Notes for Field Trip Leaders

First of all, thank you for volunteering to lead an Intermediate Glacier Travel field trip! Without your help, this module wouldn't be possible. This document outlines the material you are expected to cover during the two field days, along with some helpful tips and a sample itinerary. All students attending the field trip should have completed an AIARE Level 1 prior to signing up, but it might be worthwhile confirming with your group ahead of time.

Field Trip Format

This module requires two full days in the field to cover all of the required material. Different from prior years, however, **the field trip does NOT need to be run as an overnight**. Although an overnight trip is preferred, it is entirely up to the trip leader's discretion to spend the night in the field, or to offer two separate outings on non-consecutive days.

Material to Cover

You must cover the topics below during your two days in the field.

Efficient movement on snow

Efficient movement on snow and ice is often the deciding factor between a successful, fun summit and a frustrating slog uphill. Students coming into this course should already be familiar with the basic techniques, although this is our opportunity to review and fine-tune them. This is also a good opportunity to demonstrate techniques for *teaching* these efficiency techniques. Since these students are the future leaders of Basic climbs and SIGs, it's important that everyone knows how to model perfect climbing technique, including:

- **Posturing.** Emphasize the importance of the rest position: standing tall, with head up, shoulders back and chest open, and with all the weight on the downhill leg. This leg should be locked off, supporting the body on the skeleton instead of the muscle. Each step a climber takes should transition from one position of rest to another, as quickly as possible. This technique---known as the rest step---is the most important technique in efficient movement and one that everyone needs to master. Emphasize short steps when walking (one foot right in front of the other), instead of long, lunging steps prevent an effective rest.

- **Breathing.** Many Basic climbs take climbers above 8000', generally considered the line where "high altitude" begins. Remind everyone on the importance of deep, deliberate breathing and the pressure breath. Good posturing (standing tall so the lungs can full expand) is a necessary prerequisite.

- **Footwork techniques without crampons.** When not wearing crampons, traction comes entirely from the boot's sole. Gently placing the boot on the surface of the snow and hoping it doesn't slip is neither effective nor safe. Instead, each step should scuff the snow's surface, carving a level platform for the boot to rest on and locking in the boot's treads. Feet should be kept level whenever possible, with the heel and toe on the same plane and both on the ground. Techniques for this include the "duck walk" for moderate slopes or the crossover step for steeper. For downhill, practice aggressive plunge-stepping (for no-fall

zones) and boot skiing for easier terrain.

- **Footwork techniques with crampons.** Crampons provide traction in firm conditions. The same techniques described above are apropos with crampons as well, except kicking steps will not work. Instead, the climber's ankle should articulate to keep the boot flat on the angled surface, with all of the crampon tines engaged in the snow.

Self and Team Arrests

Practice the three main orientations of self-arrest: on the back with head uphill, on the stomach with head downhill (the "superman") and on the back with head downhill (the "sad turtle"). During rope travel, be sure to practice team arrests as well with simulated falls.

Rope Travel

The rope team is the core of glacier travel. Although simple on the surface, there are an infinite number of tricks and techniques that can make rope travel safer and more efficient for everyone. Be sure to cover the topics below, along with any other tips you have learned from your experience in the backcountry.

- **Rope travel basics.** Before leading a rope team, students should understand why we use a rope and when ropes are appropriate. Review the basics, including general rope construction, basic techniques for clipping in, slack management, and rope interval selection. Emphasize that there is NO single interval that is always the best; the distance between climbers depends entirely on terrain, hazards, and the size of expected crevasses. Denali intervals are much different than Rainier or Shuksan intervals. Talk about storing the extra rope on the ends so that it is accessible in case of a rescue.

- **Other rope techniques.** Stretched out intervals are not always the best. Discuss other rope techniques such as short-roping, belayed climbing, and when it is appropriate to ditch the rope altogether.

- **Protection.** Navigating glaciated climbs requires navigating around and near objective hazards, such as steep or exposed slopes, crevasses, bergschrunds, ledges, etc. It's important to know how to manage each of these types of terrain and how to add additional protection to increase security. This includes where and how to place pickets for running belays, when to pitch out a slope and belay climbers, when to set up fixed lines or hand lines, etc.

- **Off-trail navigation.** Not all climbs will have a well established boot track for teams to follow. Be sure to cover issues such as route selection, identifying objective hazards (such as cornices overhead and crevasses underfoot), obstacle avoidance, exposure, and proper wanding techniques

- **Team dynamics.** In the backcountry, we have safety in numbers. In a group with multiple rope teams, be sure to emphasise the importance of staying together. No fast ropes, no slow ropes. Teams should move together at a safe, consistent pace.

