groups.yahoo.com/group/AmcBoston_IceGrads/ -- For you, by you

<http://www.mountwashington.org/avalanche/> -- Updated avalanche conditions

<http://alpineclub-edm.org/accidents/>

<http://bostonclimbers.org> – The Mountaineering Committee's very own site

<http://www.neice.com> – Another, broader based ice conditions site, more forum based

<http://www.chesslerbooks.com> – A great long-standing source for mountaineering and climbing books, guidebooks and movies, based in Colorado

<http://www.tuckerman.org/>

<http://www.chauvinguides.com/conditions.htm>