

## FIELD TRIP #2 – SKILLS TEST AND GLACIER TRAVEL PRACTICE

### Belay, Prusiking, and Leader Tie-off with Belay Escape Tests & Glacier Skills

<b>FIELD TRIP #2– BELAY &amp; PRUSIK TEST</b>	
<b>Time:</b>	Date: March 17 <sup>th</sup> or March 18 <sup>th</sup> Starting Time: Arrive by 6:30 am and be ready to go by 7:00 am. Duration: Approximately eight hours
<b>Location:</b>	<i>Tacoma Mountaineer Clubhouse 2302 North 30<sup>th</sup> St, Tacoma</i>
<b>Purpose:</b>	<ul style="list-style-type: none"> <li>▪ Critical Skills Test: Belaying (Munter and Device – PBUS method)</li> <li>▪ Essential Skills Tests: Prusik and Leader Tie-off with Belay Escape</li> <li>▪ Practice and/or take knot test (must be passed by the end of FT3)</li> <li>▪ 10 Essential Systems checked</li> <li>▪ Practice roped glacier travel and snow belays</li> <li>▪ Practice the kiwi coil</li> <li>▪ Introduction to crevasse rescue systems: 3:1 (Z) pulley demo</li> </ul>
<b>Prerequisites:</b>	<ul style="list-style-type: none"> <li>▪ Lecture 1 &amp; 2</li> <li>▪ Field Trip #1 Prep &amp; Field Trip 1 (or equivalent)</li> </ul>
<b>Assignments:</b>	<ul style="list-style-type: none"> <li>▪ Reading: <i>Freedom of the Hills, 9th edition</i> Glacier Travel and Crevasse Rescue... Chapter 18 Snow Travel and Climbing.....Chapter 16</li> <li>▪ Study: Information contained in Field Trip 2 Information required for Lecture 2 Information and assignments for Field Trip 1 Prep and Field Trip 1</li> </ul>

### EQUIPMENT

**See Required Equipment FT2 on the Equipment Matrix (Lecture 1)**

### PROCEDURE

When you walk in, start getting ready for the day by putting on your helmet, harness, and boots. Next the field trip leader will split you into groups and/or assign you to your first station. At each skill testing station (prusik, belays, and leader tie-off with belay escape), you will be expected to correctly and proficiently perform each skill without help from the instructor. For the remainder of the stations you will start preparing for Field Trip 3 by practicing roped glacier travel skills, knots, and 10Es. At the end of the day, the instructors will demo the 3:1 (Z) pulley crevasse rescue system. If you can, take your Knots Test. It must be passed by the end of Field Trip 3.

### Rules

1. Helmet and gloves REQUIRED at the belay, prusik, and leader-tie off w/escape stations.
2. Correct clothing and mountaineering boots are required for this field trip.
3. You should come prepared for the skill tests prior to showing up for the field trip, no help will be given by the instructors to pass the skills test.
4. You will fail (receive a NS grade at a testing station) if you do anything considered unsafe or need instruction.

### 10 ESSENTIAL SYSTEMS STATION

At this station, we will continue refining what you carry for your 10 Essentials, and talk about things that you could/should have. Your 10 Essential System will be “tested” at the beginning of Field Trip 3, and checked on EVERY field trip after that.

### KNOTS STATION

At this station you will continue to practice correctly tying and dressing knots, as well as memorizing their uses. If you feel ready, ask the instructor if you can take the knots test. It must be passed by the end of Field Trip 3.

## **BELAY TEST STATION (Munter and Device)**

This is a test of your ability to perform the **Critical Skill** of belaying a fellow climber. You will be expected to perform four belays (both right and left handed, munter hitch and device) with no coaching from the instructor.

Assumptions/Scenario: The leader has just finished building the anchor, you now need to set up the belay in order to start the rock climb.

NOTE: You should already have your helmet on and your slings, carabiners, and gloves on you or very nearby.