Group camp construction

Almost every glaciated climb involves at least one night in tents on snow. Here are some of the considerations for constructing group camps that should be passed on to the students.

- **Camp-site selection.** If there are dedicated camp locations, then this is an easy task. On longer climbs, however, climbers can often choose where to set up camp, so it's important to talk about what should be considered when making this decision. Emphasize the importance of choosing hazard-free areas (not under ice falls or near large crevasses, for example). Also consider other potential amenities such as easy access to water and comfort.

- **Minimizing impact.** With groups, it's usually better to have one area for the whole team, rather than spreading individual tents out. Not only is this safer and easier to set up, but it helps minimize the impact of a group on other climbers in the area. It also allows us to have designated areas for cooking, obtaining snow for drinking water, and managing human waste.

- **Digging tent platforms.** Camping on glaciated terrain often requires levelling out an area for the tents. Techniques for efficiently digging a tent platform mirror the techniques for rescue-digging: shovel from the uphill side and fill in the down hill. Build one large platform big enough to accommodate all of the group's tents in a row

- **Common areas.** Practice digging common areas for a group site, such as a kitchen with enough seating area for the team and a designated bathroom that provides privacy. Mark the edges of camp with wands, to encourage the climbers to stay in the area determined to be safe.

Winter camping techniques

- **Basic tips and tricks.** With winter mountaineering, the biggest challenge is often staying warm and dry. Be sure to share with groups whatever tips and tricks you know to make winter camping safe and enjoyable. This can be an open-ended discussion that unfolds around lunch or dinner. A few ideas you can start the discussion off with include: dressing appropriately, including layering for insulation and waterproof layers for staying dry; changing socks frequently to keep feet dry; sleeping with water bottles to prevent them from freezing; keeping a clean camp to avoid losing equipment in the snow; staying inside during storms and clearing the tents to avoid collapse.

- **Shelters.** Although not specific to winter camping, discuss improvised snow shelters and fortification. Specifically, demonstrate and practice digging a snow cave and fortifying tent platforms with windwalls. Sleeping in the snow cave is not required, but it could be a unique experience if you are running the field trip as an overnight. A snow saw will be extremely helpful in cutting blocks for building the walls.

Snow anchor construction

The evening lectures will cover basics of SRENE/EARNEST anchors. The field day is an opportunity for students to learn about the mechanics of placing protection in the snow and build an intuition for the strength of these placements. Topics to cover include:

- **Snow evaluation.** The security of snow anchors is entirely dependent on the quality of the snow the anchor is built in. Cover the the things to look for and ways to improve its condition (e.g., through work-hardening the snow or digging down to better snow).

- **Picket placement.** Cover the three main orientations of picket placements and discuss the tradeoffs in security and time. The orientations include vertical top-clip, vertical mid-clip, and horizontal mid-clip (i.e., deadman). For vertical orientations, emphasize the importance of the placement angle of the picket, aiming for around 10 deg back from perpendicular to the surface.

- **Basic ice screw placements.** The Alpine Ice module covers more advanced screw usage, such as V-threads and A-threads. This module should focus on evaluating ice quality, improving potential placements (e.g., by chopping through surface crud), and perpendicular placements.

- **Snow/ice bollards.** Cover the basics of constructing a snow bollard for a non-gear anchor. Emphasize that size and snow quality are the deciding factors on strength. Talk about ways to improve the bollard, such as through work-hardening of the snow or adding padding.

- **Anchor evaluation and pull-tests.** This is an opportunity to build much-needed confidence in snow anchors. Have the students build SRENE anchors using their pickets and pull-test them to failure. Be sure to "belay" the anchors while doing this, so the pulled pickets do not injure any climbers. Have them construct a variety of anchor types and of various quality to see just how e

Crevasse-rescue practice

One of the evening lectures will cover the technical aspects of crevasse rescue. Specifically, they will have already practiced with on-the-ground exercises: transferring a fallen climber to an anchor, escaping the system, rappelling down to the victim to render first-aid if necessary, ascending the rope back to the anchor, and building 2:1, 3:1, 5:1 and 6:1 haul systems. For this field trip, the goal is to practice these skills in a "live-fire" scenario.

Ideally this practice should unfold in a real crevasse or over a steep roll/cornice. Be sure independent belay backups are in place throughout this exercise for student safety if practicing in consequential terrain.