### Grading Criteria

1. System Setup and Stance:
  - a. Flake out the rope on the side of you that you plan to brake. Instructors are looking for you to have the rope on the same side as your braking hand.
  - b. Correctly tie-in. Instructors are looking for a dressed re woven figure 8 and overhand back up knot, attached to your seat harness through both hard points, using the “bottom” of the stack of rope.
  - c. Attach yourself to the anchor. Instructors are looking that you have clove hitched to the anchor with the rope, no more than an arm’s length away.
  - d. Set up the belay. Instructors are checking that you have taken the rope coming from the climber, and attached it to your seat harness by either correctly threading it through your belay device with a locking carabiner attached to your belay loop or with a munter hitch on a locking carabiner to your belay loop (make sure to lock the carabiner).
  - e. Do a safety check with climber. Instructors are looking for the following checks:
    - i. Check that all harness buckles are double-backed (if applicable) and the harness is on correctly.
    - ii. Check that the figure 8’s are tied and dressed correctly.
    - iii. Check that the rope is tied to both hard points of the harness.
    - iv. Check that the belay device/munter hitch is set up correctly and the carabiner is locked.
    - v. Check that the anchor is SERENE (or as close to SERENE as possible) and all carabiners are locked.
2. Climbing Signals: Instructors want to hear you use the following signals and see that you take the proper actions of taking in or paying out rope.
  - a. On belay
  - b. Belay on
  - c. Climbing
  - d. Climbing on
  - e. Watch me
  - f. Take
  - g. Slack
  - h. Falling
3. Belay Technique. Instructors are looking for the proper hand movements of the PBUS method of belay while the leader is climbing, and that you never let go of the braking strand.
4. Braking Technique. Instructors will be watching to make sure you can safely catch an unsuspecting falling climber using the correct braking positions. Forward braking with the Munter hitch. Down/backward braking with the belay device.
5. Lowering Technique. Instructors will check that you can safely lower a climber; you are able to maintain control of the lower, and stop lowering when commanded.

## **LEADER TIE-OFF AND ESCAPING THE BELAY TEST STATION**

This is a test of your ability to perform the **Essential Skill** of tying-off a lead climber and escaping the belay to go get help. You will be expected to perform this skill with no coaching from the instructor. You will only be required to tie-off the leader using your belay device and you can choose if you want to belay either right or left handed.

Assumption/Scenario: You are setting up to go on a rock climb, and the leader has just finished building the anchor. After you set up the belay (same as the belay test station) the lead climber begins to climb, falls, and cannot be lowered so you must tie them off and escape the belay to go get help.

NOTE: You should already have your helmet on and your slings, carabiners, and gloves on you or very nearby.

Grading Criteria

1. System Setup and Stance (same as belay test station)
2. Climbing Signals (same as belay test station)
3. Belay Technique (same as belay test station)
4. Braking Technique (same as belay test station)
5. Leader-Tie Off

## Step 1: Go hands free:

Tie off the *belay device/munter* with a mule knot (device-mule/munter-mule) backed up with an overhand knot and a carabiner clipped through the bight and around the rope.

Grading: Instructors will be watching to make sure you always have a hand on the braking strand and that the mule knot is tied correctly. That the device-mule knot or munter-mule knot is backed up with an overhand knot and non-locking carabiner. All knots should be tied very close to the device or carabiner.

## Step 2: Transfer the load to the anchor:

- A) Attach the tie-off/hero loop to the rope of the fallen climber using a prusik hitch and clip the hero loop with a locking carabiner.

- B) Using the rope coming from the backside of the clove hitch (belayer's tie in) off the anchor, tie a munter-mule overhand knot to the locking carabiner clipped to the hero loop, and back up the mule overhand knot with a non-locking carabiner clipped through the bight and around the rope.

Grading Part A and B: Instructors are looking to make sure you have correctly tied the munter mule overhand knot and prusik. That you have minimal slack to the anchor (so the climber is lowered very little or not at all), and that you have locked your carabiner on the prusik

- C) Untie the first overhand backup knot and device-mule/munter-mule, and slowly transfer the load to the tie-off loop using the *belay device/munter*.

Grading Part C: Instructors are watching that you never let go of the braking strand, and that you slowly lower the lead climber, watching to make sure the prusik catches and will hold the weight.

## Step 3: Connect the rope from the fallen climber to the anchor to remove yourself from the system:

- A) Using the slack rope (braking strand) behind the belay device/munter, tie a munter hitch on a new locking carabiner attached to the anchor. This step introduces a secondary belay point.

- B) Now it is safe to remove the primary *belay device/munter* maintaining control of the braking strand through the secondary munter off the anchor.

Grading Part A and B: Instructors are watching to make sure you always have a hold of the braking strand and that you attach the locking carabiner to the master point of the anchor.

- C) Take in all the slack from removing the primary belay munter/device, and tie off the munter connected to the anchor with a mule knot (munter-mule) backed up with an overhand knot and a non-locking carabiner clipped through the bight and around the rope.

Grading Part C: Instructors are looking to make sure you do not let go of the braking strand, take in all the slack from removing the belay device, and correctly mule overhand knots.

## Step 4: Back up the system:

Back up the munter-mule to the anchor with a catastrophe knot (an overhand or figure-eight on a bight) attached to the anchor with another locking carabiner.

Grading: Instructors are looking for you to have placed the locker on the master point of the anchor and locked it after attaching the catastrophe knot.

## Step 5: Get your gear back, get out of the system, and go get help:

- A) Untie the overhand/carabiner backup and mule knot coming from the munter on the carabiner clipped to the hero loop, and slowly transfer the load back to the rope of the fallen climber. Now that the load has been fully transferred to the rope attached to the anchor, remove the munter, locking carabiner and prusik hitch.

Grading Part A: Instructors are watching that you slowly transfer the load back to the climber's rope.

- B) Get out of the system: Untie the figure-eight from your harness and go get help.

Grading Part B: Instructors want to know that you know when you would come out of the system.

## Step 6: You made it back with help, and now need to lower the lead climber.

Grading: Instructors are looking that you always have your hand on a braking strand when removing the munter mule over hand knots, and that you have control while lowering the fallen climber.

## **SELF CREVASSE RESCUE (TEXAS PRUSIK) TEST STATION**

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This is a test of your ability to perform the Essential Skill of self-rescue from a crevasse. You will be expected to perform this skill with no coaching from the instructor.

Assumption/Scenario: You have fallen into a crevasse and are basically uninjured and able to maneuver in the crevasse. The rope is icy and your pack is heavy so after a couple of hauls you decide to softly drop your pack so you can get out of the crevasse more efficiently (because Brrrr its cold down there).

NOTE: You should already be wearing your helmet, chest harness, and back pack (with pack-sling set up). If you do not have these items set up, or on, do it when you arrive at the station.

### Grading Criteria

1. Tying In/Attaching Prusiks (also see section below: roping up for glacier travel on a 3 or 4 person team)
  - a. End of the rope tie-in: use a dressed rewoven figure 8 and overhand back up knot, attached to your seat harness through both hard points. Prusiks go above the overhand knot with the chest prusik above the foot prusik. The chest prusik should be attached to the belay loop of your seat harness with a locking carabiner.
  - b. Middle of the rope tie-in: use a butterfly knot. Attach the butterfly knot to the belay loop of your seat harness with two locking carabiners opposite and opposed. Your prusiks should be attached to either side of the butterfly knot. Your chest prusik is placed on the same side of the butterfly knot as the lead climber. Then attached to the belay loop of your seat harness with another locking carabiner. The foot prusik is attached to the opposite side of the knot (going to the following climber).

Grading: Instructors will check that you have correctly tied-in, attached your prusiks, and locked your carabiners.
2. Ascending/Descending

Suspended in the air, you will be expected to don your foot prusiks and connect your chest prusik to your chest harness. Once this is complete, you will start ascending the rope until you have enough slack to softly drop your pack. Continue ascending the rope until you reach the rafters, then descend to the ground.

Grading: Instructors will be watching to make sure you SOFTLY drop your pack.
3. Physical Conditioning

You risk hypothermia if you cannot quickly get out of the crevasse.

Grading: You have 20 minutes to ascend the rope and touch the rafters.

## **GLACIER TRAVEL SKILLS STATION**

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With Field Trip 3 quickly approaching, we need to start introducing and practicing glacier travel skills.

### **ROPING UP FOR GLACIER TRAVEL**

**Leader:** Ties into the rope with a Rewoven Figure-8. Lower prusik tied on next to the Figure-8 and the foot loops are tucked into the pockets to keep them out of the way. The upper prusik is tied on above the foot prusik and clipped into a locking carabiner off of the belay loop of the seat harness.

**Middle:** Ties in with an Alpine Butterfly, secured to the harness using two opposite and opposed locking carabiners. Typically the seat prusik is tied into the rope going to the leader and foot prusik is tied into the rope going to the end climber. The foot loops are tucked into pockets or clipped to the harness to keep them out of the way. The chest/waist prusik loop is clipped into the belay loop of the seat harness using a separate locking carabiner.

**End:** The end person is tied in exactly the same way as the leader.

**THE KIWI COIL** The "Kiwi Coil" is commonly used for glacier travel when the rope needs to be shortened, resulting in closer spacing between climbing partners. Typically only the end climbers will coil and carry the extra rope. NOTE: your prusiks are placed on the rope after the coil is finished.

Step 1: Tie into the end of the rope with a rewoven figure 8 through both hard points of the harness, back up the figure 8 with an overhand knot.