Transceiver searches

All students attending the field trips are AIARE Level 1 certified. They should all already know the basics of single-burial transceiver searches. However, effective searching and efficient rescue-digging techniques are perishable and must be practiced to stay XXX. Also have the students perform beacon checks before entering avalanche terrain, verifying adequate battery and signal.

Bonus Material (not required, only if time permits)

If you have additional time during the field trips, here is a list of additional material that could be covered. This list isn't exhaustive and everything here is considered optional.

- **Self-cleaning rappel anchor.** A common issue in intermediate glacier terrain is descending steeper slopes. The leaders of a rope team can belay their team down (or even lower them if appropriate), but

how do the rope leaders protect themselves as they down climb without leaving gear behind? A quick and effective technique is the self-cleaning rappel anchor (see XXX).

- **Multiple-burial beacon searches.** Most students probably do not have much experience with a multiple-burial beacon search. This is an advanced skill and isn't typically covered in AIARE Level 1 classes. If you have a group that has the basic transceiver search dialed, challenge them to find and recover two or three beacons placed nearby!

- **Evening and morning lectures.** If running this field trip as an overnight, you'll likely have plenty of time in the evening or morning for light lectures on a variety of topics. Since many of the students will likely be leading trips on Rainier, Baker, or Hood in the future, high-altitude medicine is one possibility. You can discuss signs, symptoms, and possible treatments for the spectrum of maladies, including acute mountain sickness (AMS), and high-altitude cerebral edema (HACE) or pulmonary edema (HAPE). Another idea is to share you experience with managing group dynamics in the backcountry. How do you handle turning people or whole climbs around? How do you deal with other leaders or climbers you don't get along with?

- **Anything else.** It's your field trip! Feel free to supplement the required material with anything else you feel is appropriate, interesting, fun, or useful.

Sample Itinerary

The sample itineraries below are just that: samples. As the leader of the trip, you are free to cover the material in any order you choose, as long as all of the topics under the "Material to Cover" section are addressed. These itineraries were written for a non-overnight trip and are intended only as a single example of a possible order and pacing for the material.

Field Day 1

Location TBD, 8am - 330pm

- (800am - 900am) Meeting at parking lot and walking to our training location
- (900am - 945am) Walking in good style
    - Moving efficiently / confidently
    - Posturing, breathing, footwork, etc.
    - Differences with crampons
    - Appropriate pacing
- (945am - 1030am) Self-arrest practice
    - Standard three orientations
    - Discuss arrests with crampons, but no practice is necessary
- (1030am - 1130am) Basic rope travel
    - When to rope up, why we rope up, pros/cons of roping up
    - Slack management, corners, etc.
    - Running belays, when to use, how to place, how to pass
    - Hand lines and fixed lines (up and down)
    - Transitioning to/from group breaks; where to break, how to stay warm and happy at breaks
- (1200pm - 1230pm) Lunch and light discussion on something (altitude medicine? Cold injuries?)

- (1230pm - 200pm) Student-led mini-leads
    - Pick some varied terrain, and have the students lead rope teams; provide feedback on pacing, route selection, hazard evaluation and safety
    - Have them set up running protection, hand lines and belay climbers
    - “Treat every slope like it was 20 deg steeper”
- (200pm - 300pm) Camp site selection and construction
    - Identifying a good location and digging tent platforms
    - Digging common areas (kitchen, bathroom)
    - Improvised snow shelters
        - Snow caves, wind walls
- (300pm - 330pm) Packing up and returning to the parking lot
- (330pm) Depart for home!

Field Day 2

Location TBD, 8am - 3pm

- (800am - 900am) Meeting at parking lot and walking to our training location
    - For crevasse rescue practice, the target area should have at steep roll, edge, or crevasse
- (900am - 1030am) Snow anchors
    - Constructing anchors in snow with a variety of placements, including picket placements, bollards, and basic ice screws placements
    - Pull tests for demonstration; everyone builds a couple of anchors and pulls to failure; make sure to “belay” the anchor to avoid injuries
- (1030am - 1200pm) Crevasse-Rescue practice
    - This should be “live-load”; identify a crevasse, steep roll, etc. and do the rescue over that
    - Provide independent belay backups for students throughout this exercise if in consequential terrain
- (1200pm - 1230pm) Lunch and another light discussion on something
- (1230pm - 200pm) Beacon searches
    - Pre-climb beacon checks (battery and signal)
    - Single (and maybe multiple burial) scenarios
    - Effective digging techniques
- (200pm - 300pm) Packing up and returning to the parking lot
- (3pm) Depart for home!