Step 2: Start coiling the rope over your neck and around your hand with your palm facing down as seen in figure 1 (your palm should be at or very near your belay loop, the pictures have the coils too short, which can pull on you neck in the event of arresting a fall). Continue coiling up the rope until you have taken in the desired amount. Typically 8-12 coils, but it depends entirely on the specific situation.



Figure 1

Step 3: Take the coils, keeping them around your neck, but putting your arm through the center so that they are now over the shoulder opposite the hand you used to coil around. The free end of the rope should come down from behind the shoulder the coils were placed over (figure 2).

Step 4: Take free rope end into your hand (figure 2) and begin to “tie off.” Make a bight in the free end and pass it through your belay loop (figure 3). Pull the bight through the belay loop with your other hand (figure 4). Pull out roughly 18" to 24" (figure 5).



Figure 2



Figure 3



Figure 4



Figure 5

Step 5: Now reach under the coils at your chest and grab the bight with the hand that the coils cover the shoulder (figure 5). Now, draw the bight back through the chest coils to the other side (figure 6).



Figure 6



Figure 7



Figure 8



Figure 9

Step 6: Take the bight and wrap it under the rope leading to your partner (figure 7). Continue wrapping it around this strand (figure 8) and then make an over hand knot with the bight upon itself (figure 9). It is important that the knot is finished with the end leading away from you.

Step 7: Finally, clip this end of the bight back into a locking carabiner onto the belay loop your harness. Now put your prusiks on the rope, and then you are ready to go.

## **BELAYING TEAM MEMBERS IN AND OUT ON A GLACIER**

The purpose of belaying your rope team members into or out of rest stops and camps on a glacier, is to never allow a significant amount of slack in the rope between yourself and your rope team members. Less slack lowers the momentum that can be gained by a falling climber. The two main methods for quick and less formal belays taught in the Tacoma Basic Climbing Course are the Seat Harness Prusik Belay and Carabiner-Ice Axe Belay.

**Seat Harness Prusik Belay:** The Seat Harness Prusik belay is a simple and the fast method of establishing an anchor for belay into or out of rest areas and camp, where a bomb-proof anchor is not needed and slip is less likely.

NOTE: The leader will probe the immediate area for hidden crevasses when stopping on snow slopes of a glacier.

Step 1. Pull 3-5 feet of rope from your harness (moving your chest prusik along the rope).

Step 2. Tie a clove hitch, and slide it up the shaft of the ice axe to the base of the head. Then plunge the axe into the snow, with the head of the axe perpendicular to the direction of fall.

Step 3. Place your uphill foot on the head of ice axe (make sure not to step on the rope), and set up a sturdy belay stance.

Step 4. Use your seat harness/chest prusik to take up rope, belaying your team member in by pulling the climbing rope through the prusik knot. The next climber in on the rope team would repeat the same procedure.

Note: A climber positioned in the middle of a rope team will belay in a follower using their foot prusik – for this application the prusik foot loops must be attached to the belayer's belay loop with a locking carabiner.

The same system can be used when departing camp, paying out the rope between climbers through the prusik knot. The last climber out of camp should however have the system ready to set up (the chest prusik should be close to the second climber), but remain ready to arrest in the chance that the lead climber falls.

**Carabiner-Ice Axe Belay:** The Carabiner-Ice Axe belay should be used to provide a top belay to a weak or tired climber whom is ascending or descending a slope and a slip may be more likely. Note: this is not a bomb-proof anchor which would be required if a fall (not slip) is more likely. Please refer to *Freedom of the Hills*, Belaying on Snow (Pages 357-359) for set up and stance.

## **SELF-BELAY WITH A PRUSIK ON A FIXED HANDLINE**

Fixed hand lines are used as a safety backup, for an unroped party on less technical but exposed terrain (where a slip and/or fall could severely injure or kill a climber) to save the time it would take to belay multiple party members across. It is not to be used in Class 5 rock situations where climbers should be properly belayed. If the slope is so steep that the climber cannot safely use one or both hands to slide the prusik knot along the fixed line then an anchored belay should be set up and utilized.

**PROCEDURE:** Tie a properly dressed prusik knot (a loose or sloppy prusik with not bite the rope if a fall occurs) onto the fixed line, and secure it with a locking carabiner to the climber's belay loop of their seat harness. The climber slides the knot along the rope with one or both hands constantly checking the knot to ensure that it is snug and dressed.

## **3:1 (Z) PULLEY CREVASSE RESCUE SYSTEM DEMO STATION**

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You will be introduced to the 3:1 (Z) pulley crevasse rescue system. Instructors will demonstrate the proper set-up and perform a simulated rescue